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

 num. of constraints = 25
 dim. of socp   var  = 26,   num. of socp blk  =  1
 dim. of linear var  = 800
 4 linear variables from unrestricted variable.

 *** convert ublk to linear blk
******************************************************************************↙
********
   SDPT3: homogeneous self-dual path-following algorithms
******************************************************************************↙
********
 version  predcorr  gam  expon
   HKM      1      0.000   1
it pstep dstep pinfeas dinfeas  gap     mean(obj)    cputime    kap   tau    theta
------------------------------------------------------------------------------↙
--------
 0|0.000|0.000|2.1e+00|5.1e+01|1.3e+06| 1.128128e+04| 0:0:00|1.3e+06|1.0e+00|1.↙
0e+00| chol 1  1
 1|0.920|0.920|1.6e-01|4.0e+00|1.1e+05| 1.025167e+04| 0:0:00|6.2e+04|1.0e+00|8.1e-↙
02| chol 1  1
 2|0.104|0.104|1.6e-01|4.0e+00|1.2e+05| 1.091300e+04| 0:0:00|5.8e+04|9.9e-01|7.8e-↙
02| chol 1  1
 3|0.735|0.735|1.3e-01|3.2e+00|1.5e+05| 1.427185e+04| 0:0:00|2.7e+04|7.9e-01|5.1e-↙
02| chol 1  1
 4|0.893|0.893|6.3e-02|1.5e+00|7.3e+04| 1.036142e+04| 0:0:00|1.5e+03|8.4e-01|2.5e-↙
02| chol 1  1
 5|0.712|0.712|2.1e-02|4.9e-01|1.9e+04| 4.083975e+03| 0:0:00|5.9e+01|1.1e+00|1.1e-↙
02| chol 1  1
 6|0.950|0.950|1.9e-03|4.6e-02|1.5e+03| 4.473042e+02| 0:0:00|1.3e+01|1.3e+00|1.2e-↙
03| chol 1  1
 7|1.000|1.000|1.0e-03|2.4e-02|9.4e+02| 2.856342e+02| 0:0:00|2.7e+00|1.3e+00|6.2e-↙
04| chol 1  1
 8|1.000|1.000|4.2e-04|1.0e-02|3.9e+02| 1.120039e+02| 0:0:00|1.4e+00|1.3e+00|2.6e-↙
04| chol 1  1
 9|1.000|1.000|2.4e-04|5.9e-03|2.2e+02| 6.187761e+01| 0:0:00|6.0e-01|1.3e+00|1.5e-↙
04| chol 1  1
10|1.000|1.000|9.4e-05|2.4e-03|8.4e+01| 1.778621e+01| 0:0:00|3.4e-01|1.4e+00|6.0e-↙
05| chol 1  1
11|1.000|1.000|4.3e-05|1.1e-03|3.7e+01| 3.437034e+00| 0:0:00|1.3e-01|1.4e+00|2.8e-↙
05| chol 1  1
12|1.000|1.000|1.3e-05|4.3e-04|1.1e+01|-5.215404e+00| 0:0:00|5.6e-02|1.5e+00|8.8e-↙
06| chol 1  1
13|1.000|1.000|4.9e-06|2.8e-04|3.8e+00|-7.376811e+00| 0:0:00|1.4e-02|1.6e+00|3.7e-↙
06| chol 1  1
14|0.979|0.979|8.0e-07|2.1e-04|5.6e-01|-8.534834e+00| 0:0:00|5.9e-03|1.7e+00|6.7e-↙
07| chol 1  1
15|1.000|1.000|2.0e-07|1.9e-04|1.3e-01|-8.676089e+00| 0:0:00|6.1e-04|1.9e+00|1.8e-↙
07| chol 1  1
16|0.976|0.976|7.1e-09|1.7e-04|4.2e-03|-8.725722e+00| 0:0:00|2.9e-04|2.0e+00|6.6e-↙
09| chol 1  1
```

```
17|0.988|0.988|2.5e-10|8.8e-06|1.4e-04|-8.727129e+00| 0:0:00|1.4e-05|2.0e+00|2.3e-↙
10| chol 1  1
18|1.000|1.000|2.4e-10|2.7e-07|1.3e-05|-8.727168e+00| 0:0:00|3.5e-07|2.0e+00|2.0e-↙
11| chol 1  1
19|0.991|0.991|1.6e-08|2.7e-07|3.0e-07|-8.727174e+00| 0:0:00|3.3e-08|2.0e+00|0.↙
0e+00| chol 1  1
20|0.995|0.995|1.4e-08|2.7e-07|6.4e-09|-8.727174e+00| 0:0:00|9.2e-10|2.0e+00|0.↙
0e+00|
  Stop: relative gap < infeasibility
-----------------------------------------------------------------
 number of iterations   = 20
 primal objective value = -8.72717427e+00
 dual   objective value = -8.72717392e+00
 gap := trace(XZ)       = 2.98e-07
 relative gap           = 3.06e-08
 actual relative gap    = -1.90e-08
 rel. primal infeas     = 1.63e-08
 rel. dual   infeas     = 2.73e-07
 norm(X), norm(y), norm(Z) = 4.0e+00, 6.2e+01, 2.1e+01
 norm(A), norm(b), norm(C) = 7.9e+02, 1.1e+00, 2.8e+01
 Total CPU time (secs)  = 0.19
 CPU time per iteration = 0.01
 termination code       = -1
 DIMACS errors: 1.6e-08  0.0e+00  2.7e-07  0.0e+00  -1.9e-08  1.6e-08
-----------------------------------------------------------------

ans =

    8.7272


 num. of constraints = 25
 dim. of socp   var  = 26,   num. of socp blk  =  1
 dim. of linear var  = 800
 4 linear variables from unrestricted variable.

 *** convert ublk to linear blk
**************************************************************************↙
********
   SDPT3: homogeneous self-dual path-following algorithms
**************************************************************************↙
********
 version  predcorr  gam  expon
   HKM      1      0.000   1
it pstep dstep pinfeas dinfeas  gap     mean(obj)    cputime    kap   tau    theta
-------------------------------------------------------------------------------↙
--------
 0|0.000|0.000|3.0e+00|5.1e+01|1.3e+06| 1.126470e+04| 0:0:00|1.3e+06|1.0e+00|1.↙
0e+00| chol 1  1
 1|0.912|0.912|2.6e-01|4.4e+00|1.2e+05| 1.027088e+04| 0:0:00|7.3e+04|1.0e+00|9.0e-↙
02| chol 1  1
 2|0.484|0.484|2.5e-01|4.3e+00|1.8e+05| 1.388643e+04| 0:0:00|5.2e+04|8.4e-01|7.2e-↙
02| chol 1  1
 3|1.000|1.000|1.2e-01|2.1e+00|1.1e+05| 1.316352e+04| 0:0:00|4.2e+03|7.7e-01|3.2e-↙
```

```
02| chol 1  1
 4|0.682|0.682|4.5e-02|7.6e-01|3.1e+04| 5.819486e+03| 0:0:00|1.8e+02|1.0e+00|1.5e-↙
02| chol 1  1
 5|0.880|0.880|6.6e-03|1.1e-01|3.7e+03| 1.017901e+03| 0:0:00|5.4e+00|1.3e+00|2.8e-↙
03| chol 1  1
 6|0.908|0.908|1.6e-03|2.8e-02|9.6e+02| 2.913789e+02| 0:0:00|5.4e+00|1.3e+00|7.3e-↙
04| chol 1  1
 7|1.000|1.000|1.1e-03|1.8e-02|7.0e+02| 2.160410e+02| 0:0:00|1.8e+00|1.3e+00|4.6e-↙
04| chol 1  1
 8|1.000|1.000|5.1e-04|8.7e-03|3.3e+02| 9.856499e+01| 0:0:00|1.1e+00|1.3e+00|2.2e-↙
04| chol 1  1
 9|1.000|1.000|2.4e-04|4.2e-03|1.6e+02| 4.421550e+01| 0:0:00|5.1e-01|1.3e+00|1.1e-↙
04| chol 1  1
10|1.000|1.000|1.0e-04|1.9e-03|6.6e+01| 1.592619e+01| 0:0:00|2.4e-01|1.4e+00|4.8e-↙
05| chol 1  1
11|1.000|1.000|4.4e-05|8.5e-04|2.7e+01| 3.957924e+00| 0:0:00|1.0e-01|1.4e+00|2.1e-↙
05| chol 1  1
12|1.000|1.000|1.2e-05|3.6e-04|7.1e+00|-2.352757e+00| 0:0:00|4.0e-02|1.5e+00|6.2e-↙
06| chol 1  1
13|0.954|0.954|5.9e-06|2.7e-04|3.2e+00|-3.440186e+00| 0:0:00|1.1e-02|1.6e+00|3.1e-↙
06| chol 1  1
14|1.000|1.000|3.1e-06|2.2e-04|1.6e+00|-3.993705e+00| 0:0:00|5.4e-03|1.7e+00|1.7e-↙
06| chol 1  1
15|1.000|1.000|1.4e-06|1.9e-04|6.7e-01|-4.273372e+00| 0:0:00|2.9e-03|1.8e+00|8.3e-↙
07| chol 1  1
16|1.000|1.000|4.8e-07|1.7e-04|2.2e-01|-4.436340e+00| 0:0:00|1.3e-03|1.9e+00|3.0e-↙
07| chol 1  1
17|1.000|1.000|1.7e-07|1.5e-04|7.6e-02|-4.485548e+00| 0:0:00|4.6e-04|1.9e+00|1.1e-↙
07| chol 1  1
18|1.000|1.000|4.2e-08|1.4e-04|1.9e-02|-4.506227e+00| 0:0:00|1.7e-04|1.9e+00|2.8e-↙
08| chol 1  1
19|1.000|1.000|1.5e-08|5.5e-05|6.4e-03|-4.510286e+00| 0:0:00|4.3e-05|2.0e+00|9.7e-↙
09| chol 1  1
20|1.000|1.000|3.5e-09|2.2e-05|1.5e-03|-4.512154e+00| 0:0:00|1.5e-05|2.0e+00|2.3e-↙
09| chol 1  1
21|1.000|1.000|1.6e-09|8.8e-06|6.8e-04|-4.512461e+00| 0:0:00|3.6e-06|2.0e+00|1.0e-↙
09| chol 1  1
22|0.975|0.975|3.3e-10|3.7e-06|1.2e-04|-4.512690e+00| 0:0:00|1.7e-06|2.0e+00|1.9e-↙
10| chol 1  1
23|0.994|0.994|6.0e-11|1.6e-07|4.2e-05|-4.512720e+00| 0:0:00|3.1e-07|2.0e+00|6.4e-↙
11| chol 1  1
24|1.000|1.000|1.1e-10|1.4e-07|1.1e-05|-4.512736e+00| 0:0:00|1.0e-07|2.0e+00|1.6e-↙
11| chol 1  1
25|1.000|1.000|4.0e-09|1.4e-07|1.5e-06|-4.512740e+00| 0:0:00|2.5e-08|2.0e+00|2.0e-↙
12| chol 1  1
26|1.000|1.000|1.1e-08|1.4e-07|1.0e-07|-4.512741e+00| 0:0:00|3.6e-09|2.0e+00|0.↙
0e+00| chol 1  1
27|1.000|1.000|2.9e-08|1.4e-07|2.2e-09|-4.512741e+00| 0:0:00|2.4e-10|2.0e+00|0.↙
0e+00|
  Stop: relative gap < infeasibility
---------------------------------------------------------------------
 number of iterations   = 27
 primal objective value = -4.51274116e+00
 dual   objective value = -4.51274061e+00
```

```
 gap := trace(XZ)       = 1.01e-07
 relative gap           = 1.83e-08
 actual relative gap    = -5.51e-08
 rel. primal infeas     = 1.14e-08
 rel. dual   infeas     = 1.41e-07
 norm(X), norm(y), norm(Z) = 7.1e+00, 4.7e+01, 2.4e+01
 norm(A), norm(b), norm(C) = 7.9e+02, 1.7e+00, 2.8e+01
 Total CPU time (secs)  = 0.24
 CPU time per iteration = 0.01
 termination code       = -1
 DIMACS errors: 1.1e-08  0.0e+00  1.4e-07  0.0e+00  -5.5e-08  1.0e-08
------------------------------------------------------------------

ans =

    4.5127

Iteration   2   Total error is: 0.0082708

 num. of constraints = 25
 dim. of socp   var  = 26,   num. of socp blk  =  1
 dim. of linear var  = 800
 4 linear variables from unrestricted variable.

 *** convert ublk to linear blk
**********************************************************************************↙
********
   SDPT3: homogeneous self-dual path-following algorithms
**********************************************************************************↙
********
 version  predcorr  gam  expon
   HKM      1      0.000   1
it pstep dstep pinfeas dinfeas  gap     mean(obj)    cputime    kap   tau    theta
-----------------------------------------------------------------------------------↙
--------
 0|0.000|0.000|2.3e+00|5.1e+01|1.5e+06| 1.351868e+04| 0:0:00|1.5e+06|1.0e+00|1.↙
0e+00| chol 1  1
 1|0.872|0.872|2.9e-01|6.4e+00|2.0e+05| 1.238724e+04| 0:0:00|1.5e+05|1.0e+00|1.3e-↙
01| chol 1  1
 2|0.603|0.603|3.4e-01|7.4e+00|4.5e+05| 2.233976e+04| 0:0:00|1.1e+05|7.1e-01|1.0e-↙
01| chol 1  1
 3|1.000|1.000|2.4e-01|5.2e+00|4.8e+05| 3.040299e+04| 0:0:00|2.6e+04|5.4e-01|5.6e-↙
02| chol 1  1
 4|0.600|0.600|1.0e-01|2.2e+00|1.4e+05| 1.575224e+04| 0:0:00|1.1e+03|7.4e-01|3.2e-↙
02| chol 1  1
 5|0.743|0.743|3.2e-02|7.1e-01|3.7e+04| 7.021277e+03| 0:0:00|4.7e+01|9.7e-01|1.4e-↙
02| chol 1  1
 6|0.938|0.938|3.4e-03|7.4e-02|3.2e+03| 8.484702e+02| 0:0:00|3.0e+01|1.3e+00|1.8e-↙
03| chol 1  1
 7|1.000|1.000|2.1e-03|4.7e-02|2.3e+03| 6.793093e+02| 0:0:00|5.6e+00|1.2e+00|1.1e-↙
03| chol 1  1
 8|1.000|1.000|8.8e-04|1.9e-02|9.4e+02| 2.672120e+02| 0:0:00|3.3e+00|1.3e+00|4.8e-↙
04| chol 1  1
 9|1.000|1.000|4.6e-04|1.0e-02|4.8e+02| 1.378782e+02| 0:0:00|1.4e+00|1.3e+00|2.5e-↙
```

```
04| chol 1  1
10|1.000|1.000|1.9e-04|4.3e-03|2.0e+02| 5.249309e+01| 0:0:00|7.1e-01|1.3e+00|1.1e-↙
04| chol 1  1
11|1.000|1.000|8.3e-05|1.9e-03|8.3e+01| 2.039370e+01| 0:0:00|2.9e-01|1.3e+00|4.8e-↙
05| chol 1  1
12|1.000|1.000|3.1e-05|7.7e-04|3.0e+01| 4.579423e+00| 0:0:00|1.2e-01|1.4e+00|1.8e-↙
05| chol 1  1
13|1.000|1.000|1.2e-05|3.8e-04|1.1e+01|-7.727658e-01| 0:0:00|4.4e-02|1.4e+00|7.6e-↙
06| chol 1  1
14|1.000|1.000|3.7e-06|2.4e-04|3.2e+00|-3.190662e+00| 0:0:00|1.6e-02|1.5e+00|2.5e-↙
06| chol 1  1
15|1.000|1.000|1.8e-06|2.0e-04|1.4e+00|-3.701615e+00| 0:0:00|4.6e-03|1.7e+00|1.3e-↙
06| chol 1  1
16|1.000|1.000|5.5e-07|1.7e-04|4.0e-01|-4.034436e+00| 0:0:00|2.5e-03|1.8e+00|4.3e-↙
07| chol 1  1
17|1.000|1.000|2.2e-07|1.5e-04|1.5e-01|-4.115013e+00| 0:0:00|7.8e-04|1.9e+00|1.8e-↙
07| chol 1  1
18|1.000|1.000|4.6e-08|1.4e-04|3.1e-02|-4.157047e+00| 0:0:00|3.3e-04|1.9e+00|3.9e-↙
08| chol 1  1
19|1.000|1.000|1.7e-08|5.5e-05|1.2e-02|-4.163341e+00| 0:0:00|7.3e-05|1.9e+00|1.5e-↙
08| chol 1  1
20|1.000|1.000|4.4e-09|2.2e-05|3.0e-03|-4.166556e+00| 0:0:00|2.7e-05|2.0e+00|3.8e-↙
09| chol 1  1
21|1.000|1.000|1.8e-09|8.8e-06|1.2e-03|-4.167165e+00| 0:0:00|7.1e-06|2.0e+00|1.6e-↙
09| chol 1  1
22|0.991|0.991|3.8e-10|3.6e-06|2.4e-04|-4.167561e+00| 0:0:00|3.0e-06|2.0e+00|3.0e-↙
10| chol 1  1
23|1.000|1.000|1.8e-10|1.4e-06|9.5e-05|-4.167613e+00| 0:0:00|5.7e-07|2.0e+00|1.2e-↙
10| chol 1  1
24|0.820|0.820|5.1e-11|7.2e-07|5.4e-05|-4.167631e+00| 0:0:00|2.9e-07|2.0e+00|6.7e-↙
11| chol 1  1
25|0.907|0.907|8.6e-11|5.8e-07|3.3e-05|-4.167641e+00| 0:0:00|1.4e-07|2.0e+00|4.2e-↙
11| chol 1  1
26|1.000|1.000|1.1e-09|5.7e-07|1.5e-05|-4.167649e+00| 0:0:00|7.9e-08|2.0e+00|1.8e-↙
11| chol 1  1
27|1.000|1.000|2.0e-09|5.7e-07|2.7e-06|-4.167654e+00| 0:0:00|3.5e-08|2.0e+00|3.2e-↙
12| chol 1  1
28|1.000|1.000|3.6e-09|5.7e-07|1.6e-07|-4.167655e+00| 0:0:00|6.5e-09|2.0e+00|0.↙
0e+00|
  Stop: relative gap < infeasibility
-----------------------------------------------------------------
 number of iterations   = 28
 primal objective value = -4.16765435e+00
 dual   objective value = -4.16765363e+00
 gap := trace(XZ)       = 2.72e-06
 relative gap           = 5.26e-07
 actual relative gap    = -7.71e-08
 rel. primal infeas     = 2.05e-09
 rel. dual   infeas     = 5.65e-07
 norm(X), norm(y), norm(Z) = 6.1e+01, 4.5e+01, 2.5e+01
 norm(A), norm(b), norm(C) = 7.9e+02, 2.9e+00, 2.8e+01
 Total CPU time (secs)  = 0.27
 CPU time per iteration = 0.01
 termination code       = -1
```

```
 DIMACS errors: 2.0e-09  0.0e+00  5.7e-07  0.0e+00  -7.7e-08  2.9e-07
------------------------------------------------------------------

ans =

    4.1677

Iteration   3   Total error is: 0.007973

 num. of constraints = 25
 dim. of socp   var  = 26,   num. of socp blk  =  1
 dim. of linear var  = 800
 4 linear variables from unrestricted variable.

 *** convert ublk to linear blk
**********************************************************************↙
********
   SDPT3: homogeneous self-dual path-following algorithms
**********************************************************************↙
********
 version  predcorr  gam  expon
   HKM      1      0.000   1
it pstep dstep pinfeas dinfeas  gap     mean(obj)    cputime    kap   tau    theta
------------------------------------------------------------------------------↙
--------
 0|0.000|0.000|2.9e+00|5.1e+01|1.3e+06| 1.126352e+04| 0:0:00|1.3e+06|1.0e+00|1.↙
0e+00| chol 1  1
 1|0.878|0.878|3.6e-01|6.1e+00|1.6e+05| 1.030162e+04| 0:0:00|1.2e+05|1.0e+00|1.2e-↙
01| chol 1  1
 2|0.619|0.619|4.2e-01|7.2e+00|3.8e+05| 1.901799e+04| 0:0:00|8.4e+04|7.0e-01|9.9e-↙
02| chol 1  1
 3|1.000|1.000|3.5e-01|6.0e+00|5.1e+05| 2.871707e+04| 0:0:00|2.4e+04|5.0e-01|5.9e-↙
02| chol 1  1
 4|0.585|0.585|1.5e-01|2.6e+00|1.5e+05| 1.521840e+04| 0:0:00|1.1e+03|6.9e-01|3.5e-↙
02| chol 1  1
 5|0.751|0.751|5.2e-02|8.9e-01|4.3e+04| 7.452578e+03| 0:0:00|4.7e+01|8.9e-01|1.6e-↙
02| chol 1  1
 6|0.990|0.990|3.9e-03|6.6e-02|2.6e+03| 6.847131e+02| 0:0:00|2.8e+01|1.2e+00|1.6e-↙
03| chol 1  1
 7|0.927|0.927|2.9e-03|5.0e-02|2.1e+03| 5.839433e+02| 0:0:00|6.4e+00|1.2e+00|1.2e-↙
03| chol 1  1
 8|1.000|1.000|1.4e-03|2.4e-02|9.8e+02| 2.658734e+02| 0:0:00|2.9e+00|1.2e+00|5.8e-↙
04| chol 1  1
 9|1.000|1.000|8.3e-04|1.4e-02|5.8e+02| 1.585921e+02| 0:0:00|1.4e+00|1.2e+00|3.5e-↙
04| chol 1  1
10|1.000|1.000|2.7e-04|4.7e-03|1.8e+02| 4.703984e+01| 0:0:00|8.2e-01|1.3e+00|1.2e-↙
04| chol 1  1
11|1.000|1.000|1.3e-04|2.3e-03|8.6e+01| 2.032719e+01| 0:0:00|2.6e-01|1.3e+00|5.7e-↙
05| chol 1  1
12|1.000|1.000|4.1e-05|8.1e-04|2.7e+01| 3.461503e+00| 0:0:00|1.3e-01|1.3e+00|1.9e-↙
05| chol 1  1
13|1.000|1.000|1.8e-05|4.1e-04|1.1e+01|-8.863420e-01| 0:0:00|3.7e-02|1.4e+00|8.4e-↙
06| chol 1  1
14|1.000|1.000|5.4e-06|2.4e-04|3.1e+00|-3.155397e+00| 0:0:00|1.6e-02|1.5e+00|2.8e-↙
```

```
06| chol 1  1
15|1.000|1.000|2.2e-06|2.0e-04|1.2e+00|-3.710799e+00| 0:0:00|4.2e-03|1.7e+00|1.3e-↙
06| chol 1  1
16|1.000|1.000|6.2e-07|1.7e-04|2.9e-01|-3.991233e+00| 0:0:00|2.0e-03|1.8e+00|3.8e-↙
07| chol 1  1
17|1.000|1.000|2.1e-07|1.5e-04|9.7e-02|-4.054841e+00| 0:0:00|5.5e-04|1.9e+00|1.4e-↙
07| chol 1  1
18|0.981|0.981|3.6e-08|1.4e-04|1.6e-02|-4.083421e+00| 0:0:00|2.1e-04|1.9e+00|2.4e-↙
08| chol 1  1
19|0.920|0.920|8.3e-09|6.2e-05|3.6e-03|-4.087692e+00| 0:0:00|5.1e-05|2.0e+00|5.5e-↙
09| chol 1  1
20|0.290|0.290|7.3e-09|5.0e-05|3.2e-03|-4.087833e+00| 0:0:00|3.9e-05|2.0e+00|4.8e-↙
09| chol 1  1
21|0.563|0.563|4.9e-09|2.7e-05|2.2e-03|-4.088186e+00| 0:0:00|2.1e-05|2.0e+00|3.2e-↙
09| chol 1  1
22|0.755|0.755|2.5e-09|9.3e-06|1.1e-03|-4.088576e+00| 0:0:00|9.1e-06|2.0e+00|1.7e-↙
09| chol 1  1
23|0.453|0.453|1.8e-09|5.7e-06|9.2e-04|-4.088685e+00| 0:0:00|6.2e-06|1.9e+00|1.3e-↙
09| chol 1  1
24|0.415|0.415|1.3e-09|3.6e-06|7.4e-04|-4.088774e+00| 0:0:00|4.5e-06|1.9e+00|1.0e-↙
09| chol 1  1
25|0.488|0.488|7.0e-10|2.0e-06|5.6e-04|-4.088861e+00| 0:0:00|3.2e-06|1.9e+00|7.6e-↙
10| chol 1  1
26|0.446|0.446|3.9e-10|1.1e-06|4.5e-04|-4.088919e+00| 0:0:00|2.4e-06|1.9e+00|6.0e-↙
10| chol 1  1
27|0.351|0.351|1.0e-09|7.5e-07|3.9e-04|-4.088956e+00| 0:0:00|1.9e-06|1.9e+00|5.1e-↙
10| chol 1  1
28|0.698|0.698|1.6e-09|2.4e-07|2.5e-04|-4.089023e+00| 0:0:00|1.2e-06|1.9e+00|3.3e-↙
10| chol 1  1
29|0.145|0.145|3.4e-09|2.1e-07|2.5e-04|-4.089030e+00| 0:0:00|1.1e-06|1.9e+00|3.2e-↙
10| chol 1  1
30|0.663|0.663|8.0e-09|7.3e-08|1.9e-04|-4.089067e+00| 0:0:00|7.8e-07|1.9e+00|2.4e-↙
10| chol 1  1
31|0.121|0.121|1.1e-08|6.5e-08|1.9e-04|-4.089070e+00| 0:0:00|7.5e-07|1.8e+00|2.3e-↙
10| chol 1  1
32|0.220|0.220|1.5e-08|5.2e-08|1.8e-04|-4.089078e+00| 0:0:00|6.9e-07|1.8e+00|2.1e-↙
10| chol 1  1
33|0.718|0.718|2.0e-08|1.7e-08|1.3e-04|-4.089113e+00| 0:0:00|5.1e-07|1.7e+00|1.4e-↙
10| chol 1  1
34|0.733|0.733|2.3e-08|5.4e-09|7.9e-05|-4.089141e+00| 0:0:00|3.6e-07|1.7e+00|8.5e-↙
11| chol 1  1
35|0.854|0.854|5.6e-08|2.2e-09|5.8e-05|-4.089152e+00| 0:0:00|2.1e-07|1.6e+00|6.0e-↙
11| chol 1  1
36|0.074|0.074|8.3e-08|2.2e-09|5.9e-05|-4.089152e+00| 0:0:00|2.0e-07|1.6e+00|6.1e-↙
11| chol 1  1
37|0.297|0.297|9.7e-08|2.0e-09|5.6e-05|-4.089155e+00| 0:0:00|1.8e-07|1.5e+00|5.6e-↙
11|
  Stop: progress is too slow
-------------------------------------------------------------------
 number of iterations   = 37
 primal objective value = -4.08913108e+00
 dual   objective value = -4.08917854e+00
 gap := trace(XZ)       = 5.65e-05
 relative gap           = 1.11e-05
```

```
 actual relative gap    = 5.17e-06
 rel. primal infeas     = 9.71e-08
 rel. dual   infeas     = 2.02e-09
 norm(X), norm(y), norm(Z) = 4.3e+03, 4.5e+01, 2.5e+01
 norm(A), norm(b), norm(C) = 7.9e+02, 2.4e+00, 2.8e+01
 Total CPU time (secs)  = 0.34
 CPU time per iteration = 0.01
 termination code       = -5
 DIMACS errors: 9.7e-08  0.0e+00  2.0e-09  0.0e+00  5.2e-06  6.2e-06
------------------------------------------------------------------

ans =

    4.0892

Iteration   4   Total error is: 0.0078918

 num. of constraints = 25
 dim. of socp   var  = 26,   num. of socp blk  =  1
 dim. of linear var  = 800
 4 linear variables from unrestricted variable.

 *** convert ublk to linear blk
**********************************************************************************↙
********
   SDPT3: homogeneous self-dual path-following algorithms
**********************************************************************************↙
********
 version  predcorr  gam  expon
   HKM      1      0.000   1
it pstep dstep pinfeas dinfeas  gap     mean(obj)    cputime    kap   tau    theta
----------------------------------------------------------------------------------↙
--------
 0|0.000|0.000|2.5e+00|5.1e+01|1.4e+06| 1.255242e+04| 0:0:00|1.4e+06|1.0e+00|1.↙
0e+00| chol 1  1
 1|0.872|0.872|3.2e-01|6.4e+00|1.9e+05| 1.149539e+04| 0:0:00|1.4e+05|1.0e+00|1.3e-↙
01| chol 1  1
 2|0.671|0.671|3.9e-01|7.9e+00|4.9e+05| 2.292847e+04| 0:0:00|9.8e+04|6.6e-01|1.0e-↙
01| chol 1  1
 3|1.000|1.000|3.1e-01|6.2e+00|6.0e+05| 3.297181e+04| 0:0:00|2.6e+04|4.9e-01|6.0e-↙
02| chol 1  1
 4|0.585|0.585|1.3e-01|2.7e+00|1.8e+05| 1.765772e+04| 0:0:00|1.2e+03|6.7e-01|3.6e-↙
02| chol 1  1
 5|0.756|0.756|4.6e-02|9.3e-01|5.1e+04| 8.769982e+03| 0:0:00|5.2e+01|8.7e-01|1.6e-↙
02| chol 1  1
 6|1.000|1.000|3.3e-03|6.5e-02|3.0e+03| 7.805041e+02| 0:0:00|3.3e+01|1.2e+00|1.6e-↙
03| chol 1  1
 7|0.949|0.949|2.3e-03|4.6e-02|2.1e+03| 5.958230e+02| 0:0:00|6.3e+00|1.2e+00|1.1e-↙
03| chol 1  1
 8|1.000|1.000|1.1e-03|2.3e-02|1.0e+03| 2.856928e+02| 0:0:00|3.0e+00|1.2e+00|5.6e-↙
04| chol 1  1
 9|1.000|1.000|5.8e-04|1.2e-02|5.2e+02| 1.442203e+02| 0:0:00|1.5e+00|1.2e+00|2.9e-↙
04| chol 1  1
10|1.000|1.000|2.3e-04|4.7e-03|2.0e+02| 5.285501e+01| 0:0:00|7.5e-01|1.3e+00|1.2e-↙
```

```
04| chol 1  1
11|1.000|1.000|9.9e-05|2.1e-03|8.5e+01| 2.030270e+01| 0:0:00|3.0e-01|1.3e+00|5.1e-↙
05| chol 1  1
12|1.000|1.000|3.6e-05|8.1e-04|3.0e+01| 4.427525e+00| 0:0:00|1.2e-01|1.4e+00|1.9e-↙
05| chol 1  1
13|1.000|1.000|1.4e-05|4.0e-04|1.2e+01|-6.139991e-01| 0:0:00|4.3e-02|1.4e+00|8.1e-↙
06| chol 1  1
14|1.000|1.000|4.7e-06|2.4e-04|3.5e+00|-2.993674e+00| 0:0:00|1.7e-02|1.5e+00|2.8e-↙
06| chol 1  1
15|1.000|1.000|1.9e-06|2.0e-04|1.3e+00|-3.618116e+00| 0:0:00|4.8e-03|1.7e+00|1.2e-↙
06| chol 1  1
16|1.000|1.000|5.3e-07|1.7e-04|3.3e-01|-3.923731e+00| 0:0:00|2.1e-03|1.8e+00|3.8e-↙
07| chol 1  1
17|1.000|1.000|1.8e-07|1.5e-04|1.1e-01|-3.994216e+00| 0:0:00|6.2e-04|1.9e+00|1.4e-↙
07| chol 1  1
18|0.986|0.986|2.9e-08|1.4e-04|1.6e-02|-4.026175e+00| 0:0:00|2.4e-04|1.9e+00|2.2e-↙
08| chol 1  1
19|0.895|0.895|1.5e-08|6.4e-05|8.4e-03|-4.028811e+00| 0:0:00|5.9e-05|1.9e+00|1.1e-↙
08| chol 1  1
20|0.858|0.858|4.1e-09|2.8e-05|2.2e-03|-4.031162e+00| 0:0:00|2.5e-05|2.0e+00|3.1e-↙
09| chol 1  1
21|0.293|0.293|3.6e-09|2.2e-05|2.0e-03|-4.031276e+00| 0:0:00|2.0e-05|2.0e+00|2.7e-↙
09| chol 1  1
22|0.325|0.325|2.9e-09|1.6e-05|1.7e-03|-4.031411e+00| 0:0:00|1.5e-05|2.0e+00|2.2e-↙
09| chol 1  1
23|0.733|0.733|1.6e-09|5.4e-06|9.5e-04|-4.031714e+00| 0:0:00|6.9e-06|1.9e+00|1.2e-↙
09| chol 1  1
24|0.270|0.270|1.3e-09|4.1e-06|8.8e-04|-4.031763e+00| 0:0:00|5.7e-06|1.9e+00|1.1e-↙
09| chol 1  1
25|0.290|0.290|1.1e-09|3.0e-06|7.7e-04|-4.031822e+00| 0:0:00|4.6e-06|1.9e+00|9.4e-↙
10| chol 1  1
26|0.596|0.596|6.0e-10|1.3e-06|5.3e-04|-4.031934e+00| 0:0:00|3.0e-06|1.9e+00|6.4e-↙
10| chol 1  1
27|0.437|0.437|3.2e-10|7.3e-07|4.3e-04|-4.031986e+00| 0:0:00|2.2e-06|1.9e+00|5.2e-↙
10| chol 1  1
28|0.537|0.537|5.5e-10|3.5e-07|3.2e-04|-4.032042e+00| 0:0:00|1.6e-06|1.9e+00|3.8e-↙
10| chol 1  1
29|0.538|0.538|1.2e-09|1.7e-07|2.4e-04|-4.032083e+00| 0:0:00|1.1e-06|1.9e+00|2.9e-↙
10| chol 1  1
30|0.525|0.525|1.3e-09|8.4e-08|1.8e-04|-4.032116e+00| 0:0:00|8.5e-07|1.9e+00|2.1e-↙
10| chol 1  1
31|0.948|0.948|5.3e-10|1.7e-08|7.5e-05|-4.032164e+00| 0:0:00|4.3e-07|1.9e+00|9.4e-↙
11| chol 1  1
32|0.361|0.361|1.1e-09|1.6e-08|6.8e-05|-4.032168e+00| 0:0:00|3.4e-07|1.9e+00|8.5e-↙
11| chol 1  1
33|1.000|1.000|8.5e-09|1.4e-08|2.2e-05|-4.032189e+00| 0:0:00|1.5e-07|1.9e+00|2.7e-↙
11| chol 1  1
34|1.000|1.000|2.2e-08|1.3e-08|2.5e-06|-4.032198e+00| 0:0:00|4.9e-08|1.9e+00|1.1e-↙
12| chol 1  1
35|1.000|1.000|5.2e-08|1.3e-08|1.2e-07|-4.032200e+00| 0:0:00|5.7e-09|1.9e+00|0.↙
0e+00|
  Stop: max(relative gap,infeasibilities) < 1.00e-07
------------------------------------------------------------------
 number of iterations   = 35
```

```
 primal objective value = -4.03220600e+00
 dual   objective value = -4.03219430e+00
 gap := trace(XZ)       = 1.21e-07
 relative gap           = 2.40e-08
 actual relative gap    = -1.29e-06
 rel. primal infeas     = 5.24e-08
 rel. dual   infeas     = 1.28e-08
 norm(X), norm(y), norm(Z) = 1.1e+03, 4.4e+01, 2.5e+01
 norm(A), norm(b), norm(C) = 7.9e+02, 2.8e+00, 2.8e+01
 Total CPU time (secs)  = 0.31
 CPU time per iteration = 0.01
 termination code       =  0
 DIMACS errors: 5.2e-08  0.0e+00  1.3e-08  0.0e+00  -1.3e-06  1.3e-08
------------------------------------------------------------------

ans =

    4.0322

Iteration   5   Total error is: 0.0078361

 num. of constraints = 25
 dim. of socp   var  = 26,   num. of socp blk  =  1
 dim. of linear var  = 800
 4 linear variables from unrestricted variable.

 *** convert ublk to linear blk
**********************************************************************************↙
********
   SDPT3: homogeneous self-dual path-following algorithms
**********************************************************************************↙
********
 version  predcorr  gam  expon
   HKM      1      0.000   1
it pstep dstep pinfeas dinfeas  gap     mean(obj)    cputime    kap   tau    theta
-----------------------------------------------------------------------------------↙
--------
 0|0.000|0.000|2.9e+00|5.1e+01|1.3e+06| 1.126234e+04| 0:0:00|1.3e+06|1.0e+00|1.↙
0e+00| chol 1  1
 1|0.871|0.871|3.7e-01|6.5e+00|1.7e+05| 1.031944e+04| 0:0:00|1.3e+05|1.0e+00|1.3e-↙
01| chol 1  1
 2|0.713|0.713|4.7e-01|8.2e+00|4.8e+05| 2.182370e+04| 0:0:00|8.7e+04|6.3e-01|1.0e-↙
01| chol 1  1
 3|1.000|1.000|3.3e-01|5.7e+00|4.9e+05| 2.853655e+04| 0:0:00|1.9e+04|5.0e-01|5.7e-↙
02| chol 1  1
 4|0.592|0.592|1.5e-01|2.6e+00|1.5e+05| 1.531181e+04| 0:0:00|8.7e+02|6.8e-01|3.5e-↙
02| chol 1  1
 5|0.754|0.754|4.9e-02|8.5e-01|4.1e+04| 7.221751e+03| 0:0:00|3.8e+01|9.0e-01|1.5e-↙
02| chol 1  1
 6|1.000|1.000|3.1e-03|5.5e-02|2.2e+03| 5.720280e+02| 0:0:00|3.0e+01|1.2e+00|1.3e-↙
03| chol 1  1
 7|0.856|0.856|2.3e-03|4.0e-02|1.6e+03| 4.569570e+02| 0:0:00|7.6e+00|1.2e+00|9.6e-↙
04| chol 1  1
 8|1.000|1.000|1.3e-03|2.2e-02|9.0e+02| 2.488706e+02| 0:0:00|2.3e+00|1.2e+00|5.4e-↙
```

```
04| chol 1  1
 9|1.000|1.000|5.9e-04|1.0e-02|4.1e+02| 1.140337e+02| 0:0:00|1.3e+00|1.3e+00|2.5e-↙
04| chol 1  1
10|1.000|1.000|2.5e-04|4.4e-03|1.7e+02| 4.348487e+01| 0:0:00|6.0e-01|1.3e+00|1.1e-↙
04| chol 1  1
11|1.000|1.000|1.0e-04|1.9e-03|6.9e+01| 1.573004e+01| 0:0:00|2.5e-01|1.3e+00|4.6e-↙
05| chol 1  1
12|1.000|1.000|3.7e-05|7.5e-04|2.4e+01| 2.875467e+00| 0:0:00|1.0e-01|1.4e+00|1.7e-↙
05| chol 1  1
13|1.000|1.000|1.5e-05|3.8e-04|9.3e+00|-1.236363e+00| 0:0:00|3.5e-02|1.4e+00|7.4e-↙
06| chol 1  1
14|1.000|1.000|4.9e-06|2.4e-04|2.8e+00|-3.144404e+00| 0:0:00|1.3e-02|1.5e+00|2.6e-↙
06| chol 1  1
15|1.000|1.000|2.0e-06|2.0e-04|1.0e+00|-3.652963e+00| 0:0:00|4.0e-03|1.7e+00|1.1e-↙
06| chol 1  1
16|1.000|1.000|5.5e-07|1.7e-04|2.7e-01|-3.901913e+00| 0:0:00|1.8e-03|1.8e+00|3.5e-↙
07| chol 1  1
17|1.000|1.000|1.8e-07|1.5e-04|8.2e-02|-3.960481e+00| 0:0:00|5.0e-04|1.9e+00|1.2e-↙
07| chol 1  1
18|0.902|0.902|3.7e-08|1.4e-04|1.6e-02|-3.982899e+00| 0:0:00|2.1e-04|1.9e+00|2.5e-↙
08| chol 1  1
19|0.581|0.581|2.7e-08|9.1e-05|1.2e-02|-3.984377e+00| 0:0:00|1.1e-04|1.9e+00|1.8e-↙
08| chol 1  1
20|0.966|0.966|4.5e-09|2.4e-05|2.0e-03|-3.988133e+00| 0:0:00|3.1e-05|2.0e+00|3.0e-↙
09| chol 1  1
21|0.634|0.634|3.3e-09|1.5e-05|1.5e-03|-3.988306e+00| 0:0:00|1.4e-05|2.0e+00|2.2e-↙
09| chol 1  1
22|1.000|1.000|1.2e-09|3.5e-06|5.6e-04|-3.988652e+00| 0:0:00|3.5e-06|2.0e+00|8.4e-↙
10| chol 1  1
23|0.847|0.847|1.4e-09|1.7e-06|1.4e-04|-3.988833e+00| 0:0:00|1.7e-06|2.0e+00|2.2e-↙
10| chol 1  1
24|0.577|0.577|4.7e-10|1.1e-06|1.1e-04|-3.988846e+00| 0:0:00|8.9e-07|2.0e+00|1.7e-↙
10| chol 1  1
25|1.000|1.000|7.3e-10|2.3e-07|4.2e-05|-3.988876e+00| 0:0:00|2.6e-07|2.0e+00|6.4e-↙
11| chol 1  1
26|1.000|1.000|1.1e-08|2.3e-07|9.8e-06|-3.988891e+00| 0:0:00|9.9e-08|2.0e+00|1.4e-↙
11| chol 1  1
27|1.000|1.000|1.9e-08|2.3e-07|7.3e-07|-3.988896e+00| 0:0:00|2.3e-08|2.0e+00|0.↙
0e+00| chol 1  1
28|1.000|1.000|3.1e-08|2.3e-07|1.8e-08|-3.988896e+00| 0:0:00|1.8e-09|2.0e+00|0.↙
0e+00|
  Stop: relative gap < infeasibility
-----------------------------------------------------------------
 number of iterations   = 28
 primal objective value = -3.98889626e+00
 dual   objective value = -3.98889480e+00
 gap := trace(XZ)       = 7.32e-07
 relative gap           = 1.47e-07
 actual relative gap    = -1.62e-07
 rel. primal infeas     = 1.90e-08
 rel. dual   infeas     = 2.26e-07
 norm(X), norm(y), norm(Z) = 5.4e+01, 4.4e+01, 2.5e+01
 norm(A), norm(b), norm(C) = 7.9e+02, 2.6e+00, 2.8e+01
 Total CPU time (secs)  = 0.25
```

```
 CPU time per iteration = 0.01
 termination code       = -1
 DIMACS errors: 1.9e-08  0.0e+00  2.3e-07  0.0e+00  -1.6e-07  8.1e-08
------------------------------------------------------------------

ans =

    3.9889

Iteration   6   Total error is: 0.0077958

 num. of constraints = 25
 dim. of socp   var  = 26,   num. of socp blk  =  1
 dim. of linear var  = 800
 4 linear variables from unrestricted variable.

 *** convert ublk to linear blk
**********************************************************************************↙
********
   SDPT3: homogeneous self-dual path-following algorithms
**********************************************************************************↙
********
 version  predcorr  gam  expon
   HKM      1      0.000   1
it pstep dstep pinfeas dinfeas  gap     mean(obj)    cputime    kap   tau    theta
-----------------------------------------------------------------------------------↙
--------
 0|0.000|0.000|2.8e+00|5.1e+01|1.3e+06| 1.126188e+04| 0:0:00|1.3e+06|1.0e+00|1.↙
0e+00| chol 1  1
 1|0.877|0.877|3.5e-01|6.2e+00|1.7e+05| 1.030953e+04| 0:0:00|1.2e+05|1.0e+00|1.3e-↙
01| chol 1  1
 2|0.724|0.724|4.3e-01|7.7e+00|4.6e+05| 2.157981e+04| 0:0:00|8.0e+04|6.4e-01|9.7e-↙
02| chol 1  1
 3|1.000|1.000|3.1e-01|5.5e+00|4.7e+05| 2.814450e+04| 0:0:00|1.8e+04|5.0e-01|5.5e-↙
02| chol 1  1
 4|0.594|0.594|1.4e-01|2.5e+00|1.5e+05| 1.508104e+04| 0:0:00|8.1e+02|6.9e-01|3.4e-↙
02| chol 1  1
 5|0.753|0.753|4.6e-02|8.2e-01|3.9e+04| 6.954680e+03| 0:0:00|3.5e+01|9.0e-01|1.5e-↙
02| chol 1  1
 6|0.987|0.987|3.2e-03|5.7e-02|2.2e+03| 5.630138e+02| 0:0:00|3.0e+01|1.2e+00|1.4e-↙
03| chol 1  1
 7|0.925|0.925|2.4e-03|4.3e-02|1.8e+03| 4.945808e+02| 0:0:00|6.0e+00|1.2e+00|1.0e-↙
03| chol 1  1
 8|1.000|1.000|1.2e-03|2.1e-02|8.6e+02| 2.337163e+02| 0:0:00|2.5e+00|1.2e+00|5.1e-↙
04| chol 1  1
 9|1.000|1.000|6.3e-04|1.1e-02|4.5e+02| 1.237996e+02| 0:0:00|1.3e+00|1.2e+00|2.7e-↙
04| chol 1  1
10|1.000|1.000|2.3e-04|4.2e-03|1.6e+02| 4.119135e+01| 0:0:00|6.5e-01|1.3e+00|1.0e-↙
04| chol 1  1
11|1.000|1.000|1.0e-04|1.9e-03|6.9e+01| 1.585801e+01| 0:0:00|2.3e-01|1.3e+00|4.6e-↙
05| chol 1  1
12|1.000|1.000|3.5e-05|7.1e-04|2.3e+01| 2.542888e+00| 0:0:00|1.0e-01|1.4e+00|1.6e-↙
05| chol 1  1
13|1.000|1.000|1.4e-05|3.7e-04|9.0e+00|-1.268590e+00| 0:0:00|3.2e-02|1.4e+00|7.1e-↙
```

```
06| chol 1  1
14|1.000|1.000|4.5e-06|2.4e-04|2.7e+00|-3.147256e+00| 0:0:00|1.3e-02|1.5e+00|2.4e-↙
06| chol 1  1
15|1.000|1.000|1.9e-06|2.0e-04|9.9e-01|-3.619881e+00| 0:0:00|3.7e-03|1.7e+00|1.1e-↙
06| chol 1  1
16|1.000|1.000|5.0e-07|1.7e-04|2.4e-01|-3.859960e+00| 0:0:00|1.7e-03|1.8e+00|3.2e-↙
07| chol 1  1
17|1.000|1.000|1.6e-07|1.5e-04|7.4e-02|-3.914346e+00| 0:0:00|4.6e-04|1.9e+00|1.1e-↙
07| chol 1  1
18|0.895|0.895|3.2e-08|1.4e-04|1.5e-02|-3.934876e+00| 0:0:00|1.9e-04|1.9e+00|2.2e-↙
08| chol 1  1
19|0.845|0.845|1.9e-08|6.8e-05|8.5e-03|-3.936890e+00| 0:0:00|5.9e-05|1.9e+00|1.3e-↙
08| chol 1  1
20|0.895|0.895|4.0e-09|2.7e-05|1.5e-03|-3.939586e+00| 0:0:00|2.4e-05|2.0e+00|2.3e-↙
09| chol 1  1
21|0.697|0.697|2.5e-09|1.4e-05|1.1e-03|-3.939725e+00| 0:0:00|9.8e-06|2.0e+00|1.6e-↙
09| chol 1  1
22|1.000|1.000|7.3e-10|3.5e-06|3.0e-04|-3.940022e+00| 0:0:00|2.5e-06|2.0e+00|4.5e-↙
10| chol 1  1
23|0.958|0.958|5.4e-10|1.5e-06|2.5e-05|-3.940138e+00| 0:0:00|7.7e-07|2.0e+00|3.9e-↙
11| chol 1  1
24|1.000|1.000|8.1e-09|1.4e-06|3.8e-06|-3.940146e+00| 0:0:00|5.9e-08|2.0e+00|5.0e-↙
12| chol 1  1
25|1.000|1.000|5.0e-09|1.4e-06|9.6e-08|-3.940147e+00| 0:0:00|9.0e-09|2.0e+00|0.↙
0e+00| chol 1  1
26|1.000|1.000|6.1e-09|1.4e-06|1.1e-09|-3.940147e+00| 0:0:00|2.4e-10|2.0e+00|0.↙
0e+00|
  Stop: relative gap < infeasibility
-----------------------------------------------------------------
 number of iterations   = 26
 primal objective value = -3.94014614e+00
 dual   objective value = -3.94014593e+00
 gap := trace(XZ)       = 3.77e-06
 relative gap           = 7.62e-07
 actual relative gap    = -2.32e-08
 rel. primal infeas     = 8.07e-09
 rel. dual   infeas     = 1.41e-06
 norm(X), norm(y), norm(Z) = 2.6e+01, 4.3e+01, 2.5e+01
 norm(A), norm(b), norm(C) = 7.9e+02, 2.6e+00, 2.8e+01
 Total CPU time (secs)  = 0.25
 CPU time per iteration = 0.01
 termination code       = -1
 DIMACS errors: 8.1e-09  0.0e+00  1.4e-06  0.0e+00  -2.3e-08  4.2e-07
-----------------------------------------------------------------

ans =

    3.9401

Iteration   7   Total error is: 0.0077458

 num. of constraints = 25
 dim. of socp   var  = 26,   num. of socp blk  =  1
 dim. of linear var  = 800
```

```
 4 linear variables from unrestricted variable.

 *** convert ublk to linear blk
**********************************************************************************↙
********
   SDPT3: homogeneous self-dual path-following algorithms
**********************************************************************************↙
********
 version  predcorr  gam  expon
   HKM      1      0.000   1
it pstep dstep pinfeas dinfeas  gap     mean(obj)    cputime    kap   tau    theta
-----------------------------------------------------------------------------------↙
--------
 0|0.000|0.000|2.8e+00|5.1e+01|1.3e+06| 1.152752e+04| 0:0:00|1.3e+06|1.0e+00|1.↙
0e+00| chol 1  1
 1|0.877|0.877|3.4e-01|6.2e+00|1.7e+05| 1.055280e+04| 0:0:00|1.2e+05|1.0e+00|1.3e-↙
01| chol 1  1
 2|0.760|0.760|4.3e-01|7.7e+00|4.9e+05| 2.290324e+04| 0:0:00|8.0e+04|6.2e-01|9.5e-↙
02| chol 1  1
 3|1.000|1.000|2.9e-01|5.4e+00|4.7e+05| 2.860966e+04| 0:0:00|1.6e+04|5.0e-01|5.3e-↙
02| chol 1  1
 4|0.600|0.600|1.3e-01|2.4e+00|1.5e+05| 1.545049e+04| 0:0:00|7.4e+02|6.8e-01|3.3e-↙
02| chol 1  1
 5|0.754|0.754|4.3e-02|7.9e-01|3.8e+04| 6.907193e+03| 0:0:00|3.2e+01|9.1e-01|1.4e-↙
02| chol 1  1
 6|0.963|0.963|3.6e-03|6.6e-02|2.6e+03| 6.427314e+02| 0:0:00|3.1e+01|1.2e+00|1.6e-↙
03| chol 1  1
 7|0.995|0.995|2.5e-03|4.6e-02|2.0e+03| 5.533405e+02| 0:0:00|4.7e+00|1.2e+00|1.1e-↙
03| chol 1  1
 8|1.000|1.000|1.2e-03|2.2e-02|9.2e+02| 2.515039e+02| 0:0:00|2.8e+00|1.2e+00|5.3e-↙
04| chol 1  1
 9|1.000|1.000|6.0e-04|1.1e-02|4.5e+02| 1.252081e+02| 0:0:00|1.3e+00|1.2e+00|2.7e-↙
04| chol 1  1
10|1.000|1.000|2.4e-04|4.4e-03|1.8e+02| 4.513265e+01| 0:0:00|6.5e-01|1.3e+00|1.1e-↙
04| chol 1  1
11|1.000|1.000|1.0e-04|1.9e-03|7.3e+01| 1.701882e+01| 0:0:00|2.6e-01|1.3e+00|4.8e-↙
05| chol 1  1
12|1.000|1.000|3.6e-05|7.5e-04|2.5e+01| 3.185352e+00| 0:0:00|1.1e-01|1.4e+00|1.7e-↙
05| chol 1  1
13|1.000|1.000|1.5e-05|3.8e-04|9.7e+00|-9.899699e-01| 0:0:00|3.6e-02|1.4e+00|7.5e-↙
06| chol 1  1
14|1.000|1.000|4.7e-06|2.4e-04|2.9e+00|-3.013335e+00| 0:0:00|1.4e-02|1.5e+00|2.6e-↙
06| chol 1  1
15|1.000|1.000|1.9e-06|2.0e-04|1.1e+00|-3.527341e+00| 0:0:00|4.0e-03|1.7e+00|1.2e-↙
06| chol 1  1
16|1.000|1.000|5.3e-07|1.7e-04|2.7e-01|-3.786326e+00| 0:0:00|1.8e-03|1.8e+00|3.5e-↙
07| chol 1  1
17|1.000|1.000|1.8e-07|1.5e-04|9.0e-02|-3.844228e+00| 0:0:00|5.2e-04|1.9e+00|1.2e-↙
07| chol 1  1
18|0.984|0.984|2.9e-08|1.4e-04|1.4e-02|-3.870425e+00| 0:0:00|2.0e-04|1.9e+00|2.1e-↙
08| chol 1  1
19|1.000|1.000|1.2e-08|5.5e-05|5.9e-03|-3.873091e+00| 0:0:00|3.3e-05|2.0e+00|8.7e-↙
09| chol 1  1
20|0.929|0.929|2.7e-09|2.4e-05|1.3e-03|-3.874859e+00| 0:0:00|1.5e-05|2.0e+00|1.9e-↙
```

```
09| chol 1  1
21|0.565|0.565|2.0e-09|1.6e-05|9.2e-04|-3.874980e+00| 0:0:00|8.4e-06|2.0e+00|1.4e-↙
09| chol 1  1
22|0.922|0.922|2.8e-09|4.5e-06|2.1e-04|-3.875257e+00| 0:0:00|2.7e-06|2.0e+00|3.1e-↙
10| chol 1  1
23|0.430|0.430|1.6e-09|3.2e-06|1.8e-04|-3.875269e+00| 0:0:00|1.7e-06|2.0e+00|2.6e-↙
10| chol 1  1
24|1.000|1.000|1.2e-09|5.7e-07|8.6e-05|-3.875304e+00| 0:0:00|4.2e-07|2.0e+00|1.3e-↙
10| chol 1  1
25|1.000|1.000|6.2e-11|2.3e-07|2.7e-05|-3.875331e+00| 0:0:00|2.0e-07|2.0e+00|4.0e-↙
11| chol 1  1
26|1.000|1.000|4.7e-09|2.3e-07|5.6e-06|-3.875341e+00| 0:0:00|6.4e-08|2.0e+00|7.8e-↙
12| chol 1  1
27|1.000|1.000|1.0e-08|2.3e-07|4.8e-07|-3.875343e+00| 0:0:00|1.3e-08|2.0e+00|0.↙
0e+00| chol 1  1
28|1.000|1.000|2.2e-08|2.3e-07|1.2e-08|-3.875344e+00| 0:0:00|1.1e-09|2.0e+00|0.↙
0e+00|
  Stop: relative gap < infeasibility
-----------------------------------------------------------------
 number of iterations   = 28
 primal objective value = -3.87534333e+00
 dual   objective value = -3.87534258e+00
 gap := trace(XZ)       = 4.75e-07
 relative gap           = 9.75e-08
 actual relative gap    = -8.61e-08
 rel. primal infeas     = 1.03e-08
 rel. dual   infeas     = 2.26e-07
 norm(X), norm(y), norm(Z) = 3.0e+01, 4.3e+01, 2.5e+01
 norm(A), norm(b), norm(C) = 7.9e+02, 2.4e+00, 2.8e+01
 Total CPU time (secs)  = 0.23
 CPU time per iteration = 0.01
 termination code       = -1
 DIMACS errors: 1.0e-08  0.0e+00  2.3e-07  0.0e+00  -8.6e-08  5.4e-08
-----------------------------------------------------------------

ans =

    3.8753

Iteration   8   Total error is: 0.0076773
The total representation error of the testing signals is: 0.26069
>>
```