

W.Quapp and J.M.Bofill

Sliding Paths for Series of Frenkel – Kontorova Models–
A contribution to the concept of 1 D – superlubricity

Supplementary Material 5

MF reci golden mean 0.618034 .. N = 50, .. 69 with runaway 101

reci GOLDen mean ### ## ## ## ## ## ## ##

N = 50 GOLD a0 - min

k = 1.0 ;

as = 6.283185307180;

a0 = 2./(1. + Sqrt[5.])*as;

Setxx = Table[a0*(i - 1), {i, 50}];

SetAA = Table[A[i], {i, 50}];

SetX = Setxx + SetAA;

VVV = Sum[1 - Cos[SetX[[i]]], {i, 50}] + Sum[k/2.*(SetX[[i + 1]] - SetX[[i]] - a0)^2, {i, 49}];

 GGG = Table[D[VVV, A[i]], {i, 50}];

Set00 = Table[-0.172, {i, 50}];

Set22 = Table[0.172, {i, 50}];

SetAA00 = Riffle[SetAA, Set00];

SetA0 = Partition[SetAA00, 2];

SetAA22 = Riffle[SetA0, Set22];

SetFl = Flatten[SetAA22];

SetFin = Partition[SetFl, 3];

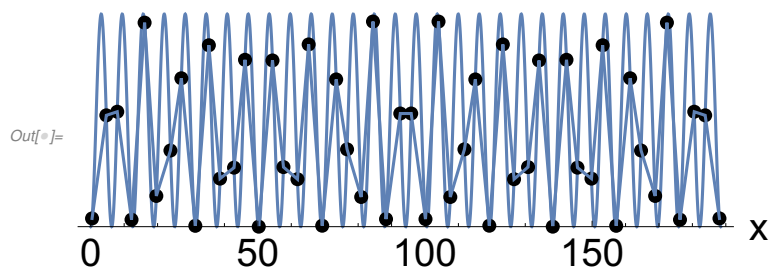
NMinimize[VVV, SetFin]

HHH = Table[D[GGG, A[j]], {j, 50}];

```
{0.396071083233199, 4.665089666043752, 7.93522680872834, 12.20206536018995,
16.11260374083238, 19.62945389410812, 23.84951110126390, 27.11063143833817,
31.29002726159528, 35.34385617188342, 38.68991495043762, 42.87244025257562,
46.15933057199621, 50.26801880624936, 54.37924366978276, 57.66435902038589,
61.84768950907378, 65.19821070454103, 69.24861569458302, 73.43220099203329,
76.69287678173335, 80.91566675883263, 84.44538441412723, 88.34380870221942,
92.61242369619534, 95.88312196295188, 100.1517380620413, 104.0501518437388,
107.5798802286678, 111.8026717231870, 115.0633465824597, 119.2469354368587,
123.2973361343972, 126.6478616622913, 130.8311922821547, 134.1163047697492,
138.2275330690451, 142.3362180276984, 145.6231116778348, 149.8056370221162,
153.1516922071356, 157.2055254203531, 161.3849191537774,
164.6460413102171, 168.8660982319011, 172.3829435905989,
176.2934880405073, 180.5603276545389, 183.8304660899565, 188.0994863228326}
```

Eigenvalues

```
Out[ ]= {4.26483, 4.2529, 4.23521, 4.20884, 4.17649, 4.13514, 4.09178, 4.03448, 3.99561,
3.92054, 3.83509, 3.77108, 3.69348, 3.61848, 3.53776, 3.46933, 3.38942, 3.35752,
3.04897, 3.04895, 2.46843, 2.41425, 2.35157, 2.27095, 2.18349, 2.09572, 2.014,
1.94703, 1.88944, 1.64661, 1.64658, 0.940828, 0.913994, 0.843728, 0.781229,
0.710552, 0.632684, 0.582798, 0.487243, 0.482986, 0.326758, 0.310901, 0.198256,
0.17428, 0.115939, 0.0898777, 0.0578822, 0.0329714, 0.0303176, 0.00569968}
```



SP node259 energy = 46.2945208 detHess - 86.744
 0.4597544579 × 4.7803112755 × 8.1031739254
 12.3951485113 × 16.5167363886 × 19.9148835678
 24.1879783742 × 27.6507151758 × 31.6974285145
 36.0219406743 × 39.3521053044 × 43.6788936518
 47.7069120240 × 51.1843809914 × 55.4567838062
 58.8416899769 × 62.9769323015 × 67.2567454537
 70.5776018793 × 74.8926068495 × 78.7232646308
 82.3715013288 × 86.6563464211 × 89.9754598277
 94.1992954213 × 98.3746658217 × 101.7166018681
 105.9852764815 × 109.5167802767 × 113.4732847179
 117.7969447505 × 121.1206864429 × 125.4301194130
 129.5080840545 × 132.9397032278 × 137.2088878666
 140.6253428604 × 144.7207441996 × 149.0221422302
 152.3441768087 × 156.6659453583 × 160.5857255783
 164.1490233811 × 168.4199985333 × 171.7498277617
 175.9409292809 × 180.1437712103 × 183.4679810084
 187.7429285428 × 191.3343148442

node 271 energy = 46.286441 detHess - 37.93

? BBP point crossed ?

0.3984031131 4.7235401485 × 8.0487393575
 12.3550331523 × 16.4515591550 × 19.8711461616
 24.1436723899 × 27.5806839207 × 31.6570434058
 35.9721902269 × 39.2994998651 × 43.6263717009
 47.6047855762 × 51.1206259158 × 55.3911313038
 58.7458201527 × 62.9106779479 × 67.1542790167
 70.4729569727 × 74.7690619027 × 78.4766995837
 82.2474121224 × 86.5543874390 × 89.8742295564
 94.1372129058 × 98.2898546954 × 101.6588697806
 105.9314011613 × 109.4314450104 × 113.4320941667
 117.7612845380 × 121.0916478954 × 125.4121810434
 129.4838328320 × 132.9278321663 × 137.2028525034
 140.6220061581 × 144.7225521405 × 149.0308636420
 152.3580863020 × 156.6852670334 × 160.6282251598
 164.1753272695 × 168.4484444180 × 171.7904098169
 175.9723225312 × 180.1973558015 × 183.5194436888
 187.8069568237 × 191.4590112976

emerges new glob min !

START energy 45.341737719109737

0.4005880275 × 4.6696070275 × 7.9397470275
 12.2066170275 × 16.1171170275 × 19.6340170275
 23.8540170275 × 27.1151170275 × 31.2945170275
 35.3484170275 × 38.6944170275 × 42.8769170275
 46.1638170275 × 50.2725170275 × 54.3837170275
 57.6689170275 × 61.8522170275 × 65.2027170275
 69.2531170275 × 73.4367170275 × 76.6974170275
 80.9202170275 × 84.4499170275 × 88.3483170275

92.6169170275 × 95.8876170275 × 100.1565170275
 104.0545170275 × 107.5845170275 × 111.8075170275
 115.0675170275 × 119.2515170275 × 123.3015170275
 126.6525170275 × 130.8355170275 × 134.1205170275
 138.2325170275 × 142.3405170275 × 145.6275170275
 149.8105170275 × 153.1565170275 × 157.2105170275
 161.3895170275 × 164.6505170275 × 168.8705170275
 172.3875170275 × 176.2975170275 × 180.5645170275
 183.8345170275 × 188.1035170275
 SP node260 energy = 46.2940082 detHess - 108.03
 0.4511820286 × 4.7728656341 × 8.0963773952
 12.3906548654 × 16.5101194256 × 19.9107273541
 24.1842628469 × 27.6452688758 × 31.6946639048
 36.0192009038 × 39.3496849982 × 43.6769886087
 47.7037047570 × 51.1825517626 × 55.4552215001
 58.8396757445 × 62.9757961404 × 67.2553630457
 70.5763661270 × 74.8913835045 × 78.7209837816
 82.3704060272 × 86.6555916015 × 89.9748498587
 94.1990899815 × 98.3746597138 × 101.7167984682
 105.9857496353 × 109.5178497801 × 113.4739822206
 117.7979189518 × 121.1219253678 × 125.4314134709
 129.5106923533 × 132.9416377195 × 137.2112038674
 140.6292524252 × 144.7233717917 × 149.0260583729
 152.3485975341 × 156.6709628606 × 160.5959391482
 164.1549092189 × 168.4257029117 × 171.7572940655
 175.9463395839 × 180.1525352444 × 183.4759477500
 187.7525374559 × 191.3526108575
 gMin node708 energy = 45.214916208 detHess 956.37170128
 0.5205689947 × 4.8966730867 × 8.2897094938
 12.5893089753 × 16.9118448062 × 20.3009420704
 24.6829184067 × 28.6300887551 × 32.2289610335
 36.5542094298 × 39.9687880362 × 44.1489299598
 48.4949346281 × 51.8608233800 × 56.2264109284
 60.2752904502 × 63.7719455519 × 68.0762132942
 71.5186721703 × 75.6339102384 × 79.9826589189
 83.3395825176 × 87.6926911572 × 91.7772346501
 95.2399712901 × 99.5399344537 × 103.0033066791
 107.0870775482 × 111.4403999789 × 114.7974300991
 119.1461128404 × 123.2625283695 × 126.7043496695
 131.0089007840 × 134.5070805082 × 138.5544576847
 142.9205569208 × 146.2868961454 × 150.6327342279
 154.8155894930 × 158.2292695517 × 162.5555651573
 166.1594704890 × 170.1015161752 × 174.4834848187
 177.8732673372 × 182.1941852110 × 186.4969153905
 189.8897846115 × 194.2671056447


```

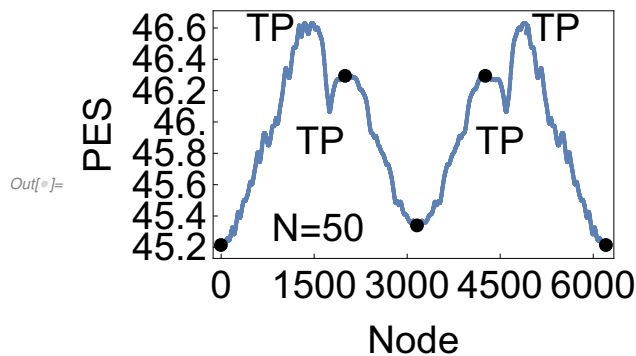
start energy 45.208363973673 detHess 833.207
0.5253763732 × 4.9008081518 × 8.2939378978
12.5918384557 × 16.9152041071 × 20.3039313351
24.6858893133 × 28.6357185843 × 32.2319769446
36.5566809512 × 39.9717388073 × 44.1504582568
48.4965476081 × 51.8622010942 × 56.2275201962
60.2771829740 × 63.7730440906 × 68.0771668953
71.5199628370 × 75.6345836863 × 79.9833706515
83.3402390024 × 87.6932380013 × 91.7781977411
95.2405951525 × 99.5405627753 × 103.0042811692
107.0876351041 × 111.4410783946 × 114.7981681799
119.1468180469 × 123.2638859891 × 126.7053570510
131.0100688813 × 134.5090991050 × 138.5556390905
142.9220213319 × 146.2886111228 × 150.6343538657
154.8187117965 × 158.2319030026 × 162.5587833189
166.1655024091 × 170.1046805053 × 174.4866210324
177.8767716077 × 182.1967739648 × 186.5011770088
189.8939586026 × 194.2719171232
SP node1430 energy = 46.2948673 detHess 18.78
? BBP point crossed ?

```

```

3.3140694052 6.9689960552 × 11.2572233675
14.5794859618 × 18.8055100251 × 22.9875024322
26.3299994630 × 30.6035385778 × 34.1511460914
38.0940340113 × 42.4216582804 × 45.7493341360
50.0578165080 × 54.1601223196 × 57.5785629307
61.8542485557 × 65.3007735304 × 69.3703767968
73.6925529320 × 77.0238108429 × 81.3535681117
85.3613257233 × 88.8563855188 × 93.1296432290
96.5036140068 × 100.6519797437 × 104.9210651570
108.2416375983 × 112.5519588744 × 116.3435400089
120.0307000185 × 124.3231890682 × 127.6420754239
131.8790473436 × 136.0482271900 × 139.3983628406
143.6685790491 × 147.1910345753 × 151.1608580098
155.4870801393 × 158.8135389258 × 163.1267247557
167.2060045566 × 170.6398483947 × 174.9118217938
178.3330682469 × 182.4269119778 × 186.7336518193
190.0585978670 × 194.3835138241

```

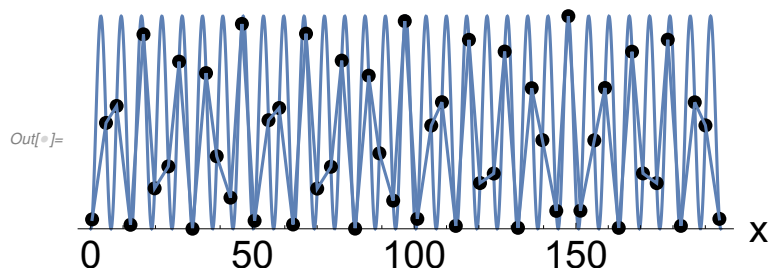


```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

```
N = 51 GOLD a0 - min
```

```
ENERGY 46.13964863
```

```
SetX = {0.4228750938590679, 4.716481151851787, 8.01009558276648,
12.29154895996311, 16.301627048824404, 19.75230347110872,
23.988011748395916, 27.31312169407168, 31.458117820198563,
35.645292714257856, 38.94687260281943, 43.196728649601624,
46.73935747882589, 50.6571119633048, 54.95656150222538, 58.256238089231175,
62.54657568543178, 66.55548964410052, 70.01467115021633, 74.25695124008892,
77.59006720309799, 81.73645272233256, 85.93785417941614,
89.24140977034973, 93.5020633121555, 97.0842186772925, 100.96681370971838,
105.27158873823235, 108.57676234344518, 112.86359563611501,
116.91881159982498, 120.34532519554766, 124.5937762907388,
127.96506056315832, 132.08114694677025, 136.33108587415117,
139.63439895897673, 143.92388719887617, 147.6575339735989,
151.3885014966485, 155.67753572312137, 158.98076597280607,
163.22992932065927, 167.3465947795957, 170.71716106405282,
174.96548313827336, 178.39249411603814, 182.44696532175564,
186.7338821373763, 190.0389614364411, 194.34366554045545}
```



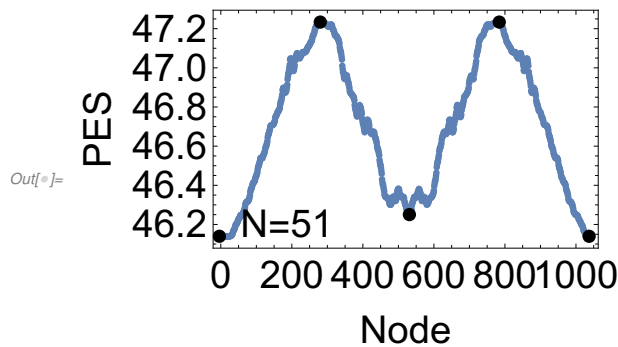
```
cut 25 nodes at start
```

```
SP node280 energy = 47.233713382 detHess - 1329.391
```

```
0.5191041320 × 4.8952124793 × 8.2879865446
12.5880495441 × 16.9097897754 × 20.2988306266
24.6804968077 × 28.6251775696 × 32.2261681093
36.5516123668 × 39.9653169690 × 44.1468134199
48.4920850220 × 51.8578101217 × 56.2233034310
60.2691427147 × 63.7678933210 × 68.0718602890
71.5118185743 × 75.6296107984 × 79.9767309109
83.3327998069 × 87.6856227249 × 91.7630785131
95.2298760517 × 99.5283369015 × 102.9839097522
107.0749763372 × 111.4239217357 × 114.7781276877
119.1262901952 × 123.2229518490 × 126.6747548297
130.9739469441 × 134.4465923954 × 138.5179495503
142.8732199012 × 146.2308867872 × 150.5777937360
154.7077851719 × 158.1418243542 × 162.4492883715
165.9650872851 × 169.9944417086 × 174.3652266114
177.7360348682 × 182.0791124591 × 186.2893226740
189.6947223958 × 194.0318576492 × 197.6896352820
iMin node531 energy = 46.250395742 detHess 2028.86
0.5403806253 × 4.9334302885 × 8.3508102756
```

12.6472888391 × 17.0245973508 × 20.4340315862
 24.8433722610 × 28.9673654503 × 32.4524863013
 36.7982647631 × 40.3601900431 × 44.3843507552
 48.7998204825 × 52.2208117371 × 56.5687767271
 60.9368493244 × 64.3570184153 × 68.7761465936
 72.8628326589 × 76.3797687185 × 80.7280617750
 84.2609968667 × 88.3268156480 × 92.7469867439
 96.1696070817 × 100.5312460549 × 104.8931661681
 108.3157779562 × 112.7359985509 × 116.8026939536
 120.3350163638 × 124.6833610228 × 128.2010161207
 132.2868431485 × 136.7061117308 × 140.1264766981
 144.4942994801 × 148.8431608134 × 152.2642840677
 156.6801116598 × 160.7069621242 × 164.2669525352
 168.6128332297 × 172.0997872367 × 176.2215868759
 180.6316360478 × 184.0417346364 × 188.4185912716
 192.7185559343 × 196.1359018839 × 200.5305136960
 SP node784 energy = 47.233795 detHess = 1674.19
 3.3834925198 × 7.0359083224 × 11.3719527553
 14.7779953450 × 18.9856386984 × 23.3289452089
 26.6992735665 × 31.0695928333 × 35.1004606092
 38.6146717400 × 42.9217867534 × 46.3562968792
 50.4852121635 × 54.8320932839 × 58.1895812353
 62.5446119867 × 66.6163353112 × 70.0885479663
 74.3876252185 × 77.8395524764 × 81.9358992129
 86.2839980295 × 89.6381188062 × 93.9869676822
 98.0779514546 × 101.5334944783 × 105.8318725222
 109.2984866208 × 113.3760477289 × 117.7287266093
 121.0846840266 × 125.4317612579 × 129.5489677283
 132.9891814411 × 137.2929563584 × 140.7908748751
 144.8374817555 × 149.2026578637 × 152.5680983035
 156.9134351796 × 161.0933386068 × 164.5075521097
 168.8323658630 × 172.4303892361 × 176.3780712416
 180.7597123868 × 184.1483233367 × 188.4710033873
 192.7691300775 × 196.1620023264 × 200.5373407069
 gMin node1037 energy = 46.14182003 detHess = 7.759
 6.7054315754 × 10.9989987221 × 14.2925717322
 18.5740937004 × 22.5836239074 × 26.0347379438
 30.2704185055 × 33.5951792427 × 37.7404713106
 41.9271110553 × 45.2287915204 × 49.4783453725
 53.0195639099 × 56.9386677747 × 61.2379600640
 64.5375190697 × 68.8279969392 × 72.8353588532
 76.2957614041 × 80.5379579126 × 83.8700851863
 88.0173209589 × 92.2172589623 × 95.5210221140
 99.7808417913 × 103.3589326256 × 107.2455322393
 111.5502584633 × 114.8552659758 × 119.1428149369
 123.1948902419 × 126.6238054785 × 130.8719692498
 134.2405798848 × 138.3590860963 × 142.6062440846
 145.9093941101 × 150.1973290701 × 153.9213494728
 157.6620596536 × 161.9528222286 × 165.2564853816

$169.5084768997 \times 173.6233751315 \times 176.9964541058$
 $181.2454174089 \times 184.6712193060 \times 188.7279480427$
 $193.0149795711 \times 196.3205718418 \times 200.6257445401$
 ok nice movement of the chain



```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

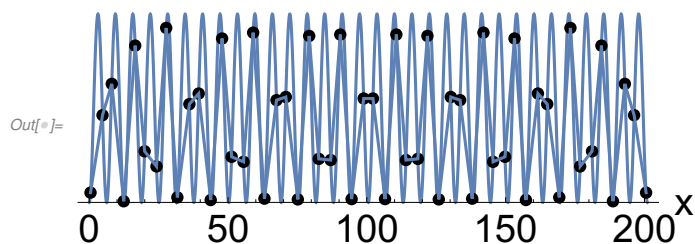
N = 52 GOLD a0 - min

ENERGY 47.023250361501

SetX = {0.45948575325564284, 4.786194995996771, 8.115626703821217,
 12.411024073326006, 16.551698829972604, 19.94524202461539,
 24.228027763700236, 27.72456554010219, 31.743592947601925,
 36.08445473829335, 39.42627826135616, 43.75590093423522, 47.86105647818409,
 51.29401926796873, 55.58352678276352, 59.05090491081857, 63.11496137282524,
 67.45835952819223, 70.80544325365585, 75.14538260301488, 79.23516631646643,
 82.68429599245708, 86.97645307358906, 90.43360534139806, 94.5137650376672,
 98.85678501976263, 102.20514433847218, 106.5481638948578,
 110.62832238420488, 114.08547512797455, 118.37763163214352,
 121.82675978319085, 125.91654511723542, 130.25648401708693,
 133.60356796412395, 137.94696648500957, 142.01102138083283,
 145.4784009298091, 149.76790837310952, 153.20087019579748,
 157.30602712652785, 161.63564962956244, 164.97747313189885,
 169.31833524657736, 173.33736149181382, 176.8339005071323,
 181.116686532459, 184.51022964596046, 188.65090515318363,
 192.9463023705305, 196.27573446507043, 200.60244371222953}

Eigenvalues

Out[*]= {4.27506, 4.26448, 4.24732, 4.22356, 4.19323, 4.15125, 4.12499, 4.06885,
 4.01416, 3.95538, 3.89296, 3.82909, 3.73502, 3.67912, 3.61144, 3.54657,
 3.4909, 3.45321, 3.12661, 3.12661, 2.55137, 2.50496, 2.43893, 2.3596,
 2.27258, 2.18455, 2.09544, 2.00675, 1.92524, 1.85619, 1.80661, 1.56506,
 1.56504, 0.863915, 0.833268, 0.786607, 0.732197, 0.679655, 0.579156,
 0.575977, 0.404707, 0.356772, 0.306176, 0.259422, 0.22367, 0.202376,
 0.112051, 0.0858159, 0.0601713, 0.0401275, 0.0262343, 0.0186445}



SP node367 energy = 48.27052288 detHess - 1209.47

0.5408600695 × 4.9336782458 × 8.3508811397

12.6471488311 × 17.0241069200 × 20.4333141604

24.8424373964 × 28.9653172750 × 32.4509018416

36.7963361573 × 40.3567211892 × 44.3824148974

48.7976353974 × 52.2181504944 × 56.5666343451

60.9330838097 × 64.3528360187 × 68.7713477978

72.8528954510 × 76.3728876719 × 80.7203931738

84.2481249372 × 88.3195880230 × 92.7386355879

96.1595830543 × 100.5229488468 × 104.8782986570

108.2995444247 × 112.7171456469 × 116.7636500695

120.3091821649 × 124.6555331798 × 128.1560254917

132.2611255399 × 136.6753137432 × 140.0896304773

144.4625456734 × 148.7847662167 × 152.2026123344

156.6069372896 × 160.5559744833 × 164.1764794226

168.5237912301 × 171.9700410410 × 176.1457664030

180.5363804025 × 183.9325225243 × 188.3175323093

192.5254540841 × 195.9573738370 × 200.3133766058

203.9887999175

iMin node602 energy = 47.375967479 detHess - 231.25

? BBP point crossed ?

660 energy = 47.370541749 detHess 4508.519

0.5768734686 × 4.9945063206 × 8.4516710271

12.7354738109 × 17.1875750001 × 20.6438306246

25.0752187116 × 29.4491159982 × 32.9004074718

37.3479760843 × 41.4515802100 × 44.9815993186

49.3527121671 × 52.9326240538 × 56.9693861479

61.4145645377 × 64.8715021297 × 69.2205270053

73.6748449725 × 77.1407810654 × 81.5920024580

85.9539363800 × 89.4110596947 × 93.8604638704

97.9321636965 × 101.4873352990 × 105.8596114210

109.4158402819 × 113.4861215858 × 117.9354682378

121.3927102210 × 125.7541096315 × 130.2057894387

133.6719362416 × 138.1262103185 × 142.4768046110

145.9338739979 × 150.3796868904 × 154.4206994324

157.9975755545 × 162.3688053664 × 165.9018142520

170.0016065971 × 174.4495549293 × 177.9016556994

182.2741655491 × 186.7084277251 × 190.1659992313

194.6186104113 × 198.9117709878 × 202.3681197275

206.7896639731

node717 energy = 47.375390 detHess 113.53

? BBP point crossed ?

SP node956 energy = 48.27140524 detHess - 1113.97

3.3418207110 × 7.0241329059 × 11.3814324815

14.8122562682 × 19.0237311827 × 23.4085020335

26.8050221613 × 31.1963971446 × 35.3700017948

38.8176097520 × 43.1646627013 × 46.7821856943

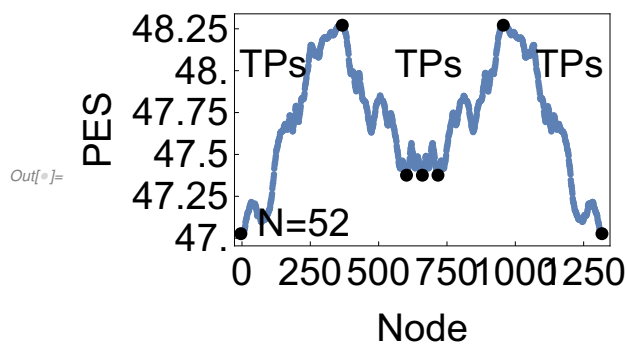
50.7348018516 × 55.1396973829 × 58.5576581827

62.8811383778 × 67.2538839285 × 70.6684880715

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75.0829417653 × 79.1873109510 × 82.6884901276
87.0349451135 × 90.5799899359 × 94.6272832121
99.0450359270 × 102.4663877136 × 106.8219965267
111.1854515641 × 114.6065152068 × 119.0256811443
123.0974070331 × 126.6250518155 × 130.9726591940
134.4929957613 × 138.5742454368 × 142.9929093368
146.4128452454 × 150.7792159129 × 155.1283559738
158.5490096885 × 162.9645248711 × 166.9921944226
170.5511946817 × 174.8967382989 × 178.3837240399
182.5049745989 × 186.9146685090 × 190.3244133670
194.7010456756 × 199.0000572931 × 202.4172430551
206.8113020288
gMin node1317 energy = 47.026854478 detHess 2572.74
6.7398888855 × 11.0669667949 × 14.3965920671
18.6927549466 × 22.8327585942 × 26.2270454596
30.5099416640 × 34.0058047537 × 38.0258159021
42.3667502246 × 45.7086856881 × 50.0385410836
54.1433980987 × 57.5766871124 × 61.8662537573
65.3334303736 × 69.3978147448 × 73.7412219375
77.0883425172 × 81.4283526093 × 85.5179985339
88.9672614099 × 93.2594333215 × 96.7164877733
100.7967865498 × 105.1397874596 × 108.4881465808
112.8311853032 × 116.9112048564 × 120.3684555274
124.6605971806 × 128.1095921386 × 132.1995151279
136.5393833354 × 139.8864305933 × 144.2298200398
148.2935475041 × 151.7611285483 × 156.0505769234
159.4832128059 × 163.5886675831 × 167.9180568234
171.2597687559 × 175.6005576571 × 179.6185990183
183.1158148036 × 187.3984917520 × 190.7912953577
194.9326382945 × 199.2272682702 × 202.5565091604
206.8828469412

```



N = 53 Gold : global minimum

SetX = {0.4073193188854115, 4.6866906319581005, 7.966392166342207,

Eigenvalues


$$0.4636638514 \times 4.7905309356 \times 8.1198321905$$
$$12.4162627763 \times 16.5540517572 \times 19.9502099384$$

24.2331497606 × 27.7277709294 × 31.7492542365
 36.0890916192 × 39.4314963721 × 43.7613302058
 47.8635293080 × 51.2987349761 × 55.5870202174
 59.0524205297 × 63.1179424463 × 67.4573182826
 70.8070746652 × 75.1473517665 × 79.2330890982
 82.6852704171 × 86.9753030231 × 90.4286490345
 94.5141731393 × 98.8548131252 × 102.2009925876
 106.5429104043 × 110.6093277648 × 114.0737927666
 118.3612144787 × 121.7966776659 × 125.8989129390
 130.2284437976 × 133.5699866553 × 137.9081777120
 141.9326983772 × 145.4286717541 × 149.7139762212
 153.1065848156 × 157.2461192796 × 161.5455088094
 164.8704725582 × 169.1951538575 × 173.0789257608
 176.6818900994 × 180.9632708110 × 184.2962804123
 188.5021212389 × 192.7123763862 × 196.0436962437
 200.3273239635 × 203.9319847068
 gMin node514 energy = 48.01576197 detHess 183.2129
 0.5245037867 × 4.9035457448 × 8.3008025900
 12.5998847596 × 16.9324748011 × 20.3244246795
 24.7117770359 × 28.6904887351 × 32.2649539484
 36.5900573202 × 40.0198828239 × 44.1814144730
 48.5407502932 × 51.9119108566 × 56.2802126779
 60.3832723226 × 63.8474747566 × 68.1614855914
 71.6600194629 × 75.7203959795 × 80.0974003306
 83.4744919634 × 87.8269794812 × 92.0422861233
 95.4523414665 × 99.7960792167 × 103.4693146082
 107.3443965973 × 111.7252244865 × 115.1257254511
 119.4233446368 × 123.7637745351 × 127.1578822376
 131.5490560459 × 135.5528061468 × 139.1087395223
 143.4345590667 × 146.8790328594 × 151.0238096447
 155.3939948967 × 158.7707671844 × 163.1403075672
 167.2891691052 × 170.7313763417 × 175.0580611120
 178.6196903964 × 182.6172672160 × 187.0087647327
 190.4037883301 × 194.7424196176 × 199.0447339880
 202.4450410090 × 206.8277868142
 node525 energy = 48.0155734 detHess 273.47
 SP node775 energy = 49.06459805 detHess - 1228.08
 3.4376496574 × 7.0359121841 × 11.3178061597
 14.6511691530 × 18.8553158808 × 23.0652225360
 26.3959799646 × 30.6798131997 × 34.2922337879
 38.1668390725 × 42.4923031445 × 45.8210299481
 50.1140760039 × 54.2562934148 × 57.6477465564
 61.9299888235 × 65.4277467076 × 69.4445203046
 73.7848467664 × 77.1260796445 × 81.4550039920
 85.5594526110 × 88.9922384108 × 93.2811079655
 96.7469778914 × 100.8119620589 × 105.1542600482
 108.5005242696 × 112.8401168181 × 116.9253176152
 120.3767700089 × 124.6676608923 × 128.1192241254
 132.2042922508 × 136.5439282218 × 139.8902098850

144.2325036695 \times 148.2977130249 \times 151.7634367462
 156.0523405397 \times 159.4853425428 \times 163.5895863211
 167.9186598739 \times 171.2599619185 \times 175.6003326158
 179.6177427830 \times 183.1150585016 \times 187.3973670752
 190.7892897828 \times 194.9310801926 \times 199.2246177681
 202.5534609362 \times 206.8791642613
 iMin node1038 energy = 48.06041937 detHess 34.30
 6.6951325115 \times 10.9744599566 \times 14.2540103006
 18.5267422221 \times 22.4822379684 \times 25.9661468985
 30.1902813199 \times 33.4733914045 \times 37.6403973190
 41.7487224390 \times 45.0687618487 \times 49.2737876105
 52.6418586494 \times 56.7026228223 \times 60.9167345953
 64.1895418852 \times 68.4397275767 \times 72.0647733362
 75.8805019294 \times 80.1600292883 \times 83.4407773999
 87.7037984208 \times 91.7089698413 \times 95.1472041618
 99.3684075594 \times 102.6717895941 \times 106.8170573038
 110.9652320912 \times 114.2668468105 \times 118.4890213433
 121.9331812034 \times 125.9328145630 \times 130.1983199741
 133.4795858136 \times 137.7601258612 \times 141.5878234028
 145.2010462360 \times 149.4490957408 \times 152.7220053193
 156.9326442185 \times 160.9968233812 \times 164.3608593354
 168.5653063974 \times 171.8874673995 \times 175.9930352116
 180.1624062657 \times 183.4444000323 \times 187.6695578732
 191.1594888321 \times 195.1091248339 \times 199.3831636315
 202.6630255149 \times 206.9424284086

###

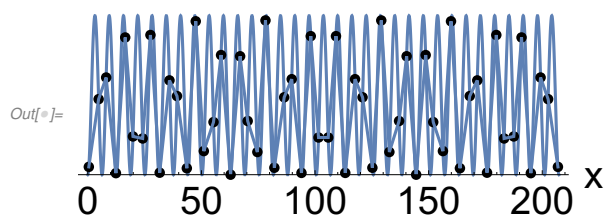
N = 54 Gold: global minimum

ENERGY 48.8920644537975

SetX = {0.44672420416472586, 4.761959751017197, 8.078423643533513,
 12.369806034243835, 16.465887273766192, 19.874553243634363,
 24.137932042219894, 27.56265580959175, 31.64048508730455, 35.94099044808664,
 39.25898984765286, 43.57692982125839, 47.500513491815404, 51.056314341839,
 55.32305378521072, 58.64877955459641, 62.837658034281134,
 67.03234141658372, 70.3552099397968, 74.62391809499299, 78.19340640506104,
 82.10241806376509, 86.42011149906229, 89.73815144923206,
 94.03570610704301, 98.12277339754318, 101.54044024150316,
 105.80465967174214, 109.22231826901277, 113.30939465951292,
 117.60694435558149, 120.9249835454062, 125.24267573167423,
 129.15166689422824, 132.72117449027337, 136.98988563926912,
 140.31275089979118, 144.5074424736846, 148.6963145460423,
 152.02204452575563, 156.28878264794355, 159.84456944688816,
 163.768169140672, 168.08611037484008, 171.40411100957604,
 175.70462038160417, 179.7824442646188, 183.20717440603767,
 187.4705551139472, 190.87921971537753, 194.97530526383932,
 199.26668824870347, 202.5831533648484, 206.8983899191365}

Eigenvalues

```
Out[ ]:= {4.27119, 4.26134, 4.24677, 4.22412, 4.19476, 4.16165, 4.11925, 4.09052,
  4.02824, 3.97189, 3.91493, 3.85382, 3.76978, 3.70932, 3.63614, 3.5781,
  3.51501, 3.45439, 3.4196, 3.11029, 3.11029, 2.52284, 2.47982, 2.42422,
  2.34864, 2.27159, 2.18271, 2.09444, 2.01764, 1.94023, 1.8821, 1.83545,
  1.58234, 1.58233, 0.887713, 0.857797, 0.810491, 0.756598, 0.701622, 0.64702,
  0.556021, 0.553431, 0.370827, 0.331778, 0.290257, 0.253186, 0.240527,
  0.120249, 0.0943169, 0.0851918, 0.0453272, 0.0315008, 0.0125358, 0.00553285}
```



SP node401 energy = 50.042224397 detHess - 413.6

```
0.5256940143 × 4.9039322238 × 8.3004588226
12.5989592347 × 16.9300424993 × 20.3213139191
24.7076850508 × 28.6816842213 × 32.2595055194
36.5843540019 × 40.0113983157 × 44.1759055814
48.5328139995 × 51.9027951287 × 56.2705648613
60.3638026567 × 63.8332818835 × 68.1450032262
71.6318189841 × 75.7035795829 × 80.0759728089
83.4489659348 × 87.8026640616 × 91.9951386954
95.4112017951 × 99.7454292471 × 103.3724526944
107.2950965367 × 111.6803587240 × 115.0774278266
119.3918981574 × 123.7177455636 × 127.1131455220
131.5011907589 × 135.4581457693 × 139.0538008074
143.3831372250 × 146.8080081959 × 150.9820745981
155.3407040207 × 158.7134344190 × 163.0841806328
167.1798810326 × 170.6503169463 × 174.9645466850
178.4569314592 × 182.5253349176 × 186.9016155397
190.2781640497 × 194.6323648739 × 198.8407082359
202.2532252372 × 206.5945918775 × 210.2539369882
```

START energy 48.8920673997

```
0.4513747663 × 4.7666107663 × 8.0830707663
12.3744507663 × 16.4705507663 × 19.8792507663
24.1425507663 × 27.5673507663 × 31.6451507663
35.9456507663 × 39.2636507663 × 43.5815507663
47.5051507663 × 51.0609507663 × 55.3277507663
58.6534507663 × 62.8423507663 × 67.0369507663
70.3598507663 × 74.6285507663 × 78.1980507663
82.1070507663 × 86.4247507663 × 89.7428507663
94.0403507663 × 98.1274507663 × 101.5446507663
105.8096507663 × 109.2266507663 × 113.3136507663
117.6116507663 × 120.9296507663 × 125.2476507663
129.1566507663 × 132.7256507663 × 136.9946507663
140.3176507663 × 144.5116507663 × 148.7006507663
152.0266507663 × 156.2936507663 × 159.8496507663
```

163.7726507663 × 168.0906507663 × 171.4086507663
 175.7096507663 × 179.7866507663 × 183.2116507663
 187.4756507663 × 190.8836507663 × 194.9796507663
 199.2716507663 × 202.5876507663 × 206.9026507663
 SP node399 energy = 50.041627251 detHess - 444.7200
 0.5218936656 × 4.9007187370 × 8.2972255028
 12.5970974823 × 16.9276914949 × 20.3192795795
 24.7057641688 × 28.6781276052 × 32.2575812598
 36.5827814811 × 40.0094861140 × 44.1749438270
 48.5318588183 × 51.9020009137 × 56.2699840872
 60.3628769103 × 63.8327350111 × 68.1445402833
 71.6311783711 × 75.7032807637 × 80.0757307743
 83.4487890964 × 87.8025869749 × 91.9950852825
 95.4112057194 × 99.7454920633 × 103.3726188155
 107.2952072623 × 111.6805122158 × 115.0776476132
 119.3920967497 × 123.7181215408 × 127.1135611823
 131.5016963360 × 135.4591975051 × 139.0544182112
 143.3837396789 × 146.8088528390 × 150.9826017146
 155.3414316459 × 158.7142410522 × 163.0850151607
 167.1815458920 × 170.6515137265 × 174.9659170547
 178.4592569047 × 182.5267129791 × 186.9033570481
 190.2802302134 × 194.6343192402 × 198.8444845476
 202.2565425234 × 206.5986739371 × 210.2617748363
 node535 TP min energy = 49.2686030 detHess 138.67802
 0.1296559820 × 4.5122852039 × 7.9148684674
 12.3155987015 × 16.4681771338 × 19.9316791180
 24.2781376432 × 27.8702854459 × 31.8555772471
 36.2664924678 × 39.6869389439 × 44.0216810667
 48.3957969255 × 51.8142486221 × 56.2324576646
 60.3396999043 × 63.8422020491 × 68.1917215945
 71.7436345247 × 75.7863376921 × 80.2074842267
 83.6333191427 × 87.9874049789 × 92.3642995152
 95.7896826161 × 100.2146483343 × 104.3285460500
 107.8325009064 × 112.1876994311 × 115.7536176106
 119.7860188847 × 124.2128966280 × 127.6469641557
 131.9971684790 × 136.3976286516 × 139.8321248034
 144.2661326619 × 148.4555189330 × 151.9270865035
 156.3033387774 × 159.9789511618 × 163.8944745584
 168.3169599102 × 171.7685254519 × 176.0717121818
 180.5169404695 × 183.9699259123 × 188.4055231406
 192.7512058908 × 196.1993946445 × 200.6363326286
 204.6604058226 × 208.2433257118 × 212.6084589534
 it is stretched structure
 start energy = 49.08008891
 0.5552802559 × 4.9459535757 × 8.3637610244
 12.6544379602 × 17.0330685116 × 20.4417295574
 24.8501635996 × 28.9797641736 × 32.4610027054
 36.8072065983 × 40.3751382522 × 44.3919993234

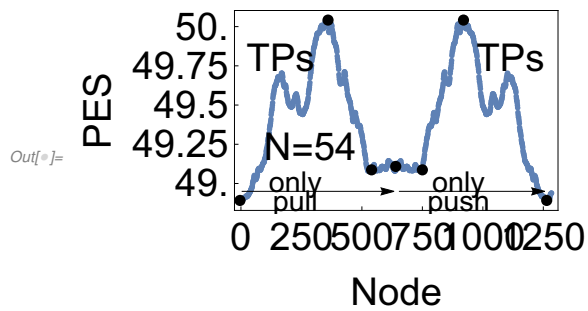
48.8072001867 × 52.2287114088 × 56.5742172547
 60.9452706297 × 64.3657489343 × 68.7855731447
 72.8818508894 × 76.3928417636 × 80.7424073076
 84.2849804579 × 88.3400026687 × 92.7616900160
 96.1869280185 × 100.5451218264 × 104.9174727947
 108.3424147578 × 112.7664950119 × 116.8657238117
 120.3783765265 × 124.7313760050 × 128.2813302991
 132.3316219035 × 136.7572383428 × 140.1876047589
 144.5441556788 × 148.9315969762 × 152.3619222353
 156.7922806655 × 160.9392131059 × 164.4282454985
 168.7923127116 × 172.4026362312 × 176.3884965862
 180.8177036677 × 184.2623322390 × 188.5943808002
 193.0250946850 × 196.4724347868 × 200.9122750495
 205.2030122495 × 208.6525150136 × 213.0675693865
 iMin below node64 energy = 49.084470377 detHess - 265.69
 node78 energy = 49.084286282 detHess - 279.13
 node111 energy = 49.08166517 detHess 1876.76
 0.5453597342 × 4.9631427843 × 8.4122001821
 12.7094576286 × 17.1493143310 × 20.5975373794
 25.0301041670 × 29.3602140008 × 32.8056098242
 37.2346494642 × 41.2157469049 × 44.8305323556
 49.1954323075 × 52.6831076780 × 56.8331452620
 61.2638388332 × 64.6945362744 × 69.0829363293
 73.4392398479 × 76.8699467392 × 81.2957498867
 85.3453831200 × 88.8960709384 × 93.2492606078
 96.7617804026 × 100.8614974046 × 105.2857611468
 108.7109239418 × 113.0834249204 × 117.4420157388
 120.8674531158 × 125.2893759641 × 129.3456496384
 132.8874864332 × 137.2372320990 × 140.7493943353
 144.8444418624 × 149.2646483302 × 152.6856150958
 157.0563283246 × 161.4037393077 × 164.8255895659
 169.2416108228 × 173.2641717732 × 176.8279934745
 181.1743986236 × 184.6594262645 × 188.7844862008
 193.1944699883 × 196.6045446054 × 200.9822815707
 205.2804544631 × 208.6981197420 × 213.0921620022
 SP node284 energy = 50.040572919 detHess - 315.0
 3.3369969477 × 7.0142900013 × 11.3592754725
 14.7696743595 × 18.9866209839 × 23.3402039039
 26.7182707907 × 31.0962291454 × 35.1599082014
 38.6569746607 × 42.9720051014 × 46.4400484044
 50.5398670521 × 54.9106403038 × 58.2836727171
 62.6432531619 × 66.8153497907 × 70.2415337574
 74.5706290811 × 78.1634185097 × 82.1237808007
 86.5122272532 × 89.9076782603 × 94.2346269308
 98.5484233036 × 101.9457959366 × 106.3310306163
 110.2517212973 × 113.8807361115 × 118.2154437940
 121.6313327285 × 125.8247845944 × 130.1786192501
 133.5518889841 × 137.9245739139 × 141.9964860701
 145.4834496464 × 149.7954049611 × 153.2653265310

157.3583586953 × 161.7265219148 × 165.0968294758
 169.4538469845 × 173.6198885341 × 177.0464534420
 181.3719237659 × 184.9524505921 × 188.9237916131
 193.3103960963 × 196.7022437774 × 201.0325339129
 205.3334323649 × 208.7299570811 × 213.1092420450
 new gMin node636 energy = 48.8938020 detHess 318.0
 6.7191751711 × 11.0356171159 × 14.3528606677
 18.6469323739 × 22.7397641845 × 26.1519708312
 30.4158820472 × 33.8382982418 × 37.9195132124
 42.2193494837 × 45.5375900918 × 49.8557105248
 53.7754308054 × 57.3350691734 × 61.6025233681
 64.9277130109 × 69.1181947103 × 73.3118327358
 76.6354710656 × 80.9039957721 × 84.4710823862
 88.3828690763 × 92.7008403303 × 96.0190961502
 100.3173150645 × 104.4035058087 × 107.8221206135
 112.0864860504 × 115.5035681439 × 119.5915044375
 123.8888625222 × 127.2069661272 × 131.5246906311
 135.4326461269 × 139.0031936641 × 143.2721107151
 146.5948704393 × 150.7899779604 × 154.9786161148
 158.3045585572 × 162.5712817127 × 166.1265711352
 170.0507737877 × 174.3687842507 × 177.6868487098
 181.9875048763 × 186.0651823494 × 189.4901045265
 193.7535380037 × 197.1621501060 × 201.2583684451
 205.5497644684 × 208.8662670523 × 213.1815376054
 it is compressed chain

start energy = 48.892097333 detHess 292.121
 0.4547735589 × 4.7690900322 × 8.0849890663
 12.3743399471 × 16.4728381151 × 19.8788745261
 24.1418590140 × 27.5683336863 × 31.6436077687
 35.9446016972 × 39.2624228750 × 43.5802173723
 47.5066780194 × 51.0596260903 × 55.3258391052
 58.6519798035 × 62.8396551491 × 67.0351326325
 70.3574268109 × 74.6262876829 × 78.1976186844
 82.1045078217 × 86.4219897742 × 89.7398549620
 94.0369059733 × 98.1246378817 × 101.5415760321
 105.8056917788 × 109.2237743496 × 113.3102051921
 117.6079082139 × 120.9258801158 × 125.2435570260
 129.1533256840 × 132.7220449188 × 136.9906102572
 140.3135350562 × 144.5079282009 × 148.6969875190
 152.0225365261 × 156.2892939533 × 159.8454344868
 163.7685937942 × 168.0864997424 × 171.4044311708
 175.7048501066 × 179.7827985539 × 183.2073589533
 187.4707059044 × 190.8793780152 × 194.9753854129
 199.2667778738 × 202.5831890464 × 206.8984190115
 SP node192 energy = 50.113129487 detHess -284.0
 3.4927312634 × 7.0404766327 × 11.2751775773
 14.5487135261 × 18.7387527180 × 22.8182152954
 26.1617292729 × 30.3620208268 × 33.6929524083

37.7846981789 × 41.9619258368 × 45.2385216074
 49.4660463117 × 52.9766078802 × 56.9044649024
 61.1806596127 × 64.4600844321 × 68.7378603133
 72.6473378291 × 76.1759733023 × 80.4062865868
 83.6799938818 × 87.8635865872 × 91.9463432477
 95.2843524772 × 99.4830259900 × 102.8153036501
 106.9036293714 × 111.0813148871 × 114.3564863184
 118.5834880450 × 122.0952041097 × 126.0209797229
 130.2964766149 × 133.5751413864 × 137.8521561532
 141.7601823120 × 145.2893959074 × 149.5191351689
 152.7916326619 × 156.9754206610 × 161.0551851656
 164.3943516966 × 168.5916057908 × 171.9192569835
 176.0101649791 × 180.1819608859 × 183.4575341936
 187.6805549425 × 191.1758471621 × 195.1162561963
 199.3878054116 × 202.6646882261 × 206.9410602971
 iMin node442 energy = 49.29900261 detHess 30 513.47
 6.4983390972 × 10.6003788453 × 13.7794972544
 17.8953308547 × 21.1952985678 × 25.2097248750
 29.3010588108 × 32.5367844206 × 36.6729839066
 39.9538842364 × 44.0098510223 × 48.0933681938
 51.3522946301 × 55.4963691547 × 58.7718790247
 62.8420088884 × 66.9222943943 × 70.1898346441
 74.3368681029 × 77.6108841743 × 81.6858813418
 85.7653508430 × 89.0358789457 × 93.1842236179
 96.4584799028 × 100.5348892915 × 104.6152230469
 107.8864295052 × 112.0359285273 × 115.3123850869
 119.3883901469 × 123.4722644363 × 126.7426354273
 130.8944590606 × 134.1776517488 × 138.2508587578
 142.3448462707 × 145.6121563588 × 149.7701717183
 153.0728113933 × 157.1366946123 × 161.2576088030
 164.5179551630 × 168.6931518819 × 172.0532777870
 176.0834848823 × 180.2673767565 × 183.5204685901
 187.7392523355 × 191.2717962343 × 195.1616216118
 199.4250377709 × 202.6906374578 × 206.9545607539
 node567 energy = 49.39599757 detHess - 61.8
 6.6601472734 × 10.9171826779 × 14.1772891314
 18.4365907979 × 22.2945655159 × 25.8537574306
 30.0730976631 × 33.3183101373 × 37.5090494183
 41.5108685032 × 44.8915730575 × 49.0613367358
 52.2975671076 × 56.4292772846 × 60.4418804134
 63.7716603446 × 67.9088846931 × 71.1118577810
 75.2254472899 × 79.1671187316 × 82.5218272979
 86.6214581217 × 89.7468917827 × 93.8500423259
 97.5658596233 × 101.1061043314 × 105.1903008222
 108.2759042972 × 112.3555685543 × 115.7596410976
 119.6248603474 × 123.7319951040 × 126.9035556582
 131.0208513240 × 134.3389006744 × 138.3382839261
 142.4456633069 × 145.6739316189 × 149.8192702133
 153.1356871301 × 157.1710974289 × 161.2978450012

164.5442330487 × 168.7157652150 × 172.0855351316
 176.1010975652 × 180.2877234844 × 183.5363052257
 187.7545702352 × 191.2978173322 × 195.1739240790
 199.4350047383 × 202.6976602033 × 206.9582081936
 node582 energy = 49.39633569 detHess - 145.76
 6.6667688711 × 10.9271663495 × 14.1899027387
 18.4512489179 × 22.3247366650 × 25.8707889920
 30.0896862811 × 33.3383386633 × 37.5258084779
 41.5408411260 × 44.9115515930 × 49.0834360586
 52.3299369243 × 56.4570431333 × 60.4926528565
 63.8092417155 × 67.9548705308 × 71.1836292217
 75.2910257047 × 79.2914293977 × 82.6090149614
 86.7267869364 × 89.8994893450 × 94.0066368473
 97.8749718722 × 101.2765681607 × 105.3565795750
 108.4429941714 × 112.5277244775 × 116.0731502318
 119.7835956524 × 123.8862896631 × 127.0102537841
 131.1091793600 × 134.4649908579 × 138.4046770434
 142.5180777432 × 145.7201875383 × 149.8568235471
 153.1861233759 × 157.1984631033 × 161.3293537911
 164.5653795641 × 168.7343695717 × 172.1128542035
 176.1160345089 × 180.3049754433 × 183.5500340135
 187.7680392034 × 191.3210248307 × 195.1848983162
 199.4438507540 × 202.7039208127 × 206.9614576022
 node623 energy = 49.40722212 detHess 12.279
 6.5350959688 × 10.6643382010 × 13.8479393576
 17.9900049780 × 21.3745210931 × 25.3373242500
 29.5032863014 × 32.7271102091 × 36.9174236016
 40.4032583839 × 44.3127206111 × 48.5466264495
 51.7914731137 × 56.0353161719 × 59.7880596463
 63.4431597213 × 67.6721977597 × 70.9094109664
 75.1217349374 × 79.0610794637 × 82.5024480856
 86.6756710331 × 89.8883578584 × 94.0393958057
 97.9835548163 × 101.3678822255 × 105.4947916391
 108.6531453358 × 112.7757488054 × 116.5822799364
 120.0521659732 × 124.1443266498 × 127.2378088807
 131.3312856454 × 134.8473091879 × 138.6021764335
 142.7206158976 × 145.8635632718 × 149.9822999258
 153.3738959852 × 157.3001847311 × 161.4452418127
 164.6498268703 × 168.8144137943 × 172.2399975652
 176.1862196217 × 180.3866519095 × 183.6194021552
 187.8387723536 × 191.4475672147 × 195.2448130834
 199.4914366001 × 202.7380601626 × 206.9791412263



test TP

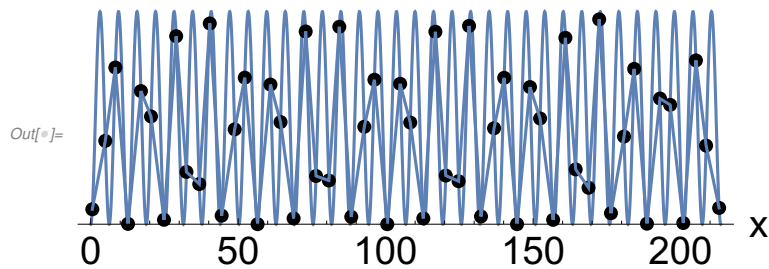
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36.2664924678, 39.6869389439, 44.0216810667,
48.3957969255, 51.8142486221, 56.2324576646,
60.3396999043, 63.8422020491, 68.1917215945,
71.7436345247, 75.7863376921, 80.2074842267,
83.6333191427, 87.9874049789, 92.3642995152,
95.7896826161, 100.2146483343, 104.3285460500,
107.8325009064, 112.1876994311, 115.7536176106,
119.7860188847, 124.2128966280, 127.6469641557,
131.9971684790, 136.3976286516, 139.8321248034,
144.2661326619, 148.4555189330, 151.9270865035,
156.3033387774, 159.9789511618, 163.8944745584,
168.3169599102, 171.7685254519, 176.0717121818,
180.5169404695, 183.9699259123, 188.4055231406,
192.7512058908, 196.1993946445, 200.6363326286,
204.6604058226, 208.2433257118, 212.6084589534};
```

ENERGY min 49.0799004834788


```
SetX = {0.5361316911118539, 4.9301680299777315, 8.347824700862466,
  12.645999125962554, 17.023717918611844, 20.43378393883058,
  24.843759780298754, 28.968759440793924, 32.45381491704037,
  36.80020379694243, 40.363944989359496, 44.386588487205024,
  48.802599260563404, 52.224426809407845, 56.57186589839334,
  60.942501123960106, 64.36344740517865, 68.78362535740538,
  72.87842377529203, 76.3907287749423, 80.74043170497409, 84.28200061452671,
  88.3385639274544, 92.76044056284182, 96.1857977553505, 100.54448333148021,
  104.91668720673367, 108.34177356449725, 112.76592815038916,
  116.86470845781321, 120.37775908402685, 124.73078516813624,
  128.28044824581994, 132.33119499364585, 136.75685528151942,
  140.18727219975315, 144.54396130596723, 148.93134450567322,
  152.3617244055649, 156.79208920110662, 160.93885658054742,
  164.42802206379613, 168.79207547819755, 172.40226217393226,
  176.38831737138506, 180.81753984050076, 184.2622036396418,
  188.59430818358433, 193.02500128359844, 196.47238253340984,
  200.9122282764176, 205.20293102555874, 208.6524826732193, 213.0675373741515}
```

Eigenvalues

```
Out[*]= {4.28491, 4.27561, 4.26031, 4.24061, 4.21854, 4.1761, 4.13718, 4.09283,
  4.04449, 3.99036, 3.93342, 3.87276, 3.8114, 3.75534, 3.65713, 3.60731,
  3.5589, 3.52309, 3.25671, 3.2241, 2.62124, 2.58078, 2.51986, 2.447,
  2.37152, 2.27733, 2.18406, 2.09069, 1.99908, 1.9236, 1.84543, 1.78052,
  1.73664, 1.4593, 1.42178, 0.818877, 0.790424, 0.751918, 0.712201, 0.678407,
  0.499178, 0.4542, 0.403171, 0.360632, 0.305113, 0.250898, 0.209062,
  0.175156, 0.153072, 0.140224, 0.0397206, 0.0263772, 0.0160026, 0.0104464}
```



START energy 49.079902595787651
 0.5407827663 × 4.9348207663 × 8.3524707663
 12.6506507663 × 17.0283507663 × 20.4384507663
 24.8484507663 × 28.9734507663 × 32.4584507663
 36.8048507663 × 40.3685507663 × 44.3912507663
 48.8072507663 × 52.2290507663 × 56.5765507663
 60.9471507663 × 64.3680507663 × 68.7882507663
 72.8830507663 × 76.3953507663 × 80.7450507663
 84.2866507663 × 88.3432507663 × 92.7650507663
 96.1904507663 × 100.5486507663 × 104.9216507663
 108.3466507663 × 112.7706507663 × 116.8696507663
 120.3826507663 × 124.7356507663 × 128.2846507663
 132.3356507663 × 136.7616507663 × 140.1916507663
 144.5486507663 × 148.9356507663 × 152.3666507663
 156.7966507663 × 160.9436507663 × 164.4326507663
 168.7966507663 × 172.4066507663 × 176.3926507663
 180.8226507663 × 184.2666507663 × 188.5986507663
 193.0296507663 × 196.4766507663 × 200.9166507663
 205.2076507663 × 208.6566507663 × 213.0726507663
 SP node357 energy = 50.03830485047 detHess - 475.26
 3.3720621767 × 7.0325093777 × 11.3741006130
 14.7864816052 × 18.9953609650 × 23.3495293028
 26.7261731344 × 31.1025607922 × 35.1706862368
 38.6633512346 × 42.9776318077 × 46.4479298673
 50.5438743848 × 54.9146287471 × 58.2873822619
 62.6460706164 × 66.8200433901 × 70.2449855866
 74.5743174468 × 78.1698441429 × 82.1269603492
 86.5150320300 × 89.9104435625 × 94.2363433269
 98.5508070598 × 101.9478956560 × 106.3331702782
 110.2557967416 × 113.8828515386 × 118.2170964416
 121.6331761177 × 125.8256582721 × 130.1793855228
 133.5523978010 × 137.9248077468 × 141.9966679327
 145.4834320450 × 149.7951779482 × 153.2647676721
 157.3579049954 × 161.7257371554 × 165.0957653289
 169.4526758063 × 173.6174608334 × 177.0444056813
 181.3693568497 × 184.9476545159 × 188.9211765075
 193.3075815793 × 196.6989459521 × 201.0298868605
 205.3287902827 × 208.7253106744 × 213.1037216596

```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

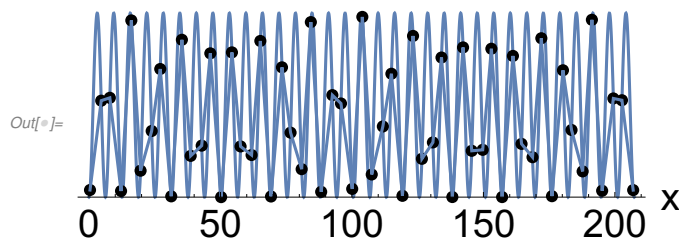
N = 55 Gold: global minimum

ENERGY 50.0070559805

```
SetX = {0.3954867323957884, 4.66396596261237, 7.933617435900616,
12.200100037434046, 16.108446669989405, 19.62692949928695,
23.846822417297595, 27.10701937379309, 31.28691571237307,
35.338158939876756, 38.685668267426756, 42.86730915148706,
46.15104439915196, 50.26127049981147, 54.36728482051734, 57.65398729849013,
61.834297236872125, 65.17445932202617, 69.23127100233475,
73.40405371486547, 76.66512838904842, 80.88038271587422, 84.37756660155766,
88.30560073464196, 92.56807054522024, 95.83646572523149,
100.10470076830534, 103.95946427483437, 107.53124106858412,
111.7602124722855, 115.01636142775199, 119.21248893404801,
123.241374412056, 126.61143113333009, 130.79357823840502, 134.061612551887,
138.1853311497533, 142.2643193548067, 145.56457064652352, 149.732895652207,
153.02713439835117, 157.11143209944905, 161.22752381116132,
164.4987582990491, 168.6769235390371, 172.03072375858656,
176.07117482265642, 180.25313550637316, 183.50959594314574,
187.7288682151401, 191.25438474017824, 195.15339021714055,
199.41833865228315, 202.68593549577503, 206.95211707525522}
```

Eigenvalues

```
Out[ ]= {4.26509, 4.25515, 4.24057, 4.21903, 4.19167, 4.15872, 4.11909, 4.07785,
4.02506, 3.98997, 3.92034, 3.84109, 3.78409, 3.71486, 3.64598, 3.57519,
3.50462, 3.44306, 3.37485, 3.34644, 3.0483, 3.04549, 2.46787, 2.42062,
2.36897, 2.29962, 2.22193, 2.14332, 2.06505, 1.99478, 1.93929, 1.88947,
1.65015, 1.64727, 0.950231, 0.926203, 0.86564, 0.810872, 0.746026, 0.682921,
0.612071, 0.567999, 0.484636, 0.4793, 0.328335, 0.314874, 0.214682, 0.18696,
0.135231, 0.105598, 0.0756, 0.0536087, 0.0309985, 0.0285366, 0.00378207}
```



```
start energy = 50.00720481 detHess 712.25
-5.8750780055 - 1.6066163605 × 1.6624815243
5.9273828494 × 9.8439412867 × 13.3534857831
17.5713501826 × 20.8317134365 × 25.0086550648
29.0618275354 × 32.4064107338 × 36.5872980186
39.8716644655 × 43.9803860765 × 48.0871966858
51.3729073984 × 55.5531925033 × 58.8944377555
62.9501363254 × 67.1238458381 × 70.3846091179
74.6003672522 × 78.1002506260 × 82.0256831386
86.2886354963 × 89.5570964927 × 93.8253375010
97.6835824803 × 101.2518429935 × 105.4801575023
108.7363616048 × 112.9314681223 × 116.9614631265
120.3301589465 × 124.5120798153 × 127.7805437331
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131.9036194988 × 135.9834357235 × 139.2830553314
 143.4516051230 × 146.7469656270 × 150.8305477152
 154.9482243844 × 158.2189561201 × 162.3980562352
 165.7552323627 × 169.7934470630 × 173.9785729230
 177.2349669860 × 181.4564495590 × 184.9919700246
 188.8816577026 × 193.1479235194 × 196.4159832777
 200.6818437727

SP node281 energy = 50.9372316 detHess - 9.0

- 5.8343693150 - 1.5210115729 × 1.7935851736
 6.0834669666 × 10.1749554817 × 13.5846753569
 17.8456147903 × 21.2629603769 × 25.3458243967
 29.6401627545 × 32.9554335029 × 37.2702147794
 41.1691280380 × 44.7454900667 × 49.0130843657
 52.3309406028 × 56.5289261465 × 60.7071713543
 64.0349293138 × 68.2958366478 × 71.8261429808
 75.7737636890 × 80.0881593497 × 83.4028070755
 87.7061357750 × 91.7538738930 × 95.1982686129
 99.4563631865 × 102.8350571500 × 106.9567235313
 111.2204806945 × 114.5307093019 × 118.8315102811
 122.6104678127 × 126.3011859328 × 130.5870761497
 133.8951404269 × 138.1328111902 × 142.2733696781
 145.6295454865 × 149.8841962762 × 153.3479637271
 157.3681555991 × 161.6728839815 × 164.9847008667
 169.2952131178 × 173.2620853987 × 176.7720733192
 181.0286267009 × 184.3591531606 × 188.5283369685
 192.7302926605 × 196.0441732430 × 200.3117903244
 203.8976665775

identic SP node633 energy = 50.95024117 detHess - 46.95

- 5.8319163487 - 1.5189063372 × 1.7954496578
 6.0846770453 × 10.1766973252 × 13.5856757239
 17.8463982569 × 21.2639479095 × 25.3462785946
 29.6405275214 × 32.9556346612 × 37.2702586017
 41.1690543780 × 44.7453686485 × 49.0128274435
 52.3304677796 × 56.5284617889 × 60.7062511975
 64.0340377165 × 68.2946527195 × 71.8238588421
 75.7724539883 × 80.0866053454 × 83.4010448644
 87.7044282118 × 91.7505705045 × 95.1960070776
 99.4538268274 × 102.8310412808 × 106.9539100635
 111.2160841479 × 114.5260635794 × 118.8259682756
 122.5993100030 × 126.2955318675 × 130.5823727423
 133.8904135127 × 138.1297924987 × 142.2690552328
 145.6266187316 × 149.8813684478 × 153.3435074520
 157.3657680513 × 161.6702754933 × 164.9821848503
 169.2929148907 × 173.2578476020 × 176.7696696750
 181.0264558808 × 184.3563979549 × 188.5264948407
 192.7275224176 × 196.0417517676 × 200.3089868191
 203.8924326975

start energy = 50.00712916 detHess 654.88

0.3955132175 × 4.6640342860 × 7.9336810120

12.2001965357 × 16.1086511492 × 19.6270375046
 23.8469407178 × 27.1071403583 × 31.2870310362
 35.3383776124 × 38.6858048813 × 42.8674749675
 46.1512747609 × 50.2614697204 × 54.3676520430
 57.6542786343 × 61.8346806096 × 65.1751089274
 69.2317608719 × 73.4048752983 × 76.6659106621
 80.8813939955 × 84.3794857979 × 88.3067072690
 92.5694187090 × 95.8378774481 × 100.1061818009
 103.9623493445 × 107.5327589606 × 111.7615258001
 115.0177453418 × 119.2134972758 × 123.2429961552
 126.6124290119 × 130.7945595051 × 134.0629406487
 138.1863481905 × 142.2660398670 × 145.5658954118
 149.7345127007 × 153.0298034967 × 157.1135313910
 161.2311524022 × 164.5019639820 × 168.6810707363
 172.0381554918 × 176.0764711468 × 180.2615385771
 183.5179555236 × 187.7394096713 × 191.2747380475
 195.1646221074 × 199.4308794595 × 202.6989453700
 206.9648259898

SP node266 energy = 50.93722138 detHess - 11.564

0.4452033157 × 4.7590668875 × 8.0740196750
 12.3648616094 × 16.4555555146 × 19.8663743601
 24.1276317969 × 27.5446686069 × 31.6283255864
 35.9227882091 × 39.2382973258 × 43.5533068613
 47.4523635996 × 51.0288215402 × 55.2966173682
 58.6147840363 × 62.8127673852 × 66.9916662063
 70.3193896938 × 74.5807201714 × 78.1126102511
 82.0588299398 × 86.3735737911 × 89.6885221442
 93.9917687598 × 98.0417919355 × 101.4847042155
 105.7432013964 × 109.1240429138 × 113.2439619985
 117.5099827221 × 120.8205906814 × 125.1226660960
 128.9097137392 × 132.5925360673 × 136.8770718219
 140.1852305238 × 144.4204287867 × 148.5629270534
 151.9171061430 × 156.1716724942 × 159.6379886750
 163.6550332609 × 167.9601521416 × 171.2718825304
 175.5820962393 × 179.5521449425 × 183.0592053156
 187.3154511083 × 190.6470497133 × 194.8147303444
 199.0183890309 × 202.3317257191 × 206.6001027689
 210.1904989167

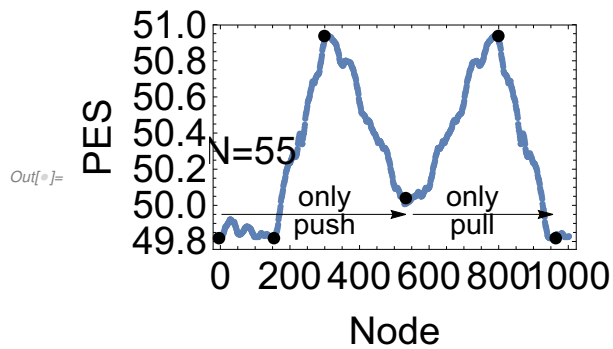
gMin node420 energy = 49.82061693 detHess 2295.92

0.4596617277 × 4.7865288851 × 8.1161431465
 12.4115894461 × 16.5528718584 × 19.9462438330
 24.2293159317 × 27.7269365213 × 31.7450237586
 36.0862998267 × 39.4284584241 × 43.7580742382
 47.8653412582 × 51.2972492238 × 55.5873644048
 59.0575412105 × 63.1190577880 × 67.4638469134
 70.8118659877 × 75.1519536268 × 79.2482530051
 82.6939049818 × 86.9877136822 × 90.4527666157
 94.5257252857 × 98.8730647052 × 102.2241952701
 106.5678401472 × 110.6676579555 × 114.1141908654

118.4111817768 \times 121.8836607844 \times 125.9520934406
 130.3049325881 \times 133.6603027205 \times 138.0055205666
 142.1280646948 \times 145.5643046766 \times 149.8684861856
 153.3722682910 \times 157.4121178513 \times 161.7783605148
 165.1446964902 \times 169.4888372173 \times 173.6764581003
 177.0877239134 \times 181.4152069443 \times 185.0273105557
 188.9602918298 \times 193.3414568943 \times 196.7315210148
 201.0495134668 \times 205.3550898750 \times 208.7472632045
 213.1252490911

node463 energy = 49.82698 detHess = 115.53

and node 516 and node 571



```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

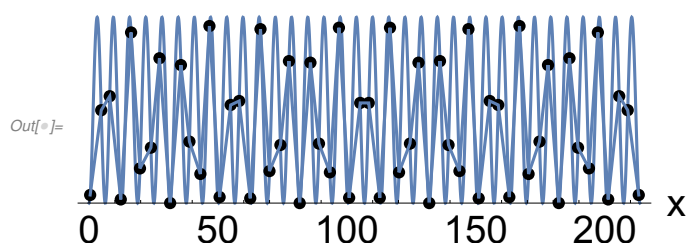
N = 56 Gold : global minimum

ENERGY 50.788888272593105`

```
SetX = {0.4209812938222085, 4.712859649631424, 8.004738072021008,
12.285274492935438, 16.288402168730315, 19.743138931850666,
23.977197498796844, 27.29624192753624, 31.444719437012708,
35.621986098233634, 38.92472230868263, 43.16847140466988, 46.68530074879204,
50.6267927893172, 54.92178508536092, 58.218350080899306, 62.51002991303384,
66.4854131878235, 69.9709030995281, 74.21153113839458, 77.52502469063634,
81.68788913149565, 85.85723334787424, 89.16710771180297, 93.40992893710903,
96.90954344945773, 100.87078509797486, 105.16534463875428,
108.46294532504513, 112.75750547824764, 116.71873882370654,
120.21836099434664, 124.46118279915356, 127.77105396396402,
131.94040175647805, 136.1032601983149, 139.4167567463561,
143.65738286161513, 147.14286123426672, 151.1182562406376,
155.40993447696366, 158.706499479571, 163.00149309701854, 166.9429728964505,
170.45981448435595, 174.70356587243387, 178.0063001824017,
182.18357210379102, 186.33204646734364, 189.65109461811434,
193.88515394428768, 197.33988672251243, 201.34302025202282,
205.62355722952904, 208.91543727920399, 213.20731733340517}
```

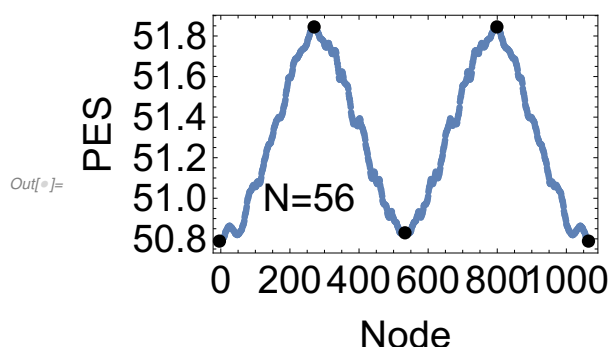
Eigenvalues

```
Out[ ]= {4.26913, 4.26015, 4.2453, 4.22372, 4.19944, 4.16718, 4.12957, 4.08296, 4.05371,
3.99129, 3.93505, 3.87681, 3.79723, 3.74066, 3.67467, 3.60799, 3.53158,
3.48136, 3.43042, 3.39545, 3.0783, 3.0783, 2.504, 2.46521, 2.4081, 2.33891,
2.26296, 2.18257, 2.102, 2.02486, 1.9546, 1.89503, 1.85374, 1.61607, 1.61607,
0.907473, 0.87888, 0.835758, 0.786923, 0.726513, 0.669187, 0.618407,
0.520504, 0.518641, 0.351748, 0.317478, 0.285018, 0.270067, 0.145069,
0.119873, 0.0928814, 0.0684563, 0.0566925, 0.0288241, 0.0162244, 0.00898146}
```



```
start energy 50.78889172688 detHess 764.92
-5.8462098328 - 1.5556438214 × 1.7350228496
6.0122429392 × 10.0218234054 × 13.4691877098
17.7016269511 × 21.0221488004 × 25.1669905453
29.3460751899 × 32.6471226727 × 36.8910647336
40.4120628055 × 44.3486967104 × 48.6435902309
51.9397792451 × 56.2306283177 × 60.2087676973
63.6913209396 × 67.9313820518 × 71.2454322246
75.4069651907 × 79.5772398910 × 82.8864012118
87.1294210890 × 90.6310118455 × 94.5901017166
98.8848754746 × 102.1824626057 × 106.4768176192
110.4401925839 × 113.9378402635 × 118.1804828807
121.4910518024 × 125.6594818679 × 129.8236876758
```

133.1366169115 × 137.3778330628 × 140.8662791788
 144.8388762479 × 149.1313686174 × 152.4282907635
 156.7233576585 × 160.6696364237 × 164.1823808866
 168.4259781934 × 171.7304592424 × 175.9058937012
 180.0580351794 × 183.3756605644 × 187.6113976541
 191.0737509846 × 195.0701842862 × 199.3539493059
 202.6471022897 × 206.9401694827
 SP node270 energy = 51.84475277 detHess - 3991.29
 - 5.8177417851 - 1.4917186145 × 1.8374295694
 6.1312412058 × 10.2736927221 × 13.6655805148
 17.9483170033 × 21.4469570596 × 25.4633236799
 29.8042842971 × 33.1460789927 × 37.4752033471
 41.5822854639 × 45.0139130176 × 49.3036703198
 52.7731981023 × 56.8349989368 × 61.1792344479
 64.5268155361 × 68.8666979081 × 72.9607845992
 76.4074823462 × 80.7006174157 × 84.1628144482
 88.2382762075 × 92.5840161024 × 95.9340743338
 100.2774700364 × 104.3700770665 × 107.8203655818
 112.1154669803 × 115.5790316349 × 119.6556314118
 124.0038845446 × 127.3560978104 × 131.7009274671
 135.8022657152 × 139.2489070305 × 143.5470435893
 147.0224380214 × 151.0889282471 × 155.4437470985
 158.8006835076 × 163.1463529304 × 167.2772438290
 170.7099683092 × 175.0169797947 × 178.5331338221
 182.5614046026 × 186.9316624905 × 190.3019441806
 194.6446029832 × 198.8535221740 × 202.2589213931
 206.5952653517 × 210.2500804683
 iMin node533 energy = 50.82979694 detHess 20.0
 - 5.7569362641 - 1.3715017119 × 2.0337263679
 6.3337023146 × 10.6841737850 × 14.0827398548
 18.4798251363 × 22.5155459953 × 26.0505753673
 30.3798923718 × 33.8488195121 × 37.9685937576
 42.3546000882 × 45.7422248290 × 50.1120174863
 54.3289468517 × 57.7491420532 × 62.1015480980
 65.7868572801 × 69.6576741035 × 74.0448858138
 77.4556485868 × 81.7503258813 × 86.1138655227
 89.5163310605 × 93.9186149703 × 97.9976462530
 101.5052256475 × 105.8400918508 × 109.3477849448
 113.4266705277 × 117.8289699477 × 121.2314545554
 125.5949566233 × 129.8897633154 × 133.3005167432
 137.6877810784 × 141.5589417542 × 145.2439228054
 149.5962657126 × 153.0165037234 × 157.2332731380
 161.6030792670 × 164.9906819716 × 169.3766567593
 173.4965299582 × 176.9653781619 × 181.2946954151
 184.8298196067 × 188.8654184605 × 193.2625015130
 196.6610722288 × 201.0115082374 × 205.3115440157
 208.7167626092 × 213.1022165221



```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

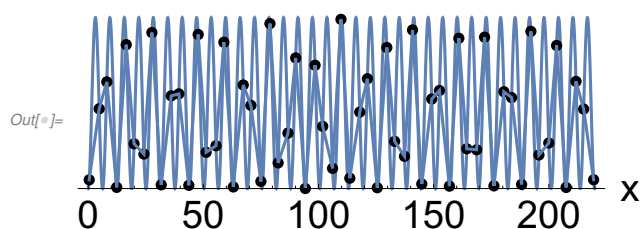
N = 57 Gold : global minimum

ENERGY 51.65711135757

```
SetX = {0.455673145630733, 4.778961991451399, 8.104466190339318,
12.398762760316314, 16.526234955643815, 19.923741595506236,
24.20045063283753, 27.674172621695543, 31.712670316959535,
36.043575744477806, 39.37806952508264, 43.70671933533387, 47.763265868785,
51.22311738896664, 55.50080190291109, 58.912127139443825,
63.025403337174026, 67.33102357214001, 70.65928881787352, 74.98720186105055,
78.91556857949855, 82.47696290902933, 86.75260851034689, 90.0919390176401,
94.28035334361799, 98.5013356082075, 101.82574790345075, 106.11231003217182,
109.75324832596162, 113.59530024032776, 117.91499067507834,
121.24021640186638, 125.52400010309178, 129.66853195725633,
133.0531155966622, 137.3317124996234, 140.82800014526907,
144.84156775927042, 149.17757506408836, 152.51473805978068,
156.84104307275618, 160.93101581718602, 164.369313622525, 168.6525744061255,
172.0979326943057, 176.179568442996, 180.50897622153153, 183.8471628974819,
188.18330285358743, 192.2122360486676, 195.69726373671674,
199.97699490368802, 203.3724532176023, 207.5065641062453,
211.80142360506073, 215.12889287409953, 219.45389928705404}
```

Eigenvalues

```
Out[*]= {4.27306, 4.26555, 4.25069, 4.23103, 4.20578, 4.17321, 4.13723, 4.11157, 4.05348,
4.00557, 3.95119, 3.89403, 3.83688, 3.75413, 3.69376, 3.63865, 3.574, 3.51734,
3.47089, 3.43023, 3.12417, 3.12172, 2.53659, 2.50473, 2.44675, 2.37896,
2.30195, 2.22742, 2.13862, 2.06444, 1.98537, 1.91598, 1.85592, 1.82211,
1.57022, 1.56762, 0.878891, 0.848301, 0.808466, 0.760436, 0.707472, 0.65797,
0.573732, 0.569476, 0.386379, 0.354144, 0.308837, 0.271137, 0.231847, 0.220421,
0.110971, 0.101692, 0.0623722, 0.0476878, 0.0302916, 0.0218238, 0.00204336}
```



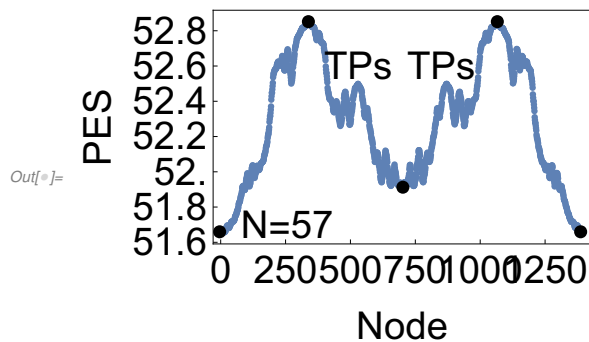
start energy = 51.657160 detHess 305.27

0.4626070016 × 4.7850231437 × 8.1100744379

12.4025136177 × 16.5318280250 × 19.9273648042

24.2038247165 × 27.6793125228 × 31.7153269572
 36.0462891605 × 39.3806123453 × 43.7088156673
 47.7669331827 × 51.2254168113 × 55.5030559703
 58.9154618854 × 63.0274402373 × 67.3337616282
 70.6621512081 × 74.9902613972 × 78.9216316078
 82.4803956291 × 86.7558096492 × 90.0960368438
 94.2831757227 × 98.5057033681 × 101.8297350933
 106.1169954537 × 109.7622167295 × 113.5997607724
 117.9188573438 × 121.2439028974 × 125.5264498031
 129.6721706994 × 133.0555829884 × 137.3341126947
 140.8318287762 × 144.8435442116 × 149.1795708234
 152.5166552187 × 156.8426019212 × 160.9337303295
 164.3711265131 × 168.6544557031 × 172.1009073861
 176.1813394468 × 180.5112599762 × 183.8496577695
 188.1858474273 × 192.2172526143 × 195.7005493494
 199.9805400336 × 203.3779184574 × 207.5102553582
 211.8069829954 × 215.1349258994 × 219.4608118775
 SP node338 energy = 52.850443 detHess - 668.29
 0.5319887703 × 4.9141458052 × 8.3165868017
 12.6139206971 × 16.9587867586 × 20.3544088576
 24.7478574790 × 28.7658547068 × 32.3118847178
 36.6387228124 × 40.0930153045 × 44.2272539459
 48.6040069976 × 51.9848685854 × 56.3547110054
 60.5318104648 × 63.9632331006 × 68.2996558673
 71.9080907359 × 75.8580518417 × 80.2518070662
 83.6555136710 × 87.9789878991 × 92.3168552287
 95.7188708518 × 100.1159200395 × 104.1097382312
 107.6801694473 × 112.0123566419 × 115.4602502801
 119.6104828263 × 123.9886558866 × 127.3722584675
 131.7463876864 × 135.9213538771 × 139.3564549979
 143.6944171204 × 147.3020219039 × 151.2551841844
 155.6511623353 × 159.0572517432 × 163.3817238293
 167.7251006319 × 171.1291411889 × 175.5293422053
 179.5402663627 × 183.0987633561 × 187.4320545120
 190.8912821951 × 195.0291207188 × 199.4147276856
 202.8032521571 × 207.1772722692 × 211.3842364608
 214.8094123365 × 219.1596172004 × 222.8268172972
 iMin node702 energy = 51.91263181 detHess 3193.206
 0.5725420303 × 4.9856775498 × 8.4359245477
 12.7215678541 × 17.1617861320 × 20.6088380082
 25.0381789712 × 29.3730985435 × 32.8173717804
 37.2473393621 × 41.2407460685 × 44.8446961427
 49.2080517902 × 52.7003109083 × 56.8419464840
 61.2726745549 × 64.7034701119 × 69.0893592988
 73.4495722278 × 76.8803270823 × 81.3071512965
 85.3683938013 × 88.9108829135 × 93.2646230823
 96.7861117651 × 100.8749309188 × 105.3009735009
 108.7286756333 × 113.0978822775 × 117.4676356699
 120.8953330542 × 125.3214637374 × 129.4119941299

132.9323688494 × 137.2862795005 × 140.8303983017
 144.8897429209 × 149.3167376146 × 152.7478778224
 157.1074472698 × 161.4948277213 × 164.9260461980
 169.3572360366 × 173.5036551353 × 176.9936573996
 181.3581910994 × 184.9686903909 × 188.9550047596
 193.3847703455 × 196.8301282782 × 201.1622097182
 205.5944030612 × 209.0427376315 × 213.4830405377
 217.7785938402 × 221.2280070366 × 225.6452661419
 SP node1066 energy = 52.85167314 detHess - 768.30
 3.3467756555 × 7.0240527926 × 11.3762581983
 14.8000528621 × 19.0120670633 × 23.3858780339
 26.7751487764 × 31.1618565309 × 35.2972189079
 38.7585151521 × 43.0918750178 × 46.6478975101
 50.6621406638 × 55.0627219954 × 58.4669009764
 62.8113284701 × 67.1352328031 × 70.5416218409
 74.9376302131 × 78.8891587735 × 82.4984073002
 86.8367505471 × 90.2716036902 × 94.4474735768
 98.8217128542 × 102.2055218244 × 106.5839524933
 110.7342131214 × 114.1822826756 × 118.5146309650
 122.0853070858 × 126.0790310935 × 130.4762423774
 133.8784642075 × 138.2163090631 × 142.5403866588
 145.9442148818 × 150.3382809265 × 154.2900425700
 157.8970259586 × 162.2333743352 × 165.6655480336
 169.8416052031 × 174.2120193741 × 177.5931269452
 181.9698999338 × 186.1065679605 × 189.5596961211
 193.8871947115 × 197.4366470181 × 201.4511485002
 205.8451156228 × 209.2415877932 × 213.5854945153
 217.8866083799 × 221.2890577494 × 225.6728973074
 gMin node1387 energy = 51.65970022 detHess 144.83
 6.7391996484 × 11.0624462042 × 14.3879278536
 18.6821333914 × 22.8096974544 × 26.2071064424
 30.4838034154 × 33.9576129815 × 37.9959876087
 42.3268963100 × 45.6613818388 × 49.9900099102
 54.0466362836 × 57.5064192548 × 61.7841021592
 65.1954831117 × 69.3086936192 × 73.6143512135
 76.9426237726 × 81.2705479710 × 85.1990733279
 88.7603291589 × 93.0359630122 × 96.3753411145
 100.5636881838 × 104.7847526822 × 108.1091445710
 112.3957435734 × 116.0369081105 × 119.8787213771
 124.1983802328 × 127.5235959388 × 131.8073143513
 135.9519084245 × 139.3364302275 × 143.6150232930
 147.1113854601 × 151.1248561321 × 155.4608640422
 158.7980224030 × 163.1243086163 × 167.2143403719
 170.6525916469 × 174.9358553208 × 178.3812687268
 182.4628432785 × 186.7922765408 × 190.1304732895
 194.4666151996 × 198.4956713406 × 201.9806122930
 206.2603559849 × 209.6559087430 × 213.7899318944
 218.0848836518 × 221.4123756801 × 225.7374252511



```
## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ##
```

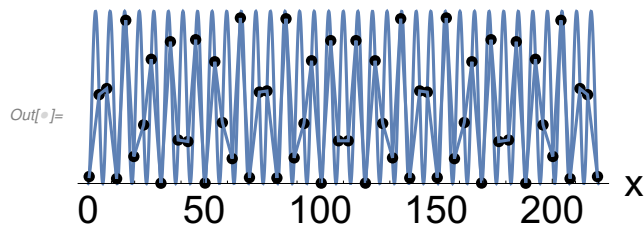
```
N = 58 Gold: global minimum
```

```
ENERGY 52.7186606510596
```

```
SetX = {0.40393165148540283, 4.680190258573766, 7.956967132508564,
12.22844563977826, 16.168394124446184, 19.664008384077786,
23.886972493337623, 27.16229461360205, 31.334220387298377,
35.42453074907752, 38.75244253460841, 42.94942992783106, 46.28764561713283,
50.36799233326708, 54.550669292912595, 57.82321769678085, 62.05220490102605,
65.57816278513809, 69.48918997219671, 73.76569985573724, 77.04411445500041,
81.31971073258701, 85.24144385985755, 88.75683916408568, 92.98416597252506,
96.25830356409392, 100.43730866414144, 104.52279442500082,
107.85684365878396, 112.05465740743414, 115.38871439126004,
119.474192696152, 123.65320603805279, 126.92734155299989,
131.15467260836252, 134.67009045312315, 138.5918012374058,
142.86739936748512, 146.14581355633348, 150.42232177582892,
154.33337098060844, 157.85930618013228, 162.08828855403453,
165.36083804513535, 169.54350692332864, 173.6238589155196,
176.9620671661697, 181.15905280978777, 184.48696746973692,
188.57727256463832, 192.74920000633364, 196.02451970895095,
200.24748341241124, 203.74310158484806, 207.68304484424658,
211.9545226521551, 215.23129835290922, 219.50755554749577}
```

```
Eigenvalues
```

```
Out[ ] = {4.26698, 4.25862, 4.24413, 4.22591, 4.20115, 4.17037, 4.13792, 4.09717, 4.04879,
4.01888, 3.95433, 3.89893, 3.82322, 3.76896, 3.70537, 3.63596, 3.57382,
3.51085, 3.43899, 3.40207, 3.36887, 3.058, 3.058, 2.48422, 2.44843, 2.39173,
2.33005, 2.25775, 2.18231, 2.10659, 2.03365, 1.96943, 1.911, 1.8732, 1.63727,
1.63726, 0.929845, 0.903103, 0.869789, 0.806656, 0.750828, 0.688197, 0.639389,
0.589216, 0.49698, 0.495306, 0.335971, 0.310422, 0.297077, 0.177492, 0.152279,
0.13095, 0.085996, 0.0644639, 0.0415728, 0.0380711, 0.0121596, 0.00637806}
```



```

start energy = 52.7190620454 detHess 613.14
0.4180416446 × 4.6937962408 × 7.9697128413
12.2389472021 × 16.1865767572 × 19.6736380388
23.8946241311 × 27.1704386287 × 31.3392208869
35.4313721220 × 38.7567139684 × 42.9532459163
46.2929565639 × 50.3712328413 × 54.5550642963
57.8269454451 × 62.0563602022 × 65.5856988468
69.4931414082 × 73.7697467932 × 77.0480032359
81.3231548188 × 85.2476613740 × 88.7601556776
92.9869178167 × 96.2613079451 × 100.4392986146
104.5257493767 × 107.8588024875 × 112.0566277074
115.3916675373 × 119.4761917656 × 123.6562433293
126.9301136014 × 131.1580304372 × 134.6763837469
138.5952730996 × 142.8713009598 × 146.1498491806
150.4262469482 × 154.3408384606 × 157.8634353870
162.0920172550 × 165.3652497195 × 169.5467749858
173.6292328910 × 176.9659509110 × 181.1634404352
184.4940290991 × 188.5824209198 × 192.7575658132
196.0324299267 × 200.2574354012 × 203.7619599470
207.6938588548 × 211.9674758026 × 215.2451363751
219.5217507470

```

```

SP node258 energy = 53.6439793161 detHess - 40.49
0.7203864621 × 4.9986662768 × 8.3176443430
12.5310428472 × 16.7091209321 × 20.0451031077
24.3115016229 × 27.8459091849 × 31.7957551366
36.1163623798 × 39.4370410609 × 43.7437855216
47.8142733302 × 51.2479282102 × 55.5134403149
58.9189739664 × 63.0215658377 × 67.3127345311
70.6305816167 × 74.9469026386 × 78.8270689729
82.4239168054 × 86.6969023675 × 90.0154734535
94.2210012119 × 98.3997537747 × 101.7314716426
105.9954120934 × 109.5290681717 × 113.4765701731
117.7942817760 × 121.1121126156 × 125.4170436961
129.4778059855 × 132.9156190532 × 137.1775978808
140.5709227317 × 144.6821236903 × 148.9613849238
152.2753617067 × 156.5851203083 × 160.4202764131
164.0576932812 × 168.3353998033 × 171.6467659397
175.8671118659 × 180.0254209182 × 183.3676244165
187.6247240306 × 191.1169564249 × 195.1062385577
199.4171919550 × 202.7308777832 × 207.0397506064
211.0479825680 × 214.5239487018 × 218.7805292503
222.1322899226 o.k. correct SP

```

```

start energy = 52.71877250 detHess 648.708
0.4192223352 × 4.6949103567 × 7.9707344830
12.2397622470 × 16.1879565309 × 19.6743519960
23.8951575737 × 27.1709664353 × 31.3395050979
35.4316961962 × 38.7568704069 × 42.9533108919

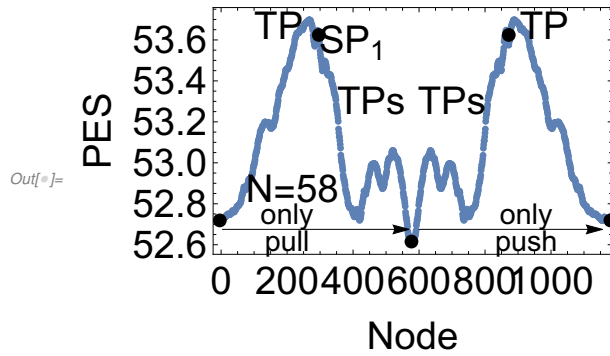
```

46.2929638639 × 50.3711775247 × 54.5548913899
 57.8267251723 × 62.0560301427 × 65.5850222089
 69.4927449692 × 73.7692628535 × 77.0474573245
 81.3225927550 × 85.2465557040 × 88.7595126360
 92.9862899258 × 96.2604999773 × 100.4386610433
 104.5246469333 × 107.8579549545 × 112.0556147011
 115.3899704859 × 119.4749421515 × 123.6541980881
 126.9281271177 × 131.1555184134 × 134.6715655546
 138.5925684985 × 142.8681892316 × 146.1465371505
 150.4229692159 × 154.3345338003 × 157.8599011305
 162.0887616125 × 165.3612952649 × 169.5437929575
 173.6242541617 × 176.9622786989 × 181.1592213746
 184.4871435318 × 188.5773715912 × 192.7493240086
 196.0245805306 × 200.2475421354 × 203.7431726655
 207.6830816432 × 211.9545731980 × 215.2313137040
 219.5075725587 SP does not exist?

SP node296 energy = 53.624265787 detHess - 193.55
 0.4575134168 × 4.7824542301 × 8.1098486089
 12.4046872294 × 16.5385459861 × 19.9340802347
 24.2136956935 × 27.6982881285 × 31.7275926452
 36.0635420661 × 39.4015885535 × 43.7309776997
 47.8116846704 × 51.2575567055 × 55.5405910387
 58.9778180068 × 63.0687290316 × 67.3943070289
 70.7311042404 × 75.0668769615 × 79.0773328898
 82.5757844863 × 86.8540543710 × 90.2363856147
 94.3829176788 × 98.6641768673 × 101.9889227167
 106.3073090519 × 110.1402774224 × 113.7897567902
 118.0776388604 × 121.4011958227 × 125.6252526596
 129.8108654884 × 133.1520126896 × 137.4270424670
 140.9826054481 × 144.9174909292 × 149.2456863008
 152.5740823714 × 156.8811634785 × 160.9910757718
 164.4049602060 × 168.6823313225 × 172.1384104492
 176.1990273694 × 180.5262203323 × 183.8600595675
 188.1909442739 × 192.2219031143 × 195.7008699793
 199.9767243107 × 203.3681792868 × 207.5011610769
 211.7895562824 × 215.1136352443 × 219.4340645921
 223.2950037161

gMin node577 energy = 52.61538008 detHess 2722.05
 0.5158623358 × 4.8923696717 × 8.2850298582
 12.5862183210 × 16.9072531873 × 20.2965065058
 24.6781007373 × 28.6205556160 × 32.2236643265
 36.5494985697 × 39.9627269137 × 44.1454039760
 48.4904656141 × 51.8563078880 × 56.2219495861
 60.2666547373 × 63.7663555250 × 68.0703598387
 71.5096010005 × 75.6283048267 × 79.9750651796
 83.3309980363 × 87.6838283524 × 91.7595669826
 95.2274318833 × 99.5256004138 × 102.9794116291
 107.0721831659 × 111.4201338150 × 114.7737401782

119.1217751636 \times 123.2139419681 \times 126.6681624489
 130.9662533033 \times 134.4334914938 \times 138.5098830674
 142.8624441371 \times 146.2182052269 \times 150.5649821151
 154.6823550533 \times 158.1222598551 \times 162.4258958359
 165.9237928172 \times 169.9702304166 \times 174.3352442887
 177.7005260636 \times 182.0457667657 \times 186.2251700348
 189.6394688892 \times 193.9640269494 \times 197.5610531476
 201.5096834134 \times 205.8912553386 \times 209.2796565522
 213.6026287311 \times 217.8999320167 \times 221.2928065085
 225.6677841436



```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

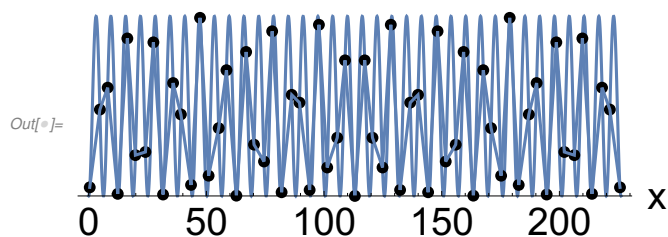
N = 59 Gold : global minimum

ENERGY 53.537064268743

```
SetX = {0.4407354013452721, 4.750562184215506, 8.061117475359858,
12.350296731041086, 16.425079522990103, 19.842648397658852,
24.097936060888948, 27.493460850841, 31.592885441789594, 35.86834682166329,
39.17741017587148, 43.48219863989047, 47.30747511665171, 50.95019579081827,
55.22536745041897, 58.531010230075154, 62.753156431290705,
66.89668719701501, 70.24265677703606, 74.4920198486462, 77.95421474226677,
81.96911047734976, 86.26775514524412, 89.57433269975077, 93.8801521075715,
97.82656904558762, 101.34958440279836, 105.60280307870694,
108.9199310344442, 113.09733552923238, 117.27474002402037,
120.59186797975772, 124.84508665566624, 128.3681020128766,
132.3145189508931, 136.6203383587138, 139.92691591322045,
144.22556058111488, 148.24045631619745, 151.70265120981838,
155.95201428142852, 159.29798386144935, 163.4415146271739,
167.6636608283892, 170.96930360804544, 175.244475267646, 178.88719594181183,
182.71247241857387, 187.01726088259298, 190.32632423680124,
194.60178561667516, 198.70121020762363, 202.09673499757588,
206.35202266080606, 209.76959153547475, 213.8443743274239,
218.13355358310514, 221.44410887424954, 225.7539356571198}
```

Eigenvalues

```
Out[ ] = {4.27047, 4.26261, 4.24932, 4.23197, 4.20682, 4.17859, 4.14451, 4.10527,
4.07874, 4.01777, 3.96769, 3.91347, 3.85978, 3.78224, 3.72666, 3.6639,
3.59722, 3.54718, 3.48537, 3.43944, 3.40513, 3.10272, 3.10272, 2.51495,
2.48225, 2.43019, 2.36925, 2.29984, 2.22133, 2.14247, 2.06423, 1.9956,
1.93294, 1.87821, 1.84301, 1.59035, 1.59035, 0.899043, 0.870403,
0.830424, 0.783047, 0.735118, 0.678554, 0.628814, 0.546641, 0.544981,
0.363409, 0.33114, 0.294461, 0.261732, 0.251957, 0.132453, 0.106885,
0.0841174, 0.0769569, 0.0423037, 0.019236, 0.00565575, 0.00322716}
```



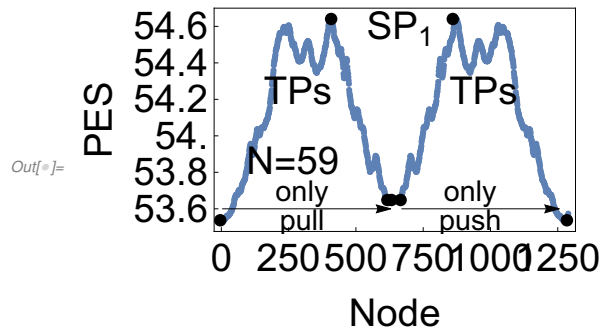
start Min energy = 53.537182659 detHess 102.71
 0.440735 × 4.750560 × 8.061120 × 12.3503
 16.425100 × 19.842600 × 24.097900 × 27.4935
 31.592900 × 35.868300 × 39.177400 × 43.4822
 47.307500 × 50.950200 × 55.225400 × 58.531
 62.753200 × 66.896700 × 70.242700 × 74.492
 77.954200 × 81.969100 × 86.267800 × 89.5743
 93.880200 × 97.826600 × 101.350000 × 105.603
 108.920000 × 113.097000 × 117.275000 × 120.592
 124.845000 × 128.368000 × 132.315000 × 136.62
 139.927000 × 144.226000 × 148.240000 × 151.703
 155.952000 × 159.298000 × 163.442000 × 167.664
 170.969000 × 175.244000 × 178.887000 × 182.712
 187.017000 × 190.326000 × 194.602000 × 198.701
 202.097000 × 206.352000 × 209.770000 × 213.844
 218.134000 × 221.444000 × 225.754

SP node312 energy = 54.63888116 detHess - 3962.66
 0.5192365904 × 4.8952184408 × 8.2878670931
 12.5878549034 × 16.9093253501 × 20.2982640146
 24.6797591633 × 28.6236055237 × 32.2252383678
 36.5506837239 × 39.9640083606 × 44.1459626129
 48.4908526382 × 51.8564448825 × 56.2218337980
 60.2661765057 × 63.7659158775 × 68.0696974508
 71.5083834240 × 75.6274249059 × 79.9736660933
 83.3292698165 × 87.6819055408 × 91.7556025714
 95.2245785171 × 99.5222645018 × 102.9738105561
 107.0686154543 × 111.4151482500 × 114.7678786057
 119.1156383775 × 123.2016023211 × 126.6591707938
 130.9557511454 × 134.4156803882 × 138.4987907879
 142.8473930235 × 146.2005112665 × 150.5468565329
 154.6461943014 × 158.0950991355 × 162.3937305405
 165.8679924418 × 169.9365730120 × 174.2916516898
 177.6489566937 × 181.9951859103 × 186.1259305887
 189.5591313761 × 193.8664284061 × 197.3828023086
 201.4111962772 × 205.7817988819 × 209.1524294622
 213.4952198081 × 217.7053219902 × 221.1105704839
 225.4475260190 × 229.1049345119

start
 0.4408462853 × 4.7507931414 × 8.0614330375
 12.3506745641 × 16.4258797397 × 19.8432420187
 24.0986812616 × 27.4947047494 × 31.5937688901
 35.8697464479 × 39.1789345627 × 43.4840202545
 47.3111787707 × 50.9521379377 × 55.2270702625
 58.5328614380 × 62.7544416556 × 66.8986852118
 70.2441403334 × 74.4936546751 × 77.9569851187
 81.9707183949 × 86.2697514369 × 89.5764389532
 93.8823122952 × 97.8307898305 × 101.3520393597
 105.6051886102 × 108.9230629393 × 113.0996314477

117.2784960443 × 120.5951588779 × 124.8490847490
 128.3755335148 × 132.3186406530 × 136.6250001278
 139.9319363019 × 144.2303069970 × 148.2494793314
 151.7084538189 × 155.9581688860 × 159.3071412700
 163.4481174818 × 167.6742903333 × 170.9797593438
 175.2572662040 × 178.9122773303 × 182.7251500428
 187.0286239640 × 190.3374846651 × 194.6098160950
 198.7140211170 × 202.1052807298 × 206.3606368309
 209.7830089516 × 213.8524270305 × 218.1441001554
 221.4550346981 × 225.7655990099
 SP node408 energy = 54.6405794423 detHess - 3731.9
 0.5157975839 × 4.8922485931 × 8.2848307858
 12.5860244139 × 16.9068705763 × 20.2960741543
 24.6775651445 × 28.6194356581 × 32.2230137175
 36.5488674977 × 39.9618575530 × 44.1448513038
 48.4896842689 × 51.8554566284 × 56.2210450987
 60.2648405130 × 63.7651535657 × 68.0690553370
 71.5075395977 × 75.6269975502 × 79.9732390078
 83.3289013968 × 87.6816240832 × 91.7551378007
 95.2243006594 × 99.5220180142 × 102.9734640959
 107.0684342498 × 111.4149569277 × 114.7676984513
 119.1154873149 × 123.2013345593 × 126.6589946456
 130.9555707533 × 134.4153969584 × 138.4986259594
 142.8471878796 × 146.2002853023 × 150.5466359778
 154.6457654407 × 158.0947877759 × 162.3933724847
 165.8673850645 × 169.9362046743 × 174.2911694750
 177.6483928774 × 181.9946240176 × 186.1248219612
 189.5582708207 × 193.8653975818 × 197.3809708583
 201.4101365087 × 205.7805148191 × 209.1509123247
 213.4938239712 × 217.7026640888 × 221.1082307526
 225.4446520929 × 229.0994207964
 iMin node617 energy = 53.6483071 detHess 663.44
 0.5329034255 × 4.9241619140 × 8.3377606102
 12.6366028474 × 17.0056195944 × 20.4117077317
 24.8177585053 × 28.9140092343 × 32.4133249522
 36.7527031671 × 40.2807601309 × 44.3399561553
 48.7492345200 × 52.1600002793 × 56.5188242282
 60.8478090704 × 64.2609724776 × 68.6641164860
 72.6314650293 × 76.2326955159 × 80.5748679148
 84.0228850323 × 88.1883394820 × 92.5756769289
 95.9681414770 × 100.3494419343 × 104.5502146515
 107.9817433961 × 112.3330810452 × 115.9924196903
 119.8957778285 × 124.2918944579 × 127.7077432939
 132.0136880142 × 136.3863796370 × 139.7960781503
 144.2057651678 × 148.3127782909 × 151.8083162444
 156.1516785427 × 159.6946456635 × 163.7401920889
 168.1542191294 × 171.5713660072 × 175.9263100055
 180.2783754122 × 183.6956768334 × 188.1091531479
 192.1457675561 × 195.6954133363 × 200.0386382262

$203.5280370001 \times 207.6427120373 \times 212.0506106611$
 $215.4585330448 \times 219.8329901761 \times 224.1290323164$
 $227.5450309001 \times 231.9368315862$
 and node 628 detHess - 411.63
 and node 639 detHess 963.46



```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

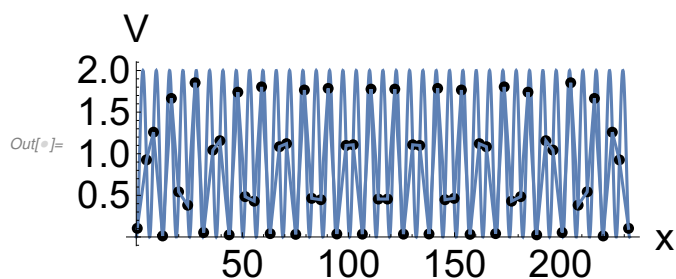
N = 60 GOLD global minimum

ENERGY 54.428352429767

```
SetX = {0.45952760296413425, 4.786274251755384, 8.115749278061596,
12.411158375587448, 16.5519776802737, 19.94548003479691,
24.228333761520847, 27.725128520498846, 31.743932789080603,
36.0848932916748, 39.426796306855465, 43.75641757502447, 47.8620751554976,
51.294786020690545, 55.58443708598131, 59.05247758053361,
63.11593380679555, 67.45966538009023, 70.80697132407414, 75.14694912601695,
79.2382885933285, 82.68657966054563, 86.9791241937424, 90.43813671391094,
94.51660590077128, 98.86067521533437, 102.20969001836886,
106.5528862558871, 110.63778061042174, 114.09229888373315,
118.38555621799269, 121.84007394633912, 125.92496914409404,
130.268165272095, 133.61718006592054, 137.96124929286177,
142.0397175032422, 145.49873081676458, 149.7912749286263,
153.23956483496664, 157.3309055137513, 161.67088320209982,
165.01818943695864, 169.36192111648253, 173.42537633674783,
176.89341788885534, 181.18306913796988, 184.61577951497694,
188.7214379908557, 193.05105926964703, 196.39296245466747,
200.73392293955868, 204.7527266583616, 208.2495219298454,
212.53237579361425, 215.9258782842949, 220.06669778900198,
224.36210692680538, 227.69158215514844, 232.0183288770842}
```

Eigenvalues

```
Out[ ]:= {4.27604, 4.26806, 4.25516, 4.23731, 4.21454, 4.18691, 4.14882, 4.12795,
4.07917, 4.03302, 3.98373, 3.93137, 3.87661, 3.82153, 3.73635, 3.6898,
3.63161, 3.57423, 3.52164, 3.47829, 3.45028, 3.12666, 3.12666, 2.55644,
2.52109, 2.46971, 2.40645, 2.33515, 2.25928, 2.18324, 2.10632, 2.02934,
1.95676, 1.89177, 1.83822, 1.80089, 1.56499, 1.56499, 0.866115, 0.843212,
0.806877, 0.762457, 0.715189, 0.672721, 0.578386, 0.576889, 0.411448,
0.372233, 0.328543, 0.285672, 0.247284, 0.218715, 0.200491, 0.113505,
0.0920618, 0.0688567, 0.0493562, 0.0342676, 0.0238518, 0.0181262}
```



```

start energy = 54.42850873 detHess 9547.22
0.4595231910 × 4.7862871340 × 8.1157340415
12.4111639936 × 16.5520027519 × 19.9454732809
24.2283336676 × 27.7250988054 × 31.7439229680
36.0849092643 × 39.4267910086 × 43.7564379022
47.8621308662 × 51.2948045170 × 55.5844679732
59.0525008667 × 63.1159581352 × 67.4597270870
70.8070191289 × 75.1470233352 × 79.2384497220
82.6866750169 × 86.9792437326 × 90.4383090798
94.5167230376 × 98.8608623321 × 102.2098836135
106.5531127569 × 110.6382474294 × 114.0926154742
118.3859292654 × 121.8406670883 × 125.9253471951
130.2687048585 × 133.6177835005 × 137.9618958476
142.0410204429 × 145.4996445782 × 149.7923383126
153.2413189875 × 157.3320281320 × 161.6724709995
165.0200182965 × 169.3638641028 × 173.4292907225
176.8961547453 × 181.1862030748 × 184.6209122854
188.7247714740 × 193.0558451121 × 196.3984527163
200.7398731770 × 204.7647732539 × 208.2574266317
212.5410022687 × 215.9392035935 × 220.0758061118
224.3759905731 × 227.7067321954 × 232.0357622836
  SP node517 energy = 55.66947418 detHess - 696.66
0.5326494272 × 4.9236891216 × 8.3369697550
12.6358615013 × 17.0041882196 × 20.4099734369
24.8157047948 × 28.9096840914 × 32.4102039665
36.7490891478 × 40.2745456230 × 44.3363963260
48.7449925985 × 52.1548539746 × 56.5143980026
60.8396789759 × 64.2524336751 × 68.6539271920
72.6104771943 × 76.2205189549 × 80.5632704989
84.0067341852 × 88.1787921972 × 92.5634139330
95.9544777385 × 100.3363210983 × 104.5247473683
107.9604498046 × 112.3073983613 × 115.9440378710
119.8713122792 × 124.2699107441 × 127.6841330189
131.9989630332 × 136.3658411016 × 139.7754644440
144.1847650043 × 148.2714447457 × 151.7798680028
156.1206891364 × 159.6429250579 × 163.7117623689
168.1225056780 × 171.5343673626 × 175.8962267637
180.2251302960 × 183.6395019970 × 188.0435711557
192.0108854986 × 195.6131059730 × 199.9561942279
203.4054881493 × 207.5707672839 × 211.9597884422
215.3535799795 × 219.7354626979 × 223.9422299423
227.3724597513 × 231.7264509710 × 235.3977757926
node567 mirror SP ? or return energy = 55.6728618163 detHess - 2253.28

```

start SP node205 energy = 55.583722365 detHess - 76.39

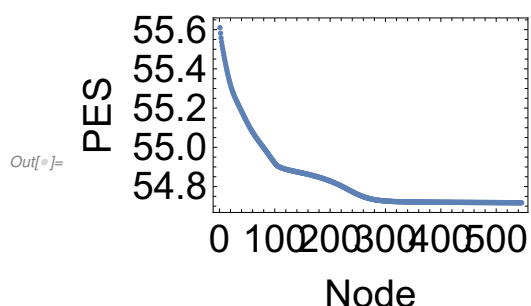
3.4521368675 × 7.0328096244 × 11.2948462104
 14.6013313989 × 18.8020125172 × 22.9551681401
 26.2868335179 × 30.5329268370 × 34.0063734862
 38.0034837612 × 42.3002880582 × 45.6032701234
 49.9049936049 × 53.8539853796 × 57.3707958317
 61.6202022693 × 64.9334112152 × 69.1090418576
 73.2786760145 × 76.5951336581 × 80.8425062440
 84.3459685322 × 88.3085763552 × 92.6084227170
 95.9106184339 × 100.2085812295 × 104.1897156817
 107.6764382431 × 111.9224941730 × 115.2459214399
 119.4070206732 × 123.5946166419 × 126.9038130319
 131.1588281328 × 134.7048544172 × 138.6251694824
 142.9303783190 × 146.2356602075 × 150.5294725333
 154.5594702006 × 158.0072693136 × 162.2552732296
 165.6086729106 × 169.7427429242 × 173.9734017482
 177.2772585816 × 181.5564142686 × 185.2256499526
 189.0228504102 × 193.3232451809 × 196.6302792891
 200.8981645016 × 205.0030154111 × 208.3908636025
 212.6440117458 × 216.0642812620 × 220.1330504675
 224.4215760309 × 227.7304942868 × 232.0388010462
 nodes 300 + xx TP !

SP node472 energy = 54.85689861 detHess - 2.52

first x_i different values !

1.5935422145 × 5.9182983114 × 9.8862106760
 13.4088916017 × 17.6778959446 × 21.0255033158
 25.1955268538 × 29.4282947746 × 32.7466879446
 37.0364107887 × 40.7108852081 × 44.5148145814
 48.8264477491 × 52.1467489274 × 56.4192401492
 60.5626648042 × 63.9402123211 × 68.2127277396
 71.7004820245 × 75.7161558040 × 80.0444325659
 83.3748984315 × 87.6978469347 × 91.7572002009
 95.2105607427 × 99.4847047193 × 102.8932923503
 107.0046368443 × 111.3053180761 × 114.6303690720
 118.9547071387 × 122.8659832500 × 126.4401265410
 130.7149999630 × 134.0467540628 × 138.2417868809
 142.4485295543 × 145.7747986696 × 150.0536269220
 153.6560871336 × 157.5367793034 × 161.8588610015
 165.1831756170 × 169.4765110962 × 173.6011647304
 176.9990751375 × 181.2741315666 × 184.7426677881
 188.7851355235 × 193.1131494583 × 196.4456534292
 200.7735421407 × 204.8170239851 × 208.2847718881
 212.5598753999 × 215.9585356695 × 220.0824183905
 224.3764025819 × 227.7008520478 × 232.0232146690

node 272 for start IRC : energy = 55.4226438 detHess - 170.8



end IRC looks like iMin !

6.5048640835821807 × 10.608181254661163 × 13.785098890151838
 17.901818142091553 × 21.204791290629835 × 25.217248735080755
 29.310821582422125 × 32.546350133145189 × 36.682759768961787
 39.973371982149217 × 44.022832017856331 × 48.119698474923567
 51.372647073107821 × 55.526871017161014 × 58.820697602355828
 62.885101670730862 × 66.991973432461094 × 70.255362921856999
 74.417626776741770 × 77.760646305226402 × 81.797961660630989
 85.967701817566507 × 89.216688318690728 × 93.429764867597626
 96.898162512856928 × 100.85158016880905 × 105.10096168090232
 108.37709910627612 × 112.63832132254137 × 116.47978768808755
 120.07254234311843 × 124.32648167841478 × 127.59002974702737
 131.80939173542481 × 135.86683809772128 × 139.23920477622434
 143.43734653880503 × 146.77714557764824 × 150.87065674689160
 155.06514058055939 × 158.33990230917948 × 162.58719429847957
 166.11284888082218 × 170.03525159385262 × 174.31395912163302
 177.61139502509826 × 181.88659737048013 × 185.86361152779222
 189.34120243463613 × 193.58365264661103 × 196.88204445827836
 201.05262224600759 × 205.19904270893849 × 208.51509237139894
 212.74300460451840 × 216.20519374623314 × 220.19809526447753
 224.47966625904664 × 227.76850176693176 × 232.05907920283198

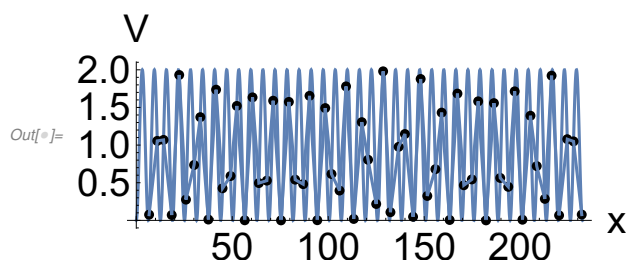
Setxx = iMin

ENERGY 54.67307997353055

```
SetX = {6.674777829658045, 10.939660467880444, 14.206105938032202,
  18.470176253084983, 22.36390230963313, 25.89344662861953, 30.11242356751479,
  33.36691123292921, 37.54999356280714, 41.58450972554836, 44.94193275934726,
  49.11833837929467, 52.38315045092045, 56.50211815594463, 60.57455315118077,
  63.873521146301556, 68.03573654505358, 71.31632353000239, 75.40465002152592,
  79.4994029086148, 82.77520132784754, 86.93937441808967, 90.24871933254929,
  94.31425200197182, 98.44620823118291, 101.70735999537048,
  105.8917387224636, 109.27905726081053, 113.29258813282664,
  117.50013325256764, 120.75522022648694, 124.9911416363062,
  128.60406854054852, 132.41687022013895, 136.68253888598082,
  139.94847803019957, 144.20354317156267, 148.15381735412737,
  151.62557636209993, 155.83467860618373, 159.09639910186831,
  163.26031201147674, 167.32189845325425, 170.65405525475657,
  174.8320061946862, 178.1200312351068, 182.22190785111508, 186.33331791432,
  189.61459184780927, 193.7955446300685, 197.14422200093276,
  201.19341163996452, 205.37370445768974, 208.633175737119,
  212.85294277750688, 216.37273825219017, 220.27932987613548,
  224.5455259370637, 227.81478981136195, 232.08283761848762}
```

Eigenvalues

```
Out[*]= {4.26526, 4.25689, 4.24458, 4.22673, 4.20344, 4.17591, 4.1426, 4.1057,
  4.06535, 4.01794, 3.98492, 3.92016, 3.84606, 3.79452, 3.7326, 3.66884,
  3.60536, 3.53901, 3.47901, 3.41978, 3.36653, 3.33518, 3.04777, 3.04391,
  2.46729, 2.42536, 2.38214, 2.32208, 2.25349, 2.18196, 2.11023, 2.04111,
  1.98012, 1.93359, 1.88978, 1.65176, 1.64782, 0.96, 0.933117, 0.885335,
  0.833235, 0.777682, 0.718165, 0.657916, 0.59828, 0.552528, 0.483533,
  0.476125, 0.329762, 0.317346, 0.232659, 0.193865, 0.156288, 0.117307,
  0.0946832, 0.0666709, 0.0509284, 0.0302999, 0.0273781, 0.00101359}
```

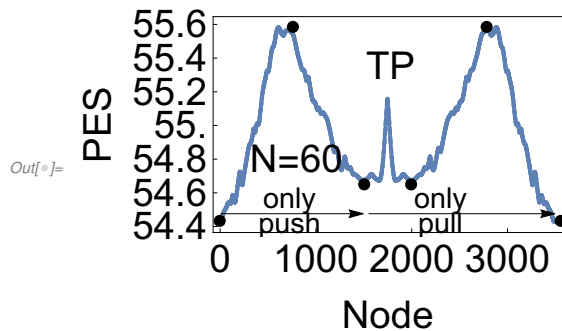


```
iMin2 node65 energy = 54.6748532 detHess 1906.37
```

```
6.6758972376 × 10.9418147260 × 14.2091769117
18.4739474997 × 22.3718794852 × 25.8982123301
30.1174219409 × 33.3734744627 × 37.5556661663
41.5949036261 × 44.9494358882 × 49.1272330192
52.3971290709 × 56.5138282668 × 60.5956950125
63.8908682349 × 68.0579150574 × 71.3540163329
75.4350671619 × 79.5529531316 × 82.8223430893
87.0007562200 × 90.3577826055 × 94.3952793635
98.5797416202 × 101.8356976971 × 106.0564671769
109.5899964717 × 113.4811721951 × 117.7468286251
121.0144623492 × 125.2801030785 × 129.1714797141
132.7048041819 × 136.9255356674 × 140.1815041703
```


144.3659030413 × 148.4034756187 × 151.7604191562
 155.9388256920 × 159.2082620340 × 163.3261025626
 167.4072359156 × 170.7032892683 × 174.8703680807
 178.1656686322 × 182.2474638988 × 186.3643419555
 189.6341885701 × 193.8120954534 × 197.1670155308
 201.2060010143 × 205.3885597969 × 208.6446054681
 212.8640728638 × 216.3915606774 × 220.2884198231
 224.5533504803 × 227.8207669420 × 232.0866547728
 iSP node116 energy = 54.6752911 detHess - 821.58
 6.6970872047 × 10.9647820701 × 14.2336509972
 18.4996171601 × 22.4045973040 × 25.9255391266
 30.1452204425 × 33.4040617698 × 37.5847251019
 41.6320566096 × 44.9817751849 × 49.1621206029
 52.4413235538 × 56.5536875826 × 60.6519199423
 63.9411290083 × 68.1169933074 × 71.4422226286
 75.5078372664 × 79.6634586955 × 82.9261545878
 87.1296645862 × 90.5792577596 × 94.5478150275
 98.7931599837 × 102.0565322079 × 106.3177344207
 110.0855676778 × 113.7431893696 × 117.9849683667
 121.2412765497 × 125.4594818924 × 129.4568110688
 132.8646699686 × 137.0539631038 × 140.3126520957
 144.4529865447 × 148.5122971640 × 151.8299487092
 155.9956751674 × 159.2682427677 × 163.3673319763
 167.4522842526 × 170.7358555411 × 174.8973513795
 178.1903021662 × 182.2680517138 × 186.3816574872
 189.6475815379 × 193.8209956220 × 197.1610343167
 201.2122185322 × 205.3967902557 × 208.6491086386
 212.8698154958 × 216.3823766811 × 220.2974013876
 224.5763406426 × 227.8304114255 × 232.1022928572
 SP node412 energy = 55.58551652 detHess - 155.90
 6.7222166102 × 11.0305016309 × 14.3393965493
 18.6279126550 × 22.6965957735 × 26.1169045358
 30.3700225203 × 33.7577625931 × 37.8626891546
 42.1304645154 × 45.4374713435 × 49.7378013758
 53.5346002036 × 57.2042193071 × 61.4834349610
 64.7872749221 × 69.0180538889 × 73.1520003333
 76.5055067452 × 80.7535004193 × 84.2011262302
 88.2313125403 × 92.5250659913 × 95.8303366977
 100.1355382472 × 104.0555378302 × 107.6018509314
 111.8568970838 × 115.1660169222 × 119.3537313123
 123.5146593826 × 126.8381672797 × 131.0841571263
 134.5705232696 × 138.5519988921 × 142.8498650509
 146.1520155906 × 150.4518579283 × 154.4138899815
 157.9178278934 × 162.1652030857 × 165.4814061013
 169.6512857638 × 173.8264478717 × 177.1397874997
 181.3889543844 × 184.9046468470 × 188.8546921822
 193.1562001648 × 196.4590467780 × 200.7559036062
 204.7514885573 × 208.2261213312 × 212.4721336916
 215.8028804423 × 219.9568204837 × 224.1560797300

227.4627742429 \times 231.7240059034 \times 235.3007865234
 gMin node617 energy = 54.43334815 detHess 14 230.37
 6.7427130350 \times 11.0694600973 \times 14.3989354745
 18.6943446633 \times 22.8351650307 \times 26.2286674568
 30.5115220058 \times 34.0083193525 \times 38.0271216022
 42.3680833878 \times 45.7099875622 \times 50.0396090861
 54.1452729760 \times 57.5779808685 \times 61.8676339209
 65.3356829360 \times 69.3991314424 \times 73.7428669323
 77.0901755252 \times 81.4301537623 \times 85.5215120264
 88.9697926422 \times 93.2623415367 \times 96.7213762274
 100.7998249073 \times 105.1439061447 \times 108.4929282356
 112.8361259669 \times 116.9210744256 \times 120.3755624497
 124.6688320980 \times 128.1234113692 \times 132.2082501562
 136.5514822966 \times 139.9005190316 \times 144.2445952160
 148.3232250522 \times 151.7821470933 \times 156.0747278707
 159.5231977161 \times 163.6143754349 \times 167.9544658432
 171.3018366099 \times 175.6455939101 \times 179.7095426574
 183.1772898948 \times 187.4670382069 \times 190.9002498799
 195.0054584488 \times 199.3354437764 \times 202.6775242883
 207.0186015317 \times 211.0389359865 \times 214.5346849197
 218.8177134246 \times 222.2123766818 \times 226.3521512497
 230.6487558970 \times 233.9785359839 \times 238.3058589013

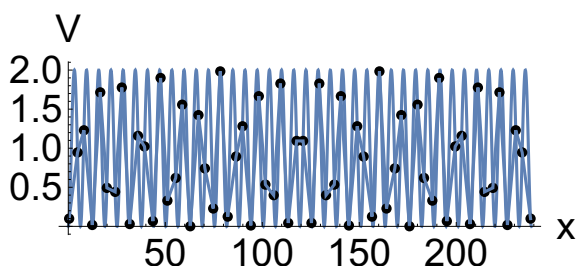


```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

N = 61 GOLD global minimum

ENERGY 55.4452042653326

```
SetX = {0.4168790091149058, 4.705009816081144, 7.99316784895675,
12.271655108245183, 16.259674733531686, 19.72354882972706,
23.954320496346117, 27.26108888557415, 31.4164105441277, 35.57221621089212,
38.87870122242098, 43.10963575281218, 46.574527915361784,
50.56156319474917, 54.84037220604372, 58.12861935282804, 62.41682459049929,
66.30181383424913, 69.86430431850839, 74.10789627531764, 77.3905624870444,
81.58568759317488, 85.68523740812674, 89.0254878611061, 93.2385302849328,
96.60514035844363, 100.6780320616887, 104.8974613384547,
108.17611739717672, 112.43304777510822, 116.07347965501418,
119.87860628543675, 124.1614774002719, 127.44669835099364,
131.70949010577738, 135.73710420618738, 139.16063099126583,
143.38610893360226, 146.70839299424875, 150.84202931720912,
155.02123180233636, 158.31697660080718, 162.5576393791199,
166.0773477310326, 170.01125537622886, 174.30234778069925,
177.59501026676594, 181.8831612416879, 185.8480141393847,
189.33867370305848, 193.57605157655559, 196.8804179349474,
201.04714763603462, 205.19909568175473, 208.51197279091735,
212.7443699623479, 216.20352990382221, 220.19925650147601,
224.47879845049968, 227.7688455185815, 232.05888688077633}
```



SP node124 energy = 56.470103786 detHess - 3041.24

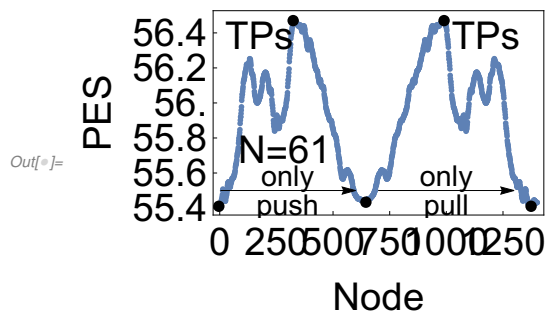
```
0.4594834152 × 4.7861907614 × 8.1156202231
12.4110171164 × 16.5516846600 × 19.9452303547
24.2280130178 × 27.7245384351 × 31.7435766841
36.0844340097 × 39.4262539742 × 43.7558768093
47.8610089677 × 51.2939834166 × 55.5834841571
59.0508314459 × 63.1149160599 × 67.4582987227
70.8053722408 × 75.1453096514 × 79.2350207125
82.6841893783 × 86.9763280228 × 90.4333932205
94.5136317679 × 98.8566019018 × 102.2049302730
106.5479414384 × 110.6278769394 × 114.0851551432
118.3772609836 × 121.8261390074 × 125.9161506215
130.2559339382 × 133.6029279280 × 137.9462911752
142.0096626080 × 145.4774494494 × 149.7668222188
153.1990890373 × 157.3048687346 × 161.6339848930
164.9755628919 × 169.3162611782 × 173.3331604165
176.8311589540 × 181.1137076708 × 184.5056548095
188.6477670683 × 192.9415001546 × 196.2705210071
```

200.5964214161 × 204.4734446505 × 208.0838114620
212.3675028896 × 215.6988603728 × 219.9079137286
224.1133950693 × 227.4463661630 × 231.7288550168
235.3304361523
gMin node449 energy = 55.42004020 detHess 563.32
0.5188257834 × 4.8979087568 × 8.2941512234
12.5950731054 × 16.9246935376 × 20.3163432604
24.7025889228 × 28.6718253466 × 32.2539551654
36.5794108415 × 40.0048963840 × 44.1722205833
48.5283284880 × 51.8982419423 × 56.2662362942
60.3555390390 × 63.8275634236 × 68.1387333514
71.6214697562 × 75.6975135067 × 80.0683989291
83.4401752190 × 87.7943371229 × 91.9790632129
95.3976088419 × 99.7288486423 × 103.3412595379
107.2789411806 × 111.6648587692 × 115.0603272669
119.3798679264 × 123.6987556761 × 127.0943216979
131.4800784743 × 135.4157927097 × 139.0300112604
143.3615402680 × 146.7796033562 × 150.9653710450
155.3192601732 × 158.6910651122 × 163.0620445183
167.1367648836 × 170.6204398320 × 174.9315003404
178.4023411495 × 182.4929445112 × 186.8604518575
190.2300264456 × 194.5862368249 × 198.7511263359
202.1775521208 × 206.5021624382 × 210.0801620680
214.0536006641 × 218.4396335354 × 221.8305573831
226.1614439404 × 230.4591094933 × 233.8554383935
238.2331594080

SP ? node274 energy = 56.73303202 detHess - 1658.08

Energy is too high !

3.4751628671 × 7.0235463372 × 11.2464842842
 14.5007353475 × 18.6896202209 × 22.7192503660
 26.0834265736 × 30.2614167484 × 33.5248100796
 37.6468939531 × 41.7167836639 × 45.0184385768
 49.1805380137 × 52.4583599774 × 56.5488493896
 60.6395204269 × 63.9172066225 × 68.0793612545
 71.3813080377 × 75.4510053217 × 79.5734597373
 82.8367451682 × 87.0149612941 × 90.3799754439
 94.4090313642 × 98.5986411341 × 101.8528932546
 106.0763372404 × 109.6271099701 × 113.5006320966
 117.7666067835 × 121.0335108955 × 125.2970390040
 129.2020610001 × 132.7206488985 × 136.9380646268
 140.1940896327 × 144.3737960217 × 148.4144880484
 151.7665244521 × 155.9434901398 × 159.2134399418
 163.3290416494 × 167.4108734416 × 170.7053773693
 174.8719306114 × 178.1674721412 × 182.2483932660
 186.3653259605 × 189.6347045823 × 193.8123594783
 197.1671775792 × 201.2059428757 × 205.3882239349
 208.6441183072 × 212.8633037355 × 216.3899545395
 220.2874687534 × 224.5521700103 × 227.8194409494
 232.0852556692



```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

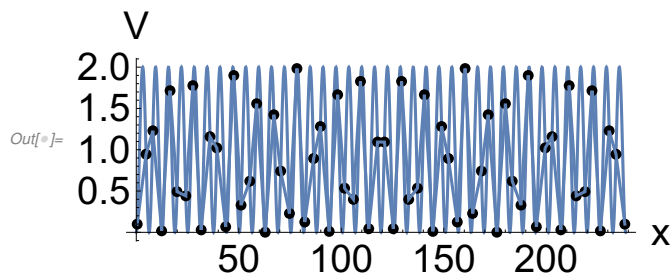
N = 62 GOLD global minimum

ENERGY 56.294841453496

```
SetX = {0.44918645496016973, 4.76664122715753, 8.085568016461353,
12.377798165168441, 16.48257129670477, 19.887908116260796,
24.15481436624173, 27.592379745914894, 31.660256210190255,
35.970038883394224, 39.29232100014645, 43.61435196872736,
47.57668414101596, 51.101536143794014, 55.36839168460594,
58.71053587911572, 62.883023798566526, 67.10665998883832,
70.42451750952748, 74.70842520025576, 78.35595119655777, 82.18630821072765,
86.50038480797762, 89.82013643327377, 94.09962113556567, 98.23148902798802,
101.61730299367683, 105.88804395262876, 109.3594985993717,
113.3924919832569, 117.71637509066889, 121.04461223984094,
125.36850104393497, 129.401453584117, 132.8729416421208,
137.14368215517553, 140.52946894371044, 144.66136605018974,
148.9408264758408, 152.2605757662843, 156.57464165388845,
160.40490829887332, 164.05252333092128, 168.33644773743126,
171.6543023972708, 175.8779694640666, 180.05043994857922,
183.3926032666789, 187.65945967302363, 191.18428216070967,
195.14665204734567, 199.46868589961312, 202.79097206996812,
207.10076365955203, 211.16862805296088, 214.6062077982822,
218.87311779595618, 222.27845073691617, 226.38323398557546,
230.67546480104576, 233.99439426263922, 238.31185198437745}
```

Eigenvalues

```
Out[*]= {4.27261, 4.26481, 4.25402, 4.23702, 4.21515, 4.18839, 4.15924, 4.12106, 4.09839,
4.04456, 3.99627, 3.94804, 3.89629, 3.84257, 3.76704, 3.71659, 3.65208,
3.60159, 3.54622, 3.49357, 3.44671, 3.4222, 3.11342, 3.11342, 2.53193,
2.49698, 2.4544, 2.39481, 2.32629, 2.26026, 2.18153, 2.10386, 2.03842,
1.96827, 1.9076, 1.86331, 1.82578, 1.57902, 1.57901, 0.885691, 0.864203,
0.827677, 0.783026, 0.73497, 0.688812, 0.645842, 0.559305, 0.558107,
0.380923, 0.346026, 0.313939, 0.273374, 0.245691, 0.235818, 0.11862,
0.0970091, 0.0908076, 0.0531031, 0.0363319, 0.0297919, 0.00514932, 0.0014638}
```



```

start energy = 56.29493856 detHess 74.0578
0.4630978543 × 4.7790570001 × 8.0972338197
12.3859723913 × 16.4952894191 × 19.8961344251
24.1626960150 × 27.6043450630 × 31.6669729706
35.9780197160 × 39.3003383138 × 43.6221952512
47.5916819850 × 51.1102455960 × 55.3766233930
58.7214539623 × 62.8904956472 × 67.1181464411
70.4352093261 × 74.7210302638 × 78.3802401827
82.1983677945 × 86.5107354784 × 89.8299323323
94.1060644883 × 98.2409546905 × 101.6235210374
105.8938979254 × 109.3685147768 × 113.3971872364
117.7212412019 × 121.0491975715 × 125.3723822739
129.4083408463 × 132.8771473327 × 137.1477388875
140.5352577386 × 144.6650241118 × 148.9459730978
152.2657671661 × 156.5804287790 × 160.4163594020
164.0583916826 × 168.3412557609 × 171.6592932436
175.8810260163 × 180.0546138620 × 183.3955650043
187.6623563087 × 191.1890438575 × 195.1489970973
199.4708119798 × 202.7928026111 × 207.1020387256
211.1705763875 × 214.6072968876 × 218.8739844097
222.2795030335 × 226.3837423053 × 230.6759360417
233.9946832238 × 238.3120145771

```

```

SP node240 energy = 57.49911164 detHess - 93.14
3.4602133348 × 7.0259923863 × 11.2681296298
14.5471807129 × 18.7433471292 × 22.8335043185
26.1774480843 × 30.3861692213 × 33.7377163333
37.8202747651 × 42.0236998821 × 45.3013821197
49.5475519637 × 53.1358944133 × 56.9921060355
61.2773653804 × 64.5627577080 × 68.8353600576
72.8319159240 × 76.2843979430 × 80.5115380600
83.8179779425 × 87.9685924992 × 92.1232052438
95.4272742777 × 99.6557567132 × 103.1165622065
107.1051566974 × 111.3806677173 × 114.6667991301
118.9529296547 × 122.8243801176 × 126.3981457428
130.6420826957 × 133.9211862725 × 138.1199828314
142.2089077311 × 145.5550356671 × 149.7644643067
153.1155747239 × 157.1995106288 × 161.4030375672
164.6812696865 × 168.9278314954 × 172.5163841852
176.3728359777 × 180.6585243650 × 183.9443563452
188.2172259458 × 192.2153421012 × 195.6669490193
199.8944963218 × 203.2022973790 × 207.3522307162
211.5092795726 × 214.8128772433 × 219.0428146528
222.5092807109 × 226.4931363604 × 230.7710457161
234.0581907682 × 238.3452903333

```

then mirror by TP

```

start energy = 56.294948335 detHess 95.613
0.4493508870 × 4.7669738257 × 8.0860428171
12.3783471677 × 16.4837264752 × 19.8888190663

```

24.1559756192 × 27.5944111177 × 31.6615978180
 35.9720006988 × 39.2945669503 × 43.6168564440
 47.5817758696 × 51.1046377185 × 55.3715944371
 58.7150447260 × 62.8863286932 × 67.1120625149
 70.4297329672 × 74.7147976705 × 78.3684057349
 82.1925869040 × 86.5059757764 × 89.8256417319
 94.1034878143 × 98.2375399526 × 101.6215173367
 105.8923886972 × 109.3665815016 × 113.3964394731
 117.7209655451 × 121.0494171694 × 125.3730744746
 129.4101699178 × 132.8786092270 × 137.1497008099
 140.5386505786 × 144.6675656899 × 148.9501735778
 152.2704859228 × 156.5861208986 × 160.4280338228
 164.0645916955 × 168.3467240617 × 171.6654907433
 175.8852745970 × 180.0611584400 × 183.4008084574
 187.6682460661 × 191.1995681951 × 195.1546498522
 199.4768470422 × 202.7991446540 × 207.1076277568
 211.1808485174 × 214.6143425016 × 218.8816849538
 222.2918305867 × 226.3918076328 × 230.6876469213
 234.0074564769 × 238.3264248200

SP node 504 energy = 57.444984455 detHess - 100.97474
 it is different to the NT above !

0.5172079240 × 4.8948852966 × 8.2891689559
 12.5902437021 × 16.9151892686 × 20.3055017076
 24.6892260699 × 28.6438332593 × 32.2372918066
 36.5628269185 × 39.9812861961 × 44.1572083860
 48.5071513042 × 51.8746274016 × 56.2413682810
 60.3056234255 × 63.7926235910 × 68.0992569898
 71.5559978198 × 75.6574405156 × 80.0152068364
 83.3775208423 × 87.7319931285 × 91.8559559913
 95.2984491053 × 99.6086983730 × 103.1219749486
 107.1584353622 × 111.5324196295 × 114.9064211865
 119.2521659275 × 123.4699079103 × 126.8755193141
 131.2173852656 × 134.8927496414 × 138.7626010431
 143.1401621440 × 146.5372016144 × 150.8333165478
 155.1662923043 × 158.5573648525 × 162.9441100570
 166.9242749235 × 170.4968032622 × 174.8211397312
 178.2506468115 × 182.4113914348 × 186.7698424038
 190.1402695696 × 194.5079663370 × 198.6081817561
 202.0735238294 × 206.3865444570 × 209.8811940964
 213.9450282515 × 218.3203212075 × 221.6958215885
 226.0486089133 × 230.2558528912 × 233.6677441998
 238.0079627822 × 241.6642930489

node530 energy = 57.4446254677 detHess - 591.82

End node650

0.5264572587 × 4.9121529172 × 8.3177351265
 12.6176971694 × 16.9689632344 × 20.3678336267
 24.7653252339 × 28.8036117521 × 32.3369881175
 36.6666087838 × 40.1376445234 × 44.2552353319
 48.6423881563 × 52.0309082035 × 56.4005476656

60.6226080489 × 64.0416471897 × 68.3962296501
 72.0923234909 × 75.9519865887 × 80.3375411890
 83.7487337419 × 88.0391679458 × 92.4041066943
 95.8060458028 × 100.2079064145 × 104.2922987038
 107.7958665320 × 112.1308865325 × 115.6430333949
 119.7164298072 × 124.1194536950 × 127.5228298502
 131.8849268302 × 136.1850988354 × 139.5956041289
 143.9851156211 × 147.8706939007 × 151.5421049663
 155.8919710850 × 159.3143398654 × 163.5242970285
 167.8950323739 × 171.2819552985 × 175.6667563432
 179.7921270891 × 183.2571019523 × 187.5868648279
 191.1279259486 × 195.1564886003 × 199.5538757852
 202.9532306176 × 207.3016620662 × 211.6066541170
 215.0115690975 × 219.3989522476 × 223.2959486071
 226.9524553639 × 231.2962758782 × 234.7148894725
 238.9196561004 × 243.2823729086

it moves x_62 further out ok

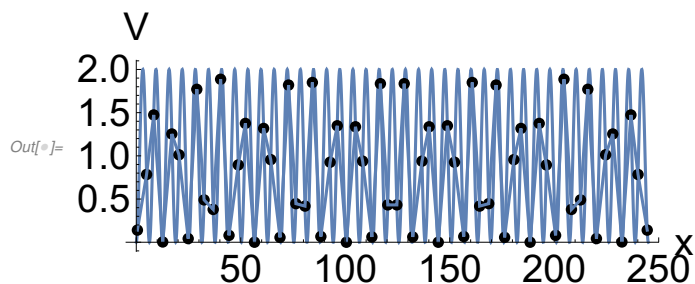
Setxx = node530

ENERGY 56.4673781411

SetX = {0.5359653213982866, 4.929858871766947, 8.347306066601716,
 12.645516624804376, 17.0227904647717, 20.43264600072642, 24.84242577317626,
 28.96595093254833, 32.451692686280566, 36.79768763005281,
 40.35947103038871, 44.384126964856016, 48.79988603391212,
 52.22117323639103, 56.5692986768324, 60.93805346455332, 64.35852145169753,
 68.7780160089368, 72.86683204576401, 76.38261601005337, 80.73133590779901,
 84.26659765413322, 88.32999530557582, 92.75071684684706, 96.17415588148728,
 100.53503982390275, 104.89999887972343, 108.32332754714781,
 112.74475843641 × 702, 116.82087154360953, 120.34733663972807,
 124.69688301009079, 128.223343941694, 132.29946296722957,
 136.72089448639832, 140.1442234137617, 144.50918455781067,
 148.8700681926129, 152.29350792154534, 156.71423012587488,
 160.77762730912275, 164.31288993249822, 168.66161002638776,
 172.17739371193375, 176.2662102965273, 180.68570491649623,
 184.1061730983226, 188.47492768584152, 192.82305276363869,
 196.24433980771707, 200.66009865882094, 204.68475325820228,
 208.2465374398035, 212.5925322886486, 216.07827308976783,
 220.2017998867607, 224.61157967674455, 228.02143507519793,
 232.39870946117713, 236.6969194746553, 240.11436674522017, 244.5082606303922}

Eigenvalues

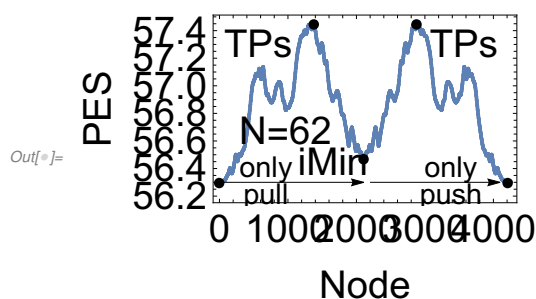
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Out[ ]= {4.28503, 4.27763, 4.26571, 4.24921, 4.22552, 4.21297, 4.17243, 4.13783, 4.09943,
  4.05728, 4.00831, 3.96588, 3.91356, 3.86012, 3.80652, 3.75672, 3.66576,
  3.62547, 3.58027, 3.54173, 3.51651, 3.22388, 3.22388, 2.62051, 2.58793,
  2.53985, 2.47969, 2.40075, 2.3489, 2.26415, 2.18308, 2.1022, 2.02107,
  1.96946, 1.88227, 1.82105, 1.77098, 1.73655, 1.45955, 1.45955, 0.823535,
  0.803142, 0.772492, 0.738946, 0.679126, 0.676999, 0.497185, 0.45865,
  0.414167, 0.369446, 0.310836, 0.295692, 0.240261, 0.204108, 0.174817,
  0.155535, 0.146079, 0.0445728, 0.0353304, 0.0248928, 0.0168817, 0.0123289}
```



```
start
```

```
0.4492262699 × 4.7667183388 × 8.0856832623
12.3779277161 × 16.4828421164 × 19.8881254133
24.1550898866 × 27.5928657417 × 31.6605766693
35.9705050220 × 39.2928579118 × 43.6149491094
47.5778980441 × 51.1022754384 × 55.3691525061
58.7116071110 × 62.8838088568 × 67.1079430804
70.4257548510 × 74.7099366687 × 78.3589031479
82.1877975894 × 86.5017144531 × 89.8214480970
94.1005460426 × 98.2329416471 × 101.6183161257
105.8890898756 × 109.3612058912 × 113.3934471631
117.7174918434 × 121.0457865577 × 125.3696236044
129.4035983112 × 132.8743348173 × 137.1451606328
140.5317215528 × 144.6628908353 × 148.9431311959
152.2630155159 × 156.5774730568 × 160.4106109290
164.0554923117 × 168.3389711652 × 171.6570344125
175.8797494907 × 180.0530455866 × 183.3945849685
187.6615706351 × 191.1879389964 × 195.1485645261
199.4706377839 × 202.7929208034 × 207.1024001765
211.1715405455 × 214.6081374204 × 218.8751408693
222.2815961198 × 226.3852505165 × 230.6783328080
233.9974588792 × 238.3152754252
SP node1377 energy = 57.44327930 detHess - 861.099
0.5185998782 × 4.8974866623 × 8.2934551688
12.5943994554 × 16.9233689131 × 20.3148277508
24.7007240433 × 28.6679168303 × 32.2516097485
36.5770575626 × 40.0015118203 × 44.1700700969
48.5252998261 × 51.8948411475 × 56.2626681838
60.3483786500 × 63.8224599311 × 68.1329000145
71.6116535098 × 75.6915874820 × 80.0606953920
83.4310489106 × 87.7854524955 × 91.9616709026
```

95.3830009060 × 99.7109584787 × 103.3077658308
 107.2613279269 × 111.6473125006 × 115.0405813085
 119.3652889062 × 123.6747651626 × 127.0703975141
 131.4525948388 × 135.3603795892 × 138.9996065700
 143.3346311596 × 146.7455721252 × 150.9455763222
 155.2941573260 × 158.6656935070 × 163.0371131879
 167.0885562591 × 170.5885124574 × 174.8975040869
 178.3483307244 × 182.4603823749 × 186.8179078738
 190.1811369398 × 194.5377858502 × 198.6558010488
 202.1028850489 × 206.4128564340 × 209.9198595949
 213.9638386214 × 218.3370950303 × 221.7103578990
 226.0577240295 × 230.2685707919 × 233.6764204972
 238.0157880298 × 241.6769973238
 iMin node2103 energy = 56.46753081 detHess 7021.7527
 0.5359651640 × 4.9298584517 × 8.3473051789
 12.6455157483 × 17.0227888505 × 20.4326439787
 24.8424235645 × 28.9659465399 × 32.4516894056
 36.7976838422 × 40.3594645086 × 44.3841238584
 48.7998834094 × 52.2211710933 × 56.5692976488
 60.9380526252 × 64.3585214610 × 68.7780168173
 72.8668344932 × 76.3826179547 × 80.7313384673
 84.2666024533 × 88.3299983986 × 92.7507210868
 96.1741611754 × 100.5350441682 × 104.9000064029
 108.3233355977 × 112.7447674381 × 116.8208902096
 120.3473489381 × 124.6968961607 × 128.2233651793
 132.2994745083 × 136.7209069518 × 140.1442377085
 144.5091957379 × 148.8700874513 × 152.2935287247
 156.7142542794 × 160.7776770928 × 164.3129233104
 168.6616462934 × 172.1774528490 × 176.2662441491
 180.6857452041 × 184.1062214899 × 188.4749689538
 192.8231276109 × 196.2444204692 × 200.6601932665
 204.6849488287 × 208.2466605244 × 212.5926588223
 216.0784673762 × 220.2019120470 × 224.6117174122
 228.0215966766 × 232.3988537613 × 236.6971903972
 240.1146360275 × 244.5085858989



```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

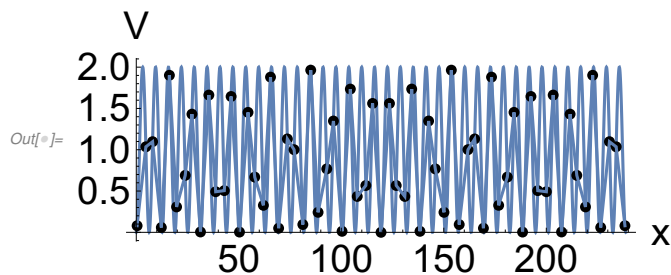
N = 63 GOLD global minimum

ENERGY 57.3815671593166

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SetX = {0.4020456991580252, 4.676569237177637, 7.951734664883979,
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61.99951995009704, 65.47753366597802, 69.43138172540677, 73.69632323603079,
76.96984618893563, 81.24336914837174, 85.09272686835033, 88.6756182501218,
92.91111943053801, 96.17390548420416, 100.37422342262425,
104.41844094537346, 107.78403737406956, 111.974455947083,
115.26352313074536, 119.38051957904054, 123.49751460380664,
126.786582868085, 130.97700086841218, 134.34259481730203,
138.38681415021557, 142.5871300812527, 145.849915550122,
150.08541495691478, 153.66829781721935, 157.51766365105232,
161.79118681724998, 165.0647101367346, 169.32965296096228,
173.28349582777616, 176.7615154685003, 180.97903491218347,
184.25295479204786, 188.4185405456743, 192.50718371424398,
195.83147727594795, 200.02455063076164, 203.35654968036445,
207.43782777664134, 211.61168584166427, 214.88328572915387,
219.10543036200605, 222.6060133147548, 226.53891713264176,
230.80930813898152, 234.0844730602992, 238.3589964364138}
```

Eigenvalues

```
Out[*]= {4.26674, 4.26, 4.24752, 4.23181, 4.2114, 4.18539, 4.15541, 4.12409, 4.08368,
4.04011, 4.01289, 3.94977, 3.90101, 3.82985, 3.77977, 3.72302, 3.66011,
3.59896, 3.54283, 3.48275, 3.42009, 3.39184, 3.35791, 3.05581, 3.05581,
2.4801, 2.45267, 2.40135, 2.34787, 2.28443, 2.2172, 2.14587, 2.07869,
2.01447, 1.95842, 1.90607, 1.87722, 1.63953, 1.63953, 0.938862, 0.911455,
0.886475, 0.829358, 0.778019, 0.725316, 0.665268, 0.625095, 0.575128,
0.49402, 0.492842, 0.33475, 0.312482, 0.302521, 0.191117, 0.161343, 0.145962,
0.101745, 0.0770151, 0.0611827, 0.037514, 0.0358946, 0.0069271, 0.00338473}
```



```

start energy 57.38157152
0.402046 × 4.67657 × 7.951730 × 12.222100 × 16.155000 × 19.6556
23.877800 × 27.149400 × 31.323200 × 35.4045
38.736500 × 42.929600 × 46.253900 × 50.3425
54.508100 × 57.782000 × 61.999500 × 65.4775
69.431400 × 73.696300 × 76.969800 × 81.2434
85.092700 × 88.675600 × 92.911100 × 96.1739 × 100.374000 × 104.41800
107.784000 × 111.974000 × 115.264000 × 119.381
123.498000 × 126.787000 × 130.977000 × 134.343
138.387000 × 142.587000 × 145.85 × 150.085
153.668000 × 157.518000 × 161.791000 × 165.065
169.33 × 173.283000 × 176.762000 × 180.979
184.253000 × 188.419000 × 192.507000 × 195.831
200.025000 × 203.357000 × 207.438000 × 211.612
214.883000 × 219.105000 × 222.606000 × 226.539
230.809000 × 234.084000 × 238.359000
SP node303 energy = 58.33793874 detHess - 303.8
0.4451296569 × 4.7607432240 × 8.0775256298
12.3694259530 × 16.4656523034 × 19.8746341171
24.1383707090 × 27.5636912546 × 31.6413327810
35.9424766564 × 39.2608389324 × 43.5791600831
47.5051753822 × 51.0590766476 × 55.3258563456
58.6525742677 × 62.8405227921 × 67.0371409280
70.3596030601 × 74.6293219247 × 78.2036944075
82.1078954174 × 86.4257709430 × 89.7441575605
94.0408313940 × 98.1320310353 × 101.5469817295
105.8119490278 × 109.2342580706 × 113.3170673431
117.6178445085 × 120.9369742290 × 125.2560010913
129.1785244178 × 132.7364268645 × 137.0043555101
140.3312340971 × 144.5207371947 × 148.7177153522
152.0409431148 × 156.3114055144 × 159.8870065057
163.7906388192 × 168.1091601583 × 171.4282578516
175.7250814373 × 179.8192120851 × 183.2328529555
187.4988524671 × 190.9251649053 × 195.0048166643
199.3086197745 × 202.6290323314 × 206.9494380663
210.8844107667 × 214.4320818493 × 218.6997384182
222.0311635716 × 226.2156973428 × 230.4212558490
233.7425146121 × 238.0172779525 × 241.6149787744

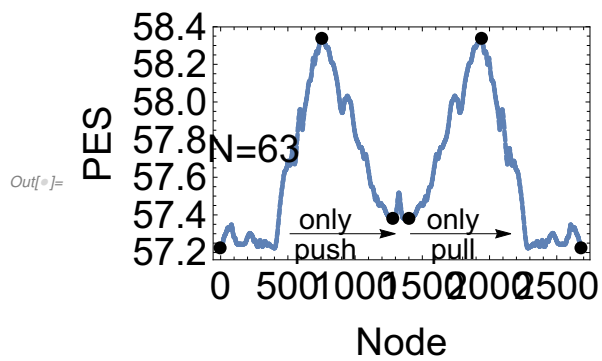
start energy = 57.381680 detHess 376.39
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12.2222649042 × 16.1553268746 × 19.6557824753
23.8779462098 × 27.1495874971 × 31.3234215371
35.4048791538 × 38.7367736893 × 42.9299190035
46.2544280000 × 50.3429457480 × 54.5088523422
57.7827167813 × 62.0004476803 × 65.4792759279
69.4324172092 × 73.6976458447 × 76.9712555968
81.2448909353 × 85.0957280401 × 88.6772022940
92.9125036536 × 96.1753843119 × 100.3753074187

```

104.4201964649 × 107.7851606603 × 111.9756064809
 115.2651756540 × 119.3817709368 × 123.4996165438
 126.7883358530 × 130.9791892498 × 134.3464392888
 138.3894960822 × 142.5913011915 × 145.8541233859
 150.0906381423 × 153.6784994136 × 157.5229975711
 161.7964805377 × 165.0699674253 × 169.3341804769
 173.2915960142 × 176.7660794387 × 180.9831359719
 184.2579477798 × 188.4221611394 × 192.5130411435
 195.8358046710 × 200.0294901975 × 203.3646147942
 207.4436536528 × 211.6210721858 × 214.8922250301
 219.1166611214 × 222.6273538007 × 226.5510596414
 230.8236591887 × 234.0997183384 × 238.3744967988
 SP node292 energy = 58.3382124 detHess - 313.04
 0.4469031211 × 4.7623001837 × 8.0789425518
 12.3703877458 × 16.4671022576 × 19.8755196709
 24.1391511579 × 27.5647922227 × 31.6419194022
 35.9431206738 × 39.2614215541 × 43.5796864233
 47.5061296412 × 51.0595732642 × 55.3262435029
 58.6529840584 × 62.8407468823 × 67.0374033994
 70.3597764748 × 74.6294618436 × 78.2039013936
 82.1079740603 × 86.4257928399 × 89.7441234115
 94.0407482762 × 98.1318176050 × 101.5467952305
 105.8116912059 × 109.2337901299 × 113.3167405532
 117.6173399253 × 120.9363882039 × 125.2553250475
 129.1771378155 × 132.7356211968 × 137.0035632155
 140.3301874636 × 144.5199651838 × 148.7164459725
 152.0397944640 × 156.3100087782 × 159.8843579081
 163.7892392491 × 168.1077357800 × 171.4267613260
 175.7238257690 × 179.8169678308 × 183.2312663219
 187.4970926393 × 190.9222774734 × 195.0029848760
 199.3060580774 × 202.6262089052 × 206.9463384958
 210.8781768234 × 214.4284684248 × 218.6962331402
 222.0265404957 × 226.2123593565 × 230.4158655930
 233.7376017373 × 238.0113503228 × 241.6036860163
 gMin node478 energy = 57.22533705446 detHess 9559.01
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 12.4113294324 × 16.5523325210 × 19.9457832927
 24.2287238365 × 27.7258465477 × 31.7443663059
 36.0854526551 × 39.4274574761 × 43.7570770556
 47.8633757315 × 51.2957662110 × 55.5856017270
 59.0544910940 × 63.1171771609 × 67.4613316802
 70.8089212960 × 75.1489453164 × 79.2422646384
 82.6894956437 × 86.9825393087 × 90.4439426808
 94.5202343178 × 98.8656223636 × 102.2154765754
 106.5588721628 × 110.6497532837 × 114.1010093383
 118.3957156620 × 121.8572576231 × 125.9357452897
 130.2829291068 × 133.6344497389 × 137.9791614343
 142.0755824057 × 145.5247978065 × 149.8216608534
 153.2909418298 × 157.3630965881 × 161.7149343386

165.0697418456 × 169.4152982991 × 173.5321908559
 176.9714094358 × 181.2741543469 × 184.7703925184
 188.8176406740 × 193.1814305015 × 196.5455719025
 200.8905606680 × 205.0650178185 × 208.4806576410
 212.8030605131 × 216.3907528173 × 220.3485670627
 224.7296782744 × 228.1163814614 × 232.4421435342
 236.7322003663 × 240.1253384864 × 244.4972312387
 node 609 energy = 57.246558786 detHess 3.261 analog
 last gMin node215 energy = 57.2250496 detHess 8241.64
 0.5181875158 × 4.8942333887 × 8.2867674457
 12.5871024032 × 16.9081676645 × 20.2971197946
 24.6784884103 × 28.6210659989 × 32.2238173660
 36.5494000281 × 39.9623365079 × 44.1449710028
 48.4895628317 × 51.8551187832 × 56.2204972672
 60.2635640511 × 63.7642204043 × 68.0679097226
 71.5056080866 × 75.6256933321 × 79.9712916531
 83.3265794582 × 87.6791027818 × 91.7499969965
 95.2206440930 × 99.5177928085 × 102.9664268239
 107.0639554425 × 111.4086992914 × 114.7603782318
 119.1078054915 × 123.1858853307 × 126.6478729615
 130.9426717578 × 134.3937271578 × 138.4849813003
 142.8283884795 × 146.1782954158 × 150.5237653288
 154.5999198921 × 158.0614736080 × 162.3545487251
 165.8017137773 × 169.8951568461 × 174.2351836518
 177.5827910429 × 181.9269719662 × 185.9896097326
 189.4585523088 × 193.7483993802 × 197.1807698276
 201.2871086241 × 205.6167280668 × 208.9587392533
 213.2998334701 × 217.3183353463 × 220.8154786484
 225.0984246339 × 228.4918721409 × 232.6328867883
 236.9283115930 × 240.2578453564 × 244.5846429128
 SP node488 energy = 58.34431850 detHess - 1133.51
 3.4388980027 × 7.0320130013 × 11.3059085285
 14.6275725021 × 18.8313783943 × 23.0170077603
 26.3474772502 × 30.6152241501 × 34.1651257792
 38.0974284192 × 42.4175983145 × 45.7377867993
 50.0409679009 × 54.1215158741 × 57.5468688091
 61.8127193880 × 65.2269156650 × 69.3202076874
 73.6172326300 × 76.9362672696 × 81.2547655861
 85.1594464708 × 88.7339940225 × 93.0042457417
 96.3275715826 × 100.5241317929 × 104.7138589344
 108.0405238010 × 112.3084591885 × 115.8668326337
 119.7887744540 × 124.1077233520 × 127.4267819679
 131.7274117650 × 135.8103197418 × 139.2324641154
 143.4973669694 × 146.9123173415 × 151.0034272261
 155.3000422680 × 158.6183757213 × 162.9361955121
 166.8402169273 × 170.4147078137 × 174.6844033159
 178.0067714105 × 182.2034482698 × 186.3911996091
 189.7179507082 × 193.9846203038 × 197.5380398643
 201.4645123458 × 205.7827805233 × 209.1010845009

$213.4022928848 \times 217.4794128572 \times 220.9050633297$
 $225.1686974076 \times 228.5771122801 \times 232.6738332770$
 $236.9652791130 \times 240.2819233089 \times 244.5973220252$
 and node583 same point




```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

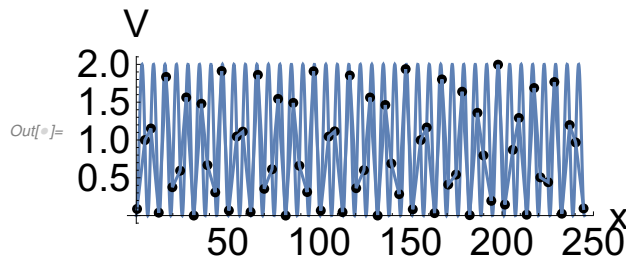
N = 64 GOLD global minimum

ENERGY 58.185848600715715

```
SetX = {0.4215243261989146, 4.713898227834362, 8.006273268383525,
12.287074333293916, 16.29219613092211, 19.745758280052613,
23.98028104408591, 27.301037676602157, 31.448538881446805,
35.628646651255735, 38.931013152727985, 43.176502241627375,
46.70060995522274, 50.63547071679231, 54.93193596417812,
58.229456059930314, 62.52093313528947, 66.50647561699454, 69.9838728700493,
74.22484699006671, 77.54375834041467, 81.70200427107929, 85.88084402355186,
89.18838512524536, 93.43632153334562, 96.95896619736394, 100.898850727628,
105.19837876857103, 108.49891802005388, 112.79296955066121,
116.78733272578276, 120.26036950289237, 124.50404872775039,
127.83106170503045, 131.98534821013368, 136.1780819962068,
139.48437490864245, 143.74099897348609, 147.2998648861081,
151.20631163053247, 155.51124320765845, 158.81617768125847,
163.10740726215593, 167.14599401267026, 170.58611605466336,
174.8338626969055, 178.19253185828998, 182.32082331900267,
186.55735173160258, 189.86061975833647, 194.14279872315458,
197.8310390027022, 201.6084588233041, 205.90560361203504, 209.211353879592,
213.4737775679119, 217.58229257831672, 220.96486806285426,
225.21654474841873, 228.63876920824933, 232.7032930260922,
236.9913488388142, 240.29911944027802, 244.60635483742658}
```

Eigenvalues

```
Out[ ]= {4.27037, 4.26357, 4.25217, 4.23657, 4.21627, 4.19239, 4.16357, 4.13026, 4.09257,
4.06514, 4.01157, 3.9641, 3.91394, 3.86329, 3.79199, 3.74236, 3.68542, 3.62632,
3.56653, 3.51338, 3.4662, 3.42629, 3.39759, 3.09913, 3.07896, 2.51266,
2.48328, 2.43809, 2.38263, 2.32173, 2.25249, 2.18139, 2.11027, 2.04094,
1.9802, 1.92292, 1.87586, 1.84489, 1.61538, 1.59415, 0.905389, 0.881596,
0.847559, 0.80559, 0.761582, 0.709612, 0.660788, 0.61823, 0.54209, 0.520399,
0.360734, 0.331836, 0.299542, 0.274604, 0.258355, 0.141328, 0.118804,
0.0955776, 0.07825, 0.0649526, 0.0338479, 0.0187342, 0.00978471, 0.00136261}
```



```

start node72 energy = 58.18802060 detHess 52.57
0.4380813095 × 4.7453250634 × 8.0531111612
12.3411364016 × 16.4058269769 × 19.8279352592
24.0796370763 × 27.4623753131 × 31.5707497646
35.8333296608 × 39.1391033025 × 43.4363341784
47.2143237408 × 50.9020025818 × 55.1840820604
58.4873477149 × 62.7237039408 × 66.8521217355
70.2106449082 × 74.4583739848 × 77.8986336145
81.9370369265 × 86.2282932253 × 89.5332142005
93.8381328073 × 97.7447660378 × 101.3034397068
105.5600231603 × 108.8663287252 × 113.0589901056
117.2133154586 × 120.5402829200 × 124.7839584549
128.2570558958 × 132.2513417899 × 136.5453965215
139.8459290199 × 144.1454466713 × 148.0853865201
151.6079722362 × 155.8558956755 × 159.1634421132
163.3422581688 × 167.5005158551 × 170.8194132949
175.0603863942 × 178.5378034735 × 182.5233208994
186.8147986765 × 190.1123164274 × 194.4087781629
198.3436558303 × 201.8677450692 × 206.1132297631
209.4155971675 × 213.5956977721 × 217.7432014802
221.0639537656 × 225.2984753632 × 228.7520405077
232.7571572441 × 237.0379576669 × 240.3303314654
244.6227041290
SP node413 energy = 59.44018953 detHess - 142.88
3.4804502150 × 7.0291553290 × 11.2565449857
14.5177946671 × 18.7074759648 × 22.7555548446
26.1115251547 × 30.2973148406 × 33.5836098116
37.6969941564 × 41.8082608160 × 45.0960256354
49.2811408246 × 52.6333480909 × 56.6843614222
60.8706523784 × 64.1321880859 × 68.3573715405
71.8953265832 × 75.7867763891 × 80.0570755942
83.3288075661 × 87.5976070204 × 91.5076015207
95.0268751666 × 99.2487849647 × 102.5120561546
106.6923305723 × 110.7510864180 × 114.0957381234
118.2809966583 × 121.5752637649 × 125.6811098815
129.8043588574 × 133.0866450718 × 137.2774618682
140.6533449053 × 144.6873520436 × 148.8945711253
152.1560983556 × 156.3954171010 × 160.0026705003
163.8267429604 × 168.0982770812 × 171.3700773053
175.6301534859 × 179.5956313870 × 183.0600259731
187.2741492973 × 190.5486896863 × 194.7091447237
198.8000561404 × 202.1204077709 × 206.3123697815
209.6456226746 × 213.7242425237 × 217.8986573309
221.1691878912 × 225.3911035556 × 228.8931821960
232.8239862816 × 237.0940501645 × 240.3687372371
244.6427436101
and node 443 energy = 59.43994288 detHess 199.49
and node 468 and node and 652

```

```
### ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ##
```

N = 64 GOLD next minimum

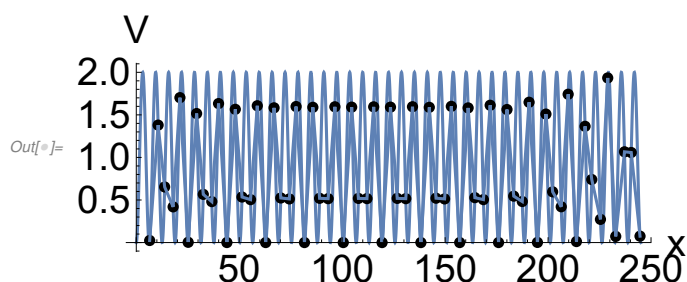
```
Setxx = {4.80, 7.0291553290, 11.2565449857,
14.5177946671, 18.7074759648, 22.7555548446,
26.1115251547, 30.2973148406, 33.5836098116,
37.6969941564, 41.8082608160, 45.0960256354,
49.2811408246, 52.6333480909, 56.6843614222,
60.8706523784, 64.1321880859, 68.3573715405,
71.8953265832, 75.7867763891, 80.0570755942,
83.3288075661, 87.5976070204, 91.5076015207,
95.0268751666, 99.2487849647, 102.5120561546,
106.6923305723, 110.7510864180, 114.0957381234,
118.2809966583, 121.5752637649, 125.6811098815,
129.8043588574, 133.0866450718, 137.2774618682,
140.6533449053, 144.6873520436, 148.8945711253,
152.1560983556, 156.3954171010, 160.0026705003,
163.8267429604, 168.0982770812, 171.3700773053,
175.6301534859, 179.5956313870, 183.0600259731,
187.2741492973, 190.5486896863, 194.7091447237,
198.8000561404, 202.1204077709, 206.3123697815,
209.6456226746, 213.7242425237, 217.8986573309,
221.1691878912, 225.3911035556, 228.8931821960,
232.8239862816, 237.0940501645, 240.3687372371, 244.6427436101};
```

ENERGY 58.629480962068186

```
SetX = {6.503918615545748, 10.606085953111757, 13.78314968650604,
  17.898201227963245, 21.199050006557716, 25.211727544424242,
  29.30330904713144, 32.538119764063985, 36.67398396328977,
  39.955067600387494, 44.0104692146128, 48.09403905355096, 51.352638857482546,
  55.496546635611004, 58.77197787430421, 62.84196881572861, 66.92207552715067,
  70.18956431963962, 74.33641794083935, 77.61003479126826, 81.68514089288473,
  85.76397895615693, 89.03468297796724, 93.1826301634393, 96.45571601274106,
  100.53260221782807, 104.6111255568564, 107.88293609866383,
  112.03136352640576, 115.30453129142117, 119.38194023764322,
  123.46076813336816, 126.73283234159557, 130.88167729146002,
  134.15562939374055, 138.23290532559506, 142.31300914626038,
  145.58476566939981, 149.73444384277562, 153.01078891041192,
  157.08710734430034, 161.17090063721272, 164.44146740810183,
  168.5933544110301, 171.87650325299498, 175.94982629447532,
  180.04378525225394, 183.31116399831254, 187.46920095260023,
  190.7718192829872, 194.8357487269419, 198.95665151899325,
  202.21702175369632, 206.39222435485186, 209.75233355621535,
  213.78256580872178, 217.96645188963322, 221.21955168926868,
  225.43833583197616, 228.97085958412882, 232.86071051036345,
  237.12413087668818, 240.38973599620348, 244.6536656049107}
```

Eigenvalues

```
Out[*]= {4.26318, 4.25651, 4.2452, 4.22935, 4.20905, 4.18439, 4.15546, 4.12241, 4.08549,
  4.04524, 4.00301, 3.96259, 3.88552, 3.84162, 3.78699, 3.72856, 3.66804,
  3.60637, 3.54449, 3.48365, 3.42553, 3.37257, 3.32826, 3.29758, 3.04275,
  2.8542, 2.43779, 2.41002, 2.36547, 2.30992, 2.24779, 2.18252, 2.11703,
  2.05416, 1.99715, 1.95026, 1.91963, 1.81758, 1.65294, 0.994433, 0.967689,
  0.928273, 0.880315, 0.826741, 0.769703, 0.71082, 0.651337, 0.592341, 0.535425,
  0.486958, 0.463823, 0.39061, 0.322703, 0.27906, 0.235214, 0.195538, 0.160305,
  0.129476, 0.103011, 0.0809089, 0.0632277, 0.0501194, 0.0418902, 0.0264941}
```



SetX - 2.0 * Pi

is iMin en = 58.629480962 strong compressed

start in iMin

Start energy = 58.6296195896 detHess 224 190.65

0.2325249769 × 4.3349150972 × 7.5077039627

11.6211371208 × 14.9239316023 × 18.9328668709

23.0250179603 × 26.2578748057 × 30.3930769877

33.6746601113 × 37.7288189020 × 41.8126815438

45.0705167899 × 49.2141872766 × 52.4897568322

56.5593303862 × 60.6395670563 × 63.9067587799

68.0535338960 × 71.3271812493 × 75.4021537554
 79.4810567836 × 82.7516349011 × 86.8995618292
 90.1726448454 × 94.2494965110 × 98.3280654483
 101.5998112497 × 105.7482456648 × 109.0214146666
 113.0988177938 × 117.1777035736 × 120.4497140019
 124.5985807196 × 127.8725618771 × 131.9498292287
 136.0300348116 × 139.3017311185 × 143.4514643865
 146.7279280215 × 150.8042081136 × 154.8882494957
 158.1587174274 × 162.3107467054 × 165.5942896941
 169.6674381310 × 173.7620209341 × 177.0291937302
 181.1876081803 × 184.4914025208 × 188.5547296806
 192.6771948052 × 195.9372211008 × 200.1134600573
 203.4771636461 × 207.5050198883 × 211.6921013702
 214.9452027855 × 219.1662459893 × 222.7091402929
 226.5892544951 × 230.8537928586 × 234.1197446568
 238.3831752575

node182

node216 energy = 58.6550449 detHess - 16 255.30

0.2245415596 × 4.3269215342 × 7.5026787311
 11.6173610810 × 14.9192044628 × 18.9305269609
 23.0227320487 × 26.2568240205 × 30.3927877282
 33.6750048691 × 37.7295604531 × 41.8145599424
 45.0725003729 × 49.2171616870 × 52.4952365341
 56.5639422046 × 60.6479217211 × 63.9140531980
 68.0631773281 × 71.3439537304 × 75.4158742237
 79.5054443379 × 82.7726081052 × 86.9269527210
 90.2200893870 × 94.2878356516 × 98.3956272495
 101.6585847612 × 105.8249363855 × 109.1556936494
 113.2038412996 × 117.3582934767 × 120.6129219232
 124.8108389879 × 128.2555864636 × 132.2227759039
 136.4623633948 × 139.7212764761 × 143.9770234195
 147.7218641470 × 151.3997455832 × 155.6449885477
 158.8994859130 × 163.1231285941 × 167.1093703650
 170.5268831866 × 174.7156952133 × 177.9676637164
 182.1122493496 × 186.1568776307 × 189.4821247021
 193.6415083423 × 196.8934161112 × 201.0010337145
 205.0477928327 × 208.3470653298 × 212.4888609046
 215.7222571712 × 219.8218979460 × 223.8320707056
 227.1396807901 × 231.2577935085 × 234.4367852719
 238.5413944536

next Min node382 energy = 58.6474792 detHess 203 219.88

same point NT turned

start node75

0.4294718104 × 4.7211997751 × 8.0129604504
 12.2921146972 × 16.3004380076 × 19.7503401780
 23.9840567300 × 27.3055474961 × 31.4512375398
 35.6322312703 × 38.9337718459 × 43.1793490378
 46.7055189604 × 50.6379614830 × 54.9343299169

58.2316451875 × 62.5226761248 × 66.5094317259
 69.9854981150 × 74.2261916758 × 77.5453410648
 81.7029657382 × 85.8821455814 × 89.1893861274
 93.4373656748 × 96.9607699885 × 100.8997750703
 105.1992876678 × 108.4997678572 × 112.7936679019
 116.7885444551 × 120.2610596164 × 124.5046597406
 127.8318334511 × 131.9858505240 × 136.1788169941
 139.4849986777 × 143.7417092180 × 147.3011672183
 151.2069858241 × 155.5119091189 × 158.8168329398
 163.1079479006 × 167.1469421460 × 170.5867098927
 174.8344561593 × 178.1933917828 × 182.3214048330
 186.5582335568 × 189.8614824153 × 194.1438234867
 197.8330479870 × 201.6094510030 × 205.9064278305
 209.2121127169 × 213.4742532693 × 217.5829542414
 220.9652578237 × 225.2168608085 × 228.6391817120
 232.7034899572 × 236.9915233827 × 240.2992318411
 244.6064151490

SP node721 energy = 59.438596047 detHess - 332.74

3.4787841941 × 7.0282956578 × 11.2558600453
 14.5171079568 × 18.7070423808 × 22.7549451853
 26.1111795967 × 30.2970405020 × 33.5832868590
 37.6968040687 × 41.8080135060 × 45.0958614306
 49.2809872464 × 52.6331201570 × 56.6842221582
 60.8704637990 × 64.1320219738 × 68.3571835013
 71.8949800295 × 75.7865954786 × 80.0568928958
 83.3286328728 × 87.5974536859 × 91.5073264247
 95.0267315524 × 99.2486706364 × 102.5119385775
 106.6922566393 × 110.7509827443 × 114.0956772885
 118.2809457098 × 121.5751995723 × 125.6810699471
 129.8043032529 × 133.0866038857 × 137.2774178914
 140.6532726517 × 144.6873059119 × 148.8945056809
 152.1560348742 × 156.3953422761 × 160.0025263510
 163.8266702045 × 168.0982106519 × 171.3700156724
 175.6301060575 × 179.5955528398 × 183.0599842833
 187.2741168763 × 190.5486554362 × 194.7091245308
 198.8000298607 × 202.1203921545 × 206.3123571731
 209.6456066131 × 213.7242337164 × 217.8986470110
 221.1691804733 × 225.3910967550 × 228.8931712923
 232.8239811254 × 237.0940459055 × 240.3687342844
 244.6427420727

and node769 energy = 59.43852362 detHess 339.21

3.4834558213 × 7.0308866284 × 11.2582724785
 14.5199655197 × 18.7092815112 × 22.7587826677
 26.1138490425 × 30.3000293554 × 33.5879043232
 37.7004472273 × 41.8143255151 × 45.1012765419
 49.2878828811 × 52.6453313312 × 56.6929641328
 60.8843930806 × 64.1459250484 × 68.3746839142
 71.9288931495 × 75.8050045276 × 80.0767708160
 83.3491096851 × 87.6167569994 × 91.5435388868

95.0467786430 × 99.2666767521 × 102.5331818846
 106.7080596252 × 110.7770456690 × 114.1139977106
 118.3013061300 × 121.6070271456 × 125.7053633971
 129.8453448551 × 133.1228987713 × 137.3235304234
 140.7367827126 × 144.7431212969 × 148.9773003411
 152.2421602393 × 156.4992073961 × 160.2078749318
 163.9298924723 × 168.1890767623 × 171.4547372152
 175.6922238161 × 179.6949571005 × 183.1132616692
 187.3154446799 × 190.5929780548 × 194.7350210083
 198.8333543775 × 202.1403358090 × 206.3285226200
 209.6663897130 × 213.7356195980 × 217.9119627493
 221.1788100760 × 225.3999620889 × 228.9074543312
 232.8307348487 × 237.0996157179 × 240.3726006415
 244.6447548836

node841 energy = 59.4385309059 detHess - 324.04

3.4891536585 × 7.0341190021 × 11.2614059827
 14.5238186249 × 18.7124081309 × 22.7642793893
 26.1177711797 × 30.3045516188 × 33.5950228464
 37.7061147910 × 41.8242096262 × 45.1098597604
 49.2988794623 × 52.6649385319 × 56.7068617693
 60.9063200268 × 64.1680403136 × 68.4023658894
 71.9828333101 × 75.8336903696 × 80.1063810057
 83.3790805954 × 87.6437423083 × 91.5930288337
 95.0744783267 × 99.2916272191 × 102.5632074334
 106.7301971743 × 110.8133324513 × 114.1402000165
 118.3309183304 × 121.6544112688 × 125.7407494590
 129.9040547698 × 133.1767176961 × 137.3918113346
 140.8634207383 × 144.8216781802 × 149.0834854897
 152.3553813130 × 156.6272067791 × 160.4618835981
 164.0582184444 × 168.2952462519 × 171.5563851840
 175.7604169099 × 179.7964770166 × 183.1688810637
 187.3584684700 × 190.6406411125 × 194.7623943749
 198.8677982182 × 202.1612660457 × 206.3456399472
 209.6888265359 × 213.7478914624 × 217.9262625455
 221.1892863818 × 225.4096931692 × 228.9232904164
 232.8382220971 × 237.1057702743 × 240.3768843490
 244.6469840086

...

start energy = 58.629484 detHess 245 553.76

0.2233319775 × 4.3255556685 × 7.5016704596
 11.6163629675 × 14.9176355045 × 18.9294919797
 23.0211994250 × 26.2555816071 × 30.3912984610
 33.6724937561 × 37.7276205167 × 41.8112521124
 45.0696879349 × 49.2135417825 × 52.4890075243
 56.5589034480 × 60.6390348886 × 63.9064634623
 68.0532977743 × 71.3269260413 × 75.4019986881
 79.4808463338 × 82.7515278852 × 86.8994680672
 90.1725571756 × 94.2494318686 × 98.3279588250

101.5997611880 × 105.7481869235 × 109.0213565725
 113.0987613196 × 117.1775918610 × 120.4496515824
 124.5984957488 × 127.8724485605 × 131.9497225318
 136.0298275873 × 139.3015816670 × 143.4512595450
 146.7276039598 × 150.8039232497 × 154.8877183591
 158.1582837120 × 162.3101709972 × 165.5933201769
 169.6666425151 × 173.7606026501 × 177.0279795072
 181.1860157660 × 184.4886325755 × 188.5525626768
 192.6734654912 × 195.9338355238 × 200.1090386528
 203.4691469699 × 207.4993797304 × 211.6832660687
 214.9363651765 × 219.1551491243 × 222.6876708921
 226.5775232373 × 230.8409440457 × 234.1065483942
 238.3704793032

node 2286 energy = 58.726757397 detHess 1927.05

0.3904779512 × 4.6529892016 × 7.9172633956
 12.1795388773 × 16.0645581952 × 19.6004920845
 23.8187495420 × 27.0698004698 × 31.2545236178
 35.2785436940 × 38.6424089594 × 42.8157727679
 46.0697474804 × 50.1931992163 × 54.2444306256
 57.5527860305 × 61.7048305813 × 64.9537372714
 69.0545995574 × 73.0950597980 × 76.3919260876
 80.5268443871 × 83.7471435480 × 87.8474411388
 91.8308533282 × 95.1513796211 × 99.2574660252
 102.4074203312 × 106.5110253227 × 110.3161258696
 113.7685937041 × 117.8430349116 × 120.9180279526
 124.9924716891 × 128.4449603459 × 132.2500415181
 136.3536526633 × 139.5036003728 × 143.6096932272
 146.9302423435 × 150.9136411924 × 155.0139664247
 158.2342558426 × 162.3691917973 × 165.6661138355
 169.7065441648 × 173.8074787812 × 177.0563612643
 181.2084506062 × 184.5169514984 × 188.5681045120
 192.6917396921 × 195.9456748419 × 200.1191637070
 203.4834621974 × 207.5071936903 × 211.6922956801
 214.9433444084 × 219.1618701669 × 222.6990353997
 226.5828956333 × 230.8453040984 × 234.1096136971
 238.3720722530

node 3148 energy = 58.726979 detHess - 2240.58

0.3879642941 × 4.6501459223 × 7.9115020259
 12.1785301951 × 16.0652165546 × 19.6014194577
 23.8196455988 × 27.0704358505 × 31.2564236042
 35.2811180193 × 38.6457246255 × 42.8194901151
 46.0756008447 × 50.1986020160 × 54.2522287787
 57.5606760290 × 61.7144576838 × 64.9697020272
 69.0685073984 × 73.1183759452 × 76.4122726024
 80.5524215369 × 83.7890541664 × 87.8850182907
 91.8991086803 × 95.2037655287 × 99.3226177939
 102.5072878539 × 106.6101184071 × 110.5083103294
 113.8849767340 × 117.9669478812 × 121.0616159161
 125.1490846129 × 128.7433162607 × 132.4024026094

136.4973529818 × 139.6067122162 × 143.6954677173
 147.0540488359 × 150.9797206181 × 155.0849830411
 158.2794580839 × 162.4055140973 × 165.7119716608
 169.7332829035 × 173.8376312010 × 177.0759014670
 181.2246165458 × 184.5372385926 × 188.5808571637
 192.7051240665 × 195.9559962435 × 200.1283159066
 203.4951084120 × 207.5146829590 × 211.7006304726
 214.9503823305 × 219.1689904209 × 222.7095247363
 226.5898364708 × 230.8511927347 × 234.1151085349
 238.3757249751

node 3888 energy = 58.744722313 detHess 67.2305269

0.2311338235 × 4.3432723230 × 7.5193407447
 11.6494427757 × 14.9831789922 × 18.9793590222
 23.1040221564 × 26.3307682145 × 30.4918274386
 33.8520688624 × 37.8630770962 × 42.0350417065
 45.2769016576 × 49.4816207206 × 52.9776608088
 56.8924941360 × 61.1418971200 × 64.3985934021
 68.6555162381 × 72.4664912952 × 76.0714316806
 80.2971221207 × 83.5405402489 × 87.7427797740
 91.7226320004 × 95.1269878560 × 99.2989251611
 102.5285000612 × 106.6677057651 × 110.6589740302
 114.0071906711 × 118.1414312105 × 121.3305959683
 125.4475394226 × 129.3490906312 × 132.7366974633
 136.8304506405 × 139.9402265375 × 144.0387771445
 147.6798044510 × 151.2977920792 × 155.3938216661
 158.4968031837 × 162.5879078011 × 165.9771534057
 169.8725488237 × 173.9884788977 × 177.1730661643
 181.3039474298 × 184.6448227101 × 188.6391803720
 192.7721406287 × 196.0012675878 × 200.1683771539
 203.5543412576 × 207.5470893440 × 211.7380729966
 214.9803471349 × 219.1984928471 × 222.7605375458
 226.6139610663 × 230.8706133156 × 234.1288693283
 238.3828658963

meaning is not clear ?

PP, eps 10⁻¹⁰, pred 0.0025 and start gMin right

```

lastmin = { 0.4380813095 × 4.7453250634 × 8.0531111612 ×
12.3411364016 × 16.4058269769 × 19.8279352592 ×
24.0796370763 × 27.4623753131 × 31.5707497646 ×
35.8333296608 × 39.1391033025 × 43.4363341784 ×
47.2143237408 × 50.9020025818 × 55.1840820604 ×
58.4873477149 × 62.7237039408 × 66.8521217355 ×
70.2106449082 × 74.4583739848 × 77.8986336145 ×
81.9370369265 × 86.2282932253 × 89.5332142005 ×
93.8381328073 × 97.7447660378 × 101.3034397068 ×
105.5600231603 × 108.8663287252 × 113.0589901056 ×
117.2133154586 × 120.5402829200 × 124.7839584549 ×
128.2570558958 × 132.2513417899 × 136.5453965215 ×
139.8459290199 × 144.1454466713 × 148.0853865201 ×
151.6079722362 × 155.8558956755 × 159.1634421132 ×
163.3422581688 × 167.5005158551 × 170.8194132949 ×
175.0603863942 × 178.5378034735 × 182.5233208994 ×
186.8147986765 × 190.1123164274 × 194.4087781629 ×
198.3436558303 × 201.8677450692 × 206.1132297631 ×
209.4155971675 × 213.5956977721 × 217.7432014802 ×
221.0639537656 × 225.2984753632 × 228.7520405077 ×
232.7571572441 × 237.0379576669 × 240.3303314654 ×
244.6227041290};

```

```

start energy = 58.1858488241 detHess 136.899
0.4383363195 × 4.7455923066 × 8.0533994501
12.3413886861 × 16.4062891704 × 19.8282532898
24.0799884915 × 27.4629340659 × 31.5711312779
35.8339108744 × 39.1397153992 × 43.4370568178
47.2157746313 × 50.9027368147 × 55.1846899414
58.4879538824 × 62.7240902274 × 66.8526721784
70.2110083457 × 74.4587166398 × 77.8991576618
81.9373223188 × 86.2286160757 × 89.5335213580
93.8384249087 × 97.7453110262 × 101.3037267014
105.5602576874 × 108.8665838139 × 113.0591476428
117.2135328644 × 120.5404380732 × 124.7841133864
128.2573093183 × 132.2514774191 × 136.5455437648
139.8460710993 × 144.1455772357 × 148.0856273818
151.6081045134 × 155.8560104653 × 159.1635784019
163.3423491097 × 167.5006523682 × 170.8195211323
175.0605073498 × 178.5380156088 × 182.5234415100
186.8149426069 × 190.1124678353 × 194.4089301354
198.3439500419 × 201.8679132886 × 206.1133885118
209.4157991853 × 213.5958462790 × 217.7434449028
221.0641551629 × 225.2987165675 × 228.7524721714
232.7574192482 × 237.0383018599 × 240.3307056822
244.6231088694

```

```

SP node8655 energy = 59.24880598 detHess - 13 765.505
0.4592564336 × 4.7860775662 × 8.1156124743
12.4111168183 × 16.5519903146 × 19.9455388322
24.2284653879 × 27.7254142976 × 31.7441290507
36.0851858127 × 39.4271725161 × 43.7568186477
47.8628920014 × 51.2954146246 × 55.5852013135
59.0538132809 × 63.1167671904 × 67.4607961331
70.8083046667 × 75.1483231236 × 79.2410339686
82.6885963103 × 86.9814911931 × 90.4421642060
94.5191270412 × 98.8641196877 × 102.2137214848
106.5570622781 × 110.6461377874 × 114.0983715900
118.3926357117 × 121.8520361342 × 125.9324831750
130.2784827919 × 133.6292427109 × 137.9737868284
142.0648375299 × 145.5169108491 × 149.8124209936
153.2751977218 × 157.3533342205 × 161.7017677581
165.0542714150 × 169.3995048304 × 173.5007284785
176.9477459655 × 181.2461155617 × 184.7217203687
188.7882834317 × 193.1434081192 × 196.5006147945
200.8464314893 × 204.9784139154 × 208.4107578335
212.7182018883 × 216.2360817189 × 220.2627796956
224.6335906882 × 228.0044488803 × 232.3468866448
236.5587287894 × 239.9634378260 × 244.3010515368
247.9620357744

```

ok ! NOTE SP is lower than above ! ?

```

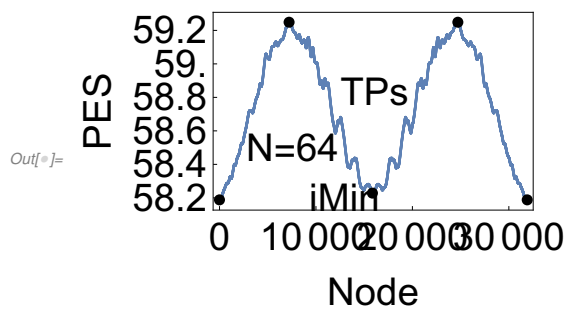
PP direction start energy 58.1858486691 detHess 134.57
0.4380813095 × 4.7453250634 × 8.0531111612 × 12.3411364016

```

16.4058269769 × 19.8279352592 × 24.0796370763 × 27.4623753131
 31.5707497646 × 35.8333296608 × 39.1391033025 × 43.4363341784
 47.2143237408 × 50.9020025818 × 55.1840820604 × 58.4873477149
 62.7237039408 × 66.8521217355 × 70.2106449082 × 74.4583739848
 77.8986336145 × 81.9370369265 × 86.2282932253 × 89.5332142005
 93.8381328073 × 97.7447660378 × 101.3034397068 × 105.5600231603
 108.8663287252 × 113.0589901056 × 117.2133154586 × 120.5402829200
 124.7839584549 × 128.2570558958 × 132.2513417899 × 136.5453965215
 139.8459290199 × 144.1454466713 × 148.0853865201 × 151.6079722362
 155.8558956755 × 159.1634421132 × 163.3422581688 × 167.5005158551
 170.8194132949 × 175.0603863942 × 178.5378034735 × 182.5233208994
 186.8147986765 × 190.1123164274 × 194.4087781629 × 198.3436558303
 201.8677450692 × 206.1132297631 × 209.4155971675 × 213.5956977721
 217.7432014802 × 221.0639537656 × 225.2984753632 × 228.7520405077
 232.7571572441 × 237.0379576669 × 240.3303314654 × 244.6227041290
 SP node7214 energy = 59.24880399 detHess = 13 853.81
 0.4593073705 × 4.7861217135 × 8.1156530833
 12.4111433843 × 16.5520290842 × 19.9455640451
 24.2284885706 × 27.7254497830 × 31.7441465664
 36.0852019392 × 39.4271865583 × 43.7568284062
 47.8629069876 × 51.2954237618 × 55.5852093062
 59.0538246902 × 63.1167728408 × 67.4608014473
 70.8083092017 × 75.1483263254 × 79.2410389396
 82.6885992523 × 86.9814936779 × 90.4421676113
 94.5191286852 × 98.8641211544 × 102.2137226334
 106.5570629804 × 110.6461387226 × 114.0983720371
 118.3926359117 × 121.8520361974 × 125.9324830518
 130.2784823635 × 133.6292420190 × 137.9737859501
 142.0648356156 × 145.5169093713 × 149.8124191584
 153.2751945131 × 157.3533321676 × 161.7017648843
 165.0542679795 × 169.3995012466 × 173.5007212709
 176.9477405854 × 181.2461091866 × 184.7217093753
 188.7882766883 × 193.1433991693 × 196.5006042153
 200.8464208729 × 204.9783928911 × 208.4107414232
 212.7181821502 × 216.2360465407 × 220.2627593608
 224.6335661040 × 228.0044198083 × 232.3468599661
 236.5586780540 × 239.9633929875 × 244.3009964469
 247.9619298702
 iMin node 15 855 energy = 58.22828230 detHess = 1345.38
 0.5234934840 × 4.9068253540 × 8.3090004982
 12.6094283804 × 16.9529007252 × 20.3489969376
 24.7425484399 × 28.7557332219 × 32.3058980738
 36.6331167586 × 40.0850648257 × 44.2227672754
 48.5986289757 × 51.9791006182 × 56.3493905475
 60.5217195732 × 63.9551332654 × 68.2900716776
 71.8904849029 × 75.8489178150 × 80.2429411826
 83.6457071996 × 87.9720452340 × 92.3058341329
 95.7077118514 × 100.1034504392 × 104.0845787663
 107.6652448983 × 111.9979134531 × 115.4396369406

119.5982225426 \times 123.9727942941 \times 127.3545712460
 131.7291485980 \times 135.8876996253 \times 139.3294413342
 143.6621019974 \times 147.2427171361 \times 151.2239011121
 155.6196400784 \times 159.0215114994 \times 163.3553182736
 167.6816254051 \times 171.0843910744 \times 175.4784035317
 179.4367436757 \times 183.0372356703 \times 187.3721816377
 190.8055607487 \times 194.9779441047 \times 199.3482122652
 202.7286762926 \times 207.1045406362 \times 211.2421443581
 214.6941415370 \times 219.0213348476 \times 222.5713614390
 226.5846894645 \times 230.9782229290 \times 234.3742874035
 238.7177997448 \times 243.0180836329 \times 246.4202590492
 250.8035277869

Join[Daten64aoPrPPdir, Daten64iMinPrPPdir];



```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

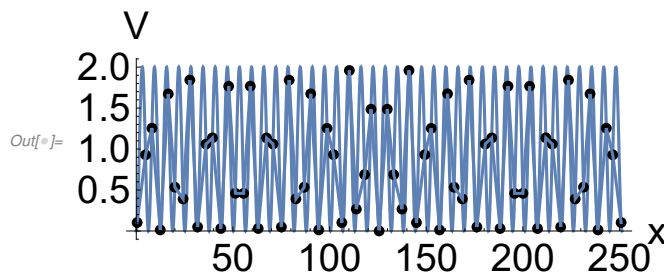
N = 65 GOLD global min

ENERGY 59.061629858142766

```
SetX = {0.45793175869928504, 4.78324732806844, 8.111072169028018,
12.406030828593561, 16.54133593313631, 19.936437946602695,
24.216720366232884, 27.703817542272965, 31.73098142839708, 36.0680139198177,
39.406863735742014, 43.73634957212674, 47.822359838482285,
51.265323545618244, 55.549672441413875, 58.993093727998485,
63.07856308722687, 67.40824730997333, 70.7471648642995, 75.08420236594405,
79.11235479292883, 82.59873988511315, 86.87910670499132, 90.2749430374212,
94.40954990829216, 98.7052226692411, 102.03321863797059, 106.358866716025,
110.24479781381066, 113.84568253156529, 118.1269955841433,
121.4582185298521, 125.66369452695835, 129.86915862135513,
133.2003866784451, 137.48169676940807, 141.08255383412688,
144.96851515954882, 149.2941664229231, 152.62216376116834,
156.91784418975237, 161.05244136995407, 164.44828666910448,
168.7286544883417, 172.2150297040778, 176.24319553296505, 180.5802334816659,
183.9191525850706, 188.24884017259456, 192.3343044006091,
195.77773151659164, 200.06208179405834, 203.5050429286812,
207.59105828681433, 211.92054484554887, 215.25939592634882,
219.59642919723797, 223.62359201644963, 227.1106905276519,
231.3909730809505, 234.78607431728594, 238.92138038619385,
243.21633936611263, 246.54416453534242, 250.86948054733287}
```

Eigenvalues

```
Out[*]= {4.27402, 4.26866, 4.25678, 4.24203, 4.22224, 4.19894, 4.16879, 4.13747, 4.11677,
4.06413, 4.02467, 3.97751, 3.92984, 3.87849, 3.82913, 3.7534, 3.70111, 3.65483,
3.59638, 3.54665, 3.49829, 3.46344, 3.42922, 3.12462, 3.12461, 2.54175,
2.51995, 2.47149, 2.41829, 2.35474, 2.28591, 2.22118, 2.14295, 2.07861,
2.00807, 1.94384, 1.88925, 1.83923, 1.81648, 1.56716, 1.56716, 0.879729,
0.854339, 0.823961, 0.783839, 0.740456, 0.695285, 0.653133, 0.574657, 0.573615,
0.392715, 0.369035, 0.327869, 0.29034, 0.260415, 0.224553, 0.217605, 0.112401,
0.105565, 0.0680434, 0.05741, 0.0368587, 0.0275927, 0.0196723, 0.00275446}
```



```

start energy = 59.0616827 detHess 1235.566
0.4680848221 × 4.7920402340 × 8.1191575880
12.4113270469 × 16.5490733261 × 19.9414323946
24.2212847220 × 27.7107402210 × 31.7344246328
36.0712498272 × 39.4097018465 × 43.7384003242
47.8256120747 × 51.2672891598 × 55.5514150087
58.9955537734 × 63.0798541798 × 67.4096227299
70.7484336205 × 75.0852916650 × 79.1142981906
82.5999027609 × 86.8802002753 × 90.2764719098
94.4104860659 × 98.7064908353 × 102.0344941570
106.3602408729 × 110.2475026881 × 113.8471257255
118.1282382417 × 121.4596433325 × 125.6646127801
129.8704888936 × 133.2014796138 × 137.4828964922
141.0847357096 × 144.9695887456 × 149.2950990692
152.6230136467 × 156.9184034123 × 161.0532601033
164.4488094761 × 168.7291313040 × 172.2157423255
176.2435491507 × 180.5805670197 × 183.9194371314
188.2490460588 × 192.3346284144 × 195.7779199640
200.0622461317 × 203.5052641098 × 207.5911728933
211.9206665057 × 215.2594954736 × 219.5965096104
223.6237273273 × 227.1107602002 × 231.3910288480
234.7861328282 × 238.9214096681 × 243.2163694601
246.5441790679 × 250.8694902469
SP node1209 energy = 60.23187264 detHess - 1115.82
3.4502641685 × 7.0315223193 × 11.2932014985
14.5988456714 × 18.7997958104 × 22.9510063708
26.2831069281 × 30.5281207483 × 33.9974457542
37.9980191750 × 42.2930687605 × 45.5951232295
49.8962945784 × 53.8366077771 × 57.3604750094
61.6098743250 × 64.9194961354 × 69.0984996023
73.2609650464 × 76.5796257384 × 80.8234256103
84.3107001758 × 88.2881592899 × 92.5835669726
95.8833347865 × 100.1810064786 × 104.1358194074
107.6437638172 × 111.8893787678 × 115.2001009722
119.3726331211 × 123.5372776365 × 126.8523550046
131.0952983286 × 134.5859107676 × 138.5582054707
142.8527723190 × 146.1513589260 × 150.4476817068
154.4022664411 × 157.9091199549 × 162.1535587173
165.4626432272 × 169.6350253172 × 173.7964296510
177.1116230233 × 181.3523469991 × 184.8352108558
188.8138746437 × 193.1055054917 × 196.4023790061
200.6978569099 × 204.6372516800 × 208.1563888422
212.4006908088 × 215.7033056155 × 219.8814773895
224.0296453052 × 227.3492330548 × 231.5834387582
235.0377998104 × 239.0415635550 × 243.3221844682
246.6142212988 × 250.9062578078

```

```

start energy = 59.0616424 detHess 1233.64
0.4629191877 × 4.7875696227 × 8.1150427250
12.4086338537 × 16.5451415038 × 19.9388915185
24.2189609945 × 27.7072122746 × 31.7326703923
36.0696026205 × 39.4082577239 × 43.7373582079
47.8239614204 × 51.2662920037 × 55.5505313987
58.9943073092 × 63.0792007784 × 67.4089278482
70.7477947245 × 75.0847441169 × 79.1133225506
82.5993198727 × 86.8796525490 × 90.2757076847
94.4100183578 × 98.7058572452 × 102.0338580748
106.3595553844 × 110.2461537034 × 113.8464059648
118.1276177425 × 121.4589321725 × 125.6641537231
129.8698228576 × 133.2009328236 × 137.4822948587
141.0836414256 × 144.9690503742 × 149.2946307086
152.6225878335 × 156.9181227818 × 161.0528487212
164.4485479153 × 168.7288924350 × 172.2153866853
176.2433726185 × 180.5803996534 × 183.9192957020
188.2489429353 × 192.3344654828 × 195.7778262633
200.0621640789 × 203.5051556094 × 207.5911163387
211.9206051497 × 215.2594464433 × 219.5964689331
223.6236584525 × 227.1107258047 × 231.3910010759
234.7861058920 × 238.9213959002 × 243.2163540948
246.5441730803 × 250.8694854609
SP node1212 energy = 60.23143112 detHess - 1316.5
3.4466119517 × 7.0296240213 × 11.2916647805
14.5972210160 × 18.7988057413 × 22.9496620688
26.2821802739 × 30.5272331325 × 33.9960372944
37.9972826137 × 42.2923001166 × 45.5944136156
49.8956735592 × 53.8354962468 × 57.3598837845
61.6093964046 × 64.9189682798 × 69.0981825257
73.2605417164 × 76.5793234107 × 80.8231294705
84.3102165924 × 88.2879097057 × 92.5833147452
95.8831034753 × 100.1808110261 × 104.1354762144
107.6435799304 × 111.8892300215 × 115.1999345822
119.3725334738 × 123.5371450876 × 126.8522594785
131.0952041981 × 134.5857560241 × 138.5581257174
142.8526920565 × 146.1512853469 × 150.4476197565
154.4021578999 × 157.9090618794 × 162.1535118907
165.4625910872 × 169.6349941775 × 173.7963883738
177.1115936038 × 181.3523182965 × 184.8351641444
188.8138504889 × 193.1054809519 × 196.4023565912
200.6978378033 × 204.6372180278 × 208.1563711807
212.4006769767 × 215.7032909584 × 219.8814689884
224.0296347629 × 227.3492262736 × 231.5834329964
235.0377914612 × 239.0415595947 × 243.3221810912
246.6142190139 × 250.9062566131
no iMin

```



```

Imin node431 energy = 59.3392077 detHess 3051.53
6.6742941694 × 10.9390022652 × 14.2053101311
18.4692971482 × 22.3621233946 × 25.8924255301
30.1114202468 × 33.3656611383 × 37.5489599572
41.5826704651 × 44.9406425594 × 49.1168561603
52.3808678223 × 56.5002197530 × 60.5711426227
63.8707648159 × 68.0322398287 × 71.3104414539
75.3998362264 × 79.4908435386 × 82.7678382710
86.9298028623 × 90.2320115919 × 94.3012349727
98.4238882641 × 101.6869263929 × 105.8651474170
109.2305333921 × 113.2592115936 × 117.4490598222
120.7032455861 × 124.9268190693 × 128.4784067019
132.3510955932 × 136.6170716456 × 139.8839383565
144.1473571309 × 148.0529814366 × 151.5709134893
155.7881801005 × 159.0442101212 × 163.2237050576
167.2645353258 × 170.6163537777 × 174.7932560207
178.0632308111 × 182.1787320839 × 186.2605978779
189.5550319234 × 193.7215635516 × 197.0171213065
201.0980009337 × 205.2149438433 × 208.4842997983
212.6619484666 × 216.0167791312 × 220.0555237019
224.2378086820 × 227.4936961207 × 231.7128804923
235.2395452699 × 239.1370411307 × 243.4017393406
246.6690062722 × 250.9348164773
and node 861

TP ? start point energy = 59.3386089 detHess 4168.57
6.6745978352 × 10.9393150349 × 14.2056130296
18.4695708595 × 22.3626215723 × 25.8926835465
30.1116261426 × 33.3658676484 × 37.5490920790
41.5828585900 × 44.9407469735 × 49.1169382799
52.3809597068 × 56.5002752730 × 60.5712171485
63.8708095572 × 68.0322790420 × 71.3104919129
75.3998698860 × 79.4908940636 × 82.7678748443
86.9298441358 × 90.2320770789 × 94.3012840146
98.4239699318 × 101.6869974591 × 105.8652381395
109.2306952149 × 113.2593244659 × 117.4492354140
120.7034204713 × 124.9270377025 × 128.4788300046
132.3513230229 × 136.6173128805 × 139.8841817865
144.1475839814 × 148.0534030201 × 151.5711407745
155.7883765715 × 159.0444284902 × 163.2238629029
167.2647887489 × 170.6165181385 × 174.7934254911
178.0634753620 × 182.1789223457 × 186.2609239552
189.5552918231 × 193.7218856691 × 197.0176627987
201.0984272332 × 205.2156810124 × 208.4849562592
212.6627994053 × 216.0183079413 × 220.0566142825
224.2395402882 × 227.4954180885 × 231.7150536602
235.2437389763 × 239.1393583560 × 243.4043344683
246.6716965653 × 250.9374534360
iMin node185 energy = 59.338934471 detHess - 3595.699

```

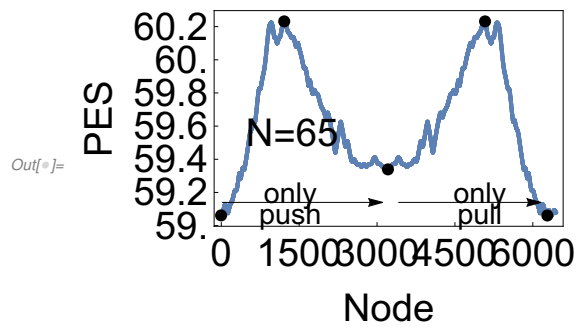
6.6750929753 × 10.9402673027 × 14.2069706715
 18.4712387490 × 22.3661496638 × 25.8947870366
 30.1138272869 × 33.3687499287 × 37.5515834184
 41.5874230517 × 44.9440285874 × 49.1208174767
 52.3870346935 × 56.5053810847 × 60.5804543127
 63.8783337683 × 68.0418799778 × 71.3267136358
 75.4131178490 × 79.5144156743 × 82.7882365185
 86.9563408659 × 90.2785435894 × 94.3370852003
 98.4848137418 × 101.7434119025 × 105.9384870969
 109.3655938967 × 113.3491855059 × 117.5819731154
 120.8405841602 × 125.0930705682 × 128.8053899449
 132.5176181739 × 136.7700901380 × 140.0286952182
 144.2614608885 × 148.2450778195 × 151.6721483579
 155.8672115394 × 159.1258067531 × 163.2735218668
 167.3320594849 × 170.6542545078 × 174.8223499702
 178.0961569597 × 182.1974549453 × 186.2838345215
 189.5686731019 × 193.7322029838 × 197.0300356543
 201.1051298186 × 205.2234105360 × 208.4896418263
 212.6663876174 × 216.0228462952 × 220.0587799420
 224.2414757516 × 227.4963994278 × 231.7153421868
 235.2435433127 × 239.1388595841 × 243.4030690149
 246.6697528047 × 250.9349393093

is same point ? ...

SP node2493 energy = 60.2314528 detHess - 1350.85

6.7043395331 × 10.9963758107 × 14.2884124096
 18.5690331990 × 22.5727960124 × 26.0271576135
 30.2613631007 × 33.5809500523 × 37.7291184223
 41.9072888689 × 45.2099038506 × 49.4542050046
 52.9733387739 × 56.9127366303 × 61.2082138320
 64.5050868955 × 68.7967178251 × 72.7753768266
 76.2582445048 × 80.4989683286 × 83.8141591850
 87.9755656697 × 92.1479433037 × 95.4570289412
 99.7014653169 × 103.2083081231 × 107.1629027425
 111.4592230548 × 114.7578082434 × 119.0523751987
 123.0246539870 × 126.5152792903 × 130.7582223191
 134.0732918331 × 138.2379433293 × 142.4104613156
 145.7211872665 × 149.9667947615 × 153.4747053745
 157.4295496433 × 161.7272137165 × 165.0269770895
 169.3223853234 × 173.2997947572 × 176.7871091267
 181.0309076945 × 184.3495427268 × 188.5120307104
 192.6909894442 × 196.0006218781 × 200.2499971582
 203.7737540434 × 207.7141712397 × 212.0153236859
 215.3173655945 × 219.6124218942 × 223.6128524480
 227.0822882606 × 231.3272938544 × 234.6593058737
 238.8105915497 × 243.0114068293 × 246.3170699186
 250.5786723110 × 254.1595584297

x_1 and x_65 moved to the rhs correctly



```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

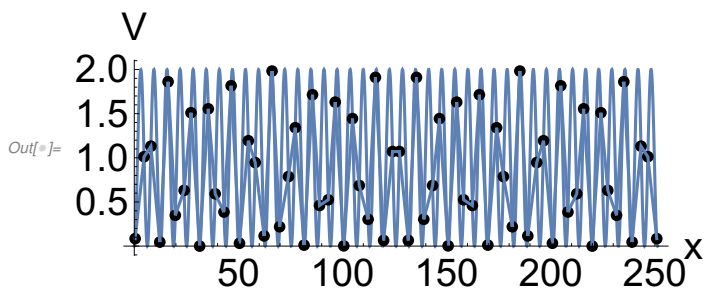
```
N = 66 GOLD global minimum
```

```
ENERGY 60.10313526383599
```

```
SetX = {0.4141938203198122, 4.699867915597583, 7.985620513195489,
12.26272103169254, 16.240816755878264, 19.71091950357618,
23.939753891827095, 27.239113058441095, 31.39844749605062,
35.54030363629916, 38.850114285290026, 43.073097946966136,
46.50707000099351, 50.51948569611678, 54.78318231267043, 58.06577159830564,
62.34691993958617, 66.16191887623077, 69.78955879916705, 74.04172126177455,
77.31675700186454, 81.5319393330714, 85.59820770687288, 88.96461256031479,
93.17249861769949, 96.5006604810315, 100.60508268879038,
104.7835549149425, 108.06588528418389, 112.29774622189518,
115.81253714265866, 119.74091567455166, 124.02193767786638,
127.30547699374196, 131.5864983209914, 135.51487777909566,
139.02966698959534, 143.26152691580106, 146.5438562877365,
150.72232789351915, 154.8267481980009, 158.15491055540278,
162.3627951946583, 165.72919620097204, 169.7954665061079,
174.010644257911, 177.28567941141534, 181.53783884647072,
185.1654639483223, 188.98047744764273, 193.2616268632208,
196.54421680625506, 200.80791723110315, 204.82032792463403,
208.25430613488703, 212.4772915701556, 215.78710176714807,
219.92896073680225, 224.08829379329228, 227.38765457513435,
231.61648901311233, 235.08658938674378, 239.06468834165685,
243.34178928342382, 246.62754247256527, 250.91321753430262}
```

```
Eigenvalues
```

```
Out[ ]= {4.26826, 4.26196, 4.25167, 4.23604, 4.2175, 4.1942, 4.16895, 4.13652, 4.10152,
4.06146, 4.03722, 3.97811, 3.93118, 3.88353, 3.81467, 3.76658, 3.71066,
3.65614, 3.5959, 3.53995, 3.47902, 3.44416, 3.40139, 3.37402, 3.07011, 3.07011,
2.49353, 2.46718, 2.42686, 2.3719, 2.31236, 2.24673, 2.18154, 2.1159, 2.04941,
1.98848, 1.93352, 1.89191, 1.86378, 1.62465, 1.62465, 0.924812, 0.901784,
0.866971, 0.834947, 0.779543, 0.726992, 0.68395, 0.63404, 0.592274, 0.510042,
0.509254, 0.343743, 0.319965, 0.294528, 0.28584, 0.167797, 0.1435, 0.118282,
0.104199, 0.0700511, 0.0498291, 0.0474449, 0.0159774, 0.00440826, 0.00212331}
```



```
start point energy = 60.103151453 detHess 125.64
```

```
0.4182880443 × 4.7038087090 × 7.9893661752
12.2657731455 × 16.2460890988 × 19.7138768907
23.9423195854 × 27.2422359198 × 31.4005296191
35.5434269899 × 38.8525505322 × 43.0758381165
46.5117997108 × 50.5223408831 × 54.7869254762
```

58.0696849236 × 62.3512056472 × 66.1703729720
 69.7938813042 × 74.0452826010 × 77.3203206192
 81.5342846190 × 85.6016542888 × 88.9667029892
 93.1743613543 × 96.5031814970 × 100.6066708551
 104.7857940330 × 108.0677822712 × 112.2998960791
 115.8164387948 × 119.7430137581 × 124.0241955462
 127.3077359377 × 131.5885965277 × 135.5187789160
 139.0318225461 × 143.2634388906 × 146.5461237312
 150.7239435208 × 154.8293228419 × 158.1568227793
 162.3649543905 × 165.7327698015 × 169.7978974895
 174.0143360293 × 177.2893802570 × 181.5423292595
 185.1742571938 × 188.9849314667 × 193.2656779491
 196.5480903229 × 200.8108564582 × 204.8251786624
 208.2571180268 × 212.4797889987 × 215.7903046260
 219.9310884271 × 224.0914736792 × 227.3902681112
 231.6194982584 × 235.0919580603 × 239.0677851307
 243.3455680688 × 246.6315142682 × 250.9173245373
 SP node482 energy = 61.0598524 detHess - 116.2
 0.7100190699 × 4.9909823436 × 8.3105023979
 12.5276141235 × 16.7059790600 × 20.0439467395
 24.3119063228 × 27.8481507408 × 31.7977935394
 36.1200899801 × 39.4424202503 × 43.7499071785
 47.8270902011 × 51.2576110411 × 55.5253238971
 58.9391834319 × 63.0354693502 × 67.3339674860
 70.6544919800 × 74.9745253310 × 78.8834240980
 82.4554367197 × 86.7264704733 × 90.0523312657
 94.2475273101 × 98.4424710570 × 101.7684538745
 106.0394021339 × 109.6108143113 × 113.5203559388
 117.8404140576 × 121.1609430637 × 125.4595809008
 129.5555080964 × 132.9696434050 × 137.2373237863
 140.6674708313 × 144.7450411273 × 149.0523207981
 152.3745845854 × 156.6968214285 × 160.6455285619
 164.1825497992 × 168.4505338767 × 171.7881301199
 175.9669086134 × 180.1833981751 × 183.5030284757
 187.7836750289 × 191.4110600737 × 195.2626156231
 199.5793805260 × 202.9000366712 × 207.1851775966
 211.3110619774 × 214.7028369502 × 218.9739814799
 222.4390423736 × 226.4802741775 × 230.8032421718
 234.1315944023 × 238.4565089406 × 242.4815760383
 245.9595047245 × 250.2301653329 × 253.6108707278
 so pull ok
 SP node1370 energy = 61.10564771 detHess - 294.42
 0.4769311862 × 4.7973830214 × 8.1214446761
 12.4099508115 × 16.5426742220 × 19.9342951529
 24.2100977121 × 27.6886999373 × 31.7200299615
 36.0507978455 × 39.3845687199 × 43.7117732722
 47.7717415260 × 51.2282349784 × 55.5054955197
 58.9187503211 × 63.0292236818 × 67.3357887122
 70.6640015812 × 74.9919761170 × 78.9247855556

82.4820643883 \times 86.7571557759 \times 90.0975384808
 94.2840334332 \times 98.5067742699 \times 101.8305496001
 106.1177719363 \times 109.7635508442 \times 113.6003407757
 117.9191914289 \times 121.2440276046 \times 125.5263290802
 129.6716851919 \times 133.0550475005 \times 137.3332870388
 140.8301992430 \times 144.8425078591 \times 149.1781459007
 152.5149120995 \times 156.8407951182 \times 160.9301047916
 164.3684308790 \times 168.6512473388 \times 172.0954377407
 176.1778283494 \times 180.5063047242 \times 183.8439165286
 188.1796838442 \times 192.2048025076 \times 195.6922685394
 199.9713962544 \times 203.3636504103 \times 207.5004622936
 211.7919972618 \times 215.1185726032 \times 219.4419076252
 223.3127325316 \times 226.9268111499 \times 231.2093526163
 234.5372376065 \times 238.7481205477 \times 242.9460827234
 246.2799001545 \times 250.5580873993 \times 254.1406242344

NTfin = {2.8, 5.1093409902, 8.4247068854,
 12.5815821819, 16.7536684596, 20.0604763489,
 24.3032249526, 27.8083684158, 31.7627981861,
 36.0571856155, 39.3541006802, 43.6474751601,
 47.6122479948, 51.1078407370, 55.3496507895,
 58.6597752001, 62.8274543974, 66.9907349073,
 70.3033186769, 74.5436402252, 78.0296525613,
 82.0040118374, 86.2954122111, 89.5916306136,
 93.8862856551, 97.8272636208, 101.3441911855,
 105.5876376239, 108.8897549308, 113.0671561967,
 117.2143824289, 120.5336359439, 124.7669322779,
 128.2188996748, 132.2242580703, 136.5034438945,
 139.7947326904, 144.0860164080, 147.9629296553,
 151.5366065446, 155.7846955485, 159.0705876815,
 163.2695085415, 167.3752551698, 170.7161272742,
 174.9342597154, 178.3136718906, 182.3799074150,
 186.6128938618, 189.8941176685, 194.1605467461,
 197.8474065685, 201.6071333352, 205.8854542279,
 209.1699406863, 213.4223389435, 217.4702281941,
 220.8736379044, 225.0974746198, 228.4313744245,
 232.5516408494, 236.7456253898, 240.0368162899,
 244.2848209874, 247.8443154566, 258.8};

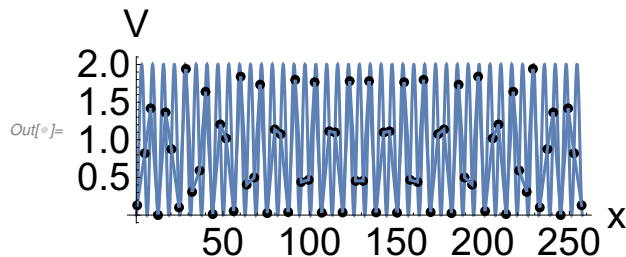
```
*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***
```

```
N = 66 GOLD global minimum
```

```
Setxx = NTfin;
```

```
ENERGY 60.0184709115669
```

```
SetX = {0.5157840161550413, 4.89222337325532, 8.284789492644597,
12.585983859041907, 16.90679097055156, 20.295984608908277,
24.67745477703829, 28.61920551913891, 32.22288011121105, 36.54873774222875,
39.961679153292955, 44.144737868196195, 48.48952381233161,
51.85528210679232, 56.220859733678914, 60.264468898904724,
63.76490797167849, 68.06878921113247, 71.50712020428315, 75.62673179519307,
79.97286816596916, 83.32847646068663, 87.68117726398637, 91.75424025458157,
95.22366778748989, 99.52129527516668, 102.97226681659414,
107.06767863965794, 111.41391202268458, 114.76648124633886,
119.11421793417604, 123.19878797304708, 126.65715449807499,
130.95343429901476, 134.41179619008926, 138.49637244639274,
142.84410883448683, 146.19667820688457, 150.54291261765204,
154.6383197054396, 158.0892954109205, 162.3869236657612, 165.85634827779205,
169.9294156591894, 174.2821164575397, 177.63772551736488,
181.98386305644163, 186.10347314791835, 189.54180574415827,
193.84568731115385, 197.34612486304468, 201.38973598231155,
205.75531365081778, 209.12107192757134, 213.46585869408867,
217.64891724240252, 221.0618587276045, 225.387716672015, 228.99139079074453,
232.93314170089664, 237.31461145293073, 240.7038046187647,
245.0246123793697, 249.3258069599385, 252.71837332296207, 257.0948130512943}
```



```

start xxx
SP node490 energy = 61.10388751 detHess - 142.48
0.4556908809 × 4.7789958667 × 8.1045182712
12.3988201917 × 16.5263545345 × 19.9238415052
24.2005785311 × 27.6744045576 × 31.7128147253
36.0437708474 × 39.3782987417 × 43.7069581269
47.7637443062 × 51.2234517535 × 55.5011844315
58.9127488500 × 63.0258214523 × 67.3316484188
70.6599884280 × 74.9879944408 × 78.9171808904
82.4778956045 × 86.7535141854 × 90.0931360091
94.2812084114 × 98.5027033918 × 101.8270234332
106.1138398364 × 109.7562011875 × 113.5967826724
117.9163044450 × 121.2415004847 × 125.5248879625
129.6699026790 × 133.0540791296 × 137.3327001945
140.8296277979 × 144.8424414299 × 149.1785216256
152.5157122069 × 156.8419015698 × 160.9325927756
164.3704138038 × 168.6537855401 × 172.0999164957
176.1807932077 × 180.5106282831 × 183.8490249730
188.1852540232 × 192.2161338065 × 195.6998415080
199.9798149267 × 203.3768356979 × 207.5095477858
211.8059525327 × 215.1338298922 × 219.4595781250
223.3486438995 × 226.9464288040 × 231.2271375376
234.5586352344 × 238.7628859614 × 242.9689809759
246.2996353983 × 250.5809659477 × 254.1832622094
and node504 energy = 61.10356212 detHess - 180.8668
same point

```

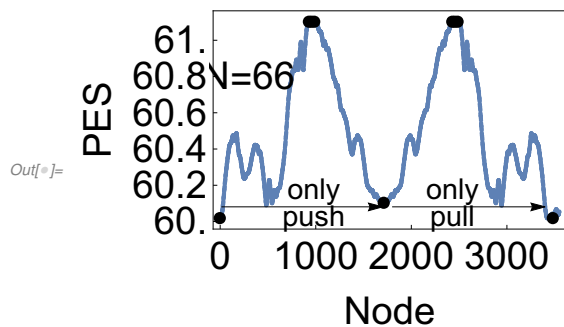


```

start en 60.0184738 detHess 6875.6
0.5214154628 × 4.8970849090 × 8.2897614161
12.5889799489 × 16.9108058944 × 20.2995663919
24.6810411423 × 28.6260201497 × 32.2265160158
36.5517053763 × 39.9651931360 × 44.1465520816
48.4914286114 × 51.8568895821 × 56.2221401549
60.2666337942 × 63.7661400521 × 68.0698239993
71.5084729895 × 75.6274135115 × 79.9735435890
83.3290486376 × 87.6816072966 × 91.7549394653
95.2240763466 × 99.5216463880 × 102.9727427879
107.0679178021 × 111.4141471732 × 114.7666799976
119.1143650905 × 123.1990243332 × 126.6572916023
130.9535513373 × 134.4119532153 × 138.4964509772
142.8441853136 × 146.1967395213 × 150.5429592825
154.6383953067 × 158.0893386569 × 162.3869619128
165.8563977458 × 169.9294399519 × 174.2821403830
177.6377406533 × 181.9838749285 × 186.1034918842
189.5418141996 × 193.8456964242 × 197.3461341048
201.3897408559 × 205.7553213999 × 209.1210770536
213.4658660020 × 217.6489327672 × 221.0618677284
225.3877289219 × 228.9914093509 × 232.9331510945
237.3146224861 × 240.7038109474 × 245.0246181317
249.3258175906 × 252.7183779394 × 257.0948173533
SP node1160 energy = 61.1025091 detHess - 373.17
3.4223777965 × 7.0262605675 × 11.3066990412
14.6351476630 × 18.8421451505 × 23.0417319347
26.3736053781 × 30.6515431404 × 34.2373888432
38.1379248333 × 42.4633260396 × 45.7900698718
50.0888659567 × 54.2119623208 × 57.6143062228
61.8917482102 × 65.3615702555 × 69.4057959777
73.7366998072 × 77.0717165586 × 81.4014646528
85.4549105905 × 88.9176703658 × 93.1956310899
96.6051015510 × 100.7208811143 × 105.0254372794
108.3536434573 × 112.6813597334 × 116.6049933045
120.1706828284 × 124.4468396326 × 127.7849784992
131.9753929772 × 136.1943051229 × 139.5193846309
143.8051071702 × 147.4403963045 × 151.2885037193
155.6090504086 × 158.9346143253 × 163.2200686298
167.3632578933 × 170.7493571926 × 175.0281801521
178.5230497386 × 182.5386712725 × 186.8748307715
190.2122366196 × 194.5390206806 × 198.6283703669
202.0673790952 × 206.3507905508 × 209.7958109964
213.8780600171 × 218.2074800371 × 221.5457593154
225.8820245904 × 229.9107119797 × 233.3960276706
237.6758357916 × 241.0712443884 × 245.2055216786
249.5003952033 × 252.8279140837 × 257.1529633208
and node1192 same point but detHess 274.25 SP2 ? !
and node 1231 detHess - 346.444

```

SP node928 energy = 61.1024125
 and node954 SP2 !
 and node984
 and iMin node1711 energy = 60.1034729 detHess 137.27
 6.6977784130 \times 10.9834361288 \times 14.2691675112
 18.5461994611 \times 22.5245063258 \times 25.9943856135
 30.2231792973 \times 33.5225864802 \times 37.6818216639
 41.8237675300 \times 45.1335137455 \times 49.3565201896
 52.7906602227 \times 56.8029138434 \times 61.0666832592
 64.3492838006 \times 68.6304607363 \times 72.4458030031
 76.0730995680 \times 80.3251965449 \times 83.6002284337
 87.8153090694 \times 91.8816583535 \times 95.2479548624
 99.4558170336 \times 102.7840187122 \times 106.8883716477
 111.0668778822 \times 114.3491813143 \times 118.5810497662
 122.0959307364 \times 126.0242097341 \times 130.3052342291
 133.5887683069 \times 137.8697772273 \times 141.7982316006
 145.3129424810 \times 149.5447867594 \times 152.8271240988
 157.0055670256 \times 161.1100119971 \times 164.4381494812
 168.6460347701 \times 172.0124660812 \times 176.0787062409
 180.2939075721 \times 183.5689397923 \times 187.8211123004
 191.4488193848 \times 195.2637475947 \times 199.5448868819
 202.8274705341 \times 207.0911513550 \times 211.1035896125
 214.5375333480 \times 218.7605097891 \times 222.0703240563
 226.2121667761 \times 230.3715043209 \times 233.6708566971
 237.8996889631 \times 241.3697968013 \times 245.3478841790
 249.6249836349 \times 252.9107341231 \times 257.1964061682



```
*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***
```

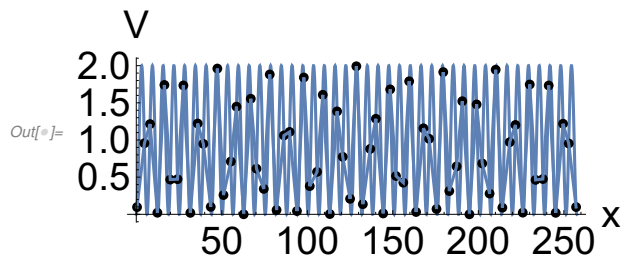
N = 67 GOLD global minimum

ENERGY 60.93684020157212

```
SetX = {0.44371838509311984, 4.756240902292526, 8.069724930675543,
12.360026365965394, 16.44544492341028, 19.85843740157743,
24.117666412618515, 27.527375882318843, 31.616494883806922,
35.90484069400492, 39.21805321733325, 43.52992203829387, 47.40468755618777,
51.002331014583525, 55.27193175770273, 58.584457299173806,
62.79080689334407, 66.95612261347519, 70.28945277034764, 74.54524647477098,
78.04779826421374, 82.0227557837143, 86.33246993299522, 89.64406425675843,
93.94975965910109, 97.96182766128966, 101.43219802346003,
105.68666138137354, 109.03778664192265, 113.18327368312258,
117.4145928365532, 120.72296654898408, 125.0053811861907,
128.67600287349754, 132.47556038122949, 136.77950278335103,
140.0906636002804, 144.3601278168455, 148.47705593440955,
151.8613378061541, 156.12035597939183, 159.5605977197711,
163.61445219082418, 167.9172941914001, 171.23257859103987,
175.54773865150463, 179.4906329643201, 183.0259019949116,
187.28788739366038, 190.6150813276587, 194.79546523579137,
198.99256926799728, 202.31140306747866, 206.5790558284421,
210.15340777335646, 214.05492295939095, 218.37023650374036,
221.68598678479646, 225.98106134519995, 230.06414687473196,
233.48194194127973, 237.74340874170457, 241.1540090161953,
245.2452417181405, 249.5361377482297, 252.85124126374424, 257.1652421903066}
```

Eigenvalues

```
Out[*]= {4.27176, 4.26556, 4.25524, 4.24199, 4.22303, 4.19983, 4.17418, 4.14436,
4.10898, 4.08771, 4.03426, 3.99059, 3.9445, 3.89757, 3.84858, 3.77814,
3.7306, 3.67613, 3.61679, 3.57216, 3.52065, 3.47083, 3.43357, 3.4097,
3.10855, 3.10648, 2.52385, 2.49674, 2.45587, 2.40747, 2.34622, 2.28603,
2.21516, 2.1469, 2.07648, 2.01704, 1.95476, 1.90552, 1.8623, 1.83375,
1.58637, 1.58418, 0.895389, 0.87537, 0.842596, 0.80401, 0.759607,
0.71754, 0.66887, 0.631063, 0.552581, 0.549974, 0.372275, 0.345852,
0.311688, 0.281235, 0.253556, 0.24571, 0.127809, 0.110173, 0.088009,
0.0824254, 0.0448041, 0.0362155, 0.0127377, 0.00917931, 0.000951927}
```



```

start energy = 60.93685876 detHess 71.7801
0.4498354960 × 4.7617886883 × 8.0749613954
12.3638174407 × 16.4515024557 × 19.8622894962
24.1213593423 × 27.5328627651 × 31.6197399661
35.9090226622 × 39.2222537433 × 43.5343496904
47.4133292135 × 51.0068915000 × 55.2757815632
58.5887193411 × 62.7935625300 × 66.9601244673
70.2924872105 × 74.5484824336 × 78.0533673431
82.0257422098 × 86.3356866792 × 89.6473180648
93.9526931312 × 97.9672451601 × 101.4355535592
105.6900334316 × 109.0426257022 × 113.1866310258
117.4198132709 × 120.7280527016 × 125.0114720595
128.6879269971 × 132.4814876593 × 136.7845421285
140.0954315857 × 144.3632514763 × 148.4816226190
151.8642475067 × 156.1230154312 × 159.5645354545
163.6165543847 × 167.9195963359 × 171.2347191245
175.5496856595 × 179.4941917512 × 183.0278252423
187.2894967249 × 190.6169448295 × 194.7966124117
198.9941470241 × 202.3126529003 × 206.5803754162
210.1557450126 × 214.0560689037 × 218.3712368421
221.6868654924 × 225.9816468564 × 230.0650098416
233.4824336420 × 237.7438002342 × 241.1544994857
245.2454774402 × 249.5363518686 × 252.8513774915
257.1653158595
SP ? node 1190 energy = 62.15316113 detHess 16.6088
3.3771191458 × 6.9812745360 × 11.2281849999
14.5020275701 × 18.7100436407 × 22.7789995606
26.1391164210 × 30.3441316741 × 33.6710860797
37.7728622507 × 41.9483219914 × 45.2291449959
49.4579539621 × 52.9641820628 × 56.8989653327
61.1769259221 × 64.4584234222 × 68.7383659547
72.6504802675 × 76.1788487982 × 80.4109410114
83.6877938195 × 87.8712685131 × 91.9615528336
95.2970261916 × 99.4995476510 × 102.8440413482
106.9254642377 × 111.1179714066 × 114.3927878036
118.6299359149 × 122.1850174021 × 126.0708469026
130.3526618358 × 133.6347513159 × 137.9099966813
141.8705994755 × 145.3527159625 × 149.5791109553
152.8673252510 × 157.0330830076 × 161.1523079017
164.4692661284 × 168.6803380196 × 172.0689823579
176.1159684235 × 180.3486501823 × 183.6239292666
187.8865562775 × 191.5771333528 × 195.3276929174
199.6000429030 × 202.8783176576 × 207.1265860951
211.1580606495 × 214.5674893852 × 218.7839976030
222.0971681896 × 226.2271779267 × 230.3896888075
233.6830773256 × 237.9103840735 × 241.3859765743
245.3555459763 × 249.6314298734 × 252.9151393208
257.1987054472

```

```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

```
N = 67 GOLD global SP
```

```
as = 6.283185307180;
```

```
a0 = 2. / (1. + Sqrt[5.]) * as;
```

```
Setxx = {3.3771191458, 6.9812745360, 11.2281849999,  
14.5020275701, 18.7100436407, 22.7789995606,  
26.1391164210, 30.3441316741, 33.6710860797,  
37.7728622507, 41.9483219914, 45.2291449959,  
49.4579539621, 52.9641820628, 56.8989653327,  
61.1769259221, 64.4584234222, 68.7383659547,  
72.6504802675, 76.1788487982, 80.4109410114,  
83.6877938195, 87.8712685131, 91.9615528336,  
95.2970261916, 99.4995476510, 102.8440413482,  
106.9254642377, 111.1179714066, 114.3927878036,  
118.6299359149, 122.1850174021, 126.0708469026,  
130.3526618358, 133.6347513159, 137.9099966813,  
141.8705994755, 145.3527159625, 149.5791109553,  
152.8673252510, 157.0330830076, 161.1523079017,  
164.4692661284, 168.6803380196, 172.0689823579,  
176.1159684235, 180.3486501823, 183.6239292666,  
187.8865562775, 191.5771333528, 195.3276929174,  
199.6000429030, 202.8783176576, 207.1265860951,  
211.1580606495, 214.5674893852, 218.7839976030,  
222.0971681896, 226.2271779267, 230.3896888075,  
233.6830773256, 237.9103840735, 241.3859765743,  
245.3555459763, 249.6314298734, 252.9151393208,  
257.1987054472};
```

```
SetX = {3.473661282028764, 7.030883980207509, 11.268059777613152,
  14.542130643410742, 18.735318278287597, 22.814516662214224,
  26.160275764986707, 30.362062137618782, 33.69450915771886,
  37.78675952103069, 41.96654566436821, 45.243702316970946,
  49.473378566838846, 52.991222909033404, 56.91303807228131,
  61.19121491197615, 64.47183047114618, 68.75005480988762, 72.67134603253969,
  76.18970975098942, 80.41947283352202, 83.69655610430924, 87.87653038388471,
  91.96855534508906, 95.3011960134746, 99.50295579589326, 102.84844444836317,
  106.92788085295247, 111.12080433892126, 114.39491755329166,
  118.63194167339367, 122.18837019540724, 126.0723864378921,
  130.35380436251538, 133.63547384792423, 137.91021792035764,
  141.8705324261328, 145.35242500807428, 149.5784050411029, 152.8659633161957,
  157.0317213692584, 161.14958944951607, 164.46682156618127,
  168.6770739845147, 172.06305115069512, 176.1118315335233,
  180.34224674681286, 183.6171360575626, 187.87828243878462,
  191.56062241549895, 195.3194382259813, 199.59299556700236,
  202.87174487398764, 207.1220734770695, 211.15121072937234,
  214.56368840811388, 218.7810002955742, 222.09369662723046,
  226.22523415325912, 230.38733240258975, 233.68147901916737,
  237.9089732616184, 241.38382528814253, 245.35452617219926,
  249.6305718408557, 252.91455158589915, 257.1983984962252}
```

Eigenvalues

```
Out[8]= {4.26814, 4.26203, 4.25203, 4.23708, 4.21955, 4.19746, 4.1725, 4.14182,
  4.10952, 4.07373, 4.04201, 3.98404, 3.94042, 3.8929, 3.83225, 3.78651,
  3.73299, 3.67739, 3.62179, 3.56872, 3.51632, 3.46016, 3.42291, 3.39157,
  3.36914, 3.06773, 2.49266, 2.46874, 2.43167, 2.38214, 2.32872, 2.26834,
  2.20559, 2.14396, 2.08093, 2.02143, 1.96853, 1.92231, 1.88631, 1.86363,
  1.62714, 0.928129, 0.907812, 0.87824, 0.847309, 0.794705, 0.747395,
  0.699007, 0.653345, 0.613237, 0.581435, 0.507042, 0.343642, -0.336184,
  0.322941, 0.301736, 0.29012, 0.172481, 0.149431, 0.126224, 0.111229,
  0.0766503, 0.0598548, 0.0469489, 0.0152329, 0.00765988, 0.0000835743}
```

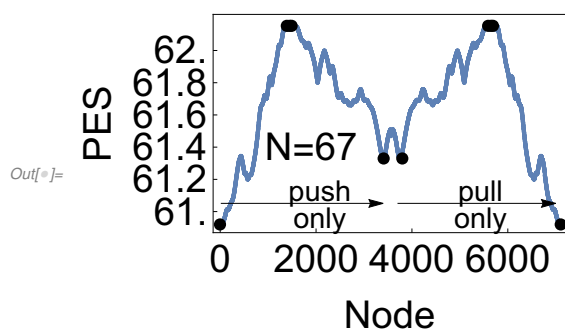
ENERGY 62.156369290079

ok is correct SP_1 but very flat!

```

iMin node696 energy = 61.329674841 detHess 9431.69
6.5069272131 × 10.6093819419 × 13.7854866930
17.9003866779 × 21.2023546754 × 25.2138265209
29.3062948342 × 32.5404562723 × 36.6766824380
39.9595316298 × 44.0138664636 × 48.0997653673
51.3574713619 × 55.5027223559 × 58.7825746961
62.8505082848 × 66.9370960044 × 70.2024041101
74.3531177446 × 77.6388536736 × 81.7085145521
85.8052776703 × 89.0702777739 × 93.2290488313
96.5363768214 × 100.5969587831 × 104.7234867206
107.9821294879 × 112.1607325807 × 115.5337857692
119.5549812445 × 123.7497534815 × 127.0028283444
131.2291865750 × 134.7978873563 × 138.6531121420
142.9188670735 × 146.1849004406 × 150.4458535556
154.3633511085 × 157.8682444913 × 162.0825133926
165.3386791463 × 169.5139217499 × 173.5574665136
176.9049689664 × 181.0806109714 × 184.3510900186
188.4645907700 × 192.5471280258 × 195.8401761758
200.0062788091 × 203.3021602978 × 207.3822147171
211.4993602068 × 214.7682661163 × 218.9457911863
222.3008720411 × 226.3392043674 × 230.5215673140
233.7773169878 × 237.9964804239 × 241.5234234353
245.4205539832 × 249.6851915240 × 252.9523787056
257.2180990466

```



```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

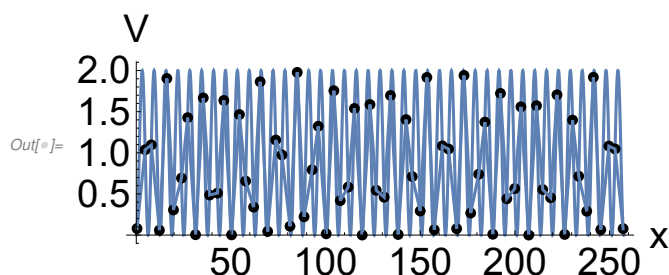
N = 68 GOLD global minimum

ENERGY 62.04528264177

```
SetX = {0.4014168529100223, 4.675362077885605, 7.949992756209971,
12.22001752964193, 16.15057246458291, 19.652828497813953,
23.874716824373625, 27.145120902514588, 31.319601335825254,
35.39790538666166, 38.73130894736639, 42.92314116636022, 46.243030622612615,
50.33420616773347, 54.494051232411174, 57.768672103619494,
61.98239412240915, 65.44519309410775, 69.41201693385933, 73.67147315926096,
76.94306580892598, 81.21432186198761, 85.03529013036852, 88.64556101872707,
92.88537555465372, 96.14682554138439, 100.35488352930055,
104.38776862651721, 107.76487693128402, 111.95582364172627,
115.23750687733809, 119.36142826621312, 123.46625862876208,
126.76109317680088, 130.94594683028848, 134.28881894266618,
138.34881408359075, 142.52726760969276, 145.79068463912742,
150.01137548298703, 153.52519022644574, 157.44022660037953,
161.7080929008614, 164.97947883132878, 169.24981350719165, 173.134241827939,
176.67892491976315, 180.90505382259246, 184.1656924193108,
188.35405707108504, 192.4013915097042, 195.7567376576725,
199.94146138580385, 203.2258807968982, 207.33948150364802,
211.44744854501928, 214.73579928345404, 218.918734030291,
222.26413605120572, 226.31914647588647, 230.49831123238707,
233.75985710834652, 237.97999061083993, 241.49609790053162,
245.4076356904265, 249.67463603834727, 252.944994856005, 257.2142595826336}
```

Eigenvalues

```
Out[ ] = {4.2668, 4.26084, 4.25019, 4.23685, 4.2189, 4.19715, 4.17152, 4.14179, 4.11097,
4.07356, 4.03182, 4.00633, 3.94794, 3.90192, 3.83512, 3.79012, 3.73703,
3.67985, 3.62444, 3.5676, 3.51395, 3.46273, 3.40626, 3.37708, 3.35268,
3.05509, 3.04926, 2.47909, 2.45409, 2.40869, 2.36303, 2.30596, 2.24549,
2.18095, 2.11655, 2.056, 1.99824, 1.95026, 1.90388, 1.8779, 1.64628,
1.64028, 0.943604, 0.923606, 0.898241, 0.847074, 0.801449, 0.753618,
0.701902, 0.64701, 0.608551, 0.567924, 0.492571, 0.485441, 0.334675,
0.316754, 0.306096, 0.199549, 0.177975, 0.155248, 0.114419, 0.0924242,
0.0722852, 0.0538315, 0.0359846, 0.0318477, 0.00654221, 0.00238439}
```



SP node505 energy = 63.46354481204 detHess - 779.32

```
3.6628987416 × 7.0464161682 × 11.1211932846
14.2038500972 × 18.2842844119 × 21.8290736163
25.5352291389 × 29.6330933132 × 32.7533532125
36.8465057760 × 40.1866605271 × 44.1352160654
48.2360952342 × 51.4402972264 × 55.5671176270
```


58.8625781936 × 62.8944039402 × 66.9887397736
 70.2334399463 × 74.3775430025 × 77.6691819875
 81.7255588029 × 85.8260710864 × 89.0834579264
 93.2404495293 × 96.5520323306 × 100.6064801221
 104.7363713697 × 107.9920490228 × 112.1715302488
 115.5519063250 × 119.5665198837 × 123.7660618838
 127.0185448364 × 131.2477994266 × 134.8335310531
 138.6714626574 × 142.9365872122 × 146.2017290455
 150.4599556722 × 154.3880047183 × 157.8811200232
 162.0926268675 × 165.3489762487 × 169.5202959618
 173.5662391596 × 176.9098681441 × 181.0843728280
 184.3553199877 × 188.4670061025 × 192.5501429842
 195.8419438764 × 200.0076598583 × 203.3038359147
 207.3831440102 × 211.5004718134 × 214.7689718397
 218.9463855284 × 222.3016932362 × 226.3396525623
 230.5220860160 × 233.7777112814 × 237.9968559121
 241.5240511517 × 245.4208507333 × 249.6854332753
 252.9525482351 × 257.2181871608

node541 energy = 63.46353055 detHess - 1201.284

3.6661957429 × 7.0485031808 × 11.1235768908
 14.2068317543 × 18.2876610060 × 21.8356995375
 25.5385618071 × 29.6361968998 × 32.7555792720
 36.8483666897 × 40.1893821221 × 44.1366361518
 48.2376171730 × 51.4412483168 × 55.5678643005
 58.8635356342 × 62.8949240211 × 66.9893415503
 70.2338062135 × 74.3778338029 × 77.6695493835
 81.7257660143 × 85.8263251219 × 89.0836222140
 93.2405958020 × 96.5522387247 × 100.6066084529
 104.7365496019 × 107.9921906310 × 112.1716894410
 115.5521788162 × 119.5666949770 × 123.7663116496
 127.0187891146 × 131.2480905326 × 134.8340918346
 138.6717504205 × 142.9368621231 × 146.2019895259
 150.4601711083 × 154.3883784719 × 157.8813155736
 162.0927802334 × 165.3491328528 × 169.5203925998
 173.5663717075 × 176.9099422516 × 181.0844297306
 184.3553840675 × 188.4670426625 × 192.5501885695
 195.8419706178 × 200.0076807540 × 203.3038612844
 207.3831580773 × 211.5004886350 × 214.7689825228
 218.9463945277 × 222.3017056752 × 226.3396593513
 230.5220938727 × 233.7777172554 × 237.9968616023
 241.5240606660 × 245.4208552312 × 249.6854369393
 252.9525508046 × 257.2181884964

is not iMin ?

node1285 energy = 63.464036525 detHess - 5225.214

3.6561735461 × 7.0462589022 × 11.1258726505
 14.1985767807 × 18.2728387790 × 21.8022992998
 25.5276908285 × 29.6315997906 × 32.7532690955
 36.8479821876 × 40.1827535479 × 44.1395664892
 48.2426741823 × 51.4483183646 × 55.5797582691

58.8752166182 × 62.9127104531 × 67.0212571476
 70.2523694306 × 74.3921213161 × 77.6803105743
 81.7337671205 × 85.8311548757 × 89.0882756631
 93.2428247290 × 96.5487763647 × 100.6059557213
 104.7290901011 × 107.9855369909 × 112.1603409289
 115.5235861401 × 119.5504620573 × 123.7394380995
 126.9903721665 × 131.2124969897 × 134.7547572505
 138.6381727449 × 142.9116114578 × 146.1815082739
 150.4515447647 × 154.3744122338 × 157.8771725752
 162.0926617994 × 165.3470417000 × 169.5242377053
 173.5696674450 × 176.9155917624 × 181.0907429777
 184.3613643032 × 188.4741684925 × 192.5567610615
 195.8499433219 × 200.0151783568 × 203.3116695445
 207.3909190367 × 211.5081737272 × 214.7775843545
 218.9551325248 × 222.3098566703 × 226.3480809404
 230.5302982878 × 233.7864625249 × 238.0054832935
 241.5323701234 × 245.4298896361 × 249.6945154760
 252.9613269182 × 257.2267646304

start energy = 62.0453064 detHess 588.2
 0.4014293205 × 4.6753898209 × 7.9500249355
 12.2200611484 × 16.1506654210 × 19.6528828603
 23.8747772083 × 27.1451967240 × 31.3196685189
 35.3980299803 × 38.7314005057 × 42.9232541663
 46.2432125592 × 50.3343480786 × 54.4942954638
 57.7688968683 × 61.9826848503 × 65.4457351413
 69.4123459735 × 73.6719062839 × 76.9435275488
 81.2148319985 × 85.0363012129 × 88.6460833161
 92.8858205433 × 96.1472771838 × 100.3552036945
 104.3882709707 × 107.7651765556 × 111.9561016761
 115.2378701466 × 119.3616896154 × 123.4666788605
 126.7614200484 × 130.9463365537 × 134.2894752722
 138.3492848310 × 142.5280213849 × 145.7914123335
 150.0122949803 × 153.5269487735 × 157.4412137157
 161.7092340036 × 164.9806740686 × 169.2510108843
 173.1365442500 × 176.6801673086 × 180.9061486019
 184.1669198631 × 188.3549642030 × 192.4028754234
 195.7577255607 × 199.9425108278 × 203.2274450443
 207.3406890349 × 211.4495069280 × 214.7375295472
 218.9209116276 × 222.2679501536 × 226.3219046677
 230.5027499375 × 233.7642211553 × 237.9855137241
 241.5067127434 × 245.4135780371 × 249.6814538875
 252.9521510811 × 257.2213973674

SP node801 energy = 62.9814250770 detHess - 193.0
 0.4425460857 × 4.7540099284 × 8.0663397978
 12.3562062804 × 16.4374521423 × 19.8522093340
 24.1098681915 × 27.5139188961 × 31.6071917834
 35.8905658925 × 39.2020695665 × 43.5112730847
 47.3666775308 × 50.9816724526 × 55.2531828839

58.5623527365 × 62.7750400913 × 66.9309450235
 70.2690951497 × 74.5216588408 × 78.0056769088
 81.9987955070 × 86.3039987805 × 89.6132312929
 93.9194357501 × 97.9031644034 × 101.3954097567
 105.6483901583 × 108.9822824518 × 113.1430116918
 117.3494012137 × 120.6598818115 × 124.9281948558
 128.5255415432 × 132.3990105786 × 136.7093523326
 140.0209474223 × 144.3084237360 × 148.3924911781
 151.8040179908 × 156.0610820578 × 159.4667975528
 163.5573848730 × 167.8413138048 × 171.1524712716
 175.4615603836 × 179.3198790882 × 182.9316680543
 187.2023108633 × 190.5112234926 × 194.7228036213
 198.8784720209 × 202.2160199803 × 206.4679950155
 209.9510692834 × 213.9445337743 × 218.2489871465
 221.5576422269 × 225.8634590749 × 229.8440865450
 233.3384380343 × 237.5910114607 × 240.9228225024
 245.0850260817 × 249.2880174448 × 252.5988066824
 256.8651089796 × 260.4530803724
 iMin not arrived turned NT
 TP by node1121 energy = 62.1736744333714 detHess - 1.252260
 0.4561245911 × 4.7798189887 × 8.1057859280
 12.4002173230 × 16.5292588688 × 19.9262713122
 24.2036886787 × 27.6800528813 × 31.7163302575
 36.0485135067 × 39.3838792458 × 43.7127573109
 47.7753474568 × 51.2315914240 × 55.5105152682
 58.9279715984 × 63.0360065907 × 67.3467799138
 70.6769856174 × 75.0071521714 × 78.9561394740
 82.5007263733 × 86.7759932366 × 90.1234119671
 94.3028706018 × 98.5373923679 × 101.8599607414
 106.1534375339 × 109.8332346105 × 113.6352337436
 117.9495650154 × 121.2736580461 × 125.5462475320
 129.7016483069 × 133.0759965675 × 137.3543748448
 140.8647598846 × 144.8606226514 × 149.1969026412
 152.5335958370 × 156.8564843956 × 160.9580720152
 164.3877036962 × 168.6719902339 × 172.1291291247
 176.1981729511 × 180.5329692231 × 183.8736575860
 188.2102547631 × 192.2654023303 × 195.7328197110
 200.0160163068 × 203.4338302228 × 207.5475584232
 211.8623499433 × 215.1961236687 × 219.5298929875
 223.4912631587 × 227.0283368859 × 231.3058110147
 234.6617384561 × 238.8355423123 × 243.0837779108
 246.4069724468 × 250.7086023912 × 254.4301661547
 258.1905589489 × 262.4989433840

```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

N = 68 GOLD int minimum becomes glob Min

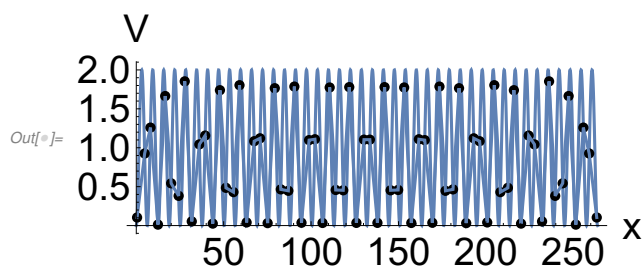
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Setxx = {0.4561245911, 4.7798189887, 8.1057859280,
12.4002173230, 16.5292588688, 19.9262713122,
24.2036886787, 27.6800528813, 31.7163302575,
36.0485135067, 39.3838792458, 43.7127573109,
47.7753474568, 51.2315914240, 55.5105152682,
58.9279715984, 63.0360065907, 67.3467799138,
70.6769856174, 75.0071521714, 78.9561394740,
82.5007263733, 86.7759932366, 90.1234119671,
94.3028706018, 98.5373923679, 101.8599607414,
106.1534375339, 109.8332346105, 113.635233743,
117.9495650154, 121.2736580461, 125.5462475320,
129.7016483069, 133.0759965675, 137.3543748448,
140.8647598846, 144.8606226514, 149.1969026412,
152.5335958370, 156.8564843956, 160.9580720152,
164.3877036962, 168.6719902339, 172.1291291247,
176.1981729511, 180.5329692231, 183.8736575860,
188.2102547631, 192.2654023303, 195.7328197110,
200.0160163068, 203.4338302228, 207.5475584232,
211.8623499433, 215.1961236687, 219.5298929875,
223.4912631587, 227.0283368859, 231.3058110147,
234.6617384561, 238.8355423123, 243.0837779108,
246.4069724468, 250.7086023912, 254.4301661547,
258.1905589489, 262.4989433840};
```

ENERGY 61.833460022291

```
SetX = {0.4595407344322517, 4.786299041161278, 8.115788175708039,
12.411201267907105, 16.552066849472524, 19.94555637716971,
24.22843238489951, 27.725310521313208, 31.744043138457453,
36.08503612995652, 39.42696518142576, 43.75658600108965, 47.8624074259958,
51.29503657148196, 55.58473555534, 59.05299496379098, 63.116254046603586,
67.46009586943323, 70.80747598119494, 75.14746735025145, 79.23932176646571,
82.68733711871855, 86.98001155574698, 90.43964504764797, 94.51755067147813,
98.86196758835005, 102.21120217777805, 106.55445472100489,
110.64092096487639, 114.09457691065603, 118.38820944379636,
121.84455063201855, 125.92778776233502, 130.27204797133942,
133.6217162472609, 137.96597892618007, 142.04920311912622,
145.505554167882, 149.79918664233554, 153.25283151644982,
157.33931113114383, 161.68256063920998, 165.03179513598283,
169.37621368283186, 173.45410376771068, 176.9137496095365,
181.20642489588846, 184.6544296859311, 188.74629865245686,
193.0862881476441, 196.43366910289328, 200.77751354331303,
204.8407608851547, 208.30903045087229, 212.5987309527578,
216.03135426690378, 220.13718619793536, 224.46680723774463,
227.80873801730152, 232.14973251917905, 236.1684594922478,
239.66534341425492, 243.9482208388735, 247.34170950715293,
251.48257831748782, 255.77799156909646, 259.1074812335462, 263.434240844448}
```

Eigenvalues

```
Out[8]= {4.2767, 4.27047, 4.26041, 4.24649, 4.22875, 4.20722, 4.18198, 4.14697,
4.13012, 4.0868, 4.04698, 4.00467, 3.95983, 3.91276, 3.8641, 3.81585,
3.73736, 3.6978, 3.64697, 3.59589, 3.54748, 3.50438, 3.46992, 3.44839,
3.12668, 3.12668, 2.55979, 2.53202, 2.49101, 2.4396, 2.38055, 2.3163,
2.24918, 2.18224, 2.11454, 2.04664, 1.98156, 1.92149, 1.86874, 1.82621,
1.79719, 1.56497, 1.56497, 0.867553, 0.849853, 0.820941, 0.784424,
0.743767, 0.702844, 0.668128, 0.578017, 0.577312, 0.416041, 0.383591,
0.345775, 0.307256, 0.270583, 0.238513, 0.214972, 0.198936, 0.114514,
0.0967862, 0.0759183, 0.0573997, 0.0421247, 0.030362, 0.022264, 0.0177778}
```



```

start energy = 61.83349167 detHess 28 259.47
0.4595402013 × 4.7863028685 × 8.1157860511
12.4112033444 × 16.5520737750 × 19.9455562561
24.2284337468 × 27.7253063722 × 31.7440420422
36.0850405175 × 39.4269654823 × 43.7565922194
47.8624232897 × 51.2950435213 × 55.5847450339
59.0530035582 × 63.1162608849 × 67.4601101745
70.8074866267 × 75.1474825020 × 79.2393538930
82.6873551127 × 86.9800333083 × 90.4396740848
94.5175696951 × 98.8619971361 × 102.2112296428
106.5544853272 × 110.6409823156 × 114.0946145363
118.3882543226 × 121.8446192991 × 125.9278341723
130.2721194978 × 133.6217960789 × 137.9660690650
142.0493880994 × 145.5056844329 × 149.7993429595
153.2530914378 × 157.3394791083 × 161.6828009670
165.0320707187 × 169.3765071055 × 173.4546955955
176.9141696844 × 181.2069130636 × 184.6552422296
188.7468161816 × 193.0870134468 × 196.4345085371
200.7784037942 × 204.8425541399 × 208.3102835158
212.6001618098 × 216.0336962335 × 220.1387062379
224.4689874263 × 227.8112366885 × 232.1524411723
236.1739427950 × 239.6689308419 × 243.9521254645
247.3477231634 × 251.4866926987 × 255.7842700480
259.1143166392 × 263.4421184833
SP ? node1325 energy = 63.06095777 detHess 70.23 ?
0.5246541743 × 4.9087900832 × 8.3121507722
12.6123752642 × 16.9585881800 × 20.3556196131
24.7505566206 × 28.7725452772 × 32.3166788098
36.6446066514 × 40.1028784250 × 44.2338311404
48.6136738255 × 51.9967962130 × 56.3670633160
60.5567225500 × 63.9843389369 × 68.3257318875
71.9572598592 × 75.8837072381 × 80.2767907083
83.6836500037 × 87.9988718540 × 92.3483645458
95.7513682074 × 100.1521142796 × 104.1830075017
107.7253308495 × 112.0578819917 × 115.5283056658
119.6510350778 × 124.0409915020 × 127.4322953792
131.8041019281 × 136.0336036790 × 139.4525384619
143.8114157089 × 147.5246641963 × 151.3677357388
155.7515235588 × 159.1646156663 × 163.4484008064
167.8176643304 × 171.2199090544 × 175.6221489442
179.7221507642 × 183.2158765020 × 187.5529605186
191.0809564830 × 195.1369113300 × 199.5434241401
202.9513037942 × 207.3088653336 × 211.6301850081
215.0414246157 × 219.4402596995 × 223.3851157297
227.0040020098 × 231.3467139942 × 234.7845269754
238.9635841437 × 243.3438017887 × 246.7324094964
251.1141353533 × 255.2841974925 × 258.7264019815
263.0668710409 × 266.6714963549

```

```
node794 = {0.5330302019, 4.9243978834, 8.3381553970,
12.6369727597, 17.0063336279, 20.4125734961,
24.8187831370, 28.9161671044, 32.4148861043,
36.7545135648, 40.2838793572, 44.3417389582,
48.7513503708, 52.1625665952, 56.5210217907,
60.8518345286, 64.2652161125, 68.6691692925,
72.6418798798, 76.2387991102, 80.5807464985,
84.0311850193, 88.1932561715, 92.5820019634,
95.9752535902, 100.3562582323, 104.563443286,
107.9929944281, 112.3467150086, 116.018338302,
119.9087721371, 124.3032328719, 127.7197256194,
132.0207937052, 136.3956969205, 139.8051349736,
144.2145663639, 148.3297232115, 151.8200805968,
156.1644444586, 159.7161288515, 163.7517081796,
168.1664497798, 171.5853500518, 175.9371017160,
180.2967664147, 183.7152914628, 188.1315138735,
192.1916788624, 195.7253023596, 200.0703344245,
203.5784661086, 207.6717408819, 212.0858646666,
215.5003905746, 219.8698698280, 224.1977451693,
227.6150480722, 232.0210593663, 235.9859948257,
239.5925372190, 243.9380196393, 247.3894960361,
251.5557627073, 255.9484005015, 259.3452120296,
263.7286359197, 267.9476624035};
```

```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

```
N = 68 GOLD int minimum becomes glob Min
```

```
Setxx = node794;
```

```
ENERGY 62.12947262183433
```

```
start point energy = 62.0452842 detHess 615.45
```

```
0.4030645535 × 4.6769827614 × 7.9515275274
```

```
12.2213185931 × 16.1528640119 × 19.6540408140
```

```
23.8756911528 × 27.1461574274 × 31.3202563550
```

```
35.3988309699 × 38.7318875375 × 42.9236688531
```

```
46.2437660022 × 50.3346809311 × 54.4947391321
```

```
57.7692531257 × 61.9830675776 × 65.4464036827
```

```
69.4127187825 × 73.6723373147 × 76.9439582033
```

```
81.2152650756 × 85.0371269809 × 88.6464959998
```

```
92.8861356198 × 96.1475679313 × 100.3553687741
```

```
104.3884744367 × 107.7652705366 × 111.9561335325
```

```
115.2378613778 × 119.3616366991 × 123.4665290040
```

```
126.7612667711 × 130.9461030160 × 134.2890421843
```

```
138.3489488621 × 142.5274479560 × 145.7908377452
```

```
150.0115461691 × 153.5254992210 × 157.4403905928
```

```
161.7082654972 × 164.9796456092 × 169.2499665412
```

```
173.1345223552 × 176.6790691820 × 180.9051677001
```

```
184.1658050582 × 188.3541272134 × 192.4014883491
```

```
195.7567911894 × 199.9415024007 × 203.2259269043
```

```
207.3395075649 × 211.4474806822 × 214.7358190842
```

```
218.9187507045 × 222.2641580995 × 226.3191586834
```

230.4983256543 × 233.7598678244 × 237.9800012776
 241.4961156904 × 245.4076443551 × 249.6746438414
 252.9450002060 × 257.2142625715

ok there are still more SPs on the PES ?

node3026 stationar ! energy = 63.4631800 detHess - 1041.63
 3.6667666174 × 7.0488659924 × 11.1239932398
 14.2073548750 × 18.2882543483 × 21.8368653093
 25.5391481884 × 29.6367425774 × 32.7559712091
 36.8486946005 × 40.1898622792 × 44.1368866246
 48.2378854522 × 51.4414160377 × 55.5679959953
 58.8637045790 × 62.8950157811 × 66.9894477026
 70.2338708357 × 74.3778851195 × 77.6696142359
 81.7258025957 × 85.8263699774 × 89.0836512346
 93.2406216565 × 96.5522752258 × 100.6066311593
 104.7365811550 × 107.9922157158 × 112.1717176580
 115.5522271332 × 119.5667260292 × 123.7663559524
 127.0188324557 × 131.2481421879 × 134.8341913531
 138.6718014852 × 142.9369108980 × 146.2020357389
 150.4602093209 × 154.3884447567 × 157.8813502554
 162.0928074329 × 165.3491606280 × 169.5204097385
 173.5663952134 × 176.9099553940 × 181.0844398218
 184.3553954319 × 188.4670491463 × 192.5501966536
 195.8419753602 × 200.0076844597 × 203.3038657836
 207.3831605721 × 211.5004916182 × 214.7689844174
 218.9463961236 × 222.3017078812 × 226.3396605553
 230.5220952661 × 233.7777183148 × 237.9968626114
 241.5240623534 × 245.4208560289 × 249.6854375891
 252.9525512603 × 257.2181887332

energy too high ?

node3239 energy = 63.46319849 detHess 1179.30 (SP2 ?)
 3.6656918199 × 7.0483628288 × 11.1236988862
 14.2072316778 × 18.2883109396 × 21.8371495982
 25.5393792566 × 29.6371326613 × 32.7564396815
 36.8493484987 × 40.1911331205 × 44.1377628720
 48.2392328444 × 51.4426410831 × 55.5695692534
 58.8665025401 × 62.8971401922 × 66.9930185944
 70.2370125983 × 74.3819654223 × 77.6767744821
 81.7314072176 × 85.8360173487 × 89.0921955551
 93.2517599016 × 96.5720104851 × 100.6216045037
 104.7617140535 × 108.0155871174 × 112.2020189752
 115.6080437804 × 119.6039277346 × 123.8213648220
 127.0754442619 × 131.3169005919 × 134.9692195502
 138.7405205265 × 143.0003859982 × 146.2619283793
 150.5076935563 × 154.4687008780 × 157.9236047811
 162.1257971531 × 165.3831773434 × 169.5411946171
 173.5945949934 × 176.9257806067 × 181.0965909745
 184.3691462000 × 188.4748741872 × 192.5599186212
 195.8476883282 × 200.0121509457 × 203.3093003797
 207.3861720701 × 211.5040891599 × 214.7712716498

218.9483243824 × 222.3043765351 × 226.3411170464
 230.5237806493 × 233.7790010008 × 237.9980850950
 241.5261077241 × 245.4218229701 × 249.6862250968
 252.9531036375 × 257.2184758248
 node5634 energy = 63.46129531 detHess 75.89
 ? BBP point crossed ?
 3.6028038803 7.0113180949 × 11.0853093839
 14.1633241657 × 18.2409968668 × 21.7469837700
 25.4947166598 × 29.5965718941 × 32.7291590351
 36.8287595785 × 40.1638040827 × 44.1252284407
 48.2290979204 × 51.4394097560 × 55.5719973268
 58.8759467684 × 62.9071508913 × 67.0135817004
 70.2575394569 × 74.4111723030 × 77.7304006786
 81.7735132042 × 85.9085997731 × 89.1591038130
 93.3396433799 × 96.7318244599 × 100.7351833325
 104.9413440862 × 108.1927642190 × 112.4257740964
 116.0365748594 × 119.8483508146 × 124.1110772676
 127.3739687443 × 131.6271505540 × 135.5660117635
 139.0452881603 × 143.2524351337 × 146.5072392015
 150.6738305843 × 154.7181122029 × 158.0590630925
 162.2301939452 × 165.4957961504 × 169.6074924892
 173.6806875419 × 176.9748686770 × 181.1343154814
 184.4127212593 × 188.4994189757 × 192.5899764429
 195.8654786453 × 200.0260926162 × 203.3264171127
 207.3956329454 × 211.5153451019 × 214.7784606027
 218.9544054549 × 222.3128367364 × 226.3457343745
 230.5291214364 × 233.7830812219 × 238.0019836772
 241.5326477917 × 245.4249147841 × 249.6887408974
 252.9548696386 × 257.2193935733

```

start energy = 61.8334614 detHess 28 006.0
0.4613908795 × 4.7879030309 × 8.1172648488
12.4121674834 × 16.5534773831 × 19.9464749896
24.2292782403 × 27.7266066457 × 31.7446833654
36.0856267906 × 39.4274811607 × 43.7569467207
47.8629642838 × 51.2953776189 × 55.5850361471
59.0534255118 × 63.1164687306 × 67.4603006463
70.8076532324 × 75.1475954929 × 79.2395250711
82.6874595562 × 86.9801190551 × 90.4397963517
94.5176266861 × 98.8620412068 × 102.2112658722
106.5545011833 × 110.6409950880 × 114.0946203453
118.3882473003 × 121.8446027170 × 125.9278142927
130.2720745070 × 133.6217395367 × 137.9659968903
142.0492329608 × 145.5055721911 × 149.7992035987
153.2528561259 × 157.3393245038 × 161.6825756673
165.0318090186 × 169.3762258820 × 173.4541257536
176.9137631329 × 181.2064379686 × 184.6544493142
188.7463091503 × 193.0862995616 × 196.4336797844
200.7775233204 × 204.8407786883 × 208.3090411814
212.5987409889 × 216.0313679814 × 220.1371931440
224.4668142532 × 227.8087432979 × 232.1497369110
236.1684668752 × 239.6653470820 × 243.9482233978
247.3417119373 × 251.4825796883 × 255.7779930937
259.1074824293 × 263.4342417024
SP node3745 energy = 62.9810632 detHess - 221.0283
3.4416685226 × 7.0297185827 × 11.2968059032
14.6072061631 × 18.8090441464 × 22.9718127630
26.3030161368 × 30.5539410298 × 34.0497773534
38.0303327457 × 42.3357699784 × 45.6450522884
49.9485846415 × 53.9421231302 × 57.4253698872
61.6757276442 × 65.0150501646 × 69.1708086010
73.3819139060 × 76.6918211469 × 80.9617561884
84.5740110897 × 88.4323384927 × 92.7399652667
96.0528878164 × 100.3369571035 × 104.4273752953
107.8332303021 × 112.0901229654 × 115.5024573868
119.5857197619 × 123.8726998288 × 127.1853729116
131.4954936014 × 135.3693085604 × 138.9667638027
143.2343032481 × 146.5458907952 × 150.7515698989
154.9119293302 × 158.2462875193 × 162.5000850966
165.9922681501 × 169.9757094375 × 174.2816814904
177.5916118230 × 181.8961390340 × 185.8890378928
189.3735649357 × 193.6261364698 × 196.9650161648
201.1211126838 × 205.3334254922 × 208.6424903138
212.9143535168 × 216.5287659005 × 220.3843549200
224.6939204976 × 228.0055044476 × 232.2888799642
236.3813906043 × 239.7855925316 × 244.0433827986
247.4586509886 × 251.5400415537 × 255.8294954350
259.1413400356 × 263.4530478934

```

```

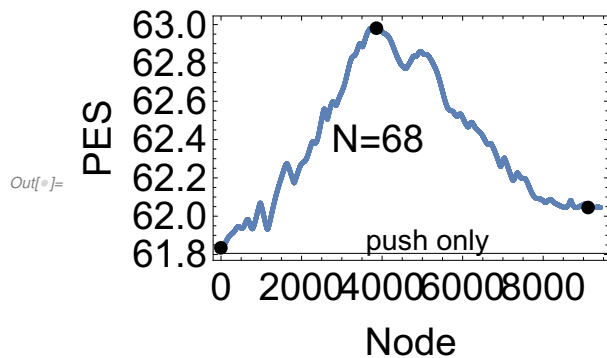
start energy = 62.981034 detHess - 245.279
3.4453746150 × 7.0311127268 × 11.2969716972
14.6079077189 × 18.8100763437 × 22.9727756455
26.3040723598 × 30.5566381995 × 34.0518249282
38.0314268323 × 42.3372609732 × 45.6458495195
49.9501393341 × 53.9442864122 × 57.4266910567
61.6785736463 × 65.0163560911 × 69.1716575158
73.3835478323 × 76.6923455679 × 80.9631125839
84.5757766178 × 88.4331550247 × 92.7421360459
96.0532381064 × 100.3369333370 × 104.4278120854
107.8332167100 × 112.0902408791 × 115.5019816671
119.5857530837 × 123.8733191401 × 127.1848984209
131.4952488008 × 135.3691547616 × 138.9660604032
143.2342835820 × 146.5447837591 × 150.7510162130
154.9118330787 × 158.2456254361 × 162.4985988836
165.9909814198 × 169.9745324724 × 174.2807355318
177.5899504180 × 181.8951247401 × 185.8883442276
189.3722573925 × 193.6248035779 × 196.9629805421
201.1188340233 × 205.3315613158 × 208.6407111261
212.9122355081 × 216.5273354783 × 220.3826223287
224.6918102442 × 228.0032999765 × 232.2866456757
236.3799427160 × 239.7839584293 × 244.0416080973
247.4563713724 × 251.5375966764 × 255.8274634870
259.1397848095 × 263.4512439321
iMin node 4801 energy = 62.04537705 detHess 502.878
6.6799501806 × 10.9492141004 × 14.2195524611
18.4864990541 × 22.3983121515 × 25.9141188641
30.1341837079 × 33.3957344512 × 37.5747995594
41.6298723142 × 44.9751777702 × 49.1580863008
52.4464570099 × 56.5543736241 × 60.6679960668
63.9523845619 × 68.1371049328 × 71.4924808229
75.5397804378 × 79.7281645181 × 82.9887948132
87.2149326928 × 90.7596794493 × 94.6440411740
98.9143752023 × 102.1857575645 × 106.4536143092
110.3686953120 × 113.8824609872 × 118.1031405855
121.3665587321 × 125.5449957743 × 129.6050010648
132.9478577284 × 137.1327070660 × 140.4275452225
144.5323670020 × 148.6562925561 × 151.9379711287
156.1289184546 × 159.5060350307 × 163.5389127076
167.7469764184 × 171.0084258886 × 175.2482439917
178.8585348489 × 182.6794821324 × 186.9507355957
190.2223263307 × 194.4817782606 × 198.4486095799
201.9113988939 × 206.1251180985 × 209.3997389645
213.5595808003 × 217.6507570665 × 220.9706442627
225.1624752522 × 228.4958788778 × 232.5741824308
236.7486631543 × 240.0190672647 × 244.2409560539
247.7432137176 × 251.6737671043 × 255.9437918426
259.2184219465 × 263.4923665914
node 5076 energy = 62.04544538 detHess - 429.5770977

```

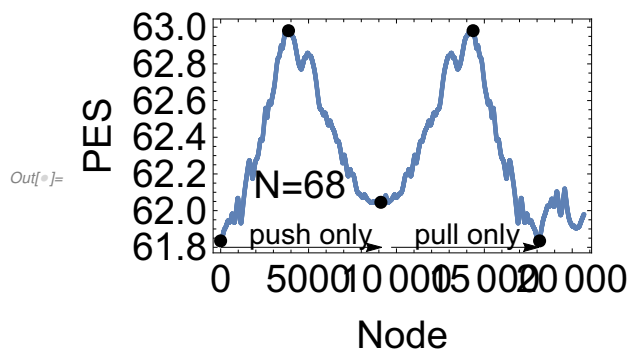
$6.6791474641 \times 10.9486667257 \times 14.2192859454$
 $18.4865352940 \times 22.3986850249 \times 25.9144860084$
 $30.1348057275 \times 33.3967888352 \times 37.5758664665$
 $41.6320104888 \times 44.9768826283 \times 49.1602879534$
 $52.4501417458 \times 56.5574244810 \times 60.6734638207$
 $63.9572256867 \times 68.1434157470 \times 71.5038039072$
 $75.5478966768 \times 79.7411042334 \times 83.0018067990$
 $87.2313231136 \times 90.7915357607 \times 94.6612332162$
 $98.9327049924 \times 102.2045538694 \times 106.4711242346$
 $110.4013562751 \times 113.9005768554 \times 118.1194080080$
 $121.3858090869 \times 125.5592941996 \times 129.6285569789$
 $132.9644550126 \times 137.1511833916 \times 140.4564760914$
 $144.5544492481 \times 148.6935979439 \times 151.9709792982$
 $156.1708699274 \times 159.5820167766 \times 163.5897240668$
 $167.8223953482 \times 171.0868536424 \times 175.3428808319$
 $179.0456188087 \times 182.7735165762 \times 187.0335683260$
 $190.2995335499 \times 194.5384357389 \times 198.5393353795$
 $201.9600154917 \times 206.1628311073 \times 209.4401730795$
 $213.5832088451 \times 217.6811682905 \times 220.9888419943$
 $225.1772243464 \times 228.5148377567 \times 232.5845690701$
 $236.7608106695 \times 240.0278509977 \times 244.2490419853$
 $247.7562398314 \times 251.6799264976 \times 255.9488716658$
 $259.2219480825 \times 263.4942022920$

the points are not to differentiate ?

node 5545 ...



start iMin with pull

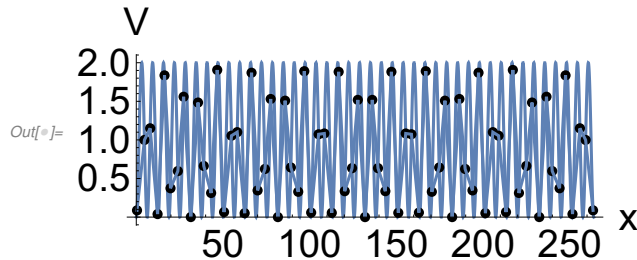


```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

N = 69 GOLD global minimum

ENERGY 62.83499853930955`

```
SetX = {0.42106006157423326, 4.713010293296777, 8.00496071803418,
12.28553543431688, 16.288951944189744, 19.743517794498583,
23.977642937678326, 27.296933424274993, 31.445270473417075,
35.622947249078514, 38.925627780069, 43.16962688975969, 46.68750026902736,
50.62804376992572, 54.9232574701856, 58.219962142528935, 62.51162113459977,
66.48849341151619, 69.97278933906418, 74.21345855618749, 77.52771710872264,
81.68992213768529, 85.86064020816924, 89.17015186298426, 93.413702025581,
96.91657509803022, 100.8748265429424, 105.17020315232062,
108.46825408444383, 112.7628369502601, 116.72912423470056,
120.2246126570014, 124.46746909601563, 127.77965657957611,
131.9468914507712, 136.1141263219662, 139.42631380552675,
143.66917024454094, 147.1646586668416, 151.13094595128229,
155.42552881709852, 158.72357974922176, 163.0189563586, 166.977207803512,
170.4800808759614, 174.72363103855815, 178.03314269337312,
182.20386076385716, 186.3660657928197, 189.6803243453549,
193.9209935624782, 197.40528949002598, 201.38216176694263,
205.67382075901347, 208.97052543135683, 213.26573913161675,
217.20628263251498, 220.72415601178278, 224.96815512147353,
228.27083565246403, 232.44851242812553, 236.59684947726763,
239.9161399638643, 244.15026510704408, 247.60483095735293,
251.6082474672258, 255.8888221835085, 259.1807726082459, 263.4727228399684}
```



SP node415 energy = 63.874033 detHess - 13 978.99

```
0.4601514029 × 4.7868143282 × 8.1162455414
12.4114822502 × 16.5524491582 × 19.9457862836
24.2286145478 × 27.7255573934 × 31.7441440038
36.0850867779 × 39.4269637683 × 43.7565328589
47.8622506259 × 51.2948918679 × 55.5845279031
59.0526051032 × 63.1159954430 × 67.4597200972
70.8070146059 × 75.1469758110 × 79.2383241680
82.6865968304 × 86.9791321419 × 90.4381399416
94.5166017511 × 98.8606596286 × 102.2096644385
106.5528533447 × 110.6377086264 × 114.0922435857
118.3854874441 × 121.8399541547 × 125.9248914622
130.2680546209 × 133.6170484797 × 137.9611101237
142.0394364011 × 145.4985285202 × 149.7910400133
153.2391712294 × 157.3306545285 × 161.6705317399
165.0177797789 × 169.3614879955 × 173.4245039433
176.8928073840 × 181.1823724688 × 184.6146378235
```

188.7206952323 × 193.0499915896 × 196.3917371749
 200.7325926274 × 204.7500321573 × 208.2477632245
 212.5304645307 × 215.9229421841 × 220.0646844079
 224.3590267333 × 227.6882367584 × 232.0144659807
 235.8937116904 × 239.5021201608 × 243.7856125799
 247.1174393112 × 251.3256877500 × 255.5322116525
 258.8648168887 × 263.1477287310 × 266.7518942317
 node856 energy = 63.87921547 detHess - 24 179.80
 0.4619374791 × 4.7883612594 × 8.1176695456
 12.4124131499 × 16.5538067757 × 19.9466696930
 24.2294270781 × 27.7268017502 × 31.7447581438
 36.0856519964 × 39.4274557989 × 43.7568746232
 47.8627752282 × 51.2952114194 × 55.5848070328
 59.0530029816 × 63.1161923301 × 67.4599049801
 70.8071718936 × 75.1470864776 × 79.2384954071
 82.6866975161 × 86.9792162304 × 90.4382538928
 94.5166561055 × 98.8607067882 × 102.2096997193
 106.5528729465 × 110.6377314856 × 114.0922519562
 118.3854858842 × 121.8399418149 × 125.9248779209
 130.2680267959 × 133.6170093718 × 137.9610636116
 142.0393376452 × 145.4984550673 × 149.7909512681
 153.2390196504 × 157.3305561528 × 161.6703912737
 165.0176142552 × 169.3613113156 × 173.4241465348
 176.8925566192 × 181.1820852477 × 184.6141663149
 188.7203877689 × 193.0495484566 × 196.3912281745
 200.7320391017 × 204.7489103783 × 208.2470319038
 212.5296703807 × 215.9217237315 × 220.0638480418
 224.3577458301 × 227.6868474021 × 232.0128600149
 235.8904530880 × 239.5003471668 × 243.7840161237
 247.1155302768 × 251.3243838247 × 255.5302089146
 258.8630905654 × 263.1457399754 × 266.7481838990
 node953 energy = 63.882718937598 detHess - 68 386.14
 not new

```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

N = 69 global SP

is SP of index 2 + 1/2

ENERGY SP 64.87175394133817

```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

N = 69 GOLD int minimum but becomes glob Min !

```
Setxx = {0.9, 4.7883612594, 8.1176695456,
12.4124131499, 16.5538067757, 19.9466696930,
24.2294270781, 27.7268017502, 31.7447581438,
36.0856519964, 39.4274557989, 43.7568746232,
47.8627752282, 51.2952114194, 55.5848070328,
59.0530029816, 63.1161923301, 67.4599049801,
70.8071718936, 75.1470864776, 79.2384954071,
82.6866975161, 86.9792162304, 90.4382538928,
94.5166561055, 98.8607067882, 102.2096997193,
106.5528729465, 110.6377314856, 114.0922519562,
118.3854858842, 121.8399418149, 125.9248779209,
130.2680267959, 133.6170093718, 137.9610636116,
142.0393376452, 145.4984550673, 149.7909512681,
153.2390196504, 157.3305561528, 161.6703912737,
165.0176142552, 169.3613113156, 173.4241465348,
176.8925566192, 181.1820852477, 184.6141663149,
188.7203877689, 193.0495484566, 196.3912281745,
200.7320391017, 204.7489103783, 208.2470319038,
212.5296703807, 215.9217237315, 220.0638480418,
224.3577458301, 227.6868474021, 232.0128600149,
235.8904530880, 239.5003471668, 243.7840161237,
247.1155302768, 251.3243838247, 255.5302089146,
258.8630905654, 263.1457399754, 266.7481838990};
```

ENERGY 62.8227331815886

```
SetX = {0.5170661995949039, 4.894620388511286, 8.28873281784988,
12.589820101461951, 16.914355254747335, 20.30455406801355,
24.68805626686408, 28.64138518421726, 32.235849541869186, 36.5614071757154,
39.97929199007128, 44.1559401445272, 48.50536012661774, 51.87264910290247,
56.23927642259682, 60.30142494060658, 63.78975208807638, 68.09606425767716,
71.55080588354396, 75.65421003988288, 80.01081377338663, 83.37239320917227,
87.72675885386175, 91.84552491512564, 95.29049234017963, 99.59923376341966,
103.10532129357112, 107.14871200476473, 111.52045788055726,
114.89222245537216, 119.2389835712729, 123.4446792248884,
126.85322158488748, 131.18995309576925, 134.83998557861182,
138.73596674793387, 143.11653378739527, 146.51221263740408,
150.81762504376928, 155.14421335844696, 158.53654341282302,
162.92239535002147, 166.88192590482313, 170.47284424281918,
174.79955833237432, 178.22201798220362, 182.3949410064051,
186.74941859803118, 190.11922974010054, 194.4876430406499,
198.56904872180857, 202.04629416805545, 206.35646023599213,
209.8313392707077, 213.9156697615609, 218.28343044478737,
221.65283010212383, 226.00772177922883, 230.17675145591468,
233.60081276591262, 237.926258566014, 241.51055361914027,
245.47696087106004, 249.86272244408536, 253.25410800133358,
257.5828272067917, 261.883779775635, 265.27964310387426, 269.6584547207637}
```

Eigenvalues

```
Out[ ] = {4.27949, 4.27313, 4.26411, 4.25067, 4.23342, 4.21395, 4.18875, 4.17296, 4.12822,
4.09191, 4.05595, 4.01522, 3.97179, 3.92674, 3.87791, 3.83518, 3.7866,
3.70919, 3.66686, 3.61667, 3.57069, 3.52924, 3.4908, 3.47196, 3.20102,
3.19917, 2.58317, 2.55304, 2.51853, 2.46888, 2.41075, 2.34967, 2.27815,
2.22265, 2.14455, 2.08939, 2.0142, 1.95273, 1.89314, 1.84253, 1.80578,
1.77488, 1.48734, 1.48527, 0.849855, 0.8339, 0.802534, 0.768182, 0.728995,
0.697723, 0.645195, 0.642073, 0.444575, 0.412258, 0.378783, 0.340298,
0.301234, 0.269072, 0.233328, 0.218626, 0.184658, 0.177622, 0.0730609,
0.0620478, 0.0406535, 0.0285288, 0.0178339, 0.0152758, 0.00315123}
```

```
start energy = 62.8228444456 detHess 1356.54
0.5319346654 × 4.9073331694 × 8.3016620240
12.5974557430 × 16.9243295861 × 20.3133571201
24.6966664631 × 28.6575908935 × 32.2445596116
36.5685367530 × 39.9878561925 × 44.1603329613
48.5099076100 × 51.8764994877 × 56.2422907907
60.3064721211 × 63.7927032775 × 68.0986237513
71.5543056793 × 75.6559884180 × 80.0125958312
83.3739842370 × 87.7279868087 × 91.8475781371
95.2918431966 × 99.6005813051 × 103.1074529893
107.1498368374 × 111.5216466555 × 114.8934486179
119.2399945039 × 123.4464728410 × 126.8546993792
131.1916817068 × 134.8432092526 × 138.7375624446
143.1179069589 × 146.5135774953 × 150.8184325337
155.1452717236 × 158.5374549246 × 162.9232912135
166.8836069121 × 170.4737411449 × 174.8002973757
178.2228886841 × 182.3953864451 × 186.7498821659
```



```

190.1196060178 × 194.4879392706 × 198.5695397429
202.0465721492 × 206.3567015501 × 209.8316546436
213.9158252070 × 218.2835847565 × 221.6529472971
226.0078133177 × 230.1769011191 × 233.6008962965
237.9263414600 × 241.5106700408 × 245.4770159866
249.8627795505 × 253.2541400612 × 257.5828513736
261.8838192934 × 265.2796512319 × 269.6584664910
  &gMin node25 energy = 62.824769752 detHess - 708.74
  node40 energy = 62.8241985 detHess 1191.88
SP node500 energy = 63.87505478 detHess - 10 343.06
3.4110834845 × 7.0217668072 × 11.3056898459
14.6373145732 × 18.8464510742 × 23.0524827328
26.3855074533 × 30.6683854136 × 34.2714258061
38.1566727598 × 42.4836809553 × 45.8132930058
50.1092437202 × 54.2495905674 × 57.6436176787
61.9265500959 × 65.4228702505 × 69.4423681539
73.7833817875 × 77.1253652704 × 81.4551517092
85.5606063694 × 88.9935438877 × 93.2832391501
96.7511472540 × 100.8148261451 × 105.1585694719
108.5059048453 × 112.8459336789 × 116.9372005267
120.3855720323 × 124.6781329490 × 128.1371050140
132.2156463020 × 136.5597187821 × 139.9087434304
144.2519557123 × 148.3368252159 × 151.7913707123
156.0846334308 × 159.5391375923 × 163.6240567765
167.9672534692 × 171.3162714840 × 175.6603462509
179.7388054690 × 183.1978285747 × 187.4903750529
190.9386608515 × 195.0300094708 × 199.3699874751
202.7172946890 × 207.0610281153 × 211.1244803577
214.5925252531 × 218.8821774111 × 222.3148868646
226.4205476371 × 230.7501691696 × 234.0920728500
238.4330340235 × 242.4518376586 × 245.9486334094
250.2314875366 × 253.6249902163 × 257.7658096871
262.0612188038 × 265.3906939116 × 269.7174407409

```

fit a Min ? yes 2 pi moved min ok

Setxx = {6.3658782704, 10.5639923126, 13.8538012215,
 18.1037299913, 21.6750800506, 25.5572623533,
 29.8513291166, 33.1454150929, 37.4269358600,
 41.4396286742, 44.8885672562, 49.1247148848,
 52.4519087509, 56.5955124372, 60.7859436652,
 64.0871338929, 68.3389606611, 71.8903018162,
 75.7998336026, 80.1002660574, 83.4007520378,
 87.6902252277, 91.7087587548, 95.1605290795,
 99.4034876342, 102.7431132193, 106.8840264345,
 111.0947590123, 114.3972693895, 118.6633202577,
 122.2720936560, 126.1282902309, 130.4325378166,
 133.7383778684, 138.0199645388, 142.0929815569,
 145.5056279925, 149.7555962261, 153.1427296774,
 157.2439440316, 161.5087313829, 164.8133777830,
 169.1108044757, 172.8982191019, 176.5752360605,
 180.8542881523, 184.1558779668, 188.3888125527,
 192.5152030875, 195.8720978745, 200.1171654642,
 203.5518741638, 207.5930806469, 211.8797193360,
 215.1821201568, 219.4843768785, 223.3723924718,
 226.9464926905, 231.2035634053, 234.5042701474,
 238.7029663983, 242.8436200146, 246.1761345758,
 250.4138735748, 253.8599419122, 257.8781094716,
 262.1606096642, 265.4562640469, 269.7518838588 };

ENERGY 62.8349985393096

start energy = 62.8350 detHess 2424.511
 0.4275121244 × 4.7189394995 × 8.0103853979
 12.2896269562 × 16.2956437983 × 19.7472257370
 23.9806840125 × 27.3005398507 × 31.4474202316
 35.6257891334 × 38.9277893172 × 43.1718362603
 46.6912777375 × 50.6299628863 × 54.9251123646
 58.2216518439 × 62.5129764105 × 66.4908002183
 69.9740410848 × 74.2144754137 × 77.5288794505
 81.6906155501 × 85.8615581197 × 89.1708252985
 93.4143751910 × 96.9176974695 × 100.8753999050
 105.1707688874 × 108.4687672625 × 112.7632584806
 116.7298505928 × 120.2250014742 × 124.4677832563
 127.7800076160 × 131.9471025111 × 136.1144084810
 139.4265166701 × 143.6693721841 × 147.1649901997
 151.1311174586 × 155.4257041961 × 158.7237372099
 163.0190914703 × 166.9774458170 × 170.4802077564
 174.7237360686 × 178.0332567534 × 182.2039304229
 186.3661606685 × 189.6803893917 × 193.9210577780
 197.4053903889 × 201.3822139224 × 205.6738753942
 208.9705704994 × 213.2657799113 × 217.2063548044
 220.7241920574 × 224.9681838250 × 228.2708615050
 232.4485287235 × 236.5968722927 × 239.9161510527
 244.1502741075 × 247.6048394371 × 251.6082520177

255.8888286573 × 259.1807733367 × 263.4727247982
 slight ? SP node667 energy = 64.097923 detHess 59.33
 ? BBP point crossed ?

3.3450070808 6.9579484255 × 11.1956021342
 14.4531947977 × 18.6612648911 × 22.6821545798
 26.0657315314 × 30.2527125418 × 33.5216117059
 37.6508361662 × 41.7318036990 × 45.0350081026
 49.2069814342 × 52.5073330710 × 56.5908512409
 60.7165403778 × 63.9868515998 × 68.1719571868
 71.5476912594 × 75.5744547012 × 79.7765383615
 83.0339077769 × 87.2675447537 × 90.8592234750
 94.6953628967 × 98.9642904640 × 102.2332265263
 106.4935334669 × 110.4386884610 × 113.9194535674
 118.1328078329 × 121.3979011014 × 125.5649220846
 129.6333195911 × 132.9651228891 × 137.1481072720
 140.4482072845 × 144.5460015710 × 148.6765295150
 151.9540741011 × 156.1474714741 × 159.5379587371
 163.5597756808 × 167.7772793781 × 171.0388361990
 175.2845992798 × 178.9294921460 × 182.7152045066
 186.9828245656 × 190.2521297302 × 194.5042284417
 198.4852459841 × 201.9309247324 × 206.1402839184
 209.4158642729 × 213.5690498128 × 217.6630193833
 220.9779532851 × 225.1683861991 × 228.5034386602
 232.5783261042 × 236.7535143458 × 240.0225633648
 244.2441669821 × 247.7483727088 × 251.6762066159
 255.9458055067 × 259.2198187475 × 263.4930938455
 may be it is near to the correct SP ?

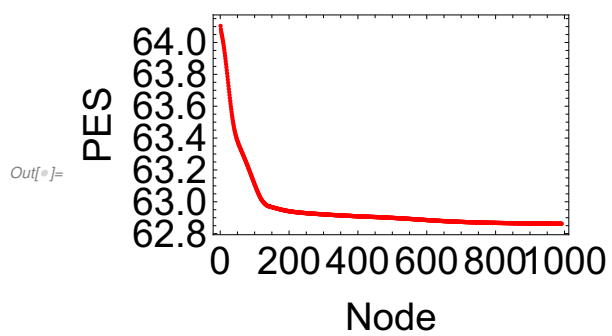
node828 energy = 64.070977 detHess - 27.0
 ? BBP point crossed ?

3.3183251634 6.9443999233 × 11.1845506199
 14.4425042672 × 18.6542035161 × 22.6717905156
 26.0600854653 × 30.2484098251 × 33.5169552846
 37.6481902943 × 41.7285257591 × 45.0331626432
 49.2056530722 × 52.5058714404 × 56.5901643642
 60.7159419793 × 63.9866518059 × 68.1720752784
 71.5481965969 × 75.5749636238 × 79.7775518867
 83.0350940603 × 87.2691600193 × 90.8625070477
 94.6971295179 × 98.9661320588 × 102.2351523812
 106.4952892893 × 110.4419410837 × 113.9213248288
 118.1345701634 × 121.4001154988 × 125.5666299688
 129.6362206631 × 132.9672581550 × 137.1505955320
 140.4522197337 × 144.5491120387 × 148.6818466387
 151.9588347420 × 156.1535767117 × 159.5490628455
 163.5672285177 × 167.7883841885 × 171.0503922883
 175.2985866091 × 178.9571498526 × 182.7291001194
 186.9950868097 × 190.2635452080 × 194.5126246404
 198.4987141793 × 201.9381380788 × 206.1458794039
 209.4218588533 × 213.5725540304 × 217.6675316626
 220.9806524596 × 225.1705733727 × 228.5062488346

232.5798657079 × 236.7553150990 × 240.0238650553
 244.2453649954 × 247.7503021720 × 251.6771189639
 255.9465580086 × 259.2203410572 × 263.4933657621
 node1369 energy = 64.0780866 detHess 61.48
 3.3334246762 × 6.9520698461 × 11.1908262945
 14.4485839349 × 18.6582419231 × 22.6777508278
 26.0633467186 × 30.2509243857 × 33.5197128659
 37.6497930158 × 41.7305743294 × 45.0343658309
 49.2066080168 × 52.5070455273 × 56.5908283367
 60.7167592291 × 63.9871988612 × 68.1725730689
 71.5489376214 × 75.5753849834 × 79.7780683615
 83.0355369215 × 87.2696245677 × 90.8633500215
 94.6975327618 × 98.9664587514 × 102.2354045239
 106.4954333168 × 110.4421137665 × 113.9213735025
 118.1345278909 × 121.3999687891 × 125.5664424672
 129.6358057525 × 132.9668956296 × 137.1500957157
 140.4513469305 × 144.5483950894 × 148.6805690455
 151.9576582239 × 156.1520333798 × 159.5462261237
 163.5653155671 × 167.7855215142 × 171.0473936877
 175.2949509599 × 178.9499446436 × 182.7254810872
 186.9919041903 × 190.2605804239 × 194.5104542243
 198.4952447378 × 201.9362780365 × 206.1444368771
 209.4203110733 × 213.5716500596 × 217.6663689575
 220.9799564462 × 225.1700091572 × 228.5055232344
 232.5794682107 × 236.7548502659 × 240.0235288404
 244.2450554288 × 247.7498033581 × 251.6768831009
 255.9463634999 × 259.2202060321 × 263.4932954689
 node1592 energy = 64.1025588 detHess - 2042.2
 3.4817437686 × 7.0296842118 × 11.2566975301
 14.5176102437 × 18.7070230716 × 22.7543851667
 26.1104834311 × 30.2958193060 × 33.5810080256
 37.6947457050 × 41.8041172601 × 45.0923447332
 49.2762920493 × 52.6246578755 × 56.6780195101
 60.8603724756 × 64.1219311298 × 68.3443464768
 71.8701300278 × 75.7728634208 × 80.0415340896
 83.3125897346 × 87.5818227948 × 91.4775630141
 95.0104052059 × 99.2340695940 × 102.4950109372
 106.6796209622 × 110.7301071480 × 114.0813315770
 118.2652726285 × 121.5511936644 × 125.6625200415
 129.7726603169 × 133.0594092801 × 137.2429736705
 140.5921050946 × 144.6442061382 × 148.8268773733
 152.0880107526 × 156.3104112671 × 159.8372357102
 163.7386826826 × 168.0072066532 × 171.2780417543
 175.5470021421 × 179.4430124615 × 182.9753280356
 187.1987033036 × 190.4593661872 × 194.6437893284
 198.6936665568 × 202.0450222114 × 206.2285937891
 209.5135859553 × 213.6252245843 × 217.7337873584
 221.0209313452 × 225.2035273568 × 228.5494703993
 232.6035060541 × 236.7828610352 × 240.0440556940

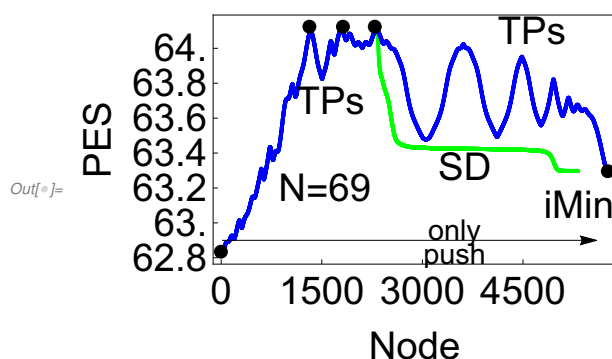
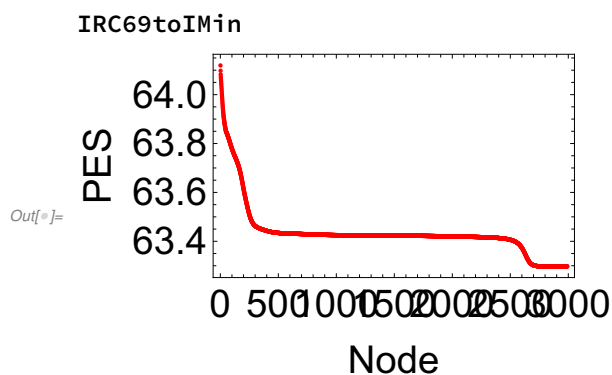
244.2641260260 × 247.7808451729 × 251.6915596068
255.9584266964 × 259.2286028699 × 263.4976649078

IRC from SP1



IRC final node is the a0 min

0.45534030124866359 × 4.7791199428410422 × 8.1031206191749732
 12.399625651690100 × 16.523273832556100 × 19.924027512540754
 24.195240062530694 × 27.670532123567739 × 31.704556436011554
 36.039427103279394 × 39.365037619264399 × 43.699818381480192
 47.735158314245119 × 51.208515392267337 × 55.472087870917427
 58.873478065126875 × 62.988157583453621 × 67.283041826068043
 70.593629958804513 × 74.917957692700412 × 78.755369858587301
 82.390957308224770 × 86.654799895180631 × 89.970773790592048
 94.175955032338564 × 98.333708534798589 × 101.66490953565598
 105.92044807267456 × 109.37596923185366 × 113.39159470194028
 117.67394635981438 × 120.98060582818951 × 125.27014930143116
 129.19574454547518 × 132.72759005547849 × 136.97899082796053
 140.26590103012302 × 144.45742994366202 × 148.57530999561158
 151.90680262669136 × 156.12106484922646 × 159.52865835255167
 163.56512325414252 × 167.81531293319466 × 171.08917124543186
 175.36299513956880 × 179.08864892160867 × 182.80019572557234
 187.05601698734367 × 190.32661778918907 × 194.55659448569230
 198.57390151733586 × 201.97771525542106 × 206.17996878206040
 209.45785827417581 × 213.59588801083407 × 217.69579465651736
 220.99943599471678 × 225.18498308572131 × 228.52708276608118
 232.59052365078259 × 236.76951106729771 × 240.03372169777401
 244.25559583980251 × 247.76624813337202 × 251.68508396909823
 255.95279392596194 × 259.22488493650127 × 263.49566338853685
 other direction final point
 6.4807035999886926 × 10.560071481951159 × 13.733327982642249
 17.825436599332107 × 21.064773834154547 × 25.102700720001280
 29.113419454476048 × 32.378950185158750 × 36.468761097250457
 39.613579674857569 × 43.703846939564265 × 47.515514110021250
 50.950494497830043 × 55.013869372573744 × 58.083636641734678
 62.148435580521884 × 65.589758359419434 × 69.402037619736731
 73.507588065810495 × 76.657694290458494 × 80.769129017305758
 84.079907877867186 × 88.076006487377882 × 92.169577269256749
 95.399277580946645 × 99.529885458132512 × 102.83245007985310
 106.86891298203052 × 110.97885918898302 × 114.22276541686024
 118.38540126739638 × 121.69210000942276 × 125.75037200831024
 129.87281589241030 × 133.13436757642219 × 137.30477918280454
 140.69671157631279 × 144.69881746678365 × 148.91058594111874
 152.15447581837810 × 156.39545481609920 × 159.98177506774590
 163.82023889559221 × 168.07607988537225 × 171.35088481510442
 175.59888327495952 × 179.54701028303708 × 183.02289350389660
 187.24355370862295 × 190.49713522072048 × 194.67379830738454
 198.72480423017038 × 202.06775102720337 × 206.23987891548103
 209.53287144556884 × 213.63089661000583 × 217.74741785584970
 221.02540373036427 × 225.21167703437894 × 228.55545458956115
 232.61000777034812 × 236.78614167388588 × 240.04893170153420
 244.26596822525329 × 247.78681371890821 × 251.69311827515526
 255.96094996696826 × 259.22974131284360 × 263.4985089055503



start

5.6149071037 \times 9.2283593908 \times 13.0369698761
 17.2990008507 \times 20.5612366721 \times 24.8135646923
 28.7521079033 \times 32.2308475008 \times 36.4372585502
 39.6910139631 \times 43.8574070072 \times 47.8992342802
 51.2410992632 \times 55.4110124229 \times 58.6732733022
 62.7860618521 \times 66.8530751606 \times 70.1495853778
 74.3057270626 \times 77.5740894397 \times 81.6649148828
 85.7392469540 \times 89.0202572161 \times 93.1714950069
 96.4425317111 \times 100.5251425558 \times 104.6019310713
 107.8774738529 \times 112.0269926689 \times 115.2991458698
 119.3787292649 \times 123.4565210889 \times 126.7300652506
 130.8790565759 \times 134.1518884299 \times 138.2302663838
 142.3088339643 \times 145.5815184943 \times 149.7305656171
 153.0043963867 \times 157.0820205676 \times 161.1620326364
 164.4340102217 \times 168.5837606612 \times 171.8600609032
 175.9365055198 \times 180.0202669949 \times 183.2909116983
 187.4428246387 \times 190.7259564066 \times 194.7993255544
 198.8932742946 \times 202.1606800128 \times 206.3187260416
 209.6213370921 \times 213.6852842776 \times 217.8061844986
 221.0665632489 \times 225.2417688315 \times 228.6018736507
 232.6321134465 \times 236.8159993831 \times 240.0691011958
 244.2878863944 \times 247.8204068004 \times 251.7102623296
 255.9736837866 \times 259.2392895806 \times 263.5032205160
 iMin node180 energy = 63.296060657 detHess 676 266.61
 6.5045290891 \times 10.6067090122 \times 13.7835490617
 17.8985151162 \times 21.1994606876 \times 25.2119465308
 29.3035548865 \times 32.5382655548 \times 36.6740932716

39.9551971587 × 44.0105372251 × 48.0941136129
51.3526777888 × 55.4965682756 × 58.7719928044
62.8419682453 × 66.9220586874 × 70.1895412234
74.3363772882 × 77.6099567058 × 81.6850721407
85.7638507149 × 89.0345707097 × 93.1824798820
96.4554549471 × 100.5323857001 × 104.6107372378
107.8826056217 × 112.0309318637 × 115.3037899577
119.3813292027 × 123.4596768140 × 126.7319058432
130.8804695877 × 134.1535563899 × 138.2311993437
142.3099648829 × 145.5821788050 × 149.7310726173
153.0049959925 × 157.0823554185 × 161.1624375800
164.4342472660 × 168.5839427916 × 171.8602773654
175.9366259574 × 180.0204118373 × 183.2909971517
187.4428905329 × 190.7260359198 × 194.7993694637
198.8933264866 × 202.1607116284 × 206.3187508977
209.6213685981 × 213.6853015321 × 217.8062046919
221.0665766322 × 225.2417802366 × 228.6018901951
232.6321224333 × 236.8160095957 × 240.0691094843
244.2878943064 × 247.8204205204 × 251.7102688215
255.9736888376 × 259.2392934846 × 263.5032224199
node 1424 and nodes 1544 , 2218 , 2588 , 3319
3626 mild , 3819 , 4666 , 5015


```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

```
GOLD N = 69 int minimum
```

```
iMin node 180 energy = 63.296060657 detHess 676 266.61
```

```
Setxx = {6.5045290891, 10.6067090122, 13.7835490617,  
17.8985151162, 21.1994606876, 25.2119465308,  
29.3035548865, 32.5382655548, 36.6740932716,  
39.9551971587, 44.0105372251, 48.0941136129,  
51.3526777888, 55.4965682756, 58.7719928044,  
62.8419682453, 66.9220586874, 70.1895412234,  
74.3363772882, 77.6099567058, 81.6850721407,  
85.7638507149, 89.0345707097, 93.1824798820,  
96.4554549471, 100.5323857001, 104.6107372378,  
107.8826056217, 112.0309318637, 115.3037899577,  
119.3813292027, 123.4596768140, 126.7319058432,  
130.8804695877, 134.1535563899, 138.2311993437,  
142.3099648829, 145.5821788050, 149.7310726173,  
153.0049959925, 157.0823554185, 161.1624375800,  
164.4342472660, 168.5839427916, 171.8602773654,  
175.9366259574, 180.0204118373, 183.2909971517,  
187.4428905329, 190.7260359198, 194.7993694637,  
198.8933264866, 202.1607116284, 206.3187508977,  
209.6213685981, 213.6853015321, 217.8062046919,  
221.0665766322, 225.2417802366, 228.6018901951,  
232.6321224333, 236.8160095957, 240.0691094843,  
244.2878943064, 247.8204205204, 251.7102688215,  
255.9736888376, 259.2392934846, 263.5032224199};
```

```
ENERGY 63.2960169199675
```

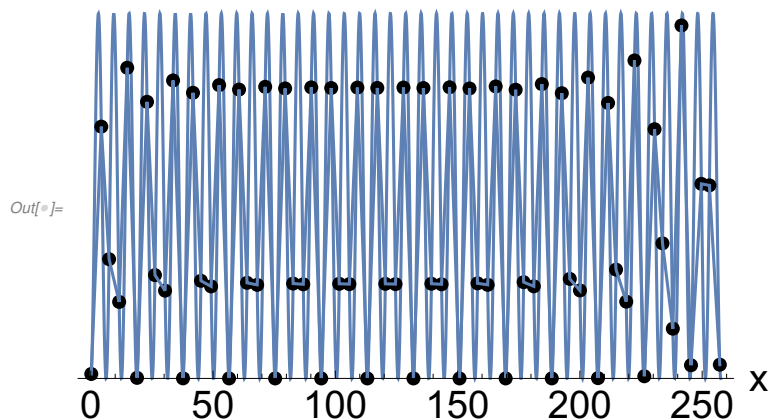
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SetX = {6.503917658571681, 10.606084000372933, 13.78314761556936,
  17.89819814163095, 21.199044115326842, 25.21172300153211, 29.30330156985805,
  32.53811305960264, 36.673975469123256, 39.95505290555008, 44.01045781060068,
  48.09401965413484, 51.352622386978105, 55.49652566903591,
  58.77194187168906, 62.841939911749805, 66.92202462071887,
  70.18952127853518, 74.33636196784576, 77.60993854502087, 81.68506199862735,
  85.76383844940202, 89.03456354649013, 93.18247438168602, 96.45544844619818,
  100.53238206458039, 104.61073283219525, 107.882603050855,
  112.03092988981297, 115.30378762684114, 119.38132789876475,
  123.45967523295337, 126.73190492062578, 130.88046887925657,
  134.15355555324007, 138.23119887562098, 142.3099643154365,
  145.5821784735512, 149.73107236247932, 153.00499569093242,
  157.08235524966094, 161.16243737519724, 164.43424714574653,
  168.5839426983981, 171.86027725386307, 175.936625894452, 180.0204117599011,
  183.29099710491084, 187.44289049465084, 190.72603587112232,
  194.79936943443738, 198.89332644739224, 202.16071160137793,
  206.318750870587, 209.62136855681013, 213.68530150345748,
  217.80620464724961, 221.0665765942527, 225.24178019006854,
  228.6018901130802, 232.6321223766537, 236.8160095084116, 240.06910939827827,
  244.28789419929865, 247.82042031432854, 251.71026870898046,
  255.97368871414926, 259.23929335827285, 263.5032222981941}
```

Eigenvalues

```
Out[8]= {4.26347, 4.25775, 4.24804, 4.23441, 4.21694, 4.19569, 4.17073, 4.14216,
  4.11013, 4.07489, 4.03696, 3.99764, 3.96043, 3.886, 3.84618, 3.79622,
  3.7426, 3.68698, 3.63014, 3.5728, 3.51583, 3.46039, 3.40804, 3.36097,
  3.3222, 3.29587, 3.04275, 2.8542, 2.43889, 2.4152, 2.3765, 2.32743, 2.27171,
  2.21228, 2.15156, 2.09179, 2.03532, 1.98491, 1.94422, 1.91819, 1.81758,
  1.65294, 0.995835, 0.972814, 0.938294, 0.895708, 0.84759, 0.795845,
  0.741935, 0.686994, 0.631938, 0.577673, 0.5258, 0.483138, 0.462338,
  0.39049, 0.324924, 0.285813, 0.244948, 0.207288, 0.173332, 0.143118,
  0.116632, 0.0938729, 0.074865, 0.0596784, 0.0484551, 0.0414497, 0.0264938}
```

SetX2Pi = SetX - 2. * Pi

```
Out[ ]:= {0.220732, 4.3229, 7.49996, 11.615, 14.9159, 18.9285, 23.0201, 26.2549, 30.3908,
33.6719, 37.7273, 41.8108, 45.0694, 49.2133, 52.4888, 56.5588, 60.6388, 63.9063,
68.0532, 71.3268, 75.4019, 79.4807, 82.7514, 86.8993, 90.1723, 94.2492,
98.3275, 101.599, 105.748, 109.021, 113.098, 117.176, 120.449, 124.597, 127.87,
131.948, 136.027, 139.299, 143.448, 146.722, 150.799, 154.879, 158.151,
162.301, 165.577, 169.653, 173.737, 177.008, 181.16, 184.443, 188.516, 192.61,
195.878, 200.036, 203.338, 207.402, 211.523, 214.783, 218.959, 222.319,
226.349, 230.533, 233.786, 238.005, 241.537, 245.427, 249.691, 252.956, 257.22}
```



from iMin further -- >> into Chaos

```
iMin node520 energy = 62.8350304 detHess 2300.6
6.7038527624 × 10.9958341259 × 14.2878155232
18.5684708676 × 22.5717279293 × 26.0264765381
30.2606425165 × 33.5798988517 × 37.7283246817
41.9059591954 × 45.2086814068 × 49.4526777439
52.9704559125 × 56.9111123320 × 61.2063297927
64.5030443994 × 68.7947236595 × 72.7715376316
76.2558980430 × 80.4965816325 × 83.8108311284
87.9730648868 × 92.1437691302 × 95.4532956173
99.6968457699 × 103.1996909085 × 107.1579762912
111.4533533610 × 114.7514073193 × 119.0459958796
123.0122639427 × 126.5077733736 × 130.7506344828
134.0628193486 × 138.2300632889 × 142.3972937603
145.7094861101 × 149.9523426580 × 153.4478226226
157.4141202863 × 161.7087031674 × 165.0067550265
169.3021332959 × 173.2603785209 × 176.7632583628
181.0068100406 × 184.3163209586 × 188.4870418713
192.6492455430 × 195.9635056840 × 200.2041749952
203.6884684825 × 207.6653438147 × 211.9570027682
215.2537077328 × 219.5489218895 × 223.4894634632
227.0073389723 × 231.2513385983 × 234.5540190277
238.7316966372 × 242.8800334225 × 246.1993244068
250.4334496987 × 253.8880152496 × 257.8914323085
262.1720071260 × 265.4639577069 × 269.7559080946
```

mild? SP node2187 energy = 64.09868706 detHess 46.67

? BBP point crossed ? No : may be VRI point ?

9.6300312734 13.2420733226 × 17.4795611433

20.7371419441 × 24.9449631242 × 28.9661077845

32.3493481498 × 36.5362493166 × 39.8052080123

43.9342824267 × 48.0153605643 × 51.3184420809

55.4904156448 × 58.7908895484 × 62.8742991330

67.0001420343 × 70.2703914242 × 74.4555783180

77.8316497323 × 81.8581634480 × 86.0605126903

89.3178892658 × 93.5517055206 × 97.1443117489

100.9795330068 × 105.2484299960 × 108.5173398685

112.7774985393 × 116.7232453885 × 120.2033880380

124.4166295748 × 127.6818123695 × 131.8486091081

135.9172816528 × 139.2488348651 × 143.4318454779

146.7322314913 × 150.8298055896 × 154.9607317187

158.2381441741 × 162.4317643038 × 165.8231350102

169.8442901239 × 174.0624352572 × 177.3240569292

181.5702431440 × 185.2175261976 × 189.0008266808

193.2681686661 × 196.5373233559 × 200.7888986595

204.7708224025 × 208.2153892618 × 212.4244617924

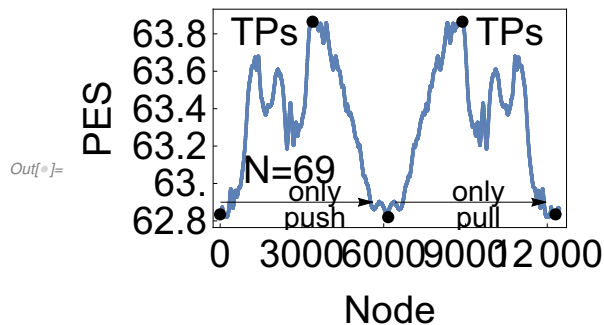
215.7001111421 × 219.8528562868 × 223.9470055503

227.2616172722 × 231.4519592137 × 234.7871215992

238.8617840751 × 243.0370186334 × 246.3059790931

250.5275642586 × 254.0318992209 × 257.9595532632

262.2291239098 × 265.5030964232 × 269.7763272412



```
### ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ##
```

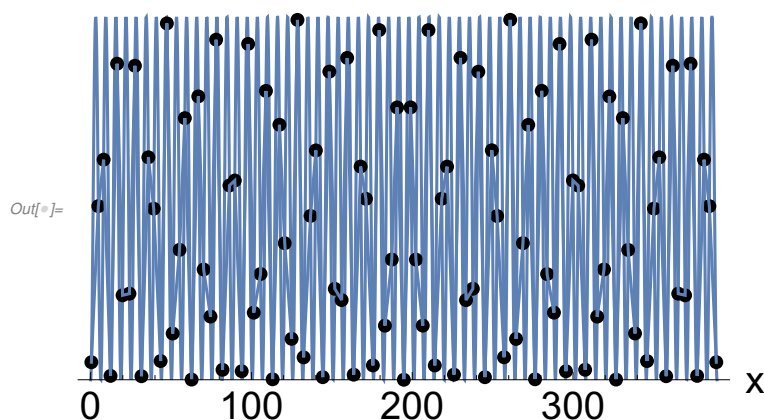
N = 101 GOLD global minimum

ENERGY 92.42726869933388

```
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47.39244104580014, 50.99563339084179, 55.26580851155645, 58.57715264242234,
62.78557362924891, 66.94773160156053, 70.2825894315323, 74.53723901549093,
78.03340472110393, 82.01461309649063, 86.3228945204207, 89.63368881175093,
93.93965584364798, 97.94235159892877, 101.41982303377182, 105.67364701366543,
109.0186283671098, 113.16946220963007, 117.39236135082336,
120.70109916610734, 124.9786967635725, 128.62361521375198,
132.44921956880378, 136.756291770841, 140.0680662190595, 144.34435674196493,
148.45254467520246, 151.84498754485597, 156.10412799310365,
159.53528374654493, 163.59984190641603, 167.89921141288536,
171.2140283464992, 175.528841812017, 179.45391814326953, 183.00516284112496,
187.26872226136456, 190.5908550603601, 194.77856266178892,
198.9660891186671, 202.2883145424353, 206.5518138273002, 210.10264110547973,
214.02816316567015, 218.34297785548324, 221.6577948472821,
225.95725008742352, 230.02150798311857, 233.45290419450163,
237.71202964493202, 241.1042242199614, 245.2126670023297, 249.4887537331738,
252.8005030979976, 257.1074826410637, 260.93230549987544, 264.5779865543905,
268.8557236843568, 272.16443834517605, 276.3875932850516, 280.5382530895427,
283.8834196362701, 288.13725454136375, 291.6144776752573, 295.6174876768819,
299.9234395507365, 303.23425444398464, 307.54258061898713,
311.5235557878013, 315.01995120027914, 319.2746369874684, 322.6094271141962,
326.77170378105393, 330.98003224174647, 334.29142000935235,
338.5615645674027, 342.16451076977216, 346.03331030569024,
350.34437097917623, 353.6570445798605, 357.94386798047793,
362.034282534482, 365.4422341480399, 369.7009746905456, 373.1145059087501,
377.19863909057773, 381.48880709542215, 384.8019345025362, 389.1141311410528}
```

Eigenvalues

```
Out[ ]:= {4.27294, 4.27003, 4.26557, 4.25948, 4.25095, 4.24227, 4.23023, 4.2166, 4.20078,
4.18495, 4.16605, 4.14643, 4.12547, 4.0996, 4.08952, 4.05, 4.02207, 3.99325,
3.9641, 3.93196, 3.90133, 3.86881, 3.83671, 3.78406, 3.75597, 3.72041,
3.68435, 3.64911, 3.60678, 3.58002, 3.54588, 3.51313, 3.47878, 3.45508,
3.43038, 3.41358, 3.40472, 3.10602, 3.106, 2.52929, 2.51606, 2.49732,
2.47408, 2.44161, 2.41086, 2.37211, 2.3309, 2.29272, 2.24559, 2.20101,
2.15657, 2.11182, 2.0653, 2.02824, 1.98639, 1.948, 1.91722, 1.88392,
1.86036, 1.84117, 1.8277, 1.58688, 1.58686, 0.899469, 0.891794, 0.877279,
0.856159, 0.833837, 0.80801, 0.779483, 0.750091, 0.723659, 0.691023,
0.661342, 0.637047, 0.620174, 0.549505, 0.549463, 0.378872, 0.364206,
0.346654, 0.32514, 0.303028, 0.283714, 0.264188, 0.251619, 0.248474,
0.132768, 0.12401, 0.111831, 0.0989229, 0.0839032, 0.0824322, 0.0484469,
0.0413683, 0.036202, 0.0165885, 0.0104493, 0.0088718, 0.00301178, 0.00134617}
```



it is symmetric

```

start point energy = 92.4272707 detHess 499.35
0.4413108955 × 4.7536933792 × 8.0669283341
12.3575760082 × 16.4409428347 × 19.8552223146
24.1140208532 × 27.5213817647 × 31.6125386734
35.8990434488 × 39.2117161015 × 43.5226961154
47.3900855300 × 50.9944116115 × 55.2648090076
58.5760913097 × 62.7849183707 × 66.9468279593
70.2819445809 × 74.5366003714 × 78.0323554536
82.0140702192 × 86.3223445169 × 89.6331704696
93.9392198473 × 97.9415824669 × 101.4193748798
105.6732372992 × 109.0180853617 × 113.1691077402
117.3918407618 × 120.7006237175 × 124.9781474307
128.6225655528 × 132.4487016879 × 136.7558512932
140.0676599646 × 144.3440917443 × 148.4521588700
151.8447507242 × 156.1039205331 × 159.5349887549
163.5996873812 × 167.8990466378 × 171.2138816053
175.5287126164 × 179.4536868466 × 183.0050437933
187.2686309779 × 190.5907603743 × 194.7785120506
198.9660312550 × 202.2882773996 × 206.5517859286
210.1026017133 × 214.0281480448 × 218.3429725561
221.6577992980 × 225.9572626318 × 230.0215412703
233.4529319152 × 237.7120671244 × 241.1042893981
245.2127141834 × 249.4888301664 × 252.8005867646
257.1075822484 × 260.9325076354 × 264.5780910231
268.8558117736 × 272.1645308315 × 276.3876535590
280.5383398150 × 283.8834810658 × 288.1373160624
291.6145774375 × 295.6175407112 × 299.9234968659
303.2343092535 × 307.5426299359 × 311.5236455242
315.0200024445 × 319.2746829287 × 322.6094858762
326.7717430710 × 330.9800910382 × 334.2914707514
338.5616234982 × 342.1646211009 × 346.0333651981
350.3444201964 × 353.6570892514 × 357.9438982259
362.0343275054 × 365.4422601944 × 369.7009969004
373.1145349004 × 377.1986533499 × 381.4888201740
384.8019436750 × 389.1141364345

```

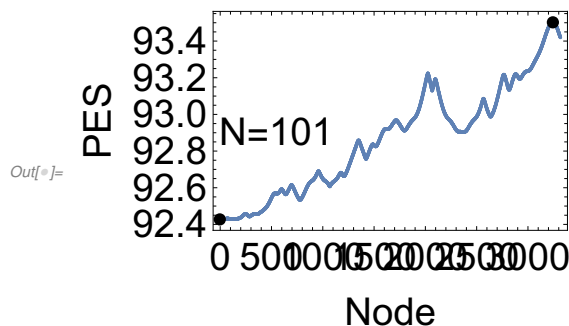
node 3243 energy = 93.5022444 detHess - 71 631.5245

slight error : direction - it moves x1 to left

-2.9134254374 × 0.7454552766 × 5.0826423990
 8.4875938458 × 12.6984394183 × 17.0409702017
 20.4116399170 × 24.7822716801 × 28.8095645925
 32.3268180063 × 36.6341219821 × 40.0666419422
 44.1982079395 × 48.5440110960 × 51.9011442759
 56.2561744272 × 60.3228640194 × 63.7983070715
 68.0966261028 × 71.5436691463 × 75.6447892800
 79.9899842816 × 83.3424460688 × 87.6908389219
 91.7688829032 × 95.2316824843 × 99.5271470954
 102.9790840826 × 107.0702333188 × 111.4146758885
 114.7653686370 × 119.1113376134 × 123.1913624279
 126.6509901292 × 130.9451504778 × 134.3969004656
 138.4864082120 × 142.8294495424 × 146.1788704083
 150.5237999810 × 154.5994475761 × 158.0608669732
 162.3534706373 × 165.7995897565 × 169.8936062778
 174.2327035512 × 177.5796892591 × 181.9235002579
 185.9824385306 × 189.4534674238 × 193.7424864098
 197.1710014208 × 201.2806690210 × 205.6073356513
 208.9479116042 × 213.2879755962 × 217.2942462620
 220.7998637503 × 225.0815310574 × 228.4661078591
 232.6151140867 × 236.9009474591 × 240.2283364214
 244.5503738754 × 248.3983892222 × 252.0354322231
 256.3228061131 × 259.6499593082 × 263.8693295904
 268.0642489984 × 271.4024499337 × 275.6816198778
 279.2585536150 × 283.1719825353 × 287.5010490559
 290.8311424087 × 295.1340237282 × 299.2621217150
 302.6653676414 × 306.9469986863 × 310.4275593193
 314.4645751888 × 318.8021797494 × 322.1421966987
 326.4739111488 × 330.5565508046 × 334.0031761921
 338.2882091188 × 341.7297253518 × 345.8184173448
 350.1479437243 × 353.4872035397 × 357.8247800865
 361.8508459341 × 365.3392253119 × 369.6198485501
 373.0147323565 × 377.1507740074 × 381.4457938312
 384.7738384093 × 389.0993449500

All other mirror at TPs ?

3773 4754 × 5220 × 5921 × 6230 × 6725 × 6867



```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

```
N = 101 GOLD int minimum
```

```
Setxx = {-5.1822322334, -0.8588361478, 2.7074771674,  
6.6943986632, 11.0810420040, 14.4713354629,  
18.8063122831, 23.0980589412, 26.4954850276,  
30.8713461441, 34.7291480330, 38.4161624322,  
42.7603412579, 46.1647503858, 50.3878572239,  
54.7330336185, 58.1080333571, 62.4829677725,  
66.5160517104, 70.0327662179, 74.3437037783,  
77.7849780010, 81.9114231572, 86.2658596286,  
89.6284690495, 93.9867498036, 98.0869549492,  
101.5447931462, 105.8514930660, 109.3374803770,  
113.4030878609, 117.7697060448, 121.1371248590,  
125.4873310319, 129.6620751231, 133.0810838289,  
137.4062854920, 140.9977601024, 144.9544921310,  
149.3382762070, 152.7283957938, 157.0540057316,  
161.3539915265, 164.7483883684, 169.1256798757,  
173.0058106016, 176.6694543639, 181.0075822731,  
184.4119455152, 188.6250571981, 192.9673052263,  
196.3383683153, 200.7093689926, 204.7350674089,  
208.2539001147, 212.5614902630, 215.9934158764,  
220.1261121595, 224.4717908656, 227.8290120494,  
232.1842149504, 236.2499781659, 239.7261691409,  
244.0244816081, 247.4708193446, 251.5727747160,  
255.9176380021, 259.2699539444, 263.6183510102,  
267.6947855012, 271.1585693849, 275.4537414655,  
278.9039954375, 282.9967451336, 287.3401977637,  
290.6903165694, 295.0361143521, 299.1117175907,  
302.5738757887, 306.8670774212, 310.3139780918,  
314.4079178427, 318.7479557033, 322.0956344897,  
326.4399213456, 330.5023650212, 333.9715213808,  
338.2614148821, 341.6937049231, 345.8002048293,  
350.1298237060, 353.4718604588, 357.8129862630,  
361.8314162981, 365.3286423186, 369.6116101635,  
373.0050445605, 377.1461056363, 381.4415341703,  
384.7710818891, 389.0978915131};
```

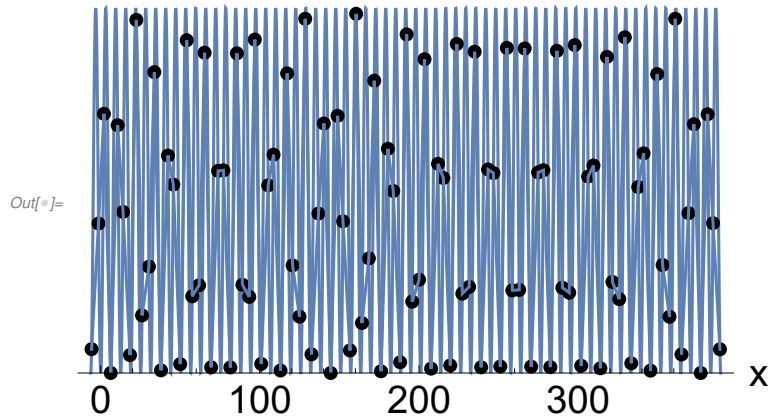
```
ENERGY 92.442200196672
```



```
SetX = {-5.766380547218314, -1.389053614151158, 2.0047429462975312,
 6.305852907557186, 10.629628158968579, 14.019618233681733,
 18.402707355281404, 22.353670971582716, 25.950000813858715,
 30.27560431158299, 33.69243996242125, 37.870421949338805,
 42.21887791963093, 45.58582852653107, 49.952243853908996,
 54.01051769768668, 57.50131116608747, 61.80705470843924, 65.25818936592401,
 69.36513473625243, 73.71957769862541, 77.07983147371601, 81.43395169251906,
 85.54313199056176, 88.992829826411, 93.29891712550297, 96.79225118840361,
 100.84784950592157, 105.21505570659367, 108.58266250657167,
 112.93078681387493, 117.11313207507654, 120.52844401032787,
 124.85567005135846, 128.4599643262829, 132.40276999293556,
 136.78582677461895, 140.17687989742322, 144.49807172383436,
 148.80407328429982, 152.19763012277966, 156.5768372828348,
 160.47416713622104, 164.1212437503203, 168.45609976770572,
 171.8626223265995, 176.06774981374525, 180.4109958841874, 183.7807082509809,
 188.1504178518652, 192.1817980682793, 195.6950627881203, 200.00169367745912,
 203.4358538082894, 207.56447367015284, 211.91069680682938,
 215.26767680387076, 219.62230592722062, 223.69176920802087,
 227.16508778385153, 231.46352791940302, 234.912841590474, 239.0114124730324,
 243.35774690078063, 246.71076483938523, 251.05920225924402,
 255.1426341694482, 258.6022395426641, 262.89877089043495, 266.3565366651879,
 270.44219220280297, 274.78997332517287, 278.1426888732973,
 282.4891684499525, 286.5842059260089, 290.03558044843055,
 294.33328451862326, 297.80248792497804, 301.87593343588884,
 306.22865331863574, 309.58430774047014, 313.9305335979866,
 318.05001715746585, 321.4884772097288, 325.79237624812725,
 329.29271099384306, 333.3364753375635, 337.70206277321176,
 341.0678331410688, 345.41265840795535, 349.5956650081933, 353.0086462034336,
 357.3345016167465, 360.93809933081275, 364.87994611625203,
 369.2614332506864, 372.65063506245775, 376.9714732440522,
 381.27266753054727, 384.66524605432926, 389.04169445023103}
```

Eigenvalues

```
Out[*]= {4.27971, 4.27645, 4.27226, 4.26632, 4.25809, 4.24848, 4.23712, 4.22346, 4.20997,
 4.19326, 4.17728, 4.16581, 4.13024, 4.10548, 4.08321, 4.05799, 4.03057,
 4.00235, 3.97259, 3.94135, 3.91055, 3.87691, 3.84524, 3.81569, 3.78377,
 3.72267, 3.69474, 3.66197, 3.62749, 3.59613, 3.56414, 3.53462, 3.51069,
 3.48424, 3.47094, 3.45507, 3.19883, 3.19754, 2.58234, 2.56372, 2.54832,
 2.52515, 2.49416, 2.46011, 2.42212, 2.37964, 2.33863, 2.2921, 2.24607,
 2.20748, 2.15423, 2.11657, 2.06796, 2.02102, 1.97998, 1.93688, 1.89896,
 1.86455, 1.8334, 1.80987, 1.79355, 1.7753, 1.48916, 1.48772, 0.862114,
 0.849951, 0.837699, 0.816486, 0.795659, 0.770858, 0.745723, 0.717911,
 0.696831, 0.674669, 0.641717, 0.639376, 0.443602, 0.422961, 0.405592,
 0.382745, 0.356395, 0.33089, 0.30538, 0.278362, 0.259421, 0.234632, 0.219588,
 0.204718, 0.186387, 0.181677, 0.0968516, 0.0756491, 0.0709966, 0.0521515,
 0.0430724, 0.0346309, 0.025114, 0.0201214, 0.014892, 0.013748, 0.00257328}
```



iMin is really another state then gMin above ! It is a stretched state

CorrectSetX = SetX + 2. * Pi

```
{0.5168047599612722, 4.894131693028428, 8.287928253477117, 12.589038214736771,
16.912813466148165, 20.30280354086132, 24.68589266246099, 28.636856278762302,
32.2331861210383, 36.558789618762574, 39.97562526960083, 44.15360725651839,
48.50206322681051, 51.86901383371065, 56.2342916108858, 60.293703004866266,
63.784496473267055, 68.09024001561883, 71.5413746731036, 75.64832004343202,
80.00276300580501, 83.3630167808956, 87.71713699969865, 91.82631729774135,
95.27601513359059, 99.58210243268255, 103.0754364955832, 107.13103481310117,
111.49824101377325, 114.86584781375126, 119.21397212105452,
123.39631738225611, 126.81162931750745, 131.13885535853805,
134.74314963346248, 138.68595530011515, 143.06901208179855,
146.4600652046028, 150.78125703101395, 155.0872585914794, 158.48081542995925,
162.86002259001438, 166.75735244340063, 170.4044290574999,
174.73928507488532, 178.1458076337791, 182.35093512092485, 186.694181191367,
190.0638935581605, 194.4336031590448, 198.4649833754589, 201.9782480952999,
206.2848789846387, 209.719039115469, 213.84765897733243, 218.19388211400897,
221.55086211105035, 225.90549123440022, 229.97495451520047,
233.44827309103113, 237.7467132265826, 241.19602689765358, 245.294597780212,
249.64093220796022, 252.99395014656483, 257.3423875664236, 261.4258194766278,
264.8854248498437, 269.1819561976145, 272.63972197236745, 276.72537750998254,
281.07315863235243, 284.42587418047685, 288.77235375713207,
292.86739123318847, 296.3187657556101, 300.6164698258028, 304.0856732321576,
308.1591187430684, 312.5118386258153, 315.8674930476497, 320.21371890516616,
324.3332024646454, 327.77166251690835, 332.0755615553068, 335.5758963010226,
339.6196606447431, 343.98524808039133, 347.35101844824834, 351.6958437151349,
355.87885031537286, 359.2918315106132, 363.61768692392604,
367.2212846379923, 371.1631314234316, 375.544618557866, 378.9338203696373,
383.2546585512318, 387.55585283772683, 390.9484313615088, 395.3248797574106}
```

```

node7972 energy = 93.51682461 detHess 4849.761
-2.8577199434 × 0.7462114441 × 5.0290046623
8.3615033072 × 12.5679536410 × 16.7759870008
20.1077704225 × 24.3910966325 × 27.9989213609
31.8786900241 × 36.2048813263 × 39.5340023586
43.8284527361 × 47.9696648494 × 51.3623916532
55.6449195856 × 59.1417962108 × 63.1600501482
67.5006409461 × 70.8421821217 × 75.1715259171
79.2761086974 × 82.7091461716 × 86.9983154980
90.4647084086 × 94.5294820425 × 98.8722470578
102.2188746816 × 106.5586523612 × 110.6457029017
114.0962470903 × 118.3876736792 × 121.8415154739
125.9246151812 × 130.2656738188 × 133.6128226968
137.9554496605 × 142.0268885969 × 145.4889944801
149.7792130373 × 153.2187742845 × 157.3171680061
161.6508696038 × 164.9945166238 × 169.3363096713
173.3733358701 × 176.8575459554 × 181.1423928711
184.5500483872 × 188.6777842993 × 192.9867384746
196.3200599116 × 200.6529468172 × 204.5881573011
208.1481471237 × 212.4276021421 × 215.7747652666
219.9607569548 × 224.1959999135 × 227.5213932495
231.8171480689 × 235.4992266413 × 239.3012381967
243.6175542941 × 246.9442382384 × 251.2172186306
255.3802282378 × 258.7529839029 × 263.0353669855
266.5609419712 × 270.5433516211 × 274.8840025018
278.2246677189 × 282.5466282318 × 286.6731443223
290.0905661545 × 294.3823123701 × 297.8739974802
301.9114499468 × 306.2620971928 × 309.6136768322
313.9513774996 × 318.0826844694 × 321.5094147409
325.8118838551 × 329.3225519459 × 333.3513616212
337.7160522281 × 341.0807561377 × 345.4218021194
349.6100591216 × 353.0191874905 × 357.3454422473
360.9570493450 × 364.8890129622 × 369.2687424311
372.6571194295 × 376.9747570493 × 381.2760340175
384.6672948701 × 389.0427899805

```

```

start energy = 92.427269239 detHess 499.59
0.4433501978 × 4.7555406772 × 8.0686617565
12.3588277006 × 16.4429374194 × 19.8564789716
24.1152120629 × 27.5231326910 × 31.6135706298
35.9003684552 × 39.2130337298 × 43.5240822998
47.3927829774 × 50.9958190873 × 55.2659757485
58.5773480029 × 62.7857103623 × 66.9479463741
70.2827607018 × 74.5374347782 × 78.0337517007
82.0148075790 × 86.3231198684 × 89.6339286574
93.9398866546 × 97.9427932486 × 101.4200991625
105.6739317993 × 109.0190394205 × 113.1697567176
117.3928319136 × 120.7015555021 × 124.9792504759
128.6246939835 × 132.4497620746 × 136.7567729351

```

140.0685324266 × 144.3446845313 × 148.4530564176
 151.8453260717 × 156.1044605699 × 159.5357965669
 163.6001375619 × 167.8995767833 × 171.2143993606
 175.5292191307 × 179.4546486167 × 183.0055689302
 187.2690877043 × 190.5913026677 × 194.7788681727
 198.9665573281 × 202.2887101709 × 206.5522708035
 210.1034789757 × 214.0286041821 × 218.3434274801
 221.6582544635 × 225.9576383575 × 230.0222029152
 233.4533672971 × 237.7125202490 × 241.1049865901
 245.2131682159 × 249.4894886263 × 252.8012758458
 257.1083688900 × 260.9340816330 × 264.5789041449
 268.8564935614 × 272.1652501505 × 276.3881181591
 280.5390130786 × 283.8839648347 × 288.1378113430
 291.6153969342 × 295.6179866557 × 299.9239939052
 303.2348095218 × 307.5430972875 × 311.5245215724
 315.0205211470 × 319.2751820359 × 322.6101612428
 326.7722145373 × 330.9808295626 × 334.2921505143
 338.5624366221 × 342.1661735671 × 346.0341600276
 350.3451697832 × 353.6578372470 × 357.9444748800
 362.0352983288 × 365.4429163628 × 369.7016824773
 373.1156168244 × 377.1993285651 × 381.4897493499
 384.8029295292 × 389.1152206738
 SP node4052 energy = 93.5022131 detHess - 70 635.31
 node4052 = {0.4581441262, 4.7836506948, 8.1116953050,
 12.4067151377, 16.5427568962, 19.9376406708,
 24.2182639588, 27.7066435241, 31.7327092109,
 36.0702858366, 39.4095457117, 43.7390720966,
 47.8277644794, 51.2692805030, 55.5543135300,
 59.0009393869, 63.0835786274, 67.4152933703,
 70.7553104807, 75.0929151201, 79.1299322738,
 82.6104920740, 86.8921233127, 90.2953703452,
 94.4234673610, 98.7263497222, 102.0564434017,
 106.3855104036, 110.2989433468, 113.8758736518,
 118.1550433565, 121.4932454894, 125.6881632876,
 129.9075357919, 133.2346884747, 137.5220633999,
 141.1591124331, 145.0071214858, 149.3291582070,
 152.6565470135, 156.9423786817, 161.0913868933,
 164.4759619995, 168.7576293837, 172.2632495279,
 176.2695170109, 180.6095811779, 183.9501571862,
 188.2768232415, 192.3864934077, 195.8150067504,
 200.1040261643, 203.5750580990, 207.6339932777,
 211.9778054871, 215.3247919516, 219.6638891721,
 223.7579118500, 227.2040275574, 231.4966326813,
 234.9580594368, 239.0337002113, 243.3786336990,
 246.7280570540, 251.0710988939, 255.1606246206,
 258.6123648290, 262.9065295486, 266.3661784986,
 270.4461838710, 274.7921646764, 278.1428649571,
 282.4873092751, 286.5785120625, 290.0304202415,
 294.3258980911, 297.7887616016, 301.8667469503,

```

306.2151743911, 309.5676589316, 313.9128581229,
318.0141360177, 321.4610977339, 325.7594586137,
329.2351007386, 333.3016056786, 337.6567298643,
341.0139321906, 345.3597362074, 349.4917476223,
352.9240693431, 357.2315151277, 360.7494280934,
364.7760866235, 369.1469002922, 372.5177616234,
376.8601905295, 381.0720652775, 384.4767629826,
388.8143880806, 392.4754385480}; ok good move

```

```

### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###

```

```

N = 101 GOLD global pre SP1

```

```

Setxx = node4052;

```

```

SetX = {0.4580017467206181, 4.783381080739578, 8.111280353601462,
12.406262096739106, 16.541820156256918, 19.93685270671287,
24.217261425233556, 27.704818347545842, 31.731605186741497,
36.06885709343274, 39.4078803083765, 43.73740510488189, 47.82448274748006,
51.26689775558797, 55.55155356612867, 58.99630774434655, 63.08065347398732,
67.41124738189082, 70.75068101057585, 75.08802283533205, 79.12012507070467,
82.60396554967261, 86.88496725197227, 90.28420139407862, 94.41595666026095,
98.71511210331248, 102.04416581964558, 106.37158503609399,
110.27077206725683, 113.86016874302662, 118.14056745962937,
121.47522436231547, 125.6757854762446, 129.88844812191803,
133.21770731012575, 137.5023388088641, 141.12182258586108,
144.98862676129195, 149.3131259182607, 152.64147676125603,
156.93248734876354, 161.07690071524348, 164.46632638354242,
168.7485628656339, 172.2490827601044, 176.2624890158373, 180.60307202801528,
183.94440876982017, 188.27278599456054, 192.38023626231626,
195.81113716114632, 200.10057462537307, 203.57005167157064,
207.6314857321382, 211.97539812317777, 215.32268518706516,
219.66235031488972, 223.7554534701193, 227.20253125500207,
231.49530535112416, 234.95616808041078, 239.03274261922203,
243.3776909345713, 246.72722241970237, 251.07046965732445,
255.15959501561179, 258.6117331919595, 262.90595859268626,
266.36535692733696, 270.44576058394915, 274.791734203914,
278.14247199891923, 282.48700042437224, 286.5779909049962,
290.0300917821726, 294.32558862969904, 297.7883025162183,
301.8665042954627, 306.2149168411386, 309.56741222663453,
313.91265446803584, 318.01378004472974, 321.46086243546375,
325.75922305584083, 329.2347335714953, 333.30140699135603,
337.65651153677777, 341.01371056681074, 345.35954684350685,
349.4914073255229, 352.9238243337311, 357.23124892246034,
360.74897947178675, 364.77584512151543, 369.1466408324466,
372.51748318543315, 376.8599602554027, 381.07165555500416,
384.47641648003656, 388.81398030175774, 392.47466925102316}

```

```

sp_1, 21. EV is SP col

```

```

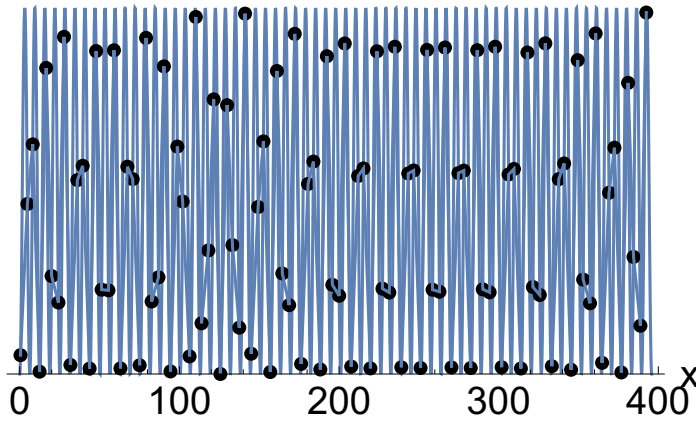
Eigenvalues

```

```
EW = {4.2772851914774, 4.27378820745494, 4.270312397725986, 4.263788456876596,
4.25569424100979, 4.246320233697755, 4.234919436966965, 4.2218612189213,
4.207498910908562, 4.191678233442027, 4.17402617702633, 4.155837237045167,
4.127761731940216, 4.10780189471669, 4.080101266632962, 4.055033223969065,
4.02951442893105, 4.000563272121797, 3.970922291952649,
3.94068259030016, 3.908970398071146, 3.876243583403686,
3.84395086769235, 3.811964216914752, 3.7560472644129015,
3.7341029498388, 3.697065360929257, 3.667102218058338, 3.63185004899922,
3.597440997031301, 3.566567030562582, 3.53666093370574, 3.508525060723384,
3.484521068948813, 3.46539475514579, 3.450032530379967, 3.429089001426463,
3.12470866369429, 2.564157990674610, 2.546390288591841, 2.53267109528297,
2.509791777674742, 2.479292100168308, 2.44723693986537, 2.41099126471027,
2.371347270225684, 2.33020153023399, 2.286533884512109, 2.243873022170133,
2.20038177290702, 2.149945143517591, 2.108098361558813, 2.06406200827288,
2.020517896109461, 1.979827540284563, 1.94080029592400, 1.905615485042803,
1.873980832350322, 1.84397207191900, 1.823597671840915, 1.808828082191679,
1.79144354481845, 1.567057060979455, 0.879987561335139, 0.86510589089586,
0.851758883118934, 0.834492613122848, 0.81343174492916, 0.789580831470147,
0.764244740087426, 0.73863892206326, 0.71283878188025, 0.688862827176010,
0.66817891889792, 0.647891695804113, 0.574306603550490, 0.42334959406447,
0.401235402365082, 0.384607467837335, 0.36399756567855, -0.35986257259662,
0.337920162735970, 0.31408843617696, 0.289419283834171, 0.267865992350432,
0.24759195779117, 0.222985734630393, 0.217425962979592, 0.19327555865426,
0.113514911265530, 0.108274988279172, 0.09009647042990, 0.071020617694403,
0.062735727006128, 0.05099015456921, 0.039067649870154, 0.032112297746813,
0.02544818507645, 0.020339879123049, 0.017573659407807, 0.00212466721297};
```

EV21

```
{0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 2.2152523816218887`*^-7,
2.571247147190032`*^-7, 6.328139008703253`*^-7, 1.1791215043144681`*^-6,
2.007968301829438`*^-6, 5.506625630890271`*^-6, 6.821402650562269`*^-6,
0.0000141702642623908, 0.0000346707946083944, 0.0000396841419593109,
0.0000969759435760905, 0.000182895914227409, 0.00030713752467848216,
0.00084193021558099, 0.0010779872407885, 0.0022238391836321,
0.0055342888220332, 0.00607302255585285, 0.0144997529926606,
0.0282822059381356, 0.04555385371879117, 0.1243812242435407,
0.1745042036799134, 0.3503138989201495, 0.9100538555548483}
```



Energy SP1 93.5021773203

Next Min

ENERGY 92.427268697623

next Min ist startMin

```
node4052withMove = {-0.8, 4.7836506948, 8.1116953050, 12.4067151377,
  16.5427568962, 19.9376406708, 24.2182639588, 27.7066435241, 31.7327092109,
  36.0702858366, 39.4095457117, 43.7390720966, 47.8277644794,
  51.2692805030, 55.5543135300, 59.0009393869, 63.0835786274, 67.4152933703,
  70.7553104807, 75.0929151201, 79.1299322738, 82.6104920740,
  86.8921233127, 90.2953703452, 94.4234673610, 98.7263497222,
  102.0564434017, 106.3855104036, 110.2989433468, 113.8758736518,
  118.1550433565, 121.4932454894, 125.6881632876, 129.9075357919,
  133.2346884747, 137.5220633999, 141.1591124331,
  145.0071214858, 149.3291582070, 152.6565470135, 156.9423786817,
  161.0913868933, 164.4759619995, 168.7576293837, 172.2632495279,
  176.2695170109, 180.6095811779, 183.9501571862,
  188.2768232415, 192.3864934077, 195.8150067504, 200.1040261643,
  203.5750580990, 207.6339932777, 211.9778054871,
  215.3247919516, 219.6638891721, 223.7579118500, 227.2040275574,
  231.4966326813, 234.9580594368, 239.0337002113, 243.3786336990,
  246.7280570540, 251.0710988939, 255.1606246206,
  258.6123648290, 262.9065295486, 266.3661784986, 270.4461838710,
  274.7921646764, 278.1428649571, 282.4873092751,
  286.5785120625, 290.0304202415, 294.3258980911, 297.7887616016,
  301.8667469503, 306.2151743911, 309.5676589316, 313.9128581229,
  318.0141360177, 321.4610977339, 325.7594586137,
  329.2351007386, 333.3016056786, 337.6567298643, 341.0139321906,
  345.3597362074, 349.4917476223, 352.9240693431,
  357.2315151277, 360.7494280934, 364.7760866235,
  369.1469002922, 372.5177616234, 376.8601905295,
  381.0720652775, 384.4767629826, 388.8143880806, 392.4754385480};
```

```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

```
N = 101 GOLD ? next iMin
```

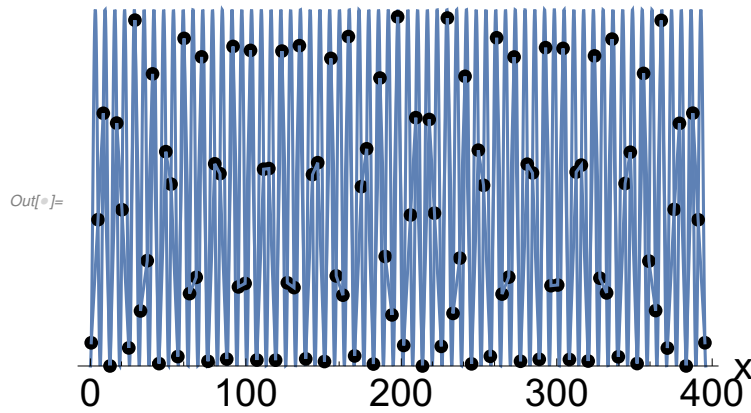
```
Setxx = node4052withMove;
```

```
ENERGY 92.442009964945
```

```
SetX = {0.5158846839772471, 4.892411362904559, 8.28509914296388,
12.58628658743664, 16.907388734673173, 20.29666020361419,
24.67829133798115, 28.62095587781008, 32.22389814640677, 36.54972740266749,
39.963044460863145, 44.1456075267038, 48.49075631882903, 51.85662762309688,
56.22229164674992, 60.26734270337296, 63.76681331149182, 68.07085964152044,
71.510393707784, 75.62880889962071, 79.97577142104068, 83.33181191046637,
87.6846851592875, 91.76129061499714, 95.2286547435938, 99.52700331989888,
102.98174728503909, 107.07365312693821, 111.42215932215326,
114.77610843588351, 119.12423435508494, 123.21886933219913,
126.67177198560884, 130.97047572321907, 134.4406847931041,
138.51432703318818, 142.86840706797022, 146.22522851275335,
150.57210151495664, 154.69650653699185, 158.13310254015343,
162.43884328684766, 165.9465815129336, 169.98366563614243,
174.35203211661508, 177.72041917912492, 182.06460917044305,
186.26157156269008, 189.67050256318228, 194.00210227911958,
197.6328141799623, 201.54710429993082, 205.92775738806446,
209.32015950658104, 213.63196033450737, 217.94742107905623,
221.33922066139323, 225.72080464388782, 229.6460591901884,
233.26644994946136, 237.59620401200237, 241.00723415124833,
245.198723839319, 249.54409655920963, 252.9119667467196, 257.27974257354424,
261.3226668096299, 264.82555832022473, 269.13113010918113,
272.5713573117264, 276.6911743990862, 281.0399629135834, 284.39752754294346,
288.7516173671165, 292.83425030640996, 296.298932635971, 300.5992147385185,
304.06145740617194, 308.1470582540991, 312.5003333145294,
315.8574898549837, 320.2065388259866, 324.3218582363856, 327.7645050961012,
332.06898325725666, 335.56599867874706, 339.61472613852163,
343.98060028027265, 347.34675782650413, 351.6928289266855,
355.87410644289855, 359.2883944123381, 363.6141477552165,
367.21520069679065, 371.1602219861539, 375.5422687273953, 378.9317414649759,
383.2536044114381, 387.5547696946471, 390.94777261318063, 395.3245274186137}
```

```
Eigenvalues
```

```
Out[ ]:= {4.27974, 4.2763, 4.2725, 4.2661, 4.25825, 4.24843, 4.23692, 4.22404, 4.20882,
4.1947, 4.17573, 4.16654, 4.13042, 4.10513, 4.08358, 4.0577, 4.03082,
4.00221, 3.9725, 3.9418, 3.90959, 3.87826, 3.84374, 3.81655, 3.7836, 3.72214,
3.69588, 3.66075, 3.62865, 3.59535, 3.5644, 3.53542, 3.50842, 3.48842,
3.46555, 3.45825, 3.19799, 3.19765, 2.58222, 2.56322, 2.54952, 2.5242,
2.49482, 2.45998, 2.42162, 2.38102, 2.33639, 2.29458, 2.2442, 2.20799,
2.15403, 2.11814, 2.06533, 2.02366, 1.97823, 1.9376, 1.89897, 1.86399,
1.83424, 1.80877, 1.79409, 1.77534, 1.48903, 1.48865, 0.859844, 0.853603,
0.835042, 0.817778, 0.795251, 0.770985, 0.745004, 0.720137, 0.692559,
0.678203, 0.640332, 0.639647, 0.443498, 0.422521, 0.406365, 0.382107,
0.356994, 0.330635, 0.304756, 0.280665, 0.255526, 0.238747, 0.215911,
0.206912, 0.186201, 0.182752, 0.0914707, 0.0838419, 0.0643861, 0.0542481,
0.0429114, 0.033128, 0.0262233, 0.0192703, 0.0142914, 0.0137968, 0.00285485}
```

it looks symmetric

```

start energy 92.442014 detHess 56 212.349
0.5171274029 × 4.8934877083 × 8.2862015768
12.5869535728 × 16.9082870739 × 20.2974641994
24.6791000861 × 28.6224946731 × 32.2247196482
36.5503991238 × 39.9638412499 × 44.1460198819
48.4911908011 × 51.8569954674 × 56.2225856260
60.2678416567 × 63.7670985396 × 68.0711003340
71.5107109287 × 75.6289694795 × 79.9759316875
83.3319494675 × 87.6847895675 × 91.7614616202
95.2287565116 × 99.5270927539 × 102.9818719865
107.0737172682 × 111.4222248217 × 114.7761680334
119.1242811994 × 123.2189495677 × 126.6718231474
130.9705259691 × 134.4407613825 × 138.5143690442
142.8684549453 × 146.2252783415 × 150.5721468876
154.6965909645 × 158.1331641620 × 162.4389125025
165.9466989732 × 169.9837317616 × 174.3521094694
177.7205066872 × 182.0646873953 × 186.2617177901
189.6706261670 × 194.0022508109 × 197.6330929221
201.5472455667 × 205.9278859394 × 209.3202941915
213.6320479922 × 217.9475493333 × 221.3393399736
225.7209318718 × 229.6463067530 × 233.2665819741
237.5963129309 × 241.0073625611 × 245.1987913070
249.5441697635 × 252.9120299812 × 257.2797949688
261.3227575565 × 264.8256102804 × 269.1311746277
272.5714162494 × 276.6912046459 × 281.0399939283
284.3975546095 × 288.7516386567 × 292.8342858146
296.2989542553 × 300.5992343625 × 304.0614855556
308.1470728712 × 312.5003484099 × 315.8575039647
320.2065497762 × 324.3218763912 × 327.7645166084
332.0689945589 × 335.5660163677 × 339.6147353645
343.9806101735 × 347.3467671542 × 351.6928361708
355.8741191239 × 359.2884039997 × 363.6141581190
367.2152184530 × 371.1602304253 × 375.5422754475
378.9317474390 × 383.2536077678 × 387.5547735902
390.9477749020 × 395.3245288890

```

mirrorMin node810 energy = 92.4421739 detHess - 46 401.33

0.5131214729 × 4.8901335338 × 8.2829001428
 12.5850831676 × 16.9059776542 × 20.2955542121
 24.6773535983 × 28.6193423716 × 32.2231263555
 36.5492639609 × 39.9626997104 × 44.1456045139
 48.4910918074 × 51.8572328835 × 56.2231546978
 60.2692815579 × 63.7682034277 × 68.0725255437
 71.5131740010 × 75.6306611631 × 79.9784984764
 83.3350501793 × 87.6881722092 × 91.7683788785
 95.2337385645 × 99.5329002879 × 102.9916381249
 107.0798836908 × 111.4307465037 × 114.7861936596
 119.1346799826 × 123.2397942202 × 126.6872688255
 130.9887114567 × 134.4720074718 × 138.5334679644
 142.8936868402 × 146.2550947702 × 150.6019121962
 154.7554189624 × 158.1795693987 × 162.4948992163
 166.0472428793 × 170.0409956707 × 174.4195502067
 177.7999733514 × 182.1357368817 × 186.3949382539
 189.7912425282 × 194.1499430642 × 197.9204672284
 201.6908613392 × 206.0495370076 × 209.4458454195
 213.7049949707 × 218.0407639714 × 221.4211739929
 225.7997182073 × 229.7934972647 × 233.3458084877
 237.6611268578 × 241.0852758498 × 245.2387665144
 249.5855722542 × 252.9469694106 × 257.3071791447
 261.3686041770 × 264.8519154863 × 269.1533474782
 272.6007812595 × 276.7059292039 × 281.0543861476
 284.4098142206 × 288.7606705433 × 292.8487934199
 296.3075967729 × 300.6067288423 × 304.0719440690
 308.1522837281 × 312.5053288796 × 315.8618274480
 320.2096580179 × 324.3267923838 × 327.7676103281
 332.0718320888 × 335.5702741529 × 339.6168577262
 343.9826095494 × 347.3485967687 × 351.6941305774
 355.8761550021 × 359.2898759851 × 363.6156713021
 367.2178157793 × 371.1614721354 × 375.5432783796
 378.9326334015 × 383.2540571974 × 387.5552357996
 390.9480555044 × 395.3246793015

node1231 energy = 92.44202003 detHess 57 271.0

0.5207704574 × 4.8968796194 × 8.2899582504
 12.5894988039 × 16.9121654897 × 20.3012786145
 24.6833110168 × 28.6308909284 × 32.2294208765
 36.5546429145 × 39.9693743331 × 44.1492941308
 48.4954357889 × 51.8613609623 × 56.2269722765
 60.2764069201 × 63.7726805507 × 68.0770022192
 71.5199142974 × 75.6346860839 × 79.9837228862
 83.3407984877 × 87.6939530120 × 91.7797577302
 95.2417802056 × 99.5420182906 × 103.0068078543
 107.0892470127 × 111.4433266822 × 114.8008656512
 119.1496093329 × 123.2694878938 × 126.7096501971
 131.0152118329 × 134.5181500734 × 138.5610024485
 142.9287736947 × 146.2966380261 × 150.6419931289

154.8335072063 × 158.2445184021 × 162.5742738308
 166.1947003304 × 170.1199102295 × 174.5014871102
 177.8932834154 × 182.2087303221 × 186.5205336463
 189.9129294627 × 194.2935805869 × 198.2078778721
 201.8385800182 × 206.1701769226 × 209.5791063945
 213.7760659379 × 218.1202540072 × 221.4886392138
 225.8570049823 × 229.8940844450 × 233.4018249626
 237.7075654633 × 241.1441576471 × 245.2685668168
 249.6154391286 × 252.9722593892 × 257.3263403156
 261.3999761934 × 264.8701887422 × 269.1688928530
 272.6217895152 × 276.7164315231 × 281.0645556492
 284.4185034652 × 288.7670118609 × 292.8589105994
 296.3136596081 × 300.6120084128 × 304.0793657311
 308.1559791309 × 312.5088514962 × 315.8648909256
 320.2118552127 × 324.3302617821 × 327.7698003985
 332.0738456914 × 335.5733054094 × 339.6183688202
 343.9840321800 × 347.3499009547 × 351.6950530519
 355.8776058953 × 359.2909274065 × 363.6167538590
 367.2196770404 × 371.1623621517 × 375.5439970159
 378.9332690520 × 383.2543793872 × 387.5555666542
 390.9482567113 × 395.3247869085
 node1839 energy = 92.4422772 detHess - 44 390.79
 0.5127402546 × 4.8903337319 × 8.2837176349
 12.5861834102 × 16.9084606917 × 20.2985184877
 24.6811638866 × 28.6274235288 × 32.2278834007
 36.5539783405 × 39.9693079028 × 44.1498750333
 48.4972369134 × 51.8640282609 × 56.2304346826
 60.2839514118 × 63.7780385887 × 68.0833180570
 71.5304135536 × 75.6415557119 × 79.9936357095
 83.3525492510 × 87.7064329130 × 91.8050130183
 95.2602728013 × 99.5636887258 × 103.0437611055
 107.1120056367 × 111.4737212382 × 114.8368308043
 119.1857450331 × 123.3411125632 × 126.7660168347
 131.0831752204 × 134.6400714510 × 138.6305037147
 143.0107477070 × 146.3933216650 × 150.7284541349
 154.9956456997 × 158.3916537965 × 162.7543665069
 166.5454812830 × 170.2955369417 × 174.6504082703
 178.0476135924 × 182.2985806999 × 186.6356479817
 190.0142175157 × 194.3914296104 × 198.3909378975
 201.9370241406 × 206.2507148018 × 209.6757510576
 213.8257342258 × 218.1718712010 × 221.5322237859
 225.8913301470 × 229.9517259190 × 233.4347853953
 237.7352716252 × 241.1806436157 × 245.2868959879
 249.6334430004 × 252.9875653324 × 257.3376991053
 261.4183086846 × 264.8809784635 × 269.1781337033
 272.6344474736 × 276.7227477847 × 281.0706350889
 284.4237092643 × 288.7707881764 × 292.8649091315
 296.3172685479 × 300.6151601567 × 304.0838176877
 308.1581949780 × 312.5109601669 × 315.8667269343

```

320.2131700849 × 324.3323357877 × 327.7711121421
332.0750537373 × 335.5751277340 × 339.6192773239
343.9848872784 × 347.3506856071 × 351.6956080581
355.8784789019 × 359.2915608830 × 363.6174067547
367.2208006303 × 371.1628994695 × 375.5444307843
378.9336528756 × 383.2545739141 × 387.5557663734
390.9483781804 × 395.3248518696
node2002 energy = 92.4422039 detHess 56 187.602
0.5197796518 × 4.8966751853 × 8.2905017003
12.5905702022 × 16.9148359573 × 20.3045941921
24.6876601635 × 28.6401943662 × 32.2349731079
36.5602470601 × 39.9773621408 × 44.1545044464
48.5030042385 × 51.8698181468 × 56.2360698587
60.2947888263 × 63.7851265306 × 68.0907815935
71.5421076062 × 75.6486913284 × 80.0031321208
83.3633427284 × 87.7173844344 × 91.8267262374
95.2762767175 × 99.5823526388 × 103.0758202142
107.1312349559 × 111.4984480904 × 114.8660549656
119.2141397644 × 123.3966099398 × 126.8118584067
131.1391159281 × 134.7436214077 × 138.6861949577
143.0692353259 × 146.4602995336 × 150.7814169062
155.0875043635 × 158.4810449398 × 162.8602754193
166.7578498414 × 170.4046889016 × 174.7394974682
178.1460507567 × 182.3510631813 × 186.6943209617
190.0640114769 × 194.4337011937 × 198.4651531644
201.9783438439 × 206.2849592729 × 209.7191417979
213.8477106839 × 218.1939338621 × 221.5509058345
225.9055248429 × 229.9750095021 × 233.4483047735
237.7467395270 × 241.1960615050 × 245.2946148345
249.6409482861 × 252.9939628480 × 257.3423976238
261.4258358032 × 264.8854336713 × 269.1819637179
272.6397315553 × 276.7253820917 × 281.0731627274
284.4258762510 × 288.7723552302 × 292.8673926503
296.3187658779 × 300.6164698255 × 304.0856723763
308.1591179157 × 312.5118376910 × 315.8674914751
320.2137171959 × 324.3331982957 × 327.7716582035
332.0755570733 × 335.5758878323 × 339.6196562799
343.9852439132 × 347.3510130234 × 351.6958396523
355.8788432115 × 359.2918254179 × 363.6176795441
367.2212703124 × 371.1631240872 × 375.5446120961
378.9338133413 × 383.2546552362 × 387.5558498585
390.9484289579 × 395.3248790249
SP node4270 energy = 93.5167785 detHess - 13 956.0
3.4319505556 × 7.0323457607 × 11.3137660906
14.6453656651 × 18.8505912618 × 23.0568521999
26.3879834589 × 30.6697421975 × 34.2726461945
38.1565857678 × 42.4822085433 × 45.8103240538
50.1055383716 × 54.2414895835 × 57.6365372830
61.9172267064 × 65.4055708334 × 69.4317575869

```

73.7693953504 × 77.1087164646 × 81.4382960399
 85.5271502845 × 88.9686192838 × 93.2537278575
 96.7005927923 × 100.7830537483 × 105.1149422403
 108.4550634607 × 112.7927287749 × 116.8304758439
 120.3105761997 × 124.5923301345 × 127.9962227466
 132.1237661864 × 136.4272636431 × 139.7575550355
 144.0869090166 × 148.0027096920 × 151.5776280784
 155.8566654440 × 159.1955861889 × 163.3895535807
 167.6102534205 × 170.9371091464 × 175.2251075096
 178.8657714661 × 182.7100122857 × 187.0316056291
 190.3588996039 × 194.6437086253 × 198.7938916566
 202.1774578063 × 206.4591677662 × 209.9663620809
 213.9707368978 × 218.3108951671 × 221.6514967836
 225.9778164073 × 230.0889767530 × 233.5165152954
 237.8057787836 × 241.2785761178 × 245.3357070952
 249.6802087359 × 253.0276270571 × 257.3666836270
 261.4642372475 × 264.9084050684 × 269.2018556219
 272.6675403299 × 276.7392239440 × 281.0863699696
 284.4372253350 × 288.7805166553 × 292.8802739379
 296.3265625364 × 300.6233090571 × 304.0954034208
 308.1639585812 × 312.5164327545 × 315.8714996837
 320.2165814779 × 324.3377092633 × 327.7745195713
 332.0781988938 × 335.5798853595 × 339.6216494519
 343.9871192303 × 347.3527363313 × 351.6970586454
 355.8807609381 × 359.2932197477 × 363.6191188212
 367.2237507169 × 371.1643103898 × 375.5455694977
 378.9346609862 × 383.2550847678 × 387.5562907279
 390.9486971301 × 395.3250224372
 it is correct anti - kink an x_1
 node4345 energy = 93.5167999 detHess 13 257.19
 3.4197014676 × 7.0259241975 × 11.3084549371
 14.6395219381 × 18.8470416964 × 23.0520472302
 26.3842582797 × 30.6659349247 × 34.2659651794
 38.1534364348 × 42.4797632226 × 45.8084132971
 50.1046464753 × 54.2407360904 × 57.6364284916
 61.9177121349 × 65.4069467570 × 69.4328634727
 73.7712818763 × 77.1112759829 × 81.4411688961
 85.5331258510 × 88.9731548012 × 93.2592497724
 96.7101250305 × 100.7892083662 × 105.1236745568
 108.4652931282 × 112.8036868044 × 116.8526336409
 120.3256795284 × 124.6093157390 × 128.0233517266
 132.1420507696 × 136.4546727133 × 139.7881527718
 144.1215523610 × 148.0731826542 × 151.6185797115
 155.8965760860 × 159.2488052290 × 163.4272861734
 167.6701907203 × 170.9939982323 × 175.2930890405
 178.9981172002 × 182.7757454862 × 187.0874140306
 190.4122801981 × 194.6779097591 × 198.8428752942
 202.2107037117 × 206.4907950140 × 210.0167609847
 213.9955659765 × 218.3334359361 × 221.6713318868

225.9914115988 × 230.1096283349 × 233.5292979357
237.8171074423 × 241.2950442348 × 245.3438718488
249.6878808015 × 253.0342502323 × 257.3713813217
261.4715707752 × 264.9128404340 × 269.2057260230
272.6730235815 × 276.7419491880 × 281.0889559837
284.4394529138 × 288.7821098009 × 292.8827781471
296.3280843034 × 300.6246478997 × 304.0973173943
308.1649103473 × 312.5173347819 × 315.8722874640
320.2171436465 × 324.3385937480 × 327.7750816937
332.0787187500 × 335.5806735914 × 339.6220424978
343.9874889473 × 347.3530764062 × 351.6972992069
355.8811394301 × 359.2934953025 × 363.6194035457
367.2242418595 × 371.1645453066 × 375.5457590498
378.9348288722 × 383.2551698325 × 387.5563780205
390.9487502335 × 395.3250508350
node5091 energy = 93.5165456 detHess - 15 620.357
node5348 energy = 93.516576 detHess 15 018.618
node6377 energy = 93.516327 detHess - 6171.0136
node6533 energy = 93.516325 detHess 6404.329

```

mirrorMin node423, 1230, 2003, 2943 no SP
final node8023 energy = 93.33660306 detHess - 104.945
0.5238698300 × 4.9073273462 × 8.3097240733
12.6100563779 × 16.9540606064 × 20.3503169173
24.7441229708 × 28.7590185218 × 32.3079842077
36.6353159952 × 40.0884419570 × 44.2248611077
48.6014728424 × 51.9824246206 × 56.3527171400
60.5283103892 × 63.9605628220 × 68.2966771286
71.9027637794 × 75.8553787782 × 80.2493913553
83.6530172504 × 87.9773884878 × 92.3145535765
95.7166798891 × 100.1136200626 × 104.1052253571
107.6775362288 × 112.0098953374 × 115.4568137459
119.6085137529 × 123.9862367812 × 127.3696425147
131.7439325885 × 135.9166541459 × 139.3526783258
143.6899345392 × 147.2937780047 × 151.2509038844
155.6470044917 × 159.0526326596 × 163.3784628079
167.7199371669 × 171.1238568626 × 175.5234631791
179.5283831956 × 183.0915035338 × 187.4248107762
190.8805557316 × 195.0227534951 × 199.4065463747
202.7939130152 × 207.1683188874 × 211.3668476134
214.7945453777 × 219.1415244088 × 222.7923953515
226.7010071128 × 231.0945957560 × 234.5057172773
238.8141907775 × 243.1757883820 × 246.5813553205
250.9863561847 × 255.0568744131 × 258.5728032220
262.9091872351 × 266.4125211308 × 270.4992112925
274.9025966900 × 278.3060692916 × 282.6719347040
286.9664566517 × 290.3782957650 × 294.7662448993
298.6370892224 × 302.3232129614 × 306.6764437019
310.0977644390 × 314.3146319349 × 318.6862424860
322.0749906438 × 326.4618403595 × 330.5879372918
334.0541168787 × 338.3853694486 × 341.9291780988
345.9562901526 × 350.3553423672 × 353.7566787462
358.1048629453 × 362.4163554667 × 365.8220728421
370.2127821422 × 374.1283233093 × 377.7686613963
382.1105300913 × 385.5340929531 × 389.7295425035
394.0962000602 × 397.4779016476
ist correct kink an x_101

```

```

SetX = {3.4660836324485196, 7.03047933964302, 11.274531387384375,
  14.557240308153098, 18.75300825061594, 22.852378446355615,
  26.19310423848265, 30.40636292081219, 33.77302193514349, 37.84615040488971,
  42.06578817166602, 45.34459174125812, 49.60173745572431, 53.24281210236139,
  57.047412053666946, 61.330335175852966, 64.61565708888278,
  68.87837851103627, 72.906643023803, 76.32971158484709, 80.55528871551705,
  83.8781157808847, 88.01137292160682, 92.19139162481783, 95.48701136875842,
  99.7281653119247, 103.25001547581813, 107.18194592942936,
  111.47343581585177, 114.76633535579592, 119.05441680603343,
  123.02214343003612, 126.51041824079759, 130.74779943939814,
  134.05347095291285, 138.21901153698164, 142.37348712588238,
  145.68551100541148, 149.91916058132153, 153.38380283733431,
  157.37473992653008, 161.6565194783753, 164.9474654127231,
  169.23831542212918, 173.13267766812217, 176.68876633266748,
  180.93347030559724, 184.22047334779137, 188.413373472291,
  192.52418034300314, 195.85978920837775, 200.07784778933146,
  203.46314213686145, 207.52300522115368, 211.7598216545898,
  215.04061928596286, 219.3088856207651, 223.01036541295053,
  226.75454521065063, 231.02980457686152, 234.3125876006671,
  238.56074153529758, 242.6099319933271, 246.00934040427074,
  250.2308623120279, 253.56274707837636, 257.68183334078884,
  261.87209511690446, 265.1622979018443, 269.4071605124181,
  272.95602595411054, 276.8595369072572, 281.15189819454787,
  284.44447256786765, 288.7285650375659, 292.7190876679339,
  296.18609561335893, 300.421534857733, 303.7356937937433, 307.8906712840969,
  312.0602394889978, 315.3661069511447, 319.6064707708225, 323.10488075089154,
  327.0643269474962, 331.35602586065096, 334.6510848161028, 338.9435910773698,
  342.89468838736104, 346.4008619218346, 350.6420377250972,
  353.9453783840942, 358.1184177006464, 362.26831427493, 365.5848508021229,
  369.8182315594894, 373.2747284430715, 377.27489003051824,
  381.5550300088075, 384.84617252123513, 389.1373144585814}

```

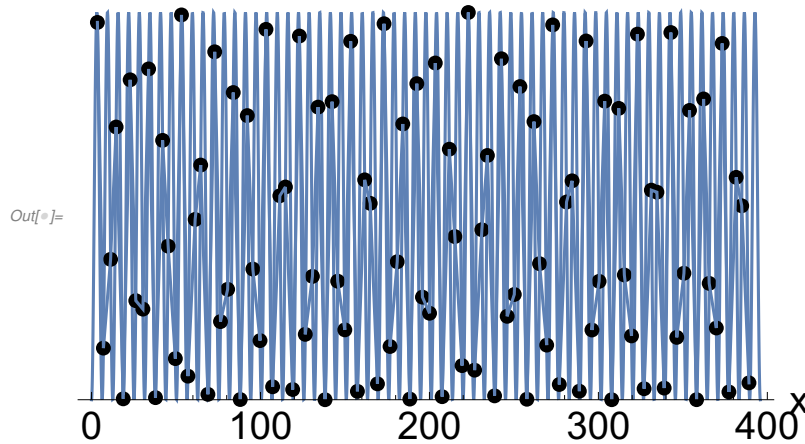
Eigenvalues

```

Out[*]= {4.27039, 4.26792, 4.26318, 4.25697, 4.24891, 4.23918, 4.22696, 4.21437, 4.20023,
  4.18272, 4.16462, 4.14489, 4.12377, 4.1005, 4.07864, 4.05937, 4.01604, 3.98989,
  3.96044, 3.92983, 3.89773, 3.86585, 3.82148, 3.79233, 3.75736, 3.72194,
  3.68556, 3.6494, 3.61343, 3.57702, 3.54344, 3.50384, 3.47606, 3.44716,
  3.42401, 3.40335, 3.38826, 3.37799, 3.07732, 2.50745, 2.49782, 2.47862,
  2.45541, 2.4266, 2.39432, 2.35862, 2.31989, 2.27953, 2.23779, 2.19532,
  2.15351, 2.11115, 2.07083, 2.03016, 1.99192, 1.95754, 1.92629, 1.8988,
  1.87652, 1.85842, 1.84905, 1.6171, 0.921036, 0.911447, 0.898116, 0.879271,
  0.858192, 0.831686, 0.808528, 0.772176, 0.741778, 0.710415, 0.679781,
  0.652052, 0.625862, 0.604292, 0.589793, 0.518295, 0.356849, 0.346492,
  -0.338113, 0.329686, 0.312321, 0.2979, 0.284084, 0.276304, 0.161078, 0.149436,
  0.13604, 0.120448, 0.107817, 0.0927824, 0.083576, 0.0659628, 0.0570515,
  0.0248876, 0.0221068, 0.012719, 0.00989801, 0.00328351, -0.000917673}

```


ENERGY SPpush 93.6345810 - very flat SP2 but main SP EW is - 0.338



```
node4850 energy = 93.634606 detHess 583.586
3.4651713390 × 7.0299957681 × 11.2741217436
14.5567918761 × 18.7527038214 × 22.8519150130
26.1927838115 × 30.4060289092 × 33.7724966150
37.8458054706 × 42.0652824025 × 45.3440966461
49.6011504327 × 53.2416708653 × 57.0468423708
61.3298366833 × 64.6151954034 × 68.8780511291
72.9061317013 × 76.3294234527 × 80.5550518291
83.8778282651 × 88.0112031799 × 92.1911701006
95.4868414761 × 99.7279917331 × 103.2497176374
107.1817954565 × 111.4732922948 × 114.7662064147
119.0543150788 × 123.0219725523 × 126.5103281765
130.7477305223 × 134.0533981543 × 138.2189720194
142.3734413740 × 145.6854836700 × 149.9191410537
153.3837786349 × 157.3747316285 × 161.6565191453
164.9474730897 × 169.2383310027 × 173.1327154560
176.6887907679 × 180.9334991066 × 184.2205148029
188.4134100245 × 192.5242484213 × 195.8598458083
200.0779195343 × 203.4632687491 × 207.5230932286
211.7599576751 × 215.0407634328 × 219.3090606323
223.0107154836 × 226.7547205865 × 231.0299538495
234.3127290575 × 238.5608382633 × 242.6100787875
246.0094256904 × 250.2309346425 × 253.5628394864
257.6818888355 × 261.8721690520 × 265.1623580613
269.4072248038 × 272.9561405430 × 276.8595946506
281.1519522908 × 284.4445219017 × 288.7286031959
292.7191511280 × 296.1861303072 × 300.4215629866
303.7357262972 × 307.8906905671 × 312.0602648324
315.3661255821 × 319.6064893212 × 323.1049116579
327.0643427847 × 331.3560415654 × 334.6510991022
338.9436029246 × 342.8947089310 × 346.4008727638
350.6420462169 × 353.9453874732 × 358.1184229007
362.2683207847 × 365.5848550234 × 369.8182351777
373.2747337363 × 377.2748925562 × 381.5550321915
```

384.8461740381 × 389.1373153080
 and node5444 energy = 93.63452544 detHess - 818.26
 3.4655850900 × 7.0305985376 × 11.2753557564
 14.5589971674 × 18.7549796960 × 22.8565269281
 26.1967335361 × 30.4112403969 × 33.7817535898
 37.8525296134 × 42.0761222826 × 45.3554291623
 49.6152639752 × 53.2697384666 × 57.0611182836
 61.3428125565 × 64.6278469746 × 68.8876314003
 72.9219638039 × 76.3389752455 × 80.5639878202
 83.8900264940 × 88.0194602058 × 92.2037323003
 95.4979131399 × 99.7411206961 × 103.2740846345
 107.1950599407 × 111.4878003862 × 114.7812910858
 119.0683861089 × 123.0483902195 × 126.5260769496
 130.7631509141 × 134.0742004745 × 138.2343523976
 142.3987799473 × 145.7073996352 × 149.9459181082
 153.4328069758 × 157.4037072301 × 161.6930391309
 164.9872658038 × 169.2800535807 × 173.2150050747
 176.7354421774 × 180.9775782242 × 184.2756334147
 188.4548595522 × 192.5933972617 × 195.9149025143
 200.1434301593 × 203.5772660092 × 207.5972176241
 211.8666097759 × 215.1541669896 × 219.4407150305
 223.2736897703 × 226.8878382979 × 231.1409635318
 234.4213196951 × 238.6330354600 × 242.7170943020
 246.0737980372 × 250.2875798549 × 253.6390422836
 257.7284108811 × 261.9353204137 × 265.2164361076
 269.4669219518 × 273.0655389461 × 276.9144867378
 281.2022978048 × 284.4905515283 × 288.7632842001
 292.7758066386 × 296.2173566500 × 300.4469642039
 303.7654776939 × 307.9083166791 × 312.0833867086
 315.3833220954 × 319.6237431875 × 323.1339008457
 327.0791523240 × 331.3706026469 × 334.6643249927
 338.9544618125 × 342.9134272178 × 346.4107660383
 350.6497866006 × 353.9536896355 × 358.1231590443
 362.2742260270 × 365.5886799383 × 369.8215001183
 373.2794985990 × 377.2771520095 × 381.5569546069
 384.8474768598 × 389.1379962880
 mild node5922 and mild node6035 grad
 iMin is not here ?

```

start energy = 92.4272701 detHess 504.77
0.4433514890 × 4.7555430069 × 8.0686655153
12.3588318123 × 16.4429459660 × 19.8564857992
24.1152206113 × 27.5231476436 × 31.6135809138
35.9003841045 × 39.2130513921 × 43.5241027685
47.3928246895 × 50.9958418511 × 55.2659964157
58.5773726227 × 62.7857278704 × 66.9479742703
70.2827834397 × 74.5374610982 × 78.0337988732
82.0148342987 × 86.3231513293 × 89.6339627964
93.9399199596 × 97.9428575127 × 101.4201397550
105.6739741149 × 109.0191014514 × 113.1698014896
117.3929040812 × 120.7016258467 × 124.9793363572
128.6248620313 × 132.4498469710 × 136.7568490648
140.0686072029 × 144.3447381447 × 148.4531417227
151.8453837175 × 156.1045192036 × 159.5358891277
163.6001923914 × 167.8996471248 × 171.2144729467
175.5292960619 × 179.4547998151 × 183.0056542088
187.2691668733 × 190.5914026818 × 194.7789388041
198.9666692079 × 202.2888072919 × 206.5523859149
210.1036929632 × 214.0287185546 × 218.3435475595
221.6583806488 × 225.9577484128 × 230.0224038222
233.4535037085 × 237.7126685776 × 241.1052208694
245.2133247927 × 249.4897218142 × 252.8015241602
257.1086562043 × 260.9346598842 × 264.5792048031
268.8567494057 × 272.1655246298 × 276.3882998479
280.5392832116 × 283.8841635458 × 288.1380214668
291.6157509527 × 295.6181831319 × 299.9242200408
303.2350432150 × 307.5433219049 × 311.5249494786
315.0207782938 × 319.2754358995 × 322.6105117023
326.7724644919 × 330.9812286867 × 334.2925226937
338.5628872475 × 342.1670386699 × 346.0346051367
350.3455938679 × 353.6582648808 × 357.9448090381
362.0358667205 × 365.4433041346 × 369.7020931090
373.1162700926 × 377.1997392256 × 381.4903191553
384.8035377633 × 389.1158927834
SPpull node6127 energy = 93.50219528 detHess - 71 047.66

```

```

SPpull = {0.4581441150, 4.7836506735, 8.1116952721,
12.4067151016, 16.5427568211, 19.9376406072,
24.2182638772, 27.7066433748, 31.7327091196,
36.0702857168, 39.4095455704, 43.7390719533,
47.8277641952, 51.2692802945, 55.5543132852,
59.0009389724, 63.0835783630, 67.4152930000,
70.7553100522, 75.0929146631, 79.1299313525,
82.6104914538, 86.8921226224, 90.2953692549,
94.4234666219, 98.7263486064, 102.0564421677,
106.3855089956, 110.2989404841, 113.8758720302,
118.1550418214, 121.4932435213, 125.6881619016,
129.9075336024, 133.2346864704, 137.5220610213,
141.1591078731, 145.0071192019, 149.3291561881,
152.6565450509, 156.9423773354, 161.0913848295,
164.4759605489, 168.7576279052, 172.2632470890,
176.2695157229, 180.6095798267, 183.9501558149,
188.2768220781, 192.3864913165, 195.8150052624,
200.1040245216, 203.5750553565, 207.6339916540,
211.9778034257, 215.3247896166, 219.6638868563,
223.7579073080, 227.2040242491, 231.4966288451,
234.9580529399, 239.0336961807, 243.3786282528,
246.7280507078, 251.0710923635, 255.1606115889,
258.6123553332, 262.9065184723, 266.3661597390,
270.4461721415, 274.7921486699, 278.1428462271,
282.4872899132, 286.5784733379, 290.0303919324,
294.3258649948, 297.7887053880, 301.8667119390,
306.2151268753, 309.5676031883, 313.9128008669,
318.0140217229, 321.4610128367, 325.7593585810,
329.2349287109, 333.3015004344, 337.6565906364,
341.0137679600, 345.3595716865, 349.4914220968,
352.9238154208, 357.2312099078, 360.7488842965,
364.7757723384, 369.1465204155, 372.5173125185,
376.8597784296, 381.0712816207, 384.4760706167,
388.8135374858, 392.4738036129};

```

```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

```
N = 101 GOLD global pre? SP1 - pull
```

```
Setxx = SPpull;
```

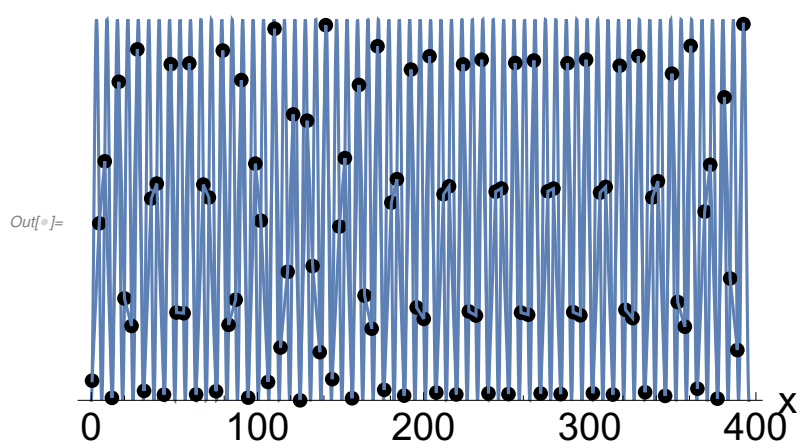
```
*** NMinimize: "Failed to converge to the  
requested accuracy or precision within 100 iterations"
```

```
SetX = {0.45800643583188844, 4.783389948359522, 8.111293979187865,  
12.40627694616723, 16.541850825474153, 19.936878477908003,  
24.217294202451928, 27.704878040376627, 31.731641414810547,  
36.06890423716279, 39.407935484972064, 43.7374606289759,  
47.824592374604315, 51.266977461514024, 55.551646146317566,  
58.996463246495374, 63.08075200405166, 67.41138421995414,  
70.75083772549392, 75.08818893282628, 79.12045838554947, 82.60418668853774,  
86.88520926864533, 90.28457796445204, 94.4162105938803, 98.71549319660484,  
102.04458083635541, 106.37205683474222, 110.27172594768763,  
113.86069568304029, 118.14104707664742, 121.47581150089606,  
125.67618501584322, 129.88905873543317, 133.21824180613035,  
137.5029539093044, 141.1229764549648, 144.98919886179846, 149.3136236892471,  
152.6419427915831, 156.93279438088302, 161.07735183561527, 164.466624928718,  
168.74884265548636, 172.2495177139393, 176.26270476379534,  
180.60327198142033, 183.9445848345851, 188.27290953219878,  
192.380427513317, 195.8112549204802, 200.10067902744603, 203.5702022448015,  
207.63156076141524, 211.97546940787666, 215.32274674486368,  
219.66239445319823, 223.75552292529608, 227.20257296762767,  
231.49534156574745, 234.95621887001172, 239.0327679401764,  
243.3777151612961, 246.72724323655316, 251.0704847278307,  
255.15961892155917, 258.61174749522195, 262.9059709980427,  
266.36537422853104, 270.4457691657906, 274.79174231340187,  
278.14247884863113, 282.4870052736586, 286.57799848979295,  
290.0300963564415, 294.32559269925895, 297.78830835140013,  
301.86650729514145, 306.2149198814079, 309.56741500272716,  
313.91265661556224, 318.0137836211629, 321.4608647061334,  
325.75922519273746, 329.2347367801369, 333.30140866777845,  
337.6565132844263, 341.01371226645483, 345.3595482350408,  
349.49140975073516, 352.9238260206102, 357.2312506471611, 360.7489822388097,  
364.7758464514996, 369.1466419325684, 372.5174840436937, 376.8599606653452,  
381.0716559328444, 384.476416628678, 388.8139802899178, 392.4746690731538}
```

```
Eigenvalues
```

```
Out[ ]:= {4.27728, 4.27379, 4.27031, 4.26379, 4.25569, 4.24632, 4.23492, 4.22186, 4.2075,
  4.19168, 4.17403, 4.15583, 4.12777, 4.1078, 4.0801, 4.05504, 4.02951, 4.00056,
  3.97092, 3.94068, 3.90897, 3.87624, 3.84395, 3.81197, 3.75605, 3.7341,
  3.69707, 3.66711, 3.63185, 3.59744, 3.56657, 3.53666, 3.50852, 3.48452,
  3.46539, 3.45003, 3.42909, 3.12471, 2.56415, 2.54639, 2.53268, 2.50979,
  2.47929, 2.44724, 2.41099, 2.37135, 2.3302, 2.28653, 2.24387, 2.20038,
  2.14994, 2.1081, 2.06406, 2.02052, 1.97983, 1.9408, 1.90561, 1.87398,
  1.84398, 1.82359, 1.80884, 1.79145, 1.56705, 0.879987, 0.865106, 0.851759,
  0.834491, 0.813433, 0.789582, 0.764242, 0.738639, 0.712841, 0.688862,
  0.668179, 0.647889, 0.574315, 0.423345, 0.401227, 0.384621, 0.363993,
  -0.359863, 0.337916, 0.314093, 0.289419, 0.267858, 0.247602, 0.222982,
  0.217425, 0.19328, 0.113512, 0.108282, 0.0900834, 0.0710121, 0.0627525,
  0.0509782, 0.039063, 0.0321201, 0.0254429, 0.0203389, 0.0175762, 0.00211038}
```

it is 'true' hard SP1 ! EV - 0.359



ENERGY SPpull 93.50217691870645

```
node 7131 energy = 93.5022125 detHess 62 154.21
0.4584585697 × 4.7842471328 × 8.1126163823
12.4077256888 × 16.5448547009 × 19.9394190405
24.2205469807 × 27.7108263726 × 31.7352604444
36.0736287293 × 39.4134919639 × 43.7430647431
47.8356805579 × 51.2751056079 × 55.5611620110
59.0125636024 × 63.0909656584 × 67.4255905778
70.7672463291 × 75.1055899842 × 79.1554586800
82.6278443261 × 86.9115668068 × 90.3263636463
94.4443142811 × 98.7575368100 × 102.0912190080
106.4248456373 × 110.3789271391 × 113.9223427443
118.2003110275 × 121.5535933973 × 125.7309239865
129.9754218124 × 133.2991210529 × 137.5990295234
141.3089473648 × 145.0815461357 × 149.3923315190
152.7169759612 × 156.9810848894 × 161.1468054607
164.5135562623 × 168.7933723316 × 172.3201742073
176.2975621709 × 180.6350487236 × 183.9725565892
188.2921843975 × 192.4098364664 × 195.8294285064
200.1167838997 × 203.5935568902 × 207.6431691390
211.9864419533 × 215.3322386207 × 219.6691849976
```

223.7661945698 × 227.2090103589 × 231.5009579161
 234.9641397282 × 239.0367260371 × 243.3815178686
 246.7305307073 × 251.0728799800 × 255.1634364407
 258.6140442039 × 262.9079801614 × 266.3682004916
 270.4471900875 × 274.7931249539 × 278.1436865697
 282.4879001283 × 286.5794437937 × 290.0309766625
 294.3263778804 × 297.7894305878 × 301.8670775456
 306.2154848569 × 309.5679213779 × 313.9130408935
 318.0144163667 × 321.4612636812 × 325.7595971900
 329.2352907253 × 333.3016937891 × 337.6568004583
 341.0139807218 × 345.3597553681 × 349.4917561300
 352.9240611196 × 357.2314861938 × 360.7493606922
 364.7760387807 × 369.1468270873 × 372.5176623444
 376.8600886771 × 381.0718598716 × 384.4765752933
 388.8141505113 × 392.4749761778
 node 8983 energy = 93.5019934 detHess - 89 372.9
 0.4601616839 × 4.7864560259 × 8.1154078002
 12.4106835880 × 16.5497880345 × 19.9437335668
 24.2257533489 × 27.7194988969 × 31.7409911687
 36.0806813222 × 39.4216780235 × 43.7512576078
 47.8507605263 × 51.2866343730 × 55.5746324165
 59.0348927484 × 63.1054401812 × 67.4450149522
 70.7897588642 × 75.1291215759 × 79.2016665072
 82.6603660404 × 86.9483965102 × 90.3857292785
 94.4836749261 × 98.8141675382 × 102.1557027693
 106.4958950840 × 110.5216260370 × 114.0114216767
 118.2937776085 × 121.6910291254 × 125.8275589938
 130.1255753263 × 133.4550855977 × 137.7828163342
 141.6778731783 × 145.2716422657 × 149.5536827196
 152.8877048589 × 157.0899302556 × 161.3015715364
 164.6322554728 × 168.9164976293 × 172.5344034037
 176.4035791266 × 180.7281389043 × 184.0568225406
 188.3489263910 × 192.4931521374 × 195.8832576558
 200.1649796440 × 203.6653358897 × 207.6793653562
 212.0199789387 × 215.3611652712 × 219.6897909837
 223.7977301661 × 227.2279833416 × 231.5178726780
 234.9873030843 × 239.0482923799 × 243.3916518588
 246.7397645981 × 251.0790103667 × 255.1722015144
 258.6187155502 × 262.9114120724 × 266.3744884219
 270.4507586800 × 274.7955461457 × 278.1470220024
 282.4899832533 × 286.5827034580 × 290.0329480584
 294.3276683670 × 297.7905420086 × 301.8681227848
 306.2173690738 × 309.5697872177 × 313.9148858643
 318.0164278269 × 321.4631683643 × 325.7615935077
 329.2368414325 × 333.3038032717 × 337.6609709005
 341.0163615797 × 345.3619082066 × 349.4938474330
 352.9251495767 × 357.2334428041 × 360.7501445650
 364.7769612123 × 369.1490998262 × 372.5184827086
 376.8621465256 × 381.0734418426 × 384.4770855176

```

388.8147826231 × 392.4728125861
node 9865 energy = 93.50207247 detHess 82 147.256
SP ? nearby
0.4603390022 × 4.7867923006 × 8.1159275895
12.4112529898 × 16.5509694873 × 19.9447395867
24.2270460273 × 27.7218742136 × 31.7424300819
36.0825475901 × 39.4238824851 × 43.7534670734
47.8551257520 × 51.2898966770 × 55.5784945610
59.0415274943 × 63.1095793950 × 67.4506430064
70.7963268955 × 75.1359358083 × 79.2152995943
82.6701063127 × 86.9596502626 × 90.4044630873
94.4957137544 × 98.8312035045 × 102.1753778513
106.5169866314 × 110.5642227521 × 114.0400105583
118.3255098632 × 121.7410890553 × 125.8613380994
130.1763093505 × 133.5113866746 × 137.8466842703
141.8077062923 × 145.3464351441 × 149.6258200332
152.9827596918 × 157.1568903667 × 161.4073227962
164.7319528741 × 169.0350491499 × 172.7646143820
176.5179649272 × 180.8253004006 × 184.1497900031
188.4085085152 × 192.5785079141 × 195.9411886033
200.2200865467 × 203.7531480396 × 207.7226202852
212.0592312052 × 215.3956823955 × 219.7134332309
223.8336170540 × 227.2501494183 × 231.5374605080
235.0156927131 × 239.0623475322 × 243.4048242034
246.7510709443 × 251.0869846884 × 255.1845809314
258.6261062941 × 262.9177346027 × 266.3832642071
270.4550614275 × 274.7995216156 × 278.1502777486
282.4921822295 × 286.5859662235 × 290.0346653410
294.3288485283 × 297.7917219442 × 301.8686200674
306.2177157896 × 309.5697558876 × 313.9147361990
318.0159851290 × 321.4622675254 × 325.7602380062
329.2337376044 × 333.3022180303 × 337.6597281914
341.0149182384 × 345.3611935512 × 349.4931368743
352.9243412715 × 357.2326718295 × 360.7485334147
364.7761940580 × 369.1487736499 × 372.5181523092
376.8623948739 × 381.0745127293 × 384.4780313751
388.8162049979 × 392.4756052265
points seem to be the same but Hessian alternates ? SP1 <-> SP2 ?

start SPpull
next SP node1328, and 3779 and 4946 × 6694 × 7470 × 8699 × 9056
mild node9837
node10938 last SP ? energy = 93.49400089 detHess - 852 839.99

```



```

node10938 = {0.4595480719, 4.7863133677, 8.1158098269,
12.4112246567, 16.5521151810, 19.9455977639,
24.2284853253, 27.7254075671, 31.7441013942,
36.0851110495, 39.4270538726, 43.7566746985,
47.8625824433, 51.2951682971, 55.5848913620,
59.0532628629, 63.1164188688, 67.4603156115,
70.8077321112, 75.1477283172, 79.2398406252,
82.6877166716, 86.9804549936, 90.4403973793,
94.5180200350, 98.8626058364, 102.2119471092,
106.5552240586, 110.6424583491, 114.095692064,
118.3895076604, 121.8467417877, 125.9291633791,
130.2739354859, 133.6239213516, 137.9682697360,
142.0537917014, 145.5088718254, 149.8030427758,
153.2593245289, 157.3433999931, 161.6881948703,
165.0383749084, 169.3830725721, 173.4678585718,
176.9236473597, 181.2179002834, 184.6736809699,
188.7584767232, 193.1031713808, 196.4533501089,
200.7981454929, 204.8822050293, 208.3384965034,
212.6326644947, 216.0877274132, 220.1732658570,
224.5176047208, 227.8675849300, 232.2123556722,
236.2947339635, 239.7519925055, 244.0457983604,
247.4989832895, 251.5862622624, 255.9295102450,
259.2788341197, 263.6234144532, 267.7009082683,
271.1609238373, 275.4536336481, 278.9013676841,
282.9936088429, 287.3335155774, 290.6808809357,
295.0247571481, 299.0875216955, 302.5561273010,
306.8457741271, 310.2779645085, 314.3842272853,
318.7135593101, 322.0553623465, 326.3962786625,
330.4137600281, 333.9115143687, 338.1942668267,
341.5868394358, 345.7285500363, 350.0230183534,
353.3522796824, 357.6785861360, 361.5582794664,
365.1663062290, 369.4497709227, 372.7817089123,
376.9897971406, 381.1965640790, 384.5290983936,
388.8121182759, 392.4168938464};

```

```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

```
N = 101 GOLD last SP1 - pull
```

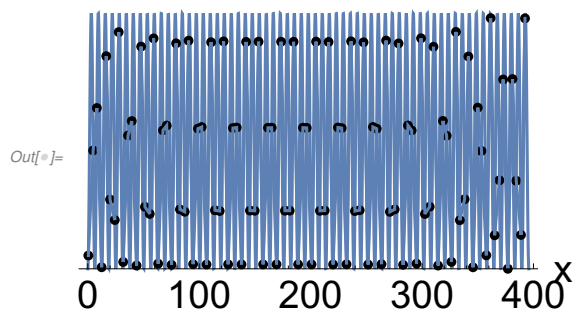
```
Setxx = node10938;
```

```
*** NMinimize: "Failed to converge to the  
requested accuracy or precision within 100 iterations."
```

```
SetX = {0.459533603580526, 4.786286192865643, 8.115768606406283,  
12.411181032905983, 16.552027049033057, 19.945525601947693,  
24.228397695859393, 27.725252128538806, 31.744013925702898,  
36.08501054308068, 39.42694669231379, 43.75657972453203, 47.862408940398524,  
51.29504780977907, 55.58476406419292, 59.05305847193377, 63.11630534627623,  
67.46018604251553, 70.80759966671533, 75.14761142267271, 79.23962807036413,  
82.68757467415381, 86.98031000948758, 90.44017162556787, 94.51789484383909,  
98.86246269067058, 102.21180239259333, 106.55509612688286,  
110.6422257023504, 114.09553852639446, 118.38935263590704,  
121.84650296825916, 125.9290311393852, 130.2737844517975,  
133.62376948232924, 137.96813567403024, 142.05354819812214,  
145.50871193820828, 149.8028821710724, 153.2590782220865,  
157.34326375959407, 161.68803946623697, 165.03821905255563,  
169.382935157857, 173.4676092021016, 176.92348402735254, 181.21773666640377,  
184.6734306142976, 188.75833832743203, 193.10301359110483,  
196.45319204186615, 200.79800612389027, 204.88195210349724,  
208.33833103500274, 212.6324988445473, 216.08747417586892,  
220.17312564850926, 224.51744437971408, 227.86742404447008,  
232.21221319297652, 236.29447464692487, 239.7518227980711,  
244.04562789396923, 247.4987223716388, 251.5861165922369,  
255.92934123126616, 259.2786629276402, 263.62326028635135,  
267.70062484156534, 271.16073824571, 275.453445810416, 278.9010798803437,  
282.9934452190452, 287.3333199501247, 290.680679921639, 295.0245702894429,  
299.08717221208764, 302.55590099906897, 306.84554480942654,  
310.2776172308563, 314.38402306761213, 318.7133017505633, 322.0550953553432,  
326.3960168643284, 330.4132590219764, 333.9112085147503, 338.19397044253793,  
341.5864212236977, 345.72829214218433, 350.02266910568534,  
353.3519347557555, 357.6782231904131, 361.5575782015386, 365.1659500619056,  
369.44950149653107, 372.78144671516816, 376.98967180679864,  
381.1964519020948, 384.52905537012737, 388.8121316989639, 392.4169735359294}
```

```
Eigenvalues
```

```
Out[8]= {4.27786, 4.27487, 4.27017, 4.26381, 4.25578, 4.24605, 4.23464, 4.22156, 4.20686,
4.19061, 4.17283, 4.15171, 4.13774, 4.10595, 4.08126, 4.05536, 4.02827,
3.99997, 3.97047, 3.93984, 3.90818, 3.87565, 3.84248, 3.80934, 3.76691,
3.73025, 3.69767, 3.66329, 3.62918, 3.59594, 3.56405, 3.53406, 3.50667,
3.48268, 3.46306, 3.44894, 3.44092, 3.12667, 2.56553, 2.55219, 2.53268,
2.50804, 2.47887, 2.44573, 2.40923, 2.37005, 2.32889, 2.28641, 2.24297,
2.19837, 2.15254, 2.10724, 2.06343, 2.02118, 1.98067, 1.94238, 1.90693,
1.87493, 1.84685, 1.82304, 1.80403, 1.79091, 1.56498, 0.871912, 0.865294,
0.852619, 0.835123, 0.813914, 0.789996, 0.764328, 0.737879, 0.711713, 0.687192,
0.666486, 0.653247, 0.577662, 0.424274, 0.407166, 0.385381, 0.361531,
-0.348184, 0.336881, 0.312233, 0.288381, 0.266245, 0.246226, 0.227574,
0.210705, 0.196705, 0.117275, 0.107491, 0.0928322, 0.0780754, 0.0644978,
0.0524274, 0.0419732, 0.0331907, 0.0261346, 0.0208853, 0.0175705, 0.0127133}
```



looks other then the first SPpull !

ENERGY last SPpull 93.49394406828172

```

start SPpush next mirror node 901
mild node 1534 and 1683
and node 10 181 energy = 92.7477967 detHess 112.867
node10181 = {6.5812985175, 10.8337710948, 14.0993052751,
18.3641227881, 22.1623488030, 25.7902096647,
30.0291855000, 33.2850517472, 37.4967469979,
41.5074557696, 44.8997282495, 49.0860434341,
52.3479664418, 56.4818088385, 60.5488421093,
63.8589589370, 68.0248812104, 71.3041038922,
75.3982094746, 79.4923008454, 82.7715340285,
86.9374519461, 90.2475455426, 94.3145946089,
98.4484089744, 101.7103391863, 105.896636874,
109.2888418639, 113.2996008086, 117.5112486972,
120.7671107782, 125.0060547831, 128.6337390323,
132.4321427046, 136.6969769997, 139.9625217263,
144.2150297361, 148.1737067206, 151.6365001493,
155.8439719235, 159.1070779683, 163.2677191637,
167.3334048136, 170.6618382736, 174.8401925411,
178.1323846486, 182.2311881562, 186.3488048018,
189.6277505710, 193.8120413208, 197.1733145151,
201.2140449656, 205.4063045981, 208.6655206320,
212.8935523204, 216.4511837240, 220.3221563184,
224.5923531421, 227.8630467300, 232.1289832300,
236.0530806858, 239.5570090349, 243.7754780838,
247.0392177026, 251.2143279260, 255.2765946561,
258.6162382015, 262.8003869624, 266.0963433522,
270.1992866692, 274.3245465937, 277.6051165228,
281.7963812735, 285.1760040232, 289.2066467908,
293.4164398093, 296.6777783302, 300.9186379267,
304.5351805865, 308.3497131587, 312.6203681832,
315.8915319424, 320.1496876795, 324.1192446712,
327.5787874175, 331.7916867348, 335.0664752510,
339.2250711413, 343.3167815566, 346.6357293832,
350.8272953292, 354.1610058192, 358.2386675626,
362.4132818243, 365.6834298626, 369.9052643631,
373.4078859862, 377.3379301046, 381.6078752662,
384.8823896974, 389.1562089508};
good moved !

```

[illegible]

N = 101 GOLD new iMin ? of SP1 - push above

```
Setx = {6.67472185344891, 10.939553743854638, 14.205955647211093,
18.469994281993724, 22.363521613577678, 25.893226232371543,
30.112206118958536, 33.36664147744194, 37.54977421447226,
41.58412572976232, 44.941669991135655, 49.1180480369138, 52.38271523482326,
56.50176707051081, 60.57393760983371, 63.87303519652563, 68.0351375604895,
71.31533204356978, 75.40385510990956, 79.49801348135624, 82.77402217900088,
86.93786877107172, 90.24611345372713, 94.31226009189126, 98.44285118106016,
101.7043076900916, 105.88782683965692, 109.27194606058474,
113.28783614342858, 117.49309693876717, 120.74809704301198,
124.98254961060135, 128.5873476779024, 132.40844848208263,
136.6749294747541, 139.94156816740724, 144.1983592475722,
148.14545349032844, 151.62144030887129, 155.8319950397483,
159.09433272967343, 163.2597738263683, 167.3223665547559,
170.65522850333411, 174.83452144026984, 178.12504860550467,
182.22651466309685, 186.3421294574009, 189.6227399928268,
193.8065656519798, 197.1642862930735, 201.20807788552673,
205.3975094108824, 208.65711477350672, 212.88343521713657,
216.43190276255493, 220.31199985079255, 224.58200873840067,
227.85291447247948, 232.12001940725273, 236.03689345336784,
239.54837471880063, 243.76834717578458, 247.03150776220156,
251.20920087120288, 255.2689681894636, 258.6114207165577,
262.79579859034027, 266.08989468718573, 270.1947825132999,
274.31749292925934, 277.59932415941677, 281.7894538604743,
285.16392806754476, 289.19856459965644, 293.4044099291463,
296.6657050625907, 300.9040422929824, 304.5067557833314, 308.3352918231952,
312.60709719997465, 315.8791018304225, 320.1400448090288,
324.1031891806555, 327.57022703947365, 331.78498177019605,
335.05933830967365, 339.2208333891389, 343.31122424049465,
346.6324035194733, 350.8245790256082, 354.15751255799046,
358.2367353309773, 362.4109920134186, 365.6817673236202,
369.9037215712655, 373.40539599676373, 377.3367493715103,
381.60689634853793, 384.8817092669326, 389.1558540654127};
```

```

SetX = {6.6748183915081665, 10.939738905193817, 14.206217951819346,
  18.470314128093857, 22.364194311317906, 25.89362165033557,
  30.112608644111585, 33.367155555645674, 37.550206953152546,
  41.58490349423436, 44.942217933822334, 49.11867899869272,
  52.38368711254185, 56.50257242740739, 60.575379492006924, 63.8741975508856,
  68.03660541546297, 71.31779658226421, 75.40586030222005, 79.50156254847118,
  82.7770765152063, 86.94182733756635, 90.25302923494705, 94.31759878290464,
  98.45193616142079, 101.71267663982715, 105.89868226927516,
  109.29185102990182, 113.3012267274621, 117.5130973912869,
  120.76866030672099, 125.00760852693027, 128.63655259556785,
  132.43349274865926, 136.6980824007899, 139.96344757705677,
  144.21564802183502, 148.1746250410072, 151.63694875837766,
  155.8442647447242, 159.10732274828342, 163.26781990367746,
  167.33346904766697, 170.66183235740783, 174.84011902410975,
  178.1322140346588, 182.2310268649998, 186.34849487184474,
  189.6274651613455, 193.81166217077657, 197.17262923577553,
  201.21356069914268, 205.40554543970833, 208.6647637971618,
  212.89261349138914, 216.44937060452727, 220.32119773137825,
  224.59137391207716, 227.86208202315734, 232.12813020414768,
  236.0515409205342, 239.55618574012888, 243.77479791227321,
  247.0384808231486, 251.21383975626924, 255.2758716499325,
  258.6157824117686, 262.79995544848515, 266.0957389917814, 270.198867602592,
  274.32389472644, 277.6045821874396, 281.7957445591399, 285.1748941913838,
  289.20590760649367, 293.41534511738786, 296.6766772249116,
  300.9173096939581, 304.53259007181384, 308.3484025539387, 312.6191725953592,
  315.8904156118985, 320.14883100154066, 324.1178286989451,
  327.5780325647013, 331.79109741348134, 335.0658483195786,
  339.22470058212207, 343.3162981423925, 346.6354406713474, 350.827060660096,
  354.16070493291465, 358.23850188425774, 362.4130866721588,
  365.6832887496057, 369.90513413124853, 373.40767632586727,
  377.3378308199963, 381.6077931097375, 384.882332622604, 389.1561791568845}

```

ENERGY iMin 92.74396732049851

Eigensystem
it is Shulter

```

EV = {4.267575911382765, 4.264647678154504, 4.2599910127503815,
      4.2536995368477895, 4.245493704448723, 4.235785143108674, 4.224130272167487,
      4.210864903547405, 4.195503789138993, 4.178674105323524, 4.159835983899003,
      4.139686626883762, 4.119991253537388, 4.0937911548346015,
      4.070467190636637, 4.045042118777732, 4.0199067497581105,
      3.994501924529173, 3.9583231922608713, 3.9261492880532853,
      3.894231171734741, 3.8454574545124016, 3.8172446283670816,
      3.7827442793098127, 3.7463630813161224, 3.7108700285823257,
      3.6714314688979233, 3.634447135622553, 3.5964620136228365,
      3.5591211070664333, 3.5240287603801774, 3.4874815726566206,
      3.4524852426670756, 3.417444140988508, 3.3986346037149877,
      3.3661530250641043, 3.3494551084810045, 3.3349273677754567,
      3.054961746751476, 3.0439521875006976, 2.4813728822213728,
      2.4677785196394755, 2.4478190834596303, 2.419327434316496,
      2.3924829032530632, 2.359398374985004, 2.3225272360610987,
      2.2826228376770183, 2.242649770454101, 2.200337197768251,
      2.1571983451600945, 2.1152138057604586, 2.0753630946618316,
      2.035255265863208, 1.9984592170727076, 1.9651958587798308,
      1.937625919362877, 1.9087884603474121, 1.8888107230222138,
      1.8751683420532808, 1.6517174901965817, 1.6404118159227166,
      0.9599633116994118, 0.94602001837192, 0.9311698573430595,
      0.9042077956402857, 0.8860796369240561, 0.8540491185004982,
      0.8224478430643578, 0.7896263919898419, 0.7586946368529816,
      0.7236816578779436, 0.6882366950078247, 0.6533092562185766,
      0.6297038721972562, 0.5886183900578182, 0.564499175072191,
      0.5470010152872388, 0.4923934655213659, 0.4764582223944475,
      0.33787171296231283, 0.32847071526856425, 0.3200639017668443,
      0.30710862321540205, 0.2321779874720208, 0.20514708904830953,
      0.1858786271229785, 0.1590901094907066, 0.15370205250573885,
      0.1234543036253675, 0.10486512339386736, 0.09270177150047312,
      0.07601784359404508, 0.06511937148779261, 0.054419473378622726,
      0.04620209743949373, 0.03577406231743259, 0.02744312611173523,
      0.0061105127447548205, 0.002060840775968921, -4.920526502793564`*^-16},

```

last EV zu - EW is also very asymmetric

```
{0.0007999506933871528, 0.0015393346775614066,
0.0021928139735898867, 0.002694997546184775, 0.005700687239260564,
0.0033977736251886905, 0.003555626846600974, 0.004653233595897962,
0.004022991123909599, 0.00737122190401745, 0.005296955381241568,
0.0062609423630416395, 0.009800700044800716, 0.008239428448968952,
0.014908833365079636, 0.012138004592283206, 0.015487121068035556,
0.026157152142957395, 0.021375398203640896, 0.03796841918677425,
0.03284013914271565, 0.04273467889768584, 0.07489425129072338,
0.05780280031389869, 0.09837332072012063, 0.09107205380412063,
0.11831820512013388, 0.21766979284599336, 0.1455846302803585,
0.21606847226737644, 0.22339630037195857, 0.27130247361738424,
0.5341829827198354, 0.270467983967568, 0.2458270137303741,
0.2307222246093865, 0.1782728972590327, 0.2962593908784895,
0.1571124999142849, 0.12277369040829016, 0.12884875299045048,
0.07808056477240573, 0.10504088188465771, 0.061038699801641734,
0.04919875333583897, 0.06015308643006956, 0.03556028560140444,
0.04652158425869254, 0.03213334315309738, 0.03139969300130344,
0.04849176939134584, 0.0300272897124695, 0.041245568096230506,
0.037595993033987606, 0.043289615673259674, 0.08107685707964954,
0.04191641036510536, 0.041203187134554696, 0.03915106229569526,
0.03332225366012054, 0.05879858858348195, 0.03088041271928086,
0.024584143349359742, 0.02558508992496628, 0.016072738520773677,
0.022529578136566523, 0.013401256590868119, 0.011455099835055455,
0.014767847275555553, 0.009366361505565968, 0.01332899135491089,
0.01014986300468116, 0.011168376781675746, 0.01870518263233699,
0.012057145708248765, 0.01727278410707482, 0.016996516328751946,
0.020160684899142314, 0.03905706693896958, 0.019689714125873472,
0.01785632848490752, 0.016571109617234656, 0.012640021411934406,
0.020807993923901393, 0.011062629600641513, 0.008598475015642077,
0.009107521493872962, 0.005360652445830104, 0.006962298285185379,
0.004142406555420948, 0.0033467226883032762, 0.004270215892113795,
0.002341162110815162, 0.0027422788179948263, 0.0019732055069867356,
0.0018103122653300124, 0.002905035909816211, 0.0013737164314936167,
0.0011343703180719316, 0.0007866144469326568, 0.0004095776741567485}
```

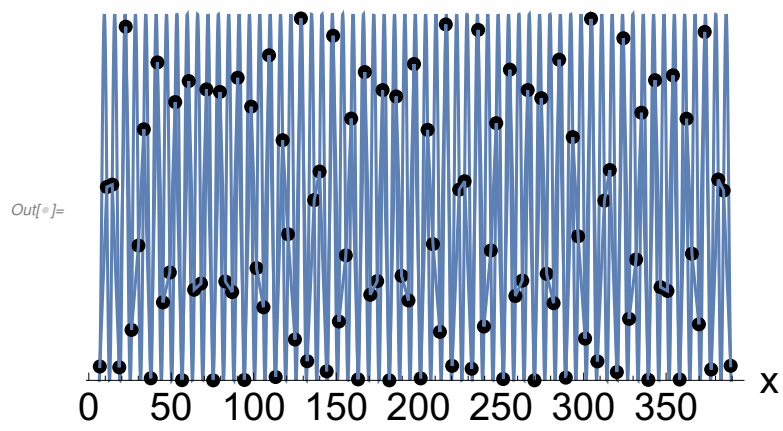
OLD first Run : for Dim 101 the 100 steps of optimization are not enough

SetX = {6.67472185344891, 10.939553743854638, 14.205955647211093,
 18.469994281993724, 22.363521613577678, 25.893226232371543,
 30.112206118958536, 33.36664147744194, 37.54977421447226, 41.58412572976232,
 44.941669991135655, 49.1180480369138, 52.38271523482326, 56.50176707051081,
 60.57393760983371, 63.87303519652563, 68.0351375604895, 71.31533204356978,
 75.40385510990956, 79.49801348135624, 82.77402217900088, 86.93786877107172,
 90.24611345372713, 94.31226009189126, 98.44285118106016, 101.7043076900916,
 105.88782683965692, 109.27194606058474, 113.28783614342858,
 117.49309693876717, 120.74809704301198, 124.98254961060135,
 128.5873476779024, 132.40844848208263, 136.6749294747541,
 139.94156816740724, 144.1983592475722, 148.14545349032844,
 151.62144030887129, 155.8319950397483, 159.09433272967343,
 163.2597738263683, 167.3223665547559, 170.65522850333411,
 174.83452144026984, 178.12504860550467, 182.22651466309685,
 186.3421294574009, 189.6227399928268, 193.8065656519798, 197.1642862930735,
 201.20807788552673, 205.3975094108824, 208.65711477350672,
 212.88343521713657, 216.43190276255493, 220.31199985079255,
 224.58200873840067, 227.85291447247948, 232.12001940725273,
 236.03689345336784, 239.54837471880063, 243.76834717578458,
 247.03150776220156, 251.20920087120288, 255.2689681894636,
 258.6114207165577, 262.79579859034027, 266.08989468718573,
 270.1947825132999, 274.31749292925934, 277.59932415941677,
 281.7894538604743, 285.16392806754476, 289.19856459965644,
 293.4044099291463, 296.6657050625907, 300.9040422929824, 304.5067557833314,
 308.3352918231952, 312.60709719997465, 315.8791018304225, 320.1400448090288,
 324.1031891806555, 327.57022703947365, 331.78498177019605,
 335.05933830967365, 339.2208333891389, 343.31122424049465,
 346.6324035194733, 350.8245790256082, 354.15751255799046, 358.2367353309773,
 362.4109920134186, 365.6817673236202, 369.9037215712655, 373.40539599676373,
 377.3367493715103, 381.60689634853793, 384.8817092669326, 389.1558540654127}

Eigenvalues

Out[*]= {4.26759, 4.26466, 4.25999, 4.25373, 4.24549, 4.23578, 4.22416, 4.2109, 4.19546,
 4.1787, 4.15986, 4.13968, 4.12004, 4.0938, 4.07032, 4.04513, 4.0202, 3.99418,
 3.95843, 3.92623, 3.8942, 3.84548, 3.81725, 3.78267, 3.74635, 3.71097,
 3.67137, 3.63435, 3.59653, 3.55925, 3.52381, 3.48758, 3.45248, 3.41691,
 3.39917, 3.36641, 3.34947, 3.33426, 3.05533, 3.04385, 2.48148, 2.46786,
 2.44775, 2.41939, 2.39247, 2.35936, 2.32252, 2.28268, 2.24258, 2.2003,
 2.15725, 2.11527, 2.07528, 2.03527, 1.99848, 1.96518, 1.9376, 1.90884,
 1.88873, 1.87506, 1.65182, 1.64003, 0.960587, 0.945968, 0.930914, 0.90373,
 0.886615, 0.854022, 0.822392, 0.789804, 0.758481, 0.723693, 0.688262,
 0.653081, 0.629975, 0.588792, 0.564086, 0.546513, 0.492793, 0.476221,
 0.337951, 0.328606, 0.320034, 0.306795, 0.23349, 0.204872, 0.185663, 0.159332,
 0.15395, 0.123279, 0.105288, 0.0929745, 0.0755523, 0.065226, 0.0544413,
 0.0459093, 0.0360451, 0.0273721, 0.00660963, 0.00290462, 0.00142244}

o.k. it is true flat Minimum ENERGY iMin 92.74398151867233



compressd but not symmetric ?

```

and node10926 energy = 92.7503149 detHess - 83.309
node10926 = {6.5532362392, 10.7955956170, 14.0578841797,
18.3170315102, 22.0684690326, 25.7426631173,
29.9896606365, 33.2470845093, 37.4708053247,
41.4681978288, 44.8784728803, 49.0696919149,
52.3304054462, 56.4715022149, 60.5355099917,
63.8513810300, 68.0191129446, 71.2974930991,
75.3945701052, 79.4879935384, 82.7690631103,
86.9356722215, 90.2455377755, 94.3136692811,
98.4476427943, 101.7101076175, 105.8968515475,
109.2896332758, 113.3003469195, 117.5126803516,
120.7688079582, 125.0083269390, 128.6383859929,
132.4345839014, 136.6993704202, 139.9649604350,
144.2171182992, 148.1774421460, 151.6386421017,
155.8459482830, 159.1095405979, 163.2695794639,
167.3365148420, 170.6641004090, 174.8427965506,
178.1365401688, 182.2344319762, 186.3543800630,
189.6326338212, 193.8182955607, 197.1845083260,
201.2219228830, 205.4186487886, 208.6779613088,
212.9090970164, 216.4814471288, 220.3382599808,
224.6090093566, 227.8798692201, 232.1441923275,
236.0810082544, 239.5724794579, 243.7892284375,
247.0554285073, 251.2262075752, 255.2959546059,
258.6298322923, 262.8154172182, 266.1198158145,
270.2171181980, 274.3545597847, 277.6316294682,
281.8300245916, 285.2368862195, 289.2473769588,
293.4769295150, 296.7406039378, 300.9945080514,
304.6851019455, 308.4250612202, 312.6868388737,
315.9534509398, 320.1952152160, 324.1922550815,
327.6178941280, 331.8220242494, 335.0989805785,
339.2440724382, 343.3412485025, 346.6503657631,
350.8391558756, 354.1762457556, 358.2470170494,
362.4230475380, 365.6904894793, 369.9117619565,
373.4183511681, 377.3428785737, 381.6119566850,
384.8852226378, 389.1576837881};

```

```
### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
```

N = 101 GOLD next iMin ? of SP1 - push above

```
### NMinimize: "Failed to converge to the
```

```
requested accuracy or precision within 100 iterations."
```

```
SetX = {6.674737397587952, 10.939583590910289, 14.205998024428967,
```

```
18.470046190157287, 22.363631234151704, 25.89329146759778,
```

```
30.112274269619245, 33.36673062392029, 37.54985143951289,
```

```
41.584267495900946, 44.94177209691856, 49.11816923212284, 52.38290555990362,
```

```
56.50192799415411, 60.574230111552474, 63.87327403288378, 68.03544355631624,
```

```
71.31584973211068, 75.4042800201294, 79.49877079065519, 82.77467710916243,
```

```
86.93872294465845, 90.24761003251702, 94.31342318154343, 98.44484231808096,
```

```
101.70614524720413, 105.89022183281102, 109.27634147562912,
```

```
113.29082224256214, 117.49760735632859, 120.7527405981876,
```

```
124.98825659145194, 128.59856617772675, 132.41422079463098,
```

```
136.68042073448038, 139.94688287732822, 144.2027411591458,
```

```
148.1530741216926, 151.6255949558665, 155.83549831955352,
```

```
159.09830420511682, 163.26250187014665, 167.32656553479242,
```

```
170.65803418327502, 174.83742451747733, 178.12938306329093,
```

```
182.22973571276404, 186.3474569137113, 189.62725277627325,
```

```
193.8121898683909, 197.1742017776585, 201.2150322791141, 205.40837574877787,
```

```
208.6679436387199, 212.89693510151858, 216.4580522101223,
```

```
220.32600317896467, 224.59671398555443, 227.86780465805944,
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232.13367359120792, 236.06212313171375, 239.56222886036832,
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```

```
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335.08624652341416, 339.2366867242914, 343.3318254522298,
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346.6447287181897, 350.8346027642365, 354.17039379946794,
```

```
358.24382295938693, 362.4193307227763, 365.6878045809431,
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```
369.90929632790085, 373.4143799754631, 377.34100246122284,
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```
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```

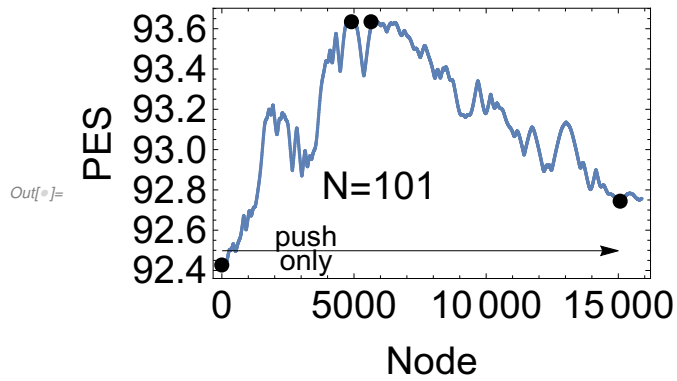
Eigenvalues

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3.99436, 3.95881, 3.92624, 3.89395, 3.84541, 3.8174, 3.78282, 3.7463, 3.71081,
3.67146, 3.6346, 3.59662, 3.55882, 3.52379, 3.48798, 3.45318, 3.41706,
3.39737, 3.36701, 3.35034, 3.3345, 3.05387, 3.04386, 2.48187, 2.46777,
2.44739, 2.41934, 2.39262, 2.35941, 2.32244, 2.28267, 2.24276, 2.20032,
2.1572, 2.1151, 2.07535, 2.03537, 1.99844, 1.96507, 1.93765, 1.90919,
1.88875, 1.87465, 1.65181, 1.64154, 0.960386, 0.945209, 0.930539, 0.905239,
0.886355, 0.853439, 0.822138, 0.789773, 0.758832, 0.723849, 0.688466,
0.652768, 0.629015, 0.589647, 0.565132, 0.546989, 0.491167, 0.476274,
0.337989, 0.328476, 0.319965, 0.30773, 0.23312, 0.203577, 0.184445, 0.160765,
0.154666, 0.122297, 0.10446, 0.0925621, 0.0767397, 0.0653407, 0.0544288,
0.0461599, 0.0350659, 0.027385, 0.00596907, 0.00116064, -0.000426028}
```

is again next SP

ENERGY SP 92.74399171388924

Join[NT101PushA0long, FKmketen101goSPpush];



```

### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ### ###
N = 101 GOLD next iMin
from Shouler - EV node 3111 energy = 92.7418109 detHess 23 775.8
node3111 = {6.6792900566, 10.9483400891, 14.2185048305,
18.4853639494, 22.3960284257, 25.9127842547, 30.1328503364, 33.3940225419,
37.5733888492, 41.6273629325, 44.9733392188, 49.1559129675, 52.4429790745,
56.5515788933, 60.6630896030, 63.9481180725, 68.1316131873,
71.4827074265, 75.5327476709, 79.7169059201, 82.9775696168,
87.2007564786, 90.7322438883, 94.6290187549, 98.8978629764,
102.1686446137, 106.4371880120, 110.3376303416, 113.8653933823,
118.0878919875, 121.3488241269, 125.5317791052, 129.5831816789,
132.9327954624, 137.1161731452, 140.4021161925, 144.5126857675,
148.6226739740, 151.9090027259, 156.0921591231, 159.4406748872,
163.4928576384, 167.6747116403, 170.9356945759, 175.1574253246,
178.6817545519, 182.5853700923, 186.8533919015, 190.1239579479,
194.3928648265, 198.2853963239, 201.8209216368, 206.0446368182,
209.3046644094, 213.4900737447, 217.5376948643, 220.8907582066,
225.0739124735, 228.3566346587, 232.4696466248, 236.5744479924,
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270.5139584394, 274.7759196304, 278.0443074778, 282.3126059404,
286.1633671990, 289.7392759591, 293.9691026026, 297.2253055116,
301.4226511813, 305.4505738594, 308.8220580155, 313.0046111313,
316.2725083144, 320.3968534211, 324.4756167085, 327.7763181951,
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346.7108869168, 350.8890925737, 354.2428165888, 358.2833960726,
362.4653340735, 365.7218376643, 369.9411174020, 373.4665509967,
377.3656661105, 381.6306330091, 384.8982534332, 389.1644621473};
Setxx = node3111;

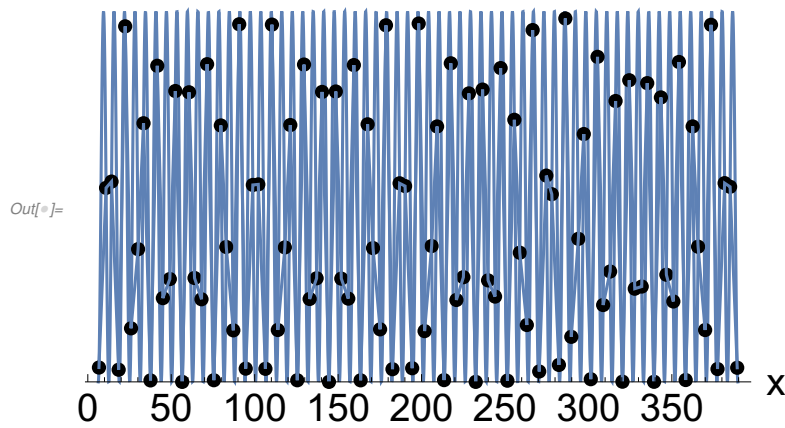
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44.97325206250895, 49.15580840410546, 52.442811043539535, 56.55144332441899,
60.66285116153745, 63.94791150925991, 68.13134804206457, 71.48223726327221,
75.53240932730613, 79.71636470854028, 82.97703439452673, 87.20008284975884,
90.73094681986684, 94.62830675523625, 98.89707665173985, 102.16783618433334,
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213.4897983318409, 217.5372972049726, 220.89052680197466, 225.0737192313073,
228.3563969318757, 232.46949778912278, 236.5742401671774, 239.8627894573662,
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```

Eigenvalues

```
Out[*]= {4.2676, 4.26474, 4.26009, 4.25322, 4.24589, 4.23582, 4.22412, 4.21064, 4.19557,
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3.70872, 3.67266, 3.63466, 3.59692, 3.55951, 3.52189, 3.48691, 3.45453,
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1.88824, 1.87546, 1.65012, 1.64657, 0.952917, 0.94535, 0.932695, 0.916681,
0.877554, 0.852793, 0.823478, 0.791453, 0.757155, 0.723427, 0.690039,
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0.337867, 0.327972, 0.318891, 0.312213, 0.216863, 0.205241, 0.190517,
0.175281, 0.13781, 0.122853, 0.107541, 0.0919572, 0.0767033, 0.0636212,
0.0533915, 0.0454844, 0.0315282, 0.0287429, 0.00724173, 0.0049447, 0.0031949}
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ENERGY iMin 92.74181024414557



start energy 92.741810874896601 SP
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 30.1327937918 × 33.3939471919 × 37.5733244689
 41.6272457959 × 44.9732523459 × 49.1558087635
 52.4428114631 × 56.5514437261 × 60.6628519477
 63.9479120752 × 68.1313488126 × 71.4822385021
 75.5324102856 × 79.7163663623 × 82.9770359281
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 132.9323502758 × 137.1157820146 × 140.4016134522
 144.5123623957 × 148.6222116698 × 151.9086720651
 156.0918183380 × 159.4401397155 × 163.4925120123
 167.6742150779 × 170.9352436876 × 175.1568967641
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 190.1234064100 × 194.3923541229 × 198.2844543719
 201.8204300507 × 206.0442394343 × 209.3042565721
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 236.5742689691 × 239.8628134535 × 244.0433677335
 247.3819869369 × 251.4406273399 × 255.6122411118
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 270.5137990404 × 274.7757396977 × 278.0441277458
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 293.9689691543 × 297.2251784317 × 301.4225739417
 305.4504709072 × 308.8220080482 × 313.0045854649
 316.2724971249 × 320.3968628967 × 324.4756566810
 327.7763641616 × 331.9448570861 × 335.2390632888
 339.3236015397 × 343.4397294898 × 346.7110900409
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 362.4659060941 × 365.7224095495 × 369.9418430740
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 384.8991678884 × 389.1653636931

SP node7004 energy = 93.6342077 detHess - 165.176

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 52.9276065230 × 56.8869868102 × 61.1770981414
 64.4707614671 × 68.7622846399 × 72.7071032919
 76.2174896889 × 80.4577476835 × 83.7571343894
 87.9324021234 × 92.0741842400 × 95.3930837569
 99.6223070509 × 103.0620163388 × 107.0761169894
 111.3479826913 × 114.6358564034 × 118.9232321434
 122.7679258999 × 126.3704866749 × 130.6215075253
 133.9021570965 × 138.1102839853 × 142.1976626370
 145.5507767733 × 149.7644214019 × 153.1188589401
 157.2050806341 × 161.4151121851 × 164.6949574713
 168.9465876116 × 172.5529581731 × 176.3936687833
 180.6811996918 × 183.9683842476 × 188.2392220607
 192.2549833012 × 195.6926341568 × 199.9214245408
 203.2406408668 × 207.3812862845 × 211.5569059455
 214.8565399667 × 219.0973066768 × 222.6102770439
 226.5524508450 × 230.8435927822 × 234.1378126190
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 284.3243768344 × 288.6164048675 × 292.5037078162
 296.0642043282 × 300.3077299580 × 303.5960912729
 307.7911392251 × 311.8997401566 × 315.2377554514
 319.4554652248 × 322.8400792043 × 326.9013143896
 331.1358091759 × 334.4183588307 × 338.6857973951
 342.3868511923 × 346.1346897268 × 350.4101292951
 353.6945140935 × 357.9443804345 × 361.9927862026
 365.3926934722 × 369.6114242463 × 372.9482328309
 377.0724240069 × 381.2587638683 × 384.5482772771
 388.7910076694 × 392.3444313291

node7430 energy = 93.634577 detHess 549.240409

6.7046368261 × 10.9958002326 × 14.2869634644
 18.5671159509 × 22.5673644296 × 26.0238047961
 30.2572005626 × 33.5737962910 × 37.7236616991
 41.8968213480 × 45.2001256646 × 49.4413663363
 52.9477821098 × 56.8986965837 × 61.1913715897
 64.4864771561 × 68.7782792576 × 72.7384193787
 76.2361150340 × 80.4762984498 × 83.7820519472
 87.9513990051 × 92.1062514937 × 95.4204308824
 99.6559145539 × 103.1229500783 × 107.1134704600
 111.3976610803 × 114.6901746480 × 118.9825535305
 122.8861821347 × 126.4348769339 × 130.6796859158
 133.9698083963 × 138.1600208993 × 142.2789866833
 145.6109770461 × 149.8325913431 × 153.2318617454

157.2813645401 × 161.5299433316 × 164.8120614981
 169.0870915789 × 172.8302637082 × 176.5326694779
 180.8015276767 × 184.0818105243 × 188.3187218719
 192.3781561162 × 195.7636424543 × 199.9816597535
 203.3168076238 × 207.4275830091 × 211.6195450722
 214.9072141475 × 219.1518374863 × 222.7071469947
 226.6022590673 × 230.8925458098 × 234.1840120887
 238.4661681019 × 242.4556600247 × 245.9216712543
 250.1552050214 × 253.4666207320 × 257.6222394223
 261.7848255674 × 265.0941941405 × 269.3355158543
 272.8187285250 × 276.7874486342 × 281.0734811197
 284.3666827802 × 288.6591971524 × 292.5865529878
 296.1101308752 × 300.3494463826 × 303.6462814986
 307.8276122812 × 311.9588871984 × 315.2833758798
 319.5082381338 × 322.9302040830 × 326.9599644816
 331.2204286609 × 334.5072154755 × 338.7893986804
 342.5932211460 × 346.2378901422 × 350.4949457457
 353.7744898793 × 357.9961137388 × 362.0672006280
 365.4344883007 × 369.6441494689 × 372.9867240262
 377.0937263228 × 381.2843240179 × 384.5662469528
 388.8076956236 × 392.3714537460

