```
>> demo_Polynomial_Dictionary_Learning
Starting to train the dictionary
solving the quadratic problem with YALMIP...

 num. of constraints =  5
 dim. of socp   var = 6,    num. of socp blk  =  1
 dim. of linear var  = 800
*********************************************************************
   SDPT3: Infeasible path-following algorithms
*********************************************************************
 version  predcorr  gam  expon  scale_data
    HKM      1      0.000   1        0
it pstep dstep pinfeas dinfeas  gap       prim-obj      dual-obj    cputime
-------------------------------------------------------------------
 0|0.000|0.000|7.5e-01|1.0e+01|1.3e+06| 2.250355e+04  0.000000e+00| 0:0:00| chol  1✓
1
 1|1.000|0.867|3.9e-05|1.5e+00|1.9e+05| 2.146778e+04 -6.017546e+01| 0:0:00| chol  1✓
1
 2|0.138|0.991|3.3e-05|4.6e-02|2.9e+04| 2.289168e+04 -1.978907e+02| 0:0:00| chol  1✓
1
 3|0.982|0.895|7.5e-06|1.4e-02|1.8e+04| 1.675140e+04 -1.865676e+02| 0:0:00| chol  1✓
1
 4|0.995|1.000|1.1e-06|3.0e-03|6.8e+02| 4.941669e+02 -1.779104e+02| 0:0:00| chol  1✓
1
 5|1.000|0.350|2.5e-06|2.1e-03|6.3e+02| 4.887475e+02 -1.372196e+02| 0:0:00| chol  1✓
1
 6|1.000|1.000|3.4e-07|3.0e-05|4.8e+02| 3.828464e+02 -9.940335e+01| 0:0:00| chol  1✓
1
 7|0.678|1.000|1.1e-07|3.1e-06|2.6e+02| 1.698102e+02 -9.203613e+01| 0:0:00| chol  1✓
1
 8|1.000|1.000|1.5e-09|3.2e-07|1.2e+02| 5.144112e+01 -6.769895e+01| 0:0:00| chol  1✓
1
 9|1.000|1.000|4.2e-10|3.0e-08|6.1e+01|-3.414997e+00 -6.413871e+01| 0:0:00| chol  1✓
1
10|1.000|1.000|8.3e-14|3.1e-09|2.5e+01|-3.061815e+01 -5.599878e+01| 0:0:00| chol  1✓
1
11|1.000|1.000|5.4e-14|3.0e-10|1.0e+01|-4.382245e+01 -5.400134e+01| 0:0:00| chol  1✓
1
12|1.000|1.000|1.9e-14|3.1e-11|4.1e+00|-4.827469e+01 -5.239320e+01| 0:0:00| chol  1✓
1
13|1.000|1.000|4.6e-15|4.0e-12|1.4e+00|-5.048675e+01 -5.190934e+01| 0:0:00| chol  1✓
1
14|1.000|1.000|1.4e-14|1.3e-12|5.9e-01|-5.109649e+01 -5.168158e+01| 0:0:00| chol  1✓
1
15|1.000|1.000|6.0e-15|1.0e-12|1.8e-01|-5.142239e+01 -5.160453e+01| 0:0:00| chol  1✓
1
16|1.000|1.000|3.1e-15|1.0e-12|7.8e-02|-5.149984e+01 -5.157759e+01| 0:0:00| chol  1✓
1
17|1.000|1.000|1.4e-15|1.0e-12|2.1e-02|-5.154645e+01 -5.156779e+01| 0:0:00| chol  1✓
1
18|1.000|1.000|6.8e-16|1.0e-12|9.3e-03|-5.155590e+01 -5.156523e+01| 0:0:00| chol  1✓
1
19|0.984|1.000|1.0e-15|1.0e-12|2.0e-03|-5.156221e+01 -5.156421e+01| 0:0:00| chol  1✓
1
```

```
20|1.000|1.000|5.4e-16|1.0e-12|9.5e-04|-5.156310e+01 -5.156405e+01| 0:0:00| chol  1↙
1
21|0.979|1.000|1.4e-15|1.0e-12|2.0e-04|-5.156378e+01 -5.156398e+01| 0:0:00| chol  1↙
1
22|1.000|1.000|1.8e-15|1.0e-12|9.4e-05|-5.156388e+01 -5.156398e+01| 0:0:00| chol  1↙
1
23|1.000|1.000|2.1e-15|1.0e-12|2.7e-05|-5.156394e+01 -5.156397e+01| 0:0:00| chol  1↙
1
24|1.000|1.000|4.3e-15|1.0e-12|8.9e-06|-5.156396e+01 -5.156397e+01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.00e-07
-------------------------------------------------------------------
 number of iterations   = 24
 primal objective value = -5.15639616e+01
 dual   objective value = -5.15639705e+01
 gap := trace(XZ)       = 8.94e-06
 relative gap           = 8.59e-08
 actual relative gap    = 8.59e-08
 rel. primal infeas     = 4.29e-15
 rel. dual   infeas     = 1.00e-12
 norm(X), norm(y), norm(Z) = 7.1e-01, 5.2e+01, 2.0e+01
 norm(A), norm(b), norm(C) = 5.8e+01, 2.9e+00, 7.7e+01
 Total CPU time (secs)  = 0.48
 CPU time per iteration = 0.02
 termination code       =  0
 DIMACS errors: 5.6e-15  0.0e+00  1.4e-12  0.0e+00  8.6e-08  8.6e-08
-------------------------------------------------------------------

ans =

   51.5640


 num. of constraints =  5
 dim. of socp  var  =  6,   num. of socp blk =  1
 dim. of linear var  = 800
********************************************************************
   SDPT3: Infeasible path-following algorithms
********************************************************************
 version  predcorr  gam  expon  scale_data
   HKM      1      0.000   1       0
it pstep dstep pinfeas dinfeas  gap      prim-obj      dual-obj    cputime
-------------------------------------------------------------------
 0|0.000|0.000|1.0e+00|2.5e+04|6.7e+10| 1.176693e+09  0.000000e+00| 0:0:00| chol  1↙
1
 1|1.000|0.869|3.9e-07|3.3e+03|1.1e+10| 1.197324e+09 -6.894822e+05| 0:0:00| chol  1↙
1
 2|0.325|0.782|2.6e-07|7.1e+02|4.3e+09| 1.342002e+09 -5.924791e+06| 0:0:00| chol  1↙
1
 3|0.521|0.353|1.3e-07|4.6e+02|3.6e+09| 1.431888e+09 -9.020929e+06| 0:0:00| chol  1↙
1
 4|0.161|0.512|1.1e-07|2.2e+02|2.6e+09| 1.448958e+09 -1.601077e+07| 0:0:00| chol  1↙
1
 5|0.297|0.317|7.4e-08|1.5e+02|2.3e+09| 1.423776e+09 -2.240309e+07| 0:0:00| chol  1↙
1
```

```
  6|0.110|0.638|6.6e-08|5.5e+01|1.8e+09| 1.398764e+09 -3.195433e+07| 0:0:00| chol  1↙
1
  7|0.337|0.206|4.4e-08|4.4e+01|1.6e+09| 1.303980e+09 -3.861661e+07| 0:0:00| chol  1↙
1
  8|0.096|0.786|3.9e-08|9.4e+00|1.3e+09| 1.250742e+09 -1.631309e+07| 0:0:00| chol  1↙
1
  9|0.093|0.225|3.5e-08|7.3e+00|1.3e+09| 1.220102e+09 -2.829444e+07| 0:0:00| chol  1↙
1
 10|0.114|0.129|2.9e-08|6.3e+00|1.3e+09| 1.175390e+09 -3.534144e+07| 0:0:00| chol  1↙
1
 11|0.108|0.336|2.3e-08|4.2e+00|1.2e+09| 1.120428e+09 -3.442835e+07| 0:0:00| chol  1↙
1
 12|0.035|0.576|2.2e-08|1.8e+00|1.2e+09| 1.097570e+09 -3.462526e+07| 0:0:00| chol  1↙
1
 13|0.090|0.148|1.4e-08|1.5e+00|1.2e+09| 1.065929e+09 -4.366703e+07| 0:0:00| chol  1↙
1
 14|0.053|0.158|5.4e-08|1.3e+00|1.1e+09| 1.040295e+09 -3.192332e+07| 0:0:00| chol  1↙
1
 15|0.163|0.225|8.2e-08|9.9e-01|1.1e+09| 1.010947e+09 -5.432875e+07| 0:0:00| chol  1↙
1
 16|0.118|0.634|8.4e-08|3.6e-01|1.0e+09| 9.352969e+08 -5.022181e+07| 0:0:00| chol  1↙
1
 17|0.152|0.139|1.3e-06|3.1e-01|9.7e+08| 8.658563e+08 -5.836395e+07| 0:0:00| chol  1↙
2
 18|0.060|0.326|2.1e-07|2.1e-01|9.4e+08| 8.424232e+08 -4.656924e+07| 0:0:00| chol  1↙
2
 19|0.080|0.216|2.1e-06|1.6e-01|9.2e+08| 8.176188e+08 -5.564543e+07| 0:0:00| chol  1↙
1
 20|0.079|0.079|9.1e-06|1.5e-01|9.1e+08| 7.916187e+08 -6.276663e+07| 0:0:00| chol  2↙
2
 21|0.055|0.070|7.0e-07|1.4e-01|9.0e+08| 7.786478e+08 -6.646472e+07| 0:0:00| chol  2↙
2
 22|0.043|0.072|6.0e-05|1.3e-01|9.0e+08| 7.691987e+08 -7.024621e+07| 0:0:00| chol  2↙
2
 23|0.036|0.059|2.2e-05|1.2e-01|9.0e+08| 7.599026e+08 -7.356726e+07| 0:0:00| chol  2↙
2
 24|0.037|0.093|8.0e-05|1.1e-01|8.9e+08| 7.530675e+08 -7.522886e+07| 0:0:00| chol  2↙
2
 25|0.037|0.133|7.3e-05|9.7e-02|8.8e+08| 7.417862e+08 -7.597709e+07| 0:0:00| chol  2↙
2
 26|0.055|0.086|3.8e-05|8.9e-02|8.7e+08| 7.310212e+08 -7.834875e+07| 0:0:00| chol  2↙
2
 27|0.047|0.048|3.5e-04|8.4e-02|8.7e+08| 7.205680e+08 -8.179108e+07| 0:0:00| chol  2↙
2
 28|0.042|0.043|5.5e-06|8.1e-02|8.6e+08| 7.132340e+08 -8.452882e+07| 0:0:00| chol  2↙
2
 29|0.033|0.038|1.6e-04|7.8e-02|8.6e+08| 7.066484e+08 -8.722759e+07| 0:0:00| chol  2↙
2
 30|0.036|0.053|1.7e-04|7.4e-02|8.6e+08| 7.021093e+08 -8.760900e+07| 0:0:00| chol  2↙
2
 31|0.036|0.048|1.5e-04|7.0e-02|8.5e+08| 6.903023e+08 -8.829619e+07| 0:0:00| chol  1↙
2
 32|0.125|0.100|1.3e-04|6.3e-02|8.4e+08| 6.719182e+08 -8.836680e+07| 0:0:00| chol  2↙
2
```

```
33|0.355|0.246|1.4e-04|4.8e-02|6.4e+08| 4.910292e+08 -8.608684e+07| 0:0:00| chol  2↙
2
34|0.347|0.745|1.5e-04|1.2e-02|4.9e+08| 4.238616e+08 -4.962896e+07| 0:0:00| chol  2↙
1
35|1.000|0.408|4.6e-04|7.2e-03|3.4e+08| 2.556696e+08 -6.997158e+07| 0:0:00| chol  1↙
1
36|1.000|1.000|5.4e-04|1.9e-05|2.1e+08| 1.697271e+08 -3.905066e+07| 0:0:00| chol  1↙
1
37|1.000|1.000|1.1e-05|2.8e-05|1.1e+08| 7.414782e+07 -3.125971e+07| 0:0:00| chol  1↙
1
38|1.000|1.000|5.5e-06|2.3e-06|4.0e+07| 3.130562e+07 -8.555377e+06| 0:0:00| chol  1↙
1
39|1.000|1.000|1.6e-06|1.1e-06|1.2e+07| 8.670775e+06 -3.485790e+06| 0:0:00| chol  1↙
1
40|1.000|1.000|1.1e-07|3.2e-07|5.4e+06| 4.192572e+06 -1.232741e+06| 0:0:00| chol  1↙
1
41|1.000|1.000|2.8e-08|2.1e-08|1.7e+06| 1.202258e+06 -4.538129e+05| 0:0:00| chol  1↙
1
42|1.000|1.000|8.0e-09|5.7e-09|7.2e+05| 5.531982e+05 -1.656558e+05| 0:0:00| chol  1↙
1
43|1.000|1.000|5.4e-09|1.6e-09|2.2e+05| 1.588396e+05 -5.916667e+04| 0:0:00| chol  1↙
1
44|1.000|1.000|6.4e-10|1.1e-09|9.5e+04| 7.273959e+04 -2.182580e+04| 0:0:00| chol  1↙
1
45|1.000|1.000|3.1e-10|1.3e-10|2.9e+04| 2.085089e+04 -7.666182e+03| 0:0:00| chol  1↙
1
46|1.000|1.000|5.5e-11|6.2e-11|1.2e+04| 9.539344e+03 -2.855446e+03| 0:0:00| chol  1↙
1
47|1.000|1.000|1.7e-11|1.1e-11|3.7e+03| 2.707605e+03 -1.007362e+03| 0:0:00| chol  1↙
1
48|1.000|1.000|6.8e-13|3.4e-12|1.6e+03| 1.224419e+03 -3.964395e+02| 0:0:00| chol  1↙
1
49|1.000|1.000|4.8e-13|1.0e-12|4.8e+02| 3.181659e+02 -1.614761e+02| 0:0:00| chol  1↙
1
50|1.000|1.000|1.4e-13|1.0e-12|2.1e+02| 1.235969e+02 -8.739205e+01| 0:0:00|
  sqlp stop: maximum number of iterations reached
-------------------------------------------------------------------
 number of iterations   = 50
 primal objective value =  1.69727101e+08
 dual   objective value = -3.90506625e+07
 gap := trace(XZ)       = 2.09e+08
 relative gap           = 1.00e+00
 actual relative gap    = 1.00e+00
 rel. primal infeas     = 5.37e-04
 rel. dual   infeas     = 1.86e-05
 norm(X), norm(y), norm(Z) = 7.1e+08, 3.9e+07, 5.5e+07
 norm(A), norm(b), norm(C) = 2.1e+06, 1.8e+06, 7.7e+01
 Total CPU time (secs) = 0.41
 CPU time per iteration = 0.01
 termination code       = -6
 DIMACS errors: 6.0e-04  0.0e+00  2.7e-05  0.0e+00  1.0e+00  1.0e+00
-------------------------------------------------------------------


ans =
```

```
   3.5825e+07

 Iteration   2   Total error is: 0.17112

 num. of constraints =  5
 dim. of socp   var  = 6,   num. of socp blk  =  1
 dim. of linear var  = 800
**********************************************************************
   SDPT3: Infeasible path-following algorithms
**********************************************************************
 version  predcorr  gam  expon   scale_data
   HKM       1      0.000   1         0
it pstep dstep pinfeas dinfeas  gap       prim-obj       dual-obj    cputime
-------------------------------------------------------------------
 0|0.000|0.000|1.0e+00|1.2e+03|3.0e+09| 5.359383e+07  0.000000e+00| 0:0:00| chol  1✔
1
 1|1.000|0.871|3.2e-07|1.6e+02|5.2e+08| 5.733928e+07 -5.579818e+04| 0:0:00| chol  1✔
1
 2|0.406|0.714|1.9e-07|4.4e+01|2.4e+08| 6.545243e+07 -2.964135e+05| 0:0:00| chol  1✔
1
 3|0.463|0.371|1.0e-07|2.8e+01|2.0e+08| 7.138657e+07 -4.918970e+05| 0:0:00| chol  1✔
1
 4|0.155|0.510|8.6e-08|1.4e+01|1.4e+08| 7.290361e+07 -9.181835e+05| 0:0:00| chol  1✔
1
 5|0.322|0.298|5.9e-08|9.6e+00|1.3e+08| 7.267735e+07 -1.276201e+06| 0:0:00| chol  1✔
1
 6|0.102|0.673|5.0e-08|3.1e+00|9.2e+07| 7.165417e+07 -1.920418e+06| 0:0:00| chol  1✔
1
 7|0.350|0.199|3.3e-08|2.5e+00|8.5e+07| 6.698302e+07 -2.321911e+06| 0:0:00| chol  1✔
1
 8|0.130|0.788|2.6e-08|5.3e-01|6.8e+07| 6.311470e+07 -8.656410e+05| 0:0:00| chol  1✔
1
 9|0.096|0.240|2.4e-08|4.1e-01|6.7e+07| 6.138114e+07 -1.662071e+06| 0:0:00| chol  1✔
1
10|0.120|0.148|2.4e-08|3.5e-01|6.5e+07| 5.878791e+07 -2.100275e+06| 0:0:00| chol  1✔
1
11|0.106|0.300|2.3e-08|2.4e-01|6.2e+07| 5.608273e+07 -2.159001e+06| 0:0:00| chol  1✔
1
12|0.036|0.655|2.3e-08|8.3e-02|5.9e+07| 5.492934e+07 -2.029912e+06| 0:0:00| chol  1✔
1
13|0.075|0.130|3.4e-09|7.2e-02|5.8e+07| 5.362457e+07 -2.426398e+06| 0:0:00| chol  1✔
1
14|0.140|0.220|1.9e-08|5.7e-02|5.7e+07| 5.210505e+07 -1.452436e+06| 0:0:00| chol  1✔
1
15|0.141|0.424|1.5e-07|3.3e-02|5.5e+07| 4.980689e+07 -3.143482e+06| 0:0:00| chol  1✔
1
16|0.312|0.529|2.7e-08|1.5e-02|4.8e+07| 4.308321e+07 -3.821487e+06| 0:0:00| chol  1✔
1
17|0.804|0.308|1.8e-06|1.1e-02|3.7e+07| 3.062575e+07 -4.512922e+06| 0:0:00| chol  1✔
1
18|0.767|0.466|3.2e-05|5.7e-03|3.1e+07| 2.506192e+07 -5.687684e+06| 0:0:00| chol  1✔
1
19|0.516|0.343|5.7e-06|3.7e-03|3.0e+07| 2.598508e+07 -2.467705e+06| 0:0:00| chol  1✔
```

```
1
20|0.841|1.000|2.6e-07|7.8e-08|1.6e+07| 1.154267e+07 -4.460166e+06| 0:0:00| chol  1↙
1
21|1.000|1.000|4.6e-07|1.8e-08|7.2e+06| 5.824862e+06 -1.392939e+06| 0:0:00| chol  1↙
1
22|0.901|0.941|4.5e-08|1.9e-08|1.5e+06| 1.181297e+06 -3.330500e+05| 0:0:00| chol  1↙
1
23|1.000|1.000|1.2e-08|9.1e-09|8.5e+05| 6.564798e+05 -1.912565e+05| 0:0:00| chol  1↙
1
24|1.000|1.000|7.3e-09|2.4e-09|2.3e+05| 1.701944e+05 -5.722604e+04| 0:0:00| chol  1↙
1
25|1.000|1.000|3.8e-10|1.5e-09|1.1e+05| 8.396844e+04 -2.518611e+04| 0:0:00| chol  1↙
1
26|1.000|1.000|8.2e-11|7.7e-11|3.1e+04| 2.335692e+04 -8.141898e+03| 0:0:00| chol  1↙
1
27|1.000|1.000|5.2e-11|1.6e-11|1.4e+04| 1.078696e+04 -3.264609e+03| 0:0:00| chol  1↙
1
28|1.000|1.000|6.0e-11|1.0e-11|4.2e+03| 3.053678e+03 -1.100452e+03| 0:0:00| chol  1↙
1
29|1.000|1.000|3.8e-12|1.2e-11|1.8e+03| 1.374684e+03 -4.462798e+02| 0:0:00| chol  1↙
1
30|1.000|1.000|5.7e-13|1.0e-12|5.4e+02| 3.624564e+02 -1.750221e+02| 0:0:00| chol  1↙
1
31|1.000|1.000|2.1e-13|1.0e-12|2.4e+02| 1.423461e+02 -9.359706e+01| 0:0:00| chol  1↙
1
32|1.000|1.000|7.9e-14|1.0e-12|6.7e+01| 6.083138e+00 -6.126565e+01| 0:0:00| chol  1↙
1
33|1.000|1.000|3.9e-15|1.0e-12|3.0e+01|-2.263600e+01 -5.251688e+01| 0:0:00| chol  1↙
1
34|1.000|1.000|7.1e-16|1.0e-12|7.2e+00|-4.202530e+01 -4.918410e+01| 0:0:00| chol  1↙
1
35|1.000|1.000|8.7e-16|1.0e-12|3.2e+00|-4.544966e+01 -4.862333e+01| 0:0:00| chol  1↙
1
36|0.967|0.987|8.6e-16|1.0e-12|3.9e-01|-4.801021e+01 -4.840115e+01| 0:0:00| chol  1↙
1
37|0.961|0.987|9.8e-15|1.0e-12|3.7e-02|-4.835455e+01 -4.839160e+01| 0:0:00| chol  1↙
1
38|0.963|0.980|4.1e-13|1.0e-12|1.6e-03|-4.838973e+01 -4.839129e+01| 0:0:00| chol  1↙
1
39|0.972|0.991|2.6e-11|1.0e-12|4.4e-05|-4.839124e+01 -4.839129e+01| 0:0:00| chol  2↙
2
40|0.974|1.000|5.6e-13|1.5e-12|4.4e-06|-4.839128e+01 -4.839129e+01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.00e-07
-------------------------------------------------------------
 number of iterations   = 40
 primal objective value = -4.83912839e+01
 dual   objective value = -4.83912882e+01
 gap := trace(XZ)        = 4.35e-06
 relative gap            = 4.45e-08
 actual relative gap     = 4.45e-08
 rel. primal infeas      = 5.56e-13
 rel. dual   infeas      = 1.50e-12
 norm(X), norm(y), norm(Z) = 3.0e+00, 5.5e+01, 2.1e+01
 norm(A), norm(b), norm(C) = 1.2e+05, 1.0e+05, 7.7e+01
```

```
 Total CPU time (secs)  = 0.28
 CPU time per iteration = 0.01
 termination code       =  0
 DIMACS errors: 7.8e-13  0.0e+00  2.1e-12  0.0e+00  4.4e-08  4.4e-08
--------------------------------------------------------------------
```

ans =

    48.3913

Iteration   3   Total error is: 0.0293

```
 num. of constraints =  5
 dim. of socp   var  =  6,    num. of socp blk  =  1
 dim. of linear var  = 800
 number of nearly dependent constraints = 1
 To remove these constraints, re-run sqlp.m with OPTIONS.rmdepconstr = 1.
**********************************************************************
   SDPT3: Infeasible path-following algorithms
**********************************************************************
 version  predcorr  gam  expon  scale_data
   HKM       1      0.000   1         0
it pstep dstep pinfeas dinfeas  gap       prim-obj        dual-obj     cputime
--------------------------------------------------------------------
 0|0.000|0.000|1.0e+00|2.5e+05|6.4e+11| 1.139331e+10  0.000000e+00| 0:0:00| chol  1 ↙
1
 1|1.000|0.875|3.6e-07|3.2e+04|1.1e+11| 1.223461e+10 -1.408024e+07| 0:0:00| chol  1 ↙
1
 2|0.421|0.703|2.1e-07|9.4e+03|5.2e+10| 1.397386e+10 -6.308723e+07| 0:0:00| chol  1 ↙
2
 3|0.448|0.379|1.1e-07|5.8e+03|4.3e+10| 1.521616e+10 -1.059905e+08| 0:0:00| chol  2 ↙
2
 4|0.159|0.502|9.6e-08|2.9e+03|3.1e+10| 1.555250e+10 -1.960542e+08| 0:0:00| chol  2 ↙
2
 5|0.314|0.304|6.6e-08|2.0e+03|2.7e+10| 1.552238e+10 -2.736706e+08| 0:0:00| chol  1 ↙
1
 6|0.105|0.653|5.9e-08|7.0e+02|2.0e+10| 1.530121e+10 -4.139555e+08| 0:0:00| chol  1 ↙
1
 7|0.357|0.204|3.8e-08|5.6e+02|1.8e+10| 1.428690e+10 -5.014867e+08| 0:0:00| chol  1 ↙
1
 8|0.110|0.751|3.4e-08|1.4e+02|1.5e+10| 1.359294e+10 -1.911355e+08| 0:0:00| chol  1 ↙
1
 9|0.111|0.255|3.1e-08|1.0e+02|1.5e+10| 1.316093e+10 -3.867210e+08| 0:0:00| chol  1 ↙
1
10|0.171|0.166|2.6e-08|8.7e+01|1.4e+10| 1.230701e+10 -5.082944e+08| 0:0:00| chol  1 ↙
1
11|0.121|0.203|2.5e-08|6.9e+01|1.3e+10| 1.170549e+10 -5.950889e+08| 0:0:00| chol  2 ↙
2
12|0.073|0.370|6.1e-09|4.4e+01|1.3e+10| 1.136577e+10 -6.964508e+08| 0:0:00| chol  1 ↙
1
13|0.127|0.204|3.5e-08|3.5e+01|1.3e+10| 1.086251e+10 -7.870207e+08| 0:0:00| chol  2 ↙
2
14|0.108|0.194|7.8e-07|2.8e+01|1.2e+10| 1.070657e+10 -5.387855e+08| 0:0:00| chol  2 ↙
2
```

```
15|0.049|0.219|8.1e-07|2.2e+01|1.2e+10| 1.013862e+10 -7.165471e+08| 0:0:00| chol  2↙
1
16|0.151|0.563|6.9e-07|9.5e+00|1.1e+10| 9.340935e+09 -6.511704e+08| 0:0:00| chol  1↙
2
17|0.094|0.155|2.3e-07|8.0e+00|1.1e+10| 8.987360e+09 -7.798668e+08| 0:0:00| chol  2↙
2
18|0.129|0.277|2.2e-07|5.8e+00|1.0e+10| 8.621396e+09 -7.675048e+08| 0:0:00| chol  1↙
2
19|0.099|0.132|4.6e-06|5.1e+00|1.0e+10| 8.228464e+09 -8.552944e+08| 0:0:00| chol  2↙
2
20|0.076|0.101|2.7e-06|4.5e+00|9.9e+09| 8.014132e+09 -9.128050e+08| 0:0:00| chol  2↙
2
21|0.057|0.107|1.1e-05|4.1e+00|9.8e+09| 7.862720e+09 -9.568473e+08| 0:0:00| chol  2↙
2
22|0.051|0.134|6.6e-06|3.5e+00|9.7e+09| 7.723007e+09 -9.754386e+08| 0:0:00| chol  2↙
2
23|0.051|0.226|1.2e-05|2.7e+00|9.4e+09| 7.584876e+09 -9.306856e+08| 0:0:00| chol  2↙
2
24|0.073|0.067|2.2e-05|2.5e+00|9.3e+09| 7.376885e+09 -9.463832e+08| 0:0:00| chol  2↙
2
25|0.052|0.076|3.7e-05|2.3e+00|9.3e+09| 7.274943e+09 -9.554572e+08| 0:0:00| chol  2↙
2
26|0.036|0.080|3.9e-05|2.2e+00|9.2e+09| 7.153266e+09 -9.327569e+08| 0:0:00| chol  2↙
2
27|0.120|0.119|6.6e-05|1.9e+00|9.0e+09| 6.901606e+09 -9.879086e+08| 0:0:00| chol  2↙
2
28|0.059|0.176|6.1e-05|1.6e+00|8.8e+09| 6.727714e+09 -9.912231e+08| 0:0:00| chol  2↙
2
29|0.055|0.111|6.2e-05|1.4e+00|8.7e+09| 6.585773e+09 -1.033559e+09| 0:0:00| chol  2↙
2
30|0.045|0.045|5.5e-05|1.3e+00|8.6e+09| 6.485193e+09 -1.061380e+09| 0:0:00| chol  2↙
2
31|0.032|0.053|1.0e-04|1.3e+00|8.6e+09| 6.424017e+09 -1.065559e+09| 0:0:00| chol  2↙
2
32|0.025|0.038|2.0e-04|1.2e+00|8.5e+09| 6.371478e+09 -1.079941e+09| 0:0:00| chol  2↙
2
33|0.022|0.047|1.7e-04|1.2e+00|8.5e+09| 6.331676e+09 -1.081539e+09| 0:0:00| chol  2↙
2
34|0.020|0.060|2.1e-04|1.1e+00|8.4e+09| 6.286770e+09 -1.075886e+09| 0:0:00| chol  2↙
2
35|0.028|0.053|4.2e-04|1.0e+00|8.4e+09| 6.236366e+09 -1.064648e+09| 0:0:00| chol  2↙
2
36|0.021|0.044|4.0e-04|9.8e-01|8.3e+09| 6.190518e+09 -1.072362e+09| 0:0:00| chol  2↙
2
37|0.036|0.042|4.7e-04|9.4e-01|8.3e+09| 6.128607e+09 -1.078276e+09| 0:0:00| chol  2↙
2
38|0.024|0.042|2.7e-04|9.0e-01|8.3e+09| 6.078299e+09 -1.094041e+09| 0:0:00| chol  2↙
2
39|0.042|0.045|3.0e-04|8.6e-01|8.2e+09| 6.007891e+09 -1.104179e+09| 0:0:00| chol  2↙
2
40|0.026|0.047|4.9e-04|8.2e-01|8.2e+09| 5.954204e+09 -1.121256e+09| 0:0:00| chol  2↙
2
41|0.037|0.046|6.6e-04|7.8e-01|8.2e+09| 5.891331e+09 -1.132217e+09| 0:0:00| chol  2↙
2
```

```
42|0.027|0.034|4.9e-04|7.6e-01|8.1e+09| 5.840261e+09 -1.153245e+09| 0:0:00| chol  2↙
2
43|0.028|0.031|4.1e-04|7.3e-01|8.1e+09| 5.796849e+09 -1.163038e+09| 0:0:00| chol  2↙
2
44|0.021|0.025|8.6e-04|7.1e-01|8.1e+09| 5.761006e+09 -1.177039e+09| 0:0:00| chol  2↙
2
45|0.025|0.026|8.5e-04|7.0e-01|8.1e+09| 5.726508e+09 -1.180253e+09| 0:0:00| chol  2↙
2
46|0.018|0.028|9.4e-04|6.8e-01|8.1e+09| 5.692790e+09 -1.182938e+09| 0:0:00| chol  2↙
2
47|0.047|0.033|5.2e-05|6.5e-01|8.0e+09| 5.625397e+09 -1.189595e+09| 0:0:00| chol  2↙
2
48|0.037|0.079|1.3e-04|6.0e-01|7.9e+09| 5.547399e+09 -1.166559e+09| 0:0:00| chol  2↙
2
49|0.049|0.073|5.3e-05|5.6e-01|7.8e+09| 5.456123e+09 -1.178049e+09| 0:0:00| chol  2↙
2
50|0.037|0.042|4.1e-04|5.4e-01|7.8e+09| 5.387125e+09 -1.201704e+09| 0:0:00|
  sqlp stop: maximum number of iterations reached
-------------------------------------------------------------------
 number of iterations   = 50
 primal objective value =  6.37147824e+09
 dual   objective value = -1.07994083e+09
 gap := trace(XZ)        = 8.53e+09
 relative gap           = 1.14e+00
 actual relative gap    = 1.00e+00
 rel. primal infeas     = 1.95e-04
 rel. dual   infeas     = 1.21e+00
 norm(X), norm(y), norm(Z) = 6.4e+09, 1.1e+09, 1.5e+09
 norm(A), norm(b), norm(C) = 2.4e+07, 1.9e+07, 7.7e+01
 Total CPU time (secs)  = 0.41
 CPU time per iteration = 0.01
 termination code       = -6
 DIMACS errors: 2.4e-04  0.0e+00  1.7e+00  0.0e+00  1.0e+00  1.1e+00
-------------------------------------------------------------------

ans =

   5.1208e+10

Iteration   4   Total error is: 6.145

 num. of constraints =   5
 dim. of socp  var  =  6,   num. of socp blk  =  1
 dim. of linear var  = 800
*********************************************************************
   SDPT3: Infeasible path-following algorithms
*********************************************************************
 version  predcorr  gam  expon  scale_data
   HKM       1      0.000   1        0
it pstep dstep pinfeas dinfeas  gap      prim-obj       dual-obj     cputime
-------------------------------------------------------------------
 0|0.000|0.000|1.0e+00|5.3e+02|1.9e+09| 3.393674e+07  0.000000e+00| 0:0:00| chol  1↙
1
 1|1.000|0.886|4.1e-07|6.0e+01|2.9e+08| 3.539826e+07 -2.740491e+04| 0:0:00| chol  1↙
```

```
1
  2|0.414|0.731|2.4e-07|1.6e+01|1.3e+08| 3.990478e+07 -1.503949e+05| 0:0:00| chol  1↙
1
  3|0.498|0.390|1.2e-07|9.9e+00|1.1e+08| 4.277440e+07 -2.453877e+05| 0:0:00| chol  1↙
1
  4|0.164|0.495|1.0e-07|5.0e+00|8.1e+07| 4.341163e+07 -4.514865e+05| 0:0:00| chol  1↙
1
  5|0.305|0.321|7.1e-08|3.4e+00|7.0e+07| 4.291472e+07 -6.346700e+05| 0:0:00| chol  1↙
1
  6|0.110|0.601|6.2e-08|1.4e+00|5.5e+07| 4.222129e+07 -9.747226e+05| 0:0:00| chol  1↙
1
  7|0.370|0.227|3.9e-08|1.0e+00|5.0e+07| 3.927169e+07 -1.185710e+06| 0:0:00| chol  1↙
1
  8|0.079|0.842|2.5e-08|1.7e-01|4.1e+07| 3.804043e+07 -7.040997e+05| 0:0:00| chol  1↙
1
  9|0.081|0.224|2.3e-08|1.3e-01|4.0e+07| 3.727890e+07 -1.062006e+06| 0:0:00| chol  1↙
1
 10|0.083|0.119|2.1e-08|1.1e-01|3.9e+07| 3.641870e+07 -1.211509e+06| 0:0:00| chol  1↙
1
 11|0.117|0.605|6.9e-09|4.5e-02|3.6e+07| 3.399213e+07 -7.672446e+05| 0:0:00| chol  1↙
1
 12|0.073|0.236|6.5e-09|3.4e-02|3.6e+07| 3.315714e+07 -1.251250e+06| 0:0:00| chol  1↙
1
 13|0.116|0.255|8.7e-08|2.5e-02|3.5e+07| 3.186613e+07 -1.563148e+06| 0:0:00| chol  1↙
1
 14|0.105|0.245|2.1e-07|1.9e-02|3.4e+07| 3.117159e+07 -1.800406e+06| 0:0:00| chol  1↙
1
 15|0.121|0.135|3.6e-07|1.7e-02|3.3e+07| 3.016540e+07 -2.017289e+06| 0:0:00| chol  1↙
1
 16|0.114|0.151|4.0e-07|1.4e-02|3.3e+07| 2.951760e+07 -2.239081e+06| 0:0:00| chol  1↙
1
 17|0.072|0.331|8.1e-07|9.5e-03|3.2e+07| 2.916003e+07 -2.516270e+06| 0:0:00| chol  1↙
1
 18|0.157|0.479|1.1e-06|4.9e-03|3.1e+07| 2.879978e+07 -1.816235e+06| 0:0:00| chol  1↙
1
 19|0.485|0.397|1.3e-05|3.0e-03|2.6e+07| 2.263802e+07 -3.034186e+06| 0:0:00| chol  1↙
1
 20|0.739|1.000|1.9e-06|9.3e-08|2.2e+07| 2.017711e+07 -1.713498e+06| 0:0:00| chol  1↙
1
 21|1.000|1.000|1.6e-07|4.0e-08|1.3e+07| 1.019958e+07 -2.548676e+06| 0:0:00| chol  1↙
1
 22|0.979|1.000|1.0e-07|3.2e-08|3.4e+06| 2.730063e+06 -6.841905e+05| 0:0:00| chol  1↙
1
 23|1.000|1.000|4.4e-08|2.0e-08|1.9e+06| 1.555115e+06 -3.805683e+05| 0:0:00| chol  1↙
1
 24|1.000|1.000|1.6e-08|8.8e-09|6.1e+05| 4.668690e+05 -1.406342e+05| 0:0:00| chol  1↙
1
 25|1.000|1.000|4.5e-09|3.3e-09|2.7e+05| 2.143293e+05 -6.041641e+04| 0:0:00| chol  1↙
1
 26|1.000|1.000|2.5e-09|8.9e-10|8.6e+04| 6.451039e+04 -2.151950e+04| 0:0:00| chol  1↙
1
 27|1.000|1.000|1.4e-10|5.0e-10|3.7e+04| 2.845206e+04 -8.482169e+03| 0:0:00| chol  1↙
1
 28|1.000|1.000|4.1e-12|2.7e-11|1.1e+04| 8.395973e+03 -2.911194e+03| 0:0:00| chol  1↙
```

```
1
29|1.000|1.000|1.5e-12|1.0e-12|4.9e+03| 3.719542e+03 -1.141584e+03| 0:0:00| chol  1↙
1
30|1.000|1.000|3.8e-12|1.0e-12|1.5e+03| 1.054936e+03 -4.054406e+02| 0:0:00| chol  1↙
1
31|1.000|1.000|3.0e-13|1.0e-12|6.3e+02| 4.535843e+02 -1.801291e+02| 0:0:00| chol  1↙
1
32|1.000|1.000|2.6e-13|1.0e-12|1.9e+02| 9.751270e+01 -8.848498e+01| 0:0:00| chol  1↙
1
33|1.000|1.000|4.0e-14|1.0e-12|8.2e+01| 1.958106e+01 -6.209611e+01| 0:0:00| chol  1↙
1
34|1.000|1.000|5.4e-15|1.0e-12|2.2e+01|-2.962071e+01 -5.176868e+01| 0:0:00| chol  1↙
1
35|1.000|1.000|7.7e-16|1.0e-12|9.8e+00|-3.958286e+01 -4.940542e+01| 0:0:00| chol  1↙
1
36|0.990|1.000|9.6e-16|1.0e-12|1.8e+00|-4.667970e+01 -4.850026e+01| 0:0:00| chol  1↙
1
37|1.000|1.000|2.8e-15|1.0e-12|6.8e-01|-4.773833e+01 -4.841966e+01| 0:0:00| chol  1↙
1
38|0.971|0.976|2.9e-15|1.0e-12|3.8e-02|-4.835525e+01 -4.839318e+01| 0:0:00| chol  1↙
1
39|0.982|0.986|6.1e-14|1.0e-12|6.8e-04|-4.839177e+01 -4.839245e+01| 0:0:00| chol  1↙
1
40|0.986|0.991|2.2e-13|1.0e-12|2.2e-05|-4.839242e+01 -4.839244e+01| 0:0:00| chol  2↙
2
41|0.975|1.000|4.2e-13|1.0e-12|1.4e-06|-4.839244e+01 -4.839244e+01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.00e-07
-------------------------------------------------------------------
 number of iterations   = 41
 primal objective value = -4.83924383e+01
 dual   objective value = -4.83924398e+01
 gap := trace(XZ)       = 1.43e-06
 relative gap           = 1.46e-08
 actual relative gap    = 1.46e-08
 rel. primal infeas     = 4.22e-13
 rel. dual   infeas     = 1.00e-12
 norm(X), norm(y), norm(Z) = 3.0e+00, 5.5e+01, 2.1e+01
 norm(A), norm(b), norm(C) = 4.7e+04, 4.9e+04, 7.7e+01
 Total CPU time (secs) = 0.32
 CPU time per iteration = 0.01
 termination code       =  0
 DIMACS errors: 4.5e-13  0.0e+00  1.4e-12  0.0e+00  1.5e-08  1.5e-08
-------------------------------------------------------------------

ans =

   48.3924

Iteration   5   Total error is: 0.0293

 num. of constraints =  5
 dim. of socp  var  =  6,   num. of socp blk =  1
 dim. of linear var  = 800
 number of nearly dependent constraints = 1
```

 To remove these constraints, re-run sqlp.m with OPTIONS.rmdepconstr = 1.
****
   SDPT3: Infeasible path-following algorithms
****
 version predcorr gam expon scale_data
   HKM   1   0.000   1   0
it pstep dstep pinfeas dinfeas gap   prim-obj   dual-obj   cputime
----
 0|0.000|0.000|1.0e+00|9.3e+04|3.5e+11| 6.174828e+09 0.000000e+00| 0:0:00| chol 1 1
 1|1.000|0.885|3.8e-07|1.1e+04|5.7e+10| 6.913315e+09 -9.191391e+06| 0:0:00| chol 1 1
 2|0.507|0.671|1.9e-07|3.5e+03|3.0e+10| 7.923075e+09 -3.249109e+07| 0:0:00| chol 1 1
 3|0.415|0.414|1.1e-07|2.1e+03|2.3e+10| 8.583826e+09 -5.732195e+07| 0:0:00| chol 1 2
 4|0.181|0.467|8.9e-08|1.1e+03|1.8e+10| 8.787666e+09 -1.028348e+08| 0:0:00| chol 2 2
 5|0.271|0.339|6.5e-08|7.3e+02|1.5e+10| 8.778898e+09 -1.484654e+08| 0:0:00| chol 1 1
 6|0.124|0.558|5.7e-08|3.2e+02|1.2e+10| 8.634156e+09 -2.292167e+08| 0:0:00| chol 1 1
 7|0.372|0.243|3.6e-08|2.4e+02|1.1e+10| 8.007353e+09 -2.832229e+08| 0:0:00| chol 1 1
 8|0.088|0.817|3.3e-08|4.4e+01|8.5e+09| 7.752883e+09 -2.330104e+08| 0:0:00| chol 1 1
 9|0.110|0.201|2.9e-08|3.5e+01|8.3e+09| 7.534750e+09 -3.099778e+08| 0:0:00| chol 1 1
10|0.140|0.105|2.0e-08|3.2e+01|8.1e+09| 7.178379e+09 -3.291586e+08| 0:0:00| chol 2 2
11|0.013|0.166|7.6e-08|2.6e+01|7.8e+09| 7.010344e+09 -1.366368e+08| 0:0:00| chol 1 1
12|0.079|0.348|5.2e-08|1.7e+01|7.5e+09| 6.810783e+09 -2.317221e+08| 0:0:00| chol 1 1
13|0.091|0.145|1.1e-07|1.5e+01|7.4e+09| 6.616147e+09 -2.975315e+08| 0:0:00| chol 2 1
14|0.089|0.170|7.9e-08|1.2e+01|7.3e+09| 6.465254e+09 -3.442130e+08| 0:0:00| chol 2 2
15|0.077|0.123|2.9e-07|1.1e+01|7.2e+09| 6.288152e+09 -3.867631e+08| 0:0:00| chol 2 2
16|0.059|0.243|4.1e-07|8.1e+00|7.0e+09| 6.173492e+09 -4.123312e+08| 0:0:00| chol 2 1
17|0.106|0.088|1.1e-06|7.4e+00|6.9e+09| 5.936963e+09 -4.407332e+08| 0:0:00| chol 2 2
18|0.046|0.338|1.2e-06|4.9e+00|6.7e+09| 5.870240e+09 -4.517907e+08| 0:0:00| chol 2 2
19|0.072|0.303|1.1e-06|3.4e+00|6.6e+09| 5.699965e+09 -4.440984e+08| 0:0:00| chol 2 2
20|0.045|0.177|1.0e-06|2.8e+00|6.4e+09| 5.551652e+09 -2.933244e+08| 0:0:00| chol 1 1
21|0.112|0.320|9.3e-07|1.9e+00|6.2e+09| 5.331618e+09 -3.936539e+08| 0:0:00| chol 2 2
22|0.131|0.131|2.0e-06|1.7e+00|5.9e+09| 5.002749e+09 -4.685885e+08| 0:0:00| chol 2 2

```
23|0.087|0.074|3.9e-06|1.5e+00|5.9e+09| 4.842444e+09 -5.049801e+08| 0:0:00| chol 2↙
2
24|0.060|0.137|1.5e-05|1.3e+00|5.8e+09| 4.756946e+09 -5.337406e+08| 0:0:00| chol 2↙
2
25|0.068|0.112|4.9e-05|1.2e+00|5.7e+09| 4.626010e+09 -5.534614e+08| 0:0:00| chol 2↙
2
26|0.056|0.269|4.7e-05|8.6e-01|5.5e+09| 4.545971e+09 -5.310099e+08| 0:0:00| chol 2↙
2
27|0.108|0.074|4.9e-05|8.0e-01|5.4e+09| 4.341138e+09 -5.468638e+08| 0:0:00| chol 2↙
2
28|0.028|0.111|6.9e-05|7.1e-01|5.4e+09| 4.276890e+09 -5.302749e+08| 0:0:00| chol 2↙
2
29|0.113|0.195|7.9e-05|5.7e-01|5.2e+09| 4.134813e+09 -5.188012e+08| 0:0:00| chol 2↙
2
30|0.064|0.157|9.2e-05|4.8e-01|5.1e+09| 4.015704e+09 -5.574109e+08| 0:0:00| chol 2↙
2
31|0.065|0.136|5.7e-05|4.2e-01|5.0e+09| 3.919634e+09 -5.701787e+08| 0:0:00| chol 2↙
2
32|0.056|0.073|1.3e-04|3.9e-01|5.0e+09| 3.849386e+09 -5.834916e+08| 0:0:00| chol 2↙
2
33|0.047|0.068|1.5e-04|3.6e-01|5.0e+09| 3.799179e+09 -5.931793e+08| 0:0:00| chol 2↙
2
34|0.033|0.057|5.2e-04|3.4e-01|4.9e+09| 3.755042e+09 -6.063797e+08| 0:0:00| chol 2↙
2
35|0.042|0.070|5.0e-04|3.2e-01|4.9e+09| 3.715868e+09 -6.067500e+08| 0:0:00| chol 2↙
2
36|0.029|0.081|4.9e-04|2.9e-01|4.8e+09| 3.673445e+09 -6.013281e+08| 0:0:00| chol 2↙
2
37|0.060|0.100|4.4e-04|2.6e-01|4.8e+09| 3.614884e+09 -5.906931e+08| 0:0:00| chol 2↙
2
38|0.041|0.086|3.8e-04|2.4e-01|4.7e+09| 3.558144e+09 -6.042951e+08| 0:0:00| chol 2↙
1
39|0.047|0.093|3.8e-04|2.2e-01|4.7e+09| 3.508131e+09 -6.058884e+08| 0:0:00| chol 2↙
2
40|0.047|0.037|6.9e-04|2.1e-01|4.6e+09| 3.453552e+09 -6.201958e+08| 0:0:00| chol 2↙
2
41|0.034|0.029|3.2e-03|2.0e-01|4.6e+09| 3.422438e+09 -6.299097e+08| 0:0:00| chol 2↙
2
42|0.033|0.025|8.3e-03|2.0e-01|4.6e+09| 3.394075e+09 -6.396374e+08| 0:0:00| chol 2↙
2
43|0.041|0.023|3.9e-03|1.9e-01|4.6e+09| 3.363380e+09 -6.494027e+08| 0:0:00| chol 2↙
2
44|0.018|0.021|5.0e-03|1.9e-01|4.6e+09| 3.344388e+09 -6.573352e+08| 0:0:00| chol 2↙
2
45|0.036|0.028|1.2e-02|1.8e-01|4.6e+09| 3.326326e+09 -6.494618e+08| 0:0:00| chol 2↙
2
46|0.087|0.068|1.0e-02|1.7e-01|4.4e+09| 3.147301e+09 -6.442824e+08| 0:0:00| chol 2↙
2
47|0.167|0.293|9.1e-03|1.2e-01|4.0e+09| 2.956491e+09 -5.392748e+08| 0:0:00| chol 2↙
1
48|0.388|0.354|6.1e-03|7.8e-02|3.1e+09| 2.190955e+09 -4.859317e+08| 0:0:00| chol 2↙
1
49|0.219|0.201|4.8e-03|6.3e-02|3.2e+09| 2.030926e+09 -4.855090e+08| 0:0:00| chol 2↙
2
```

```
50|0.303|0.123|2.9e-03|5.5e-02|3.3e+09| 1.857063e+09 -4.992407e+08| 0:0:00|
  sqlp stop: maximum number of iterations reached
-------------------------------------------------------------------
 number of iterations   = 50
 primal objective value =  4.75694632e+09
 dual   objective value = -5.33740566e+08
 gap := trace(XZ)       = 5.81e+09
 relative gap           = 1.10e+00
 actual relative gap    = 1.00e+00
 rel. primal infeas     = 1.45e-05
 rel. dual   infeas     = 1.33e+00
 norm(X), norm(y), norm(Z) = 1.9e+09, 5.3e+08, 7.6e+08
 norm(A), norm(b), norm(C) = 1.0e+07, 1.0e+07, 7.7e+01
 Total CPU time (secs)  = 0.33
 CPU time per iteration = 0.01
 termination code       = -6
 DIMACS errors: 1.7e-05  0.0e+00  1.9e+00  0.0e+00  1.0e+00  1.1e+00
-------------------------------------------------------------------


ans =

   2.7732e+10


Iteration   6   Total error is: 4.6806

 num. of constraints =  5
 dim. of socp  var  = 6,   num. of socp blk  =  1
 dim. of linear var = 800
*********************************************************************
   SDPT3: Infeasible path-following algorithms
*********************************************************************
 version  predcorr  gam  expon  scale_data
   HKM       1      0.000   1        0
it pstep dstep pinfeas dinfeas  gap      prim-obj      dual-obj     cputime
-------------------------------------------------------------------
 0|0.000|0.000|1.0e+00|2.5e+02|7.9e+08| 1.393046e+07  0.000000e+00| 0:0:00| chol  1✔
1
 1|1.000|0.886|3.4e-07|2.8e+01|1.3e+08| 1.538270e+07 -1.937653e+04| 0:0:00| chol  1✔
1
 2|0.503|0.667|1.7e-07|9.4e+00|6.6e+07| 1.761370e+07 -7.061471e+04| 0:0:00| chol  1✔
1
 3|0.406|0.416|1.0e-07|5.5e+00|5.2e+07| 1.905125e+07 -1.270872e+05| 0:0:00| chol  1✔
1
 4|0.183|0.466|8.4e-08|2.9e+00|3.9e+07| 1.950960e+07 -2.286129e+05| 0:0:00| chol  1✔
1
 5|0.270|0.343|6.1e-08|1.9e+00|3.3e+07| 1.948758e+07 -3.308995e+05| 0:0:00| chol  1✔
1
 6|0.127|0.555|5.1e-08|8.6e-01|2.6e+07| 1.916132e+07 -5.084546e+05| 0:0:00| chol  1✔
1
 7|0.370|0.249|3.2e-08|6.4e-01|2.4e+07| 1.776089e+07 -6.274622e+05| 0:0:00| chol  1✔
1
 8|0.087|0.832|2.5e-08|1.1e-01|1.9e+07| 1.722020e+07 -5.619039e+05| 0:0:00| chol  1✔
1
 9|0.122|0.204|2.2e-08|8.6e-02|1.8e+07| 1.668492e+07 -7.188295e+05| 0:0:00| chol  1✔
```

```
1
10|0.161|0.092|1.8e-08|7.8e-02|1.8e+07| 1.585597e+07 -7.538894e+05| 0:0:00| chol  1↙
1
11|0.011|0.171|8.3e-08|6.5e-02|1.7e+07| 1.564712e+07 -3.949174e+05| 0:0:00| chol  1↙
1
12|0.083|0.394|7.6e-08|3.9e-02|1.6e+07| 1.515472e+07 -5.473816e+05| 0:0:00| chol  1↙
1
13|0.067|0.168|7.1e-08|3.3e-02|1.6e+07| 1.484245e+07 -6.444982e+05| 0:0:00| chol  1↙
1
14|0.073|0.171|1.5e-08|2.7e-02|1.6e+07| 1.463260e+07 -6.947526e+05| 0:0:00| chol  1↙
1
15|0.057|0.145|1.8e-07|2.3e-02|1.6e+07| 1.446775e+07 -7.658857e+05| 0:0:00| chol  1↙
1
16|0.066|0.088|5.1e-07|2.1e-02|1.6e+07| 1.417152e+07 -8.212361e+05| 0:0:00| chol  1↙
1
17|0.058|0.089|1.1e-06|1.9e-02|1.5e+07| 1.402888e+07 -8.769595e+05| 0:0:00| chol  1↙
1
18|0.045|0.100|7.6e-07|1.7e-02|1.5e+07| 1.391009e+07 -9.386475e+05| 0:0:00| chol  1↙
1
19|0.055|0.281|1.1e-08|1.2e-02|1.5e+07| 1.383312e+07 -8.920244e+05| 0:0:00| chol  1↙
1
20|0.078|0.212|8.8e-07|9.8e-03|1.5e+07| 1.360355e+07 -1.033343e+06| 0:0:00| chol  1↙
1
21|0.136|1.000|7.9e-07|1.0e-08|1.4e+07| 1.333315e+07 -9.887963e+05| 0:0:00| chol  1↙
1
22|0.249|0.767|4.2e-07|7.8e-09|1.4e+07| 1.291557e+07 -1.365230e+06| 0:0:00| chol  1↙
1
23|0.352|1.000|1.9e-07|7.4e-09|1.4e+07| 1.215660e+07 -1.524128e+06| 0:0:00| chol  1↙
1
24|1.000|1.000|3.8e-08|1.1e-08|1.0e+07| 8.642359e+06 -1.557175e+06| 0:0:00| chol  1↙
1
25|1.000|1.000|1.1e-07|7.7e-09|5.9e+06| 4.940083e+06 -9.574853e+05| 0:0:00| chol  1↙
1
26|1.000|1.000|6.3e-08|1.1e-08|1.9e+06| 1.593065e+06 -3.501573e+05| 0:0:00| chol  1↙
1
27|1.000|1.000|1.7e-08|1.3e-08|8.5e+05| 6.769163e+05 -1.751972e+05| 0:0:00| chol  1↙
1
28|1.000|1.000|9.1e-09|3.5e-09|3.3e+05| 2.585922e+05 -6.650120e+04| 0:0:00| chol  1↙
1
29|1.000|1.000|1.1e-10|1.8e-09|1.3e+05| 9.863422e+04 -3.010273e+04| 0:0:00| chol  1↙
1
30|1.000|1.000|2.8e-10|2.3e-11|4.7e+04| 3.692946e+04 -1.055628e+04| 0:0:00| chol  1↙
1
31|1.000|1.000|4.1e-11|3.4e-11|1.7e+04| 1.306497e+04 -4.346712e+03| 0:0:00| chol  1↙
1
32|1.000|1.000|6.0e-12|8.3e-12|6.5e+03| 4.957029e+03 -1.495568e+03| 0:0:00| chol  1↙
1
33|1.000|1.000|1.7e-12|1.2e-12|2.2e+03| 1.631224e+03 -5.921717e+02| 0:0:00| chol  1↙
1
34|1.000|1.000|5.3e-13|1.0e-12|8.7e+02| 6.380774e+02 -2.328758e+02| 0:0:00| chol  1↙
1
35|1.000|1.000|3.8e-13|1.0e-12|2.8e+02| 1.671470e+02 -1.097695e+02| 0:0:00| chol  1↙
1
36|1.000|1.000|1.6e-14|1.0e-12|1.2e+02| 4.705761e+01 -6.897725e+01| 0:0:00| chol  1↙
```

```
1
37|1.000|1.000|2.8e-15|1.0e-12|3.3e+01|-2.073583e+01 -5.383903e+01| 0:0:00| chol  1↙
1
38|1.000|1.000|8.1e-15|1.0e-12|1.4e+01|-3.564927e+01 -5.002301e+01| 0:0:00| chol  1↙
1
39|1.000|1.000|2.4e-15|1.0e-12|3.0e+00|-4.560072e+01 -4.858697e+01| 0:0:00| chol  1↙
1
40|1.000|1.000|2.6e-15|1.0e-12|1.3e+00|-4.714194e+01 -4.841960e+01| 0:0:00| chol  1↙
1
41|0.966|0.974|1.2e-15|1.0e-12|1.1e-01|-4.824752e+01 -4.835309e+01| 0:0:00| chol  1↙
1
42|0.971|0.980|6.6e-14|1.0e-12|3.4e-03|-4.834752e+01 -4.835095e+01| 0:0:00| chol  1↙
1
43|0.981|0.990|9.1e-13|1.0e-12|6.6e-05|-4.835085e+01 -4.835091e+01| 0:0:00| chol  1↙
1
44|0.971|1.000|1.2e-11|1.0e-12|4.8e-06|-4.835091e+01 -4.835091e+01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.00e-07
-------------------------------------------------------------------
 number of iterations   = 44
 primal objective value = -4.83509062e+01
 dual   objective value = -4.83509111e+01
 gap := trace(XZ)        = 4.82e-06
 relative gap           = 4.94e-08
 actual relative gap    = 4.94e-08
 rel. primal infeas     = 1.16e-11
 rel. dual   infeas     = 1.00e-12
 norm(X), norm(y), norm(Z) = 3.0e+00, 5.5e+01, 2.1e+01
 norm(A), norm(b), norm(C) = 2.5e+04, 2.5e+04, 7.7e+01
 Total CPU time (secs)  = 0.33
 CPU time per iteration = 0.01
 termination code       = 0
 DIMACS errors: 1.6e-11  0.0e+00  1.4e-12  0.0e+00  4.9e-08  4.9e-08
-------------------------------------------------------------------

ans =

  48.3509

Iteration   7   Total error is: 0.029299

 num. of constraints =  5
 dim. of socp  var = 6,   num. of socp blk =  1
 dim. of linear var  = 800
*******************************************************************
   SDPT3: Infeasible path-following algorithms
*******************************************************************
 version  predcorr  gam  expon  scale_data
   HKM       1      0.000    1        0
it pstep dstep pinfeas dinfeas  gap      prim-obj      dual-obj    cputime
-------------------------------------------------------------------
 0|0.000|0.000|1.0e+00|4.0e+04|1.1e+11| 1.972681e+09  0.000000e+00| 0:0:00| chol  1↙
1
 1|1.000|0.878|3.2e-07|4.8e+03|2.0e+10| 2.281753e+09 -3.958098e+06| 0:0:00| chol  1↙
1
```

```
 2|0.511|0.639|1.6e-07|1.7e+03|1.1e+10| 2.640291e+09 -1.237802e+07| 0:0:00| chol  1↙
1
 3|0.369|0.418|9.9e-08|1.0e+03|8.5e+09| 2.879485e+09 -2.273411e+07| 0:0:00| chol  1↙
1
 4|0.187|0.452|8.0e-08|5.6e+02|6.4e+09| 2.968373e+09 -4.020731e+07| 0:0:00| chol  1↙
1
 5|0.251|0.348|6.0e-08|3.6e+02|5.4e+09| 2.985167e+09 -5.898184e+07| 0:0:00| chol  1↙
1
 6|0.133|0.528|5.2e-08|1.7e+02|4.2e+09| 2.936212e+09 -9.038787e+07| 0:0:00| chol  1↙
1
 7|0.346|0.260|3.5e-08|1.3e+02|3.8e+09| 2.731873e+09 -1.135516e+08| 0:0:00| chol  1↙
1
 8|0.089|0.798|3.2e-08|2.6e+01|3.0e+09| 2.639885e+09 -1.143977e+08| 0:0:00| chol  1↙
1
 9|0.159|0.184|2.7e-08|2.1e+01|2.9e+09| 2.525691e+09 -1.423440e+08| 0:0:00| chol  1↙
1
10|0.279|0.109|1.7e-08|1.9e+01|2.7e+09| 2.222129e+09 -1.480790e+08| 0:0:00| chol  1↙
2
11|0.017|0.169|1.8e-08|1.6e+01|2.5e+09| 2.162215e+09 -9.597611e+07| 0:0:00| chol  1↙
1
12|0.131|0.436|1.8e-08|8.8e+00|2.4e+09| 2.060269e+09 -1.167027e+08| 0:0:00| chol  1↙
1
13|0.145|0.170|8.4e-08|7.3e+00|2.3e+09| 1.935478e+09 -1.452712e+08| 0:0:00| chol  1↙
1
14|0.102|0.098|5.8e-08|6.6e+00|2.2e+09| 1.873232e+09 -1.592926e+08| 0:0:00| chol  2↙
2
15|0.065|0.216|1.1e-07|5.1e+00|2.2e+09| 1.837358e+09 -1.644027e+08| 0:0:00| chol  1↙
1
16|0.083|0.138|2.5e-07|4.4e+00|2.2e+09| 1.776657e+09 -1.702887e+08| 0:0:00| chol  2↙
2
17|0.037|0.235|3.0e-07|3.4e+00|2.1e+09| 1.746244e+09 -1.526396e+08| 0:0:00| chol  2↙
1
18|0.145|0.203|8.3e-08|2.7e+00|2.0e+09| 1.669237e+09 -1.550294e+08| 0:0:00| chol  2↙
1
19|0.086|0.161|1.1e-06|2.3e+00|2.0e+09| 1.610320e+09 -1.845332e+08| 0:0:00| chol  2↙
2
20|0.092|0.152|1.7e-06|1.9e+00|2.0e+09| 1.558404e+09 -1.935055e+08| 0:0:00| chol  2↙
1
21|0.074|0.087|2.1e-06|1.8e+00|1.9e+09| 1.520958e+09 -2.027869e+08| 0:0:00| chol  2↙
2
22|0.056|0.077|5.9e-06|1.6e+00|1.9e+09| 1.495714e+09 -2.099738e+08| 0:0:00| chol  2↙
2
23|0.044|0.082|1.2e-05|1.5e+00|1.9e+09| 1.475116e+09 -2.151974e+08| 0:0:00| chol  2↙
2
24|0.039|0.188|1.1e-06|1.2e+00|1.9e+09| 1.457657e+09 -2.054306e+08| 0:0:00| chol  2↙
2
25|0.078|0.050|2.2e-06|1.1e+00|1.8e+09| 1.416329e+09 -2.083090e+08| 0:0:00| chol  2↙
2
26|0.037|0.077|3.1e-05|1.1e+00|1.8e+09| 1.401242e+09 -2.148905e+08| 0:0:00| chol  2↙
2
27|0.040|0.073|2.8e-05|9.8e-01|1.8e+09| 1.384620e+09 -2.172644e+08| 0:0:00| chol  2↙
2
28|0.033|0.090|2.7e-05|8.9e-01|1.8e+09| 1.370130e+09 -2.172435e+08| 0:0:00| chol  2↙
2
```

```
29|0.035|0.149|3.3e-05|7.6e-01|1.8e+09| 1.355597e+09 -2.069860e+08| 0:0:00| chol  2✓
2
30|0.045|0.068|3.1e-05|7.1e-01|1.8e+09| 1.334848e+09 -2.068972e+08| 0:0:00| chol  2✓
1
31|0.032|0.075|6.4e-06|6.6e-01|1.7e+09| 1.322518e+09 -2.052656e+08| 0:0:00| chol  2✓
2
32|0.027|0.073|8.5e-06|6.1e-01|1.7e+09| 1.310072e+09 -2.039609e+08| 0:0:00| chol  2✓
2
33|0.043|0.067|3.8e-06|5.7e-01|1.7e+09| 1.293673e+09 -2.054361e+08| 0:0:00| chol  2✓
2
34|0.030|0.048|3.0e-05|5.4e-01|1.7e+09| 1.280138e+09 -2.104557e+08| 0:0:00| chol  2✓
2
35|0.034|0.045|3.6e-05|5.2e-01|1.7e+09| 1.268041e+09 -2.132362e+08| 0:0:00| chol  2✓
2
36|0.026|0.033|1.7e-05|5.0e-01|1.7e+09| 1.257635e+09 -2.170705e+08| 0:0:00| chol  2✓
2
37|0.027|0.035|2.1e-05|4.8e-01|1.7e+09| 1.249023e+09 -2.188528e+08| 0:0:00| chol  2✓
2
38|0.018|0.040|2.1e-05|4.6e-01|1.7e+09| 1.241307e+09 -2.187647e+08| 0:0:00| chol  2✓
2
39|0.040|0.044|1.8e-05|4.4e-01|1.7e+09| 1.228951e+09 -2.188168e+08| 0:0:00| chol  2✓
2
40|0.032|0.061|1.5e-05|4.2e-01|1.7e+09| 1.214275e+09 -2.183394e+08| 0:0:00| chol  1✓
2
41|0.058|0.078|1.5e-05|3.8e-01|1.6e+09| 1.192966e+09 -2.205167e+08| 0:0:00| chol  2✓
2
42|0.035|0.073|2.2e-05|3.6e-01|1.6e+09| 1.177732e+09 -2.247880e+08| 0:0:00| chol  2✓
2
43|0.033|0.041|4.2e-05|3.4e-01|1.6e+09| 1.165547e+09 -2.282171e+08| 0:0:00| chol  2✓
2
44|0.025|0.022|2.6e-04|3.3e-01|1.6e+09| 1.157242e+09 -2.305209e+08| 0:0:00| chol  2✓
2
45|0.019|0.020|2.6e-04|3.3e-01|1.6e+09| 1.151697e+09 -2.322657e+08| 0:0:00| chol  2✓
2
46|0.016|0.019|3.3e-04|3.2e-01|1.6e+09| 1.146928e+09 -2.339831e+08| 0:0:00| chol  2✓
2
47|0.015|0.024|4.0e-04|3.1e-01|1.6e+09| 1.143121e+09 -2.341526e+08| 0:0:00| chol  2✓
2
48|0.014|0.025|6.4e-04|3.0e-01|1.6e+09| 1.137924e+09 -2.325146e+08| 0:0:00| chol  2✓
2
49|0.036|0.025|4.5e-04|3.0e-01|1.6e+09| 1.128958e+09 -2.328135e+08| 0:0:00| chol  2✓
2
50|0.064|0.070|9.7e-04|2.8e-01|1.6e+09| 1.092811e+09 -2.276871e+08| 0:0:00|
  sqlp stop: maximum number of iterations reached
-------------------------------------------------------------------
 number of iterations   = 50
 primal objective value =  1.41632934e+09
 dual   objective value = -2.08308978e+08
 gap := trace(XZ)       = 1.85e+09
 relative gap           = 1.14e+00
 actual relative gap    = 1.00e+00
 rel. primal infeas     = 2.18e-06
 rel. dual   infeas     = 1.15e+00
 norm(X), norm(y), norm(Z) = 5.9e+08, 2.1e+08, 3.0e+08
```

```
 norm(A), norm(b), norm(C) = 4.6e+06, 3.8e+06, 7.7e+01
 Total CPU time (secs)  = 0.37
 CPU time per iteration = 0.01
 termination code       = -6
 DIMACS errors: 3.1e-06  0.0e+00  1.6e+00  0.0e+00  1.0e+00  1.1e+00
-----------------------------------------------------------------

ans =

   9.3909e+09


Iteration   8   Total error is: 2.625
The total representation error of the testing signals is: 0.01219
>>
```