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

 num. of constraints = 96
 dim. of socp  var  = 86,   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|1.0e+02|2.3e+07| 4.018957e+04  0.000000e+00| 0:0:00| chol  1↙
1
 1|1.000|0.991|4.8e-08|9.8e-01|2.6e+05| 4.183912e+04 -7.867973e+01| 0:0:00| chol  1↙
1
 2|1.000|0.962|4.5e-08|6.9e-02|3.9e+04| 2.847293e+04 -1.422205e+01| 0:0:00| chol  1↙
1
 3|1.000|1.000|4.1e-09|1.0e-02|3.0e+03| 2.784051e+03 -1.582551e+01| 0:0:00| chol  1↙
1
 4|0.983|1.000|1.1e-08|1.0e-03|1.0e+02| 8.397191e+01 -1.507202e+01| 0:0:00| chol
  linsysolve: Schur complement matrix not positive definite
  switch to LU factor. lu 11   1
 5|0.285|0.355|7.7e-09|6.8e-04|7.1e+01| 5.634994e+01 -1.468335e+01| 0:0:01| lu 25↙
1
 6|0.057|0.069|8.2e-09|6.3e-04|7.1e+01| 5.560283e+01 -1.488472e+01| 0:0:01| lu 12↙
1
 7|0.356|0.174|4.7e-09|5.2e-04|6.7e+01| 5.241754e+01 -1.449389e+01| 0:0:01| lu 28↙
1
 8|0.741|1.000|1.2e-09|1.0e-07|4.3e+01| 2.775771e+01 -1.489028e+01| 0:0:01| lu 12↙
1
 9|0.478|1.000|6.5e-10|1.0e-08|2.4e+01| 1.020027e+01 -1.400266e+01| 0:0:01| lu 12↙
1
10|1.000|0.674|2.0e-12|4.1e-09|1.2e+01|-1.553455e+00 -1.385533e+01| 0:0:01| lu 30↙
1
11|0.378|0.379|1.0e-11|2.6e-09|8.0e+00|-5.866514e+00 -1.383028e+01| 0:0:01| lu 11↙
1
12|0.684|0.274|1.4e-10|1.9e-09|5.4e+00|-8.428012e+00 -1.381530e+01| 0:0:01| lu 11↙
30
13|0.037|0.444|1.4e-10|1.1e-09|5.2e+00|-8.623767e+00 -1.380420e+01| 0:0:01| lu 11↙
1
14|1.000|0.088|5.4e-11|9.7e-10|4.0e+00|-9.832061e+00 -1.380251e+01| 0:0:01| lu 30↙
1
15|1.000|1.000|1.6e-10|5.1e-12|2.9e+00|-1.093974e+01 -1.379879e+01| 0:0:01| lu 11↙
1
16|0.317|1.000|1.1e-10|7.6e-12|2.0e+00|-1.184416e+01 -1.379440e+01| 0:0:01| lu 14↙
1
17|1.000|0.351|3.8e-12|1.6e-11|1.6e+00|-1.221827e+01 -1.379047e+01| 0:0:01| lu 30↙
1
18|0.874|1.000|3.6e-12|1.0e-12|2.3e-01|-1.356072e+01 -1.378997e+01| 0:0:01| lu 11↙
1
19|0.235|1.000|1.9e-11|1.0e-12|1.8e-01|-1.361446e+01 -1.378974e+01| 0:0:01| lu 30↙
```

```
1
20|1.000|0.593|1.2e-11|1.9e-12|1.3e-01|-1.365567e+01 -1.378928e+01| 0:0:01| lu 11✔
1
21|0.980|0.960|2.4e-12|2.3e-12|2.7e-03|-1.378656e+01 -1.378923e+01| 0:0:01| lu 14✔
1
22|0.862|0.969|1.6e-11|1.1e-12|3.7e-04|-1.378886e+01 -1.378923e+01| 0:0:01| lu 30✔
30
23|1.000|0.369|1.1e-08|2.2e-12|2.9e-04|-1.378894e+01 -1.378923e+01| 0:0:01| lu 21✔
1
24|0.992|0.935|1.2e-10|2.4e-12|2.0e-05|-1.378921e+01 -1.378923e+01| 0:0:01| lu 12✔
1
25|0.994|0.957|2.8e-10|3.5e-12|4.1e-07|-1.378923e+01 -1.378923e+01| 0:0:01|
  stop: max(relative gap, infeasibilities) < 1.00e-07
-------------------------------------------------------------------
 number of iterations   = 25
 primal objective value = -1.37892289e+01
 dual   objective value = -1.37892293e+01
 gap := trace(XZ)        = 4.12e-07
 relative gap            = 1.44e-08
 actual relative gap     = 1.55e-08
 rel. primal infeas      = 2.80e-10
 rel. dual   infeas      = 3.48e-12
 norm(X), norm(y), norm(Z) = 2.7e+01, 9.3e+01, 5.7e+01
 norm(A), norm(b), norm(C) = 1.5e+03, 1.9e+03, 7.7e+01
 Total CPU time (secs)  = 0.97
 CPU time per iteration = 0.04
 termination code        =  0
 DIMACS errors: 9.1e-10  0.0e+00  5.0e-12  0.0e+00  1.5e-08  1.4e-08
-------------------------------------------------------------------

ans =

   13.7892


 num. of constraints = 96
 dim. of socp   var = 87,   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|1.0e+02|2.7e+07| 4.593713e+04  0.000000e+00| 0:0:00| chol  1✔
1
 1|1.000|0.991|1.1e-07|1.0e+00|3.1e+05| 4.761453e+04 -8.285865e+01| 0:0:00| chol  1✔
1
 2|1.000|0.956|1.0e-07|7.6e-02|4.6e+04| 3.273329e+04 -1.064957e+01| 0:0:00| chol  1✔
1
 3|0.981|1.000|9.4e-09|1.0e-02|5.1e+03| 4.807466e+03 -1.365132e+01| 0:0:00| chol  1✔
1
 4|1.000|1.000|6.8e-09|1.0e-03|2.3e+02| 2.201603e+02 -1.190431e+01| 0:0:00| chol  1✔
```

```
1
 5|0.552|0.531|1.9e-08|5.2e-04|1.8e+02| 1.654013e+02 -9.249890e+00| 0:0:00| chol
  linsysolve: Schur complement matrix not positive definite
  switch to LU factor. lu 30    1
 6|0.488|0.468|9.7e-09|2.8e-04|1.3e+02| 1.190507e+02 -8.342616e+00| 0:0:00| lu 30↙
1
 7|1.000|1.000|7.9e-10|1.0e-06|1.0e+02| 9.630542e+01 -6.649116e+00| 0:0:00| lu 13↙
1
 8|0.616|0.340|3.1e-10|6.9e-07|4.0e+01| 3.334078e+01 -6.398400e+00| 0:0:00| lu 30↙
1
 9|0.094|0.063|9.2e-10|6.5e-07|4.0e+01| 3.375731e+01 -5.808810e+00| 0:0:00| lu 11↙
1
10|0.659|0.068|3.2e-10|6.1e-07|1.7e+01| 1.122963e+01 -5.779620e+00| 0:0:00| lu 30↙
1
11|0.205|1.000|2.8e-10|1.6e-10|1.6e+01| 9.995470e+00 -5.719311e+00| 0:0:00| lu 11↙
1
12|0.088|0.397|2.6e-10|1.6e-10|1.4e+01| 8.707500e+00 -5.337455e+00| 0:0:00| lu 11↙
30
13|0.027|0.056|2.5e-10|2.0e-10|1.4e+01| 8.347959e+00 -5.305669e+00| 0:0:00| lu 11↙
11
14|0.061|0.027|4.8e-09|2.5e-10|1.3e+01| 7.944669e+00 -5.366976e+00| 0:0:00| lu 30↙
^22
15|0.973|0.283|1.5e-08|2.5e-10|1.2e+01| 6.294649e+00 -5.216665e+00| 0:0:00| lu 30↙
30
16|0.305|0.433|1.5e-08|2.6e-10|9.9e+00| 4.168550e+00 -5.772648e+00| 0:0:01| lu 11↙
^30
17|0.219|1.000|1.2e-08|1.7e-10|7.7e+00| 2.041593e+00 -5.629904e+00| 0:0:01| lu 13↙
30
18|1.000|0.622|2.7e-10|3.2e-10|6.0e+00| 1.001382e+00 -5.040316e+00| 0:0:01| lu 11↙
^12
19|0.770|0.776|5.3e-10|1.3e-10|1.4e+00|-3.496337e+00 -4.881253e+00| 0:0:01| lu 11↙
30
20|0.201|0.606|3.7e-09|1.3e-10|1.1e+00|-3.771174e+00 -4.873075e+00| 0:0:01| lu 11↙
^13
21|0.047|1.000|3.3e-09|1.2e-10|1.0e+00|-3.819645e+00 -4.850407e+00| 0:0:01| lu 30↙
^21
22|1.000|0.977|4.5e-10|1.9e-10|8.8e-01|-3.964253e+00 -4.842142e+00| 0:0:01| lu 12↙
30
23|0.788|0.668|6.7e-10|1.5e-10|4.9e-01|-4.346133e+00 -4.835162e+00| 0:0:01| lu 29↙
1
24|1.000|0.440|3.9e-10|2.2e-10|3.7e-01|-4.461228e+00 -4.832881e+00| 0:0:01| lu 11↙
^20
25|0.433|0.412|1.3e-09|2.1e-10|2.1e-01|-4.621102e+00 -4.831944e+00| 0:0:01| lu 12↙
^16
26|0.048|0.106|1.1e-09|3.0e-10|2.1e-01|-4.622931e+00 -4.831690e+00| 0:0:01| lu 11↙
30
27|0.303|0.857|1.7e-09|2.2e-10|1.5e-01|-4.685345e+00 -4.830904e+00| 0:0:01| lu 30↙
30
28|0.226|1.000|1.0e-08|2.6e-10|1.4e-01|-4.692374e+00 -4.831173e+00| 0:0:01| lu 30↙
30
29|0.507|1.000|5.2e-09|3.9e-10|9.4e-02|-4.736467e+00 -4.830283e+00| 0:0:01| lu 17↙
^14
30|0.390|1.000|2.7e-09|5.9e-10|7.0e-02|-4.759832e+00 -4.830131e+00| 0:0:01| lu 30↙
30
```

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31|1.000|1.000|1.6e-09|5.4e-10|5.5e-02|-4.775506e+00 -4.830044e+00| 0:0:01| lu 30↙
^20
32|0.942|0.753|1.3e-09|4.5e-10|3.3e-03|-4.826612e+00 -4.829870e+00| 0:0:01| lu 11↙
^11
33|0.490|0.917|6.6e-10|2.9e-10|1.7e-03|-4.828201e+00 -4.829860e+00| 0:0:01| lu 11↙
30
34|0.124|1.000|5.6e-09|1.3e-10|1.5e-03|-4.828404e+00 -4.829857e+00| 0:0:01| lu 11↙
30
35|0.133|1.000|4.5e-09|2.0e-10|1.3e-03|-4.828593e+00 -4.829855e+00| 0:0:01|
  stop: progress is too slow
  stop: progress is bad*
-------------------------------------------------------------------
 number of iterations   = 35
 primal objective value = -4.82859254e+00
 dual   objective value = -4.82985468e+00
 gap := trace(XZ)        = 1.26e-03
 relative gap            = 1.18e-04
 actual relative gap     = 1.18e-04
 rel. primal infeas      = 4.48e-09
 rel. dual   infeas      = 1.98e-10
 norm(X), norm(y), norm(Z) = 3.3e+01, 8.2e+02, 6.8e+01
 norm(A), norm(b), norm(C) = 1.6e+03, 2.2e+03, 7.7e+01
 Total CPU time (secs)  = 1.06
 CPU time per iteration = 0.03
 termination code        = -5
 DIMACS errors: 1.5e-08  0.0e+00  2.8e-10  0.0e+00  1.2e-04  1.2e-04
-------------------------------------------------------------------

ans =

    4.8298

Iteration   2   Total error is: 0.0089368

 num. of constraints = 96
 dim. of socp   var = 86,   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|1.0e+02|2.5e+07| 4.392885e+04  0.000000e+00| 0:0:00| chol  1↙
1
 1|1.000|0.991|5.1e-08|1.1e+00|3.1e+05| 4.536749e+04 -8.623947e+01| 0:0:00| chol  1↙
1
 2|1.000|0.938|5.8e-08|9.8e-02|4.9e+04| 3.235917e+04 -1.404004e+01| 0:0:00| chol  1↙
1
 3|0.882|1.000|1.3e-08|1.0e-02|1.2e+04| 1.120003e+04 -2.192138e+01| 0:0:00| chol  1↙
1
 4|1.000|1.000|4.3e-09|3.0e-03|1.6e+03| 1.524329e+03 -1.783217e+01| 0:0:00| chol  1↙
1
```

```
 5|0.843|0.836|8.6e-09|7.4e-04|2.5e+02| 2.312053e+02 -1.373780e+01| 0:0:00| chol
  linsysolve: Schur complement matrix not positive definite
  switch to LU factor. lu 30    1
 6|0.142|0.194|7.3e-09|6.0e-04|2.2e+02| 2.084233e+02 -1.249274e+01| 0:0:00| lu 12✔
1
 7|0.045|1.000|7.0e-09|3.0e-06|2.2e+02| 2.052841e+02 -1.320258e+01| 0:0:00| lu 30✔
1
 8|1.000|0.498|3.1e-11|1.7e-06|1.8e+02| 1.746357e+02 -9.214791e+00| 0:0:00| lu 13✔
1
 9|0.576|1.000|1.6e-11|3.0e-08|1.4e+02| 1.310592e+02 -6.554450e+00| 0:0:00| lu 12✔
1
10|0.740|0.504|4.2e-12|1.6e-08|8.5e+01| 7.958774e+01 -5.173833e+00| 0:0:00| lu 11✔
30
11|0.083|0.116|5.0e-12|1.5e-08|7.8e+01| 7.284406e+01 -4.728775e+00| 0:0:00| lu 30✔
1
12|0.021|0.017|9.2e-12|1.4e-08|7.7e+01| 7.244170e+01 -4.891640e+00| 0:0:00| lu 11✔
1
13|0.228|0.106|1.5e-11|1.3e-08|7.3e+01| 6.900085e+01 -4.446814e+00| 0:0:00| lu 30✔
1
14|0.089|0.095|3.3e-11|1.2e-08|7.2e+01| 6.627924e+01 -5.661770e+00| 0:0:00| lu 11✔
^19
15|0.202|1.000|2.9e-11|3.4e-12|6.5e+01| 6.004801e+01 -4.668660e+00| 0:0:00| lu 13✔
1
16|1.000|0.916|9.1e-14|5.4e-12|4.9e+01| 4.688027e+01 -2.448239e+00| 0:0:00| lu 14✔
1
17|0.550|0.330|1.5e-13|4.6e-12|2.2e+01| 2.026795e+01 -2.129971e+00| 0:0:00| lu 13✔
1
18|0.786|0.136|8.7e-11|5.0e-12|2.2e+01| 2.017982e+01 -1.708285e+00| 0:0:00| lu 11✔
1
19|0.634|0.066|1.7e-11|6.1e-12|8.2e+00| 6.517208e+00 -1.691216e+00| 0:0:00| lu 12✔
1
20|0.159|1.000|1.3e-11|2.3e-12|7.9e+00| 6.321484e+00 -1.564166e+00| 0:0:00| lu 30✔
1
21|1.000|0.666|1.1e-12|3.4e-12|6.4e+00| 5.255902e+00 -1.122526e+00| 0:0:00| lu 27✔
1
22|0.610|0.565|5.6e-13|2.5e-12|2.7e+00| 1.630080e+00 -1.030707e+00| 0:0:00| lu 12✔
1
23|0.304|1.000|2.5e-12|1.0e-12|2.2e+00| 1.141428e+00 -1.022343e+00| 0:0:00| lu 11✔
1
24|0.080|0.782|2.9e-12|1.2e-12|2.0e+00| 9.893548e-01 -9.731182e-01| 0:0:00| lu 12✔
1
25|0.392|1.000|1.4e-11|1.0e-12|1.9e+00| 8.810761e-01 -9.892214e-01| 0:0:01| lu 15✔
1
26|1.000|0.739|1.5e-12|1.8e-12|1.3e+00| 3.467719e-01 -9.678396e-01| 0:0:01| lu 12✔
1
27|0.665|0.601|5.3e-13|1.7e-12|4.5e-01|-4.974903e-01 -9.471806e-01| 0:0:01| lu 30✔
1
28|0.744|1.000|5.2e-12|1.0e-12|3.2e-01|-6.221476e-01 -9.470064e-01| 0:0:01| lu 11✔
1
29|0.331|0.639|1.6e-12|1.4e-12|2.2e-01|-7.249251e-01 -9.427723e-01| 0:0:01| lu 30✔
1
30|0.725|1.000|3.0e-11|1.0e-12|1.4e-01|-8.052474e-01 -9.427264e-01| 0:0:01| lu 11✔
30
31|0.205|0.229|6.5e-10|2.3e-12|1.1e-01|-8.331195e-01 -9.424280e-01| 0:0:01| lu 11✔
```

```
^11
32|0.082|0.121|7.8e-10|4.2e-12|1.0e-01|-8.418434e-01 -9.423466e-01| 0:0:01| lu 11 ^↙
5
33|0.001|0.086|1.4e-10|7.3e-12|1.0e-01|-8.418773e-01 -9.427468e-01| 0:0:01| lu 16↙
30
34|0.039|0.347|9.1e-09|9.8e-12|1.0e-01|-8.427603e-01 -9.424359e-01| 0:0:01| lu 13↙
^12
35|0.160|0.856|8.0e-09|9.0e-12|9.1e-02|-8.507900e-01 -9.422388e-01| 0:0:01| lu 30↙
1
36|0.247|1.000|5.9e-09|1.1e-11|8.3e-02|-8.594064e-01 -9.421137e-01| 0:0:01| lu 19↙
30
37|0.823|0.964|9.2e-10|1.7e-11|5.6e-02|-8.862423e-01 -9.420641e-01| 0:0:01| lu 23 ^↙
2
38|0.482|0.749|5.7e-10|3.0e-11|3.2e-02|-9.101054e-01 -9.418136e-01| 0:0:01| lu 11↙
30
39|0.168|0.658|9.1e-10|4.9e-11|2.6e-02|-9.153987e-01 -9.417713e-01| 0:0:01| lu 11↙
30
40|0.597|1.000|2.5e-09|5.8e-11|1.3e-02|-9.285768e-01 -9.417854e-01| 0:0:01| lu 11↙
30
41|0.338|0.715|9.0e-10|1.0e-10|8.7e-03|-9.330147e-01 -9.417575e-01| 0:0:01| lu 11↙
30
42|0.205|1.000|9.7e-10|1.3e-10|7.4e-03|-9.343384e-01 -9.417628e-01| 0:0:01| lu 11↙
30
43|0.364|0.735|5.1e-10|2.3e-10|4.7e-03|-9.370338e-01 -9.417529e-01| 0:0:01| lu 11↙
30
44|0.084|1.000|4.9e-09|1.0e-10|4.6e-03|-9.371891e-01 -9.417679e-01| 0:0:01| lu 11↙
^29
45|0.337|0.860|3.9e-09|1.7e-10|3.0e-03|-9.387127e-01 -9.417530e-01| 0:0:01| lu 17↙
1
46|0.486|1.000|1.3e-09|2.3e-10|2.7e-03|-9.390781e-01 -9.417623e-01| 0:0:01| lu 30↙
3
47|0.919|0.771|1.3e-10|3.2e-10|4.6e-04|-9.412881e-01 -9.417523e-01| 0:0:01| lu 11↙
^27
48|1.000|1.000|1.2e-10|2.6e-11|1.4e-04|-9.416124e-01 -9.417513e-01| 0:0:01| lu 11↙
^14
49|0.997|0.928|4.4e-10|2.6e-11|4.8e-06|-9.417459e-01 -9.417506e-01| 0:0:01| lu 11↙
30
50|1.000|0.843|1.3e-08|4.0e-11|9.2e-07|-9.417496e-01 -9.417506e-01| 0:0:01|
  sqlp stop: maximum number of iterations reached
-----------------------------------------------------------------
 number of iterations  = 50
 primal objective value = -9.41749576e-01
 dual   objective value = -9.41750562e-01
 gap := trace(XZ)       = 9.18e-07
 relative gap           = 3.18e-07
 actual relative gap    = 3.42e-07
 rel. primal infeas     = 1.35e-08
 rel. dual   infeas     = 4.02e-11
 norm(X), norm(y), norm(Z) = 3.6e+01, 1.0e+02, 7.3e+01
 norm(A), norm(b), norm(C) = 1.6e+03, 2.5e+03, 7.7e+01
 Total CPU time (secs)  = 1.08
 CPU time per iteration = 0.02
 termination code       = -6
 DIMACS errors: 4.6e-08  0.0e+00  5.8e-11  0.0e+00  3.4e-07  3.2e-07
```

```
    ----------------------------------------------------------------

ans =

    0.9418

Iteration   3   Total error is: 0.0038693

 num. of constraints = 96
 dim. of socp   var = 86,    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|1.0e+02|2.6e+07| 4.565507e+04  0.000000e+00| 0:0:00| chol  1↙
1
 1|1.000|0.991|4.6e-08|1.1e+00|3.1e+05| 4.710618e+04 -8.433334e+01| 0:0:00| chol  1↙
1
 2|1.000|0.938|5.1e-08|9.6e-02|5.1e+04| 3.360859e+04 -1.559072e+01| 0:0:00| chol  1↙
1
 3|0.881|1.000|1.2e-08|1.0e-02|1.2e+04| 1.161454e+04 -2.379029e+01| 0:0:00| chol  1↙
1
 4|1.000|1.000|4.4e-09|3.0e-03|1.6e+03| 1.586487e+03 -1.950050e+01| 0:0:00| chol  1↙
1
 5|0.839|0.827|8.2e-09|7.6e-04|2.6e+02| 2.480278e+02 -1.504688e+01| 0:0:00| chol
  linsysolve: Schur complement matrix not positive definite
  switch to LU factor. lu 13    1
 6|0.206|0.649|6.5e-09|2.9e-04|2.5e+02| 2.356529e+02 -1.056911e+01| 0:0:00| lu 11↙
1
 7|0.212|0.190|5.1e-09|2.3e-04|2.1e+02| 1.977890e+02 -9.906462e+00| 0:0:00| lu 30↙
1
 8|0.083|0.099|4.9e-09|2.1e-04|2.1e+02| 1.945175e+02 -1.069134e+01| 0:0:00| lu 30↙
1
 9|0.284|0.274|3.4e-09|1.5e-04|2.0e+02| 1.885041e+02 -8.003136e+00| 0:0:00| lu 11↙
1
10|0.348|0.142|2.2e-09|1.3e-04|1.3e+02| 1.221274e+02 -7.788395e+00| 0:0:00| lu 11↙
1
11|0.169|0.540|1.9e-09|6.0e-05|1.3e+02| 1.186008e+02 -8.229226e+00| 0:0:00| lu 11↙
1
12|0.399|1.000|1.1e-09|4.0e-10|7.6e+01| 6.885298e+01 -6.705164e+00| 0:0:00| lu 30↙
1
13|1.000|0.359|7.5e-12|4.8e-10|6.4e+01| 5.989980e+01 -3.999945e+00| 0:0:00| lu 12↙
1
14|0.732|0.451|2.0e-12|2.7e-10|1.8e+01| 1.525286e+01 -2.709722e+00| 0:0:00| lu 13↙
1
15|0.258|0.250|1.8e-12|2.0e-10|1.7e+01| 1.551397e+01 -1.572492e+00| 0:0:00| lu 11↙
1
16|0.474|0.494|2.7e-12|1.0e-10|9.0e+00| 7.617413e+00 -1.380474e+00| 0:0:00| lu 30↙
1
17|0.134|0.312|2.3e-11|7.2e-11|8.7e+00| 7.476320e+00 -1.203647e+00| 0:0:00| lu 30↙
```

```
1
18|0.708|0.462|4.1e-12|4.0e-11|7.5e+00| 6.763397e+00 -7.409637e-01| 0:0:00| lu 30↙
1
19|0.341|0.363|5.2e-12|2.7e-11|6.1e+00| 5.431176e+00 -6.194582e-01| 0:0:00| lu 30↙
1
20|0.394|1.000|9.0e-12|1.0e-12|5.4e+00| 4.862754e+00 -5.679910e-01| 0:0:00| lu 11↙
1
21|0.131|0.281|4.6e-12|2.3e-12|4.7e+00| 4.191128e+00 -4.945541e-01| 0:0:00| lu 30↙
1
22|0.152|0.139|1.8e-10|3.0e-12|4.6e+00| 4.087325e+00 -5.052926e-01| 0:0:00| lu 12↙
1
23|0.651|1.000|6.5e-11|1.5e-12|3.6e+00| 3.081181e+00 -4.800404e-01| 0:0:00| lu 30↙
1
24|1.000|0.468|1.1e-10|3.0e-12|2.7e+00| 2.249665e+00 -4.033545e-01| 0:0:00| lu 30↙
1
25|0.573|0.497|3.8e-11|4.9e-12|1.2e+00| 7.894264e-01 -3.829635e-01| 0:0:00| lu 30↙
1
26|0.120|0.353|7.1e-11|8.2e-12|1.1e+00| 7.672849e-01 -3.743850e-01| 0:0:00| lu 12↙
1
27|0.722|1.000|1.0e-11|7.6e-12|8.7e-01| 5.186184e-01 -3.543771e-01| 0:0:00| lu 15↙
1
28|0.539|0.453|7.5e-12|6.2e-12|4.8e-01| 1.352162e-01 -3.460135e-01| 0:0:01| lu 11↙
1
29|0.177|0.397|5.0e-12|5.2e-12|4.0e-01| 5.144964e-02 -3.445065e-01| 0:0:01| lu 11↙
1
30|0.055|1.000|2.3e-11|1.0e-12|3.9e-01| 4.468218e-02 -3.474376e-01| 0:0:01| lu 30↙
1
31|0.982|0.691|2.2e-12|1.8e-12|2.6e-01|-8.350086e-02 -3.432693e-01| 0:0:01| lu 29↙
1
32|1.000|0.919|1.1e-11|1.1e-12|1.4e-01|-2.032739e-01 -3.408225e-01| 0:0:01| lu 11 ^↙
8
33|0.491|0.514|4.7e-10|2.1e-12|7.0e-02|-2.702181e-01 -3.402344e-01| 0:0:01| lu 11↙
^13
34|0.063|0.700|1.2e-09|2.9e-12|6.5e-02|-2.746162e-01 -3.400107e-01| 0:0:01| lu 12↙
1
35|0.290|0.317|5.7e-10|5.3e-12|6.3e-02|-2.771018e-01 -3.399353e-01| 0:0:01| lu 30↙
1
36|0.244|1.000|4.0e-10|5.1e-12|5.8e-02|-2.817879e-01 -3.402284e-01| 0:0:01| lu 19↙
1
37|0.479|0.674|1.8e-10|9.2e-12|3.9e-02|-3.004966e-01 -3.399130e-01| 0:0:01| lu 30↙
30
38|0.747|1.000|1.6e-10|1.1e-11|2.6e-02|-3.135098e-01 -3.398546e-01| 0:0:01| lu 12 ^↙
7
39|1.000|1.000|7.2e-11|1.7e-11|1.4e-02|-3.255254e-01 -3.398046e-01| 0:0:01| lu 16↙
1
40|0.815|0.596|4.0e-11|2.1e-11|2.7e-03|-3.371089e-01 -3.397610e-01| 0:0:01| lu 11↙
30
41|0.466|0.709|1.9e-09|1.4e-11|1.4e-03|-3.383421e-01 -3.397557e-01| 0:0:01| lu 12 ^↙
9
42|0.053|1.000|1.7e-09|1.2e-11|1.4e-03|-3.383563e-01 -3.397588e-01| 0:0:01| lu 30 ^↙
5
43|1.000|0.959|4.5e-10|1.9e-11|4.6e-04|-3.392978e-01 -3.397537e-01| 0:0:01| lu 30↙
^23
44|0.980|0.837|1.0e-10|3.0e-11|2.7e-05|-3.397261e-01 -3.397528e-01| 0:0:01| lu 11↙
```

```
30
45|1.000|1.000|3.3e-10|2.1e-11|2.2e-06|-3.397505e-01 -3.397528e-01| 0:0:01| lu 11✔
30
46|0.954|0.844|1.0e-09|3.4e-11|2.9e-07|-3.397522e-01 -3.397528e-01| 0:0:01| lu 11✔
30
47|0.199|0.560|5.0e-09|6.2e-11|2.5e-07|-3.397520e-01 -3.397528e-01| 0:0:01| lu 15✔
^11
48|0.027|0.120|4.3e-09|1.2e-10|2.6e-07|-3.397518e-01 -3.397528e-01| 0:0:01|
  stop: progress is too slow
  stop: progress is bad
  stop: progress is bad*
-------------------------------------------------------------------
 number of iterations   = 48
 primal objective value = -3.39752203e-01
 dual   objective value = -3.39752797e-01
 gap := trace(XZ)        = 2.94e-07
 relative gap            = 1.75e-07
 actual relative gap     = 3.54e-07
 rel. primal infeas      = 1.01e-09
 rel. dual   infeas      = 3.43e-11
 norm(X), norm(y), norm(Z) = 3.6e+01, 1.0e+02, 7.4e+01
 norm(A), norm(b), norm(C) = 1.7e+03, 2.6e+03, 7.7e+01
 Total CPU time (secs)  = 1.02
 CPU time per iteration = 0.02
 termination code        = -5
 DIMACS errors: 3.5e-09  0.0e+00  4.9e-11  0.0e+00  3.5e-07  1.8e-07
-------------------------------------------------------------------


ans =

    0.3398


Iteration   4   Total error is: 0.0022094

 num. of constraints = 96
 dim. of socp  var = 87,   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|1.0e+02|2.6e+07| 4.587087e+04  0.000000e+00| 0:0:00| chol  1✔
1
 1|1.000|0.991|4.2e-08|1.1e+00|3.2e+05| 4.735177e+04 -8.305173e+01| 0:0:00| chol  1✔
1
 2|1.000|0.938|4.8e-08|9.7e-02|5.2e+04| 3.395702e+04 -1.656801e+01| 0:0:00| chol  1✔
1
 3|0.875|1.000|1.1e-08|1.0e-02|1.3e+04| 1.214820e+04 -2.532012e+01| 0:0:00| chol  1✔
1
 4|1.000|1.000|4.3e-09|3.0e-03|1.7e+03| 1.695844e+03 -2.078644e+01| 0:0:00| chol  1✔
1
```

```
 5|0.848|0.835|8.0e-09|7.4e-04|2.6e+02| 2.474625e+02 -1.617281e+01| 0:0:00| chol
  linsysolve: Schur complement matrix not positive definite
  switch to LU factor. lu 30    1
 6|0.199|0.734|6.4e-09|2.2e-04|2.5e+02| 2.370708e+02 -1.061566e+01| 0:0:00| lu 30↙
1
 7|0.550|1.000|2.9e-09|3.0e-06|1.9e+02| 1.853438e+02 -9.195754e+00| 0:0:00| lu 11↙
1
 8|0.300|0.443|2.0e-09|1.8e-06|1.5e+02| 1.430097e+02 -7.208146e+00| 0:0:00| lu 30↙
1
 9|0.099|0.138|1.8e-09|1.6e-06|1.5e+02| 1.406566e+02 -7.567045e+00| 0:0:00| lu 30↙
1
10|0.451|0.294|1.0e-09|1.1e-06|1.4e+02| 1.326579e+02 -6.053900e+00| 0:0:00| lu 16↙
1
11|0.587|1.000|4.2e-10|5.0e-10|1.0e+02| 9.064974e+01 -9.277926e+00| 0:0:00| lu 30↙
1
12|0.769|1.000|9.6e-11|1.1e-10|5.3e+01| 4.932118e+01 -3.240087e+00| 0:0:00| lu 20↙
1
13|0.386|0.485|5.9e-11|7.9e-11|3.5e+01| 3.276638e+01 -1.769327e+00| 0:0:00| lu 11↙
1
14|0.136|0.155|5.1e-11|7.9e-11|3.1e+01| 2.900490e+01 -1.555035e+00| 0:0:00| lu 30↙
1
15|0.061|0.044|5.4e-11|8.5e-11|3.0e+01| 2.849949e+01 -1.743877e+00| 0:0:00| lu 11↙
1
16|0.418|1.000|3.4e-11|1.1e-11|2.5e+01| 2.376676e+01 -1.543615e+00| 0:0:00| lu 25↙
1
17|1.000|0.222|7.4e-11|1.5e-11|2.0e+01| 1.850190e+01 -1.335348e+00| 0:0:00| lu 30↙
1
18|0.538|0.568|3.3e-11|1.7e-11|1.1e+01| 1.036973e+01 -9.527409e-01| 0:0:00| lu 30↙
1
19|0.480|1.000|2.2e-11|6.7e-12|9.5e+00| 8.630397e+00 -8.386509e-01| 0:0:00| lu 30↙
1
20|1.000|0.553|2.6e-11|7.3e-12|7.1e+00| 6.709304e+00 -4.310486e-01| 0:0:00| lu 11↙
^21
21|0.686|0.389|6.3e-10|9.6e-12|2.3e+00| 1.883253e+00 -3.926398e-01| 0:0:01| lu 30↙
^14
22|0.196|0.837|1.9e-09|9.4e-12|2.1e+00| 1.836464e+00 -2.982066e-01| 0:0:01| lu 11 ^↙
3
23|0.164|0.911|2.0e-09|1.3e-11|1.7e+00| 1.505202e+00 -2.437574e-01| 0:0:01| lu 14↙
30
24|0.239|0.490|1.1e-09|2.4e-11|1.5e+00| 1.269384e+00 -2.338025e-01| 0:0:01| lu 30 ^↙
8
25|0.452|0.961|8.0e-09|2.7e-11|1.4e+00| 1.128674e+00 -2.351001e-01| 0:0:01| lu 11 ^↙
8
26|0.224|0.295|7.4e-09|5.9e-11|1.1e+00| 8.293325e-01 -2.264542e-01| 0:0:01| lu 11↙
30
27|0.035|0.273|1.1e-09|1.0e-10|1.0e+00| 7.924676e-01 -2.260030e-01| 0:0:01| lu 11 ^↙
7
28|0.003|1.000|7.2e-09|8.9e-11|1.0e+00| 7.916004e-01 -2.363836e-01| 0:0:01| lu 11↙
30
29|0.219|0.658|5.6e-09|1.6e-10|8.4e-01| 6.189756e-01 -2.214003e-01| 0:0:01| lu 11↙
30
30|0.121|0.956|5.4e-09|2.1e-10|7.5e-01| 5.303476e-01 -2.170322e-01| 0:0:01| lu 11↙
30
31|0.415|1.000|1.2e-09|3.0e-10|5.3e-01| 3.111188e-01 -2.166722e-01| 0:0:01| lu 30↙
```

```
29
32|0.122|0.114|6.1e-09|5.0e-10|5.2e-01| 3.052884e-01 -2.124160e-01| 0:0:01| lu 12✔
^21
33|0.772|1.000|1.6e-09|3.5e-10|3.0e-01| 8.533665e-02 -2.119037e-01| 0:0:01| lu 30✔
30
34|1.000|0.443|1.5e-09|5.1e-10|2.0e-01|-1.074089e-02 -2.094348e-01| 0:0:01| lu 30✔
30
35|0.608|1.000|1.1e-09|3.0e-10|1.4e-01|-7.043043e-02 -2.084929e-01| 0:0:01| lu 11✔
30
36|0.200|0.398|1.2e-09|3.9e-10|1.1e-01|-9.764271e-02 -2.075961e-01| 0:0:01| lu 30✔
30
37|0.094|1.000|1.1e-09|2.4e-10|1.1e-01|-9.921644e-02 -2.080812e-01| 0:0:01| lu 12✔
1
38|0.352|0.444|6.7e-10|3.5e-10|8.6e-02|-1.218034e-01 -2.074293e-01| 0:0:01| lu 12✔
30
39|0.659|0.463|1.8e-10|3.2e-10|5.5e-02|-1.526794e-01 -2.072920e-01| 0:0:01| lu 30✔
1
40|0.140|1.000|1.6e-09|3.7e-11|5.3e-02|-1.545881e-01 -2.072303e-01| 0:0:01| lu 24✔
30
41|1.000|1.000|3.2e-10|5.5e-11|3.2e-02|-1.746989e-01 -2.070785e-01| 0:0:01| lu 11✔
30
42|0.641|0.458|7.3e-11|9.4e-11|1.2e-02|-1.953785e-01 -2.070212e-01| 0:0:01| lu 11✔
30
43|0.045|0.230|8.7e-09|8.7e-11|1.1e-02|-1.955681e-01 -2.069902e-01| 0:0:01| lu 30✔
1
44|0.220|1.000|8.2e-09|2.2e-11|1.1e-02|-1.962326e-01 -2.070007e-01| 0:0:01| lu 30✔
1
45|1.000|1.000|3.6e-11|3.3e-11|6.8e-03|-2.002084e-01 -2.069866e-01| 0:0:01| lu 11✔
10
46|0.811|0.785|9.2e-11|1.4e-11|1.3e-03|-2.056791e-01 -2.069582e-01| 0:0:01| lu 11✔
^25
47|0.551|0.645|9.9e-10|1.6e-11|5.7e-04|-2.063813e-01 -2.069549e-01| 0:0:01| lu 13✔
30
48|0.031|1.000|6.0e-10|1.6e-11|5.7e-04|-2.063855e-01 -2.069558e-01| 0:0:01| lu 12✔
30
49|1.000|0.911|1.7e-09|2.5e-11|8.5e-05|-2.068679e-01 -2.069534e-01| 0:0:01| lu 11✔
30
50|0.824|0.967|5.0e-10|3.7e-11|1.7e-05|-2.069360e-01 -2.069532e-01| 0:0:01|
  sqlp stop: maximum number of iterations reached
-------------------------------------------------------------------
 number of iterations   = 50
 primal objective value = -2.06936012e-01
 dual   objective value = -2.06953154e-01
 gap := trace(XZ)        = 1.70e-05
 relative gap            = 1.20e-05
 actual relative gap     = 1.21e-05
 rel. primal infeas      = 5.02e-10
 rel. dual   infeas      = 3.68e-11
 norm(X), norm(y), norm(Z) = 3.6e+01, 2.2e+02, 7.5e+01
 norm(A), norm(b), norm(C) = 1.7e+03, 2.6e+03, 7.7e+01
 Total CPU time (secs)  = 1.15
 CPU time per iteration = 0.02
 termination code       = -6
 DIMACS errors: 1.7e-09  0.0e+00  5.3e-11  0.0e+00  1.2e-05  1.2e-05
```

----

ans =

    0.2070

Iteration   5   Total error is: 0.0016337

 num. of constraints = 96
 dim. of socp   var = 87,   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|1.0e+02|2.7e+07| 4.591434e+04 0.000000e+00| 0:0:00| chol 1↙
1
 1|1.000|0.991|4.2e-08|1.1e+00|3.2e+05| 4.741920e+04 -8.384629e+01| 0:0:00| chol 1↙
1
 2|1.000|0.936|4.7e-08|9.9e-02|5.2e+04| 3.413057e+04 -1.724889e+01| 0:0:00| chol 1↙
1
 3|0.863|1.000|1.2e-08|1.0e-02|1.4e+04| 1.290295e+04 -2.673290e+01| 0:0:00| chol 1↙
1
 4|1.000|1.000|4.1e-09|3.0e-03|1.9e+03| 1.851447e+03 -2.187179e+01| 0:0:00| chol 1↙
1
 5|0.864|0.850|8.0e-09|7.0e-04|2.6e+02| 2.408828e+02 -1.714835e+01| 0:0:00| chol
  linsysolve: Schur complement matrix not positive definite
  switch to LU factor. lu 11   1
 6|0.126|0.144|7.0e-09|6.1e-04|2.3e+02| 2.156889e+02 -1.587171e+01| 0:0:00| lu 14↙
1
 7|0.018|0.061|6.8e-09|5.7e-04|2.3e+02| 2.149534e+02 -1.650667e+01| 0:0:00| lu 17↙
1
 8|0.078|0.069|6.3e-09|5.3e-04|2.3e+02| 2.155824e+02 -1.389664e+01| 0:0:00| lu 30↙
1
 9|0.172|0.329|5.2e-09|3.6e-04|2.2e+02| 1.983564e+02 -2.317029e+01| 0:0:00| lu 30↙
1
10|0.847|0.584|8.0e-10|1.5e-04|1.9e+02| 1.849907e+02 -6.893691e+00| 0:0:00| lu 30↙
1
11|0.796|1.000|1.6e-10|4.6e-10|6.5e+01| 5.584797e+01 -9.239309e+00| 0:0:00| lu 11↙
1
12|0.624|1.000|6.1e-11|6.2e-11|2.2e+01| 1.853022e+01 -3.932593e+00| 0:0:00| lu 12↙
1
13|0.343|0.840|4.0e-11|2.5e-11|1.3e+01| 1.240010e+01 -5.664189e-01| 0:0:00| lu 30↙
1
14|1.000|0.908|8.8e-13|1.1e-11|9.6e+00| 8.953840e+00 -6.588053e-01| 0:0:00| lu 11↙
1
15|0.283|0.574|6.6e-13|5.5e-12|6.8e+00| 6.317814e+00 -5.107105e-01| 0:0:00| lu 11↙
1
16|1.000|0.639|2.4e-10|3.0e-12|4.2e+00| 3.836213e+00 -3.802705e-01| 0:0:00| lu 11↙
1
17|0.134|0.377|2.1e-10|3.4e-12|3.6e+00| 3.298304e+00 -3.412416e-01| 0:0:00| lu 13↙

```
30
18|0.099|0.322|3.3e-09|4.5e-12|3.5e+00| 3.202915e+00 -3.171875e-01| 0:0:00| lu 11↙
^23
19|0.710|0.460|1.8e-08|5.8e-12|2.8e+00| 2.554113e+00 -2.893077e-01| 0:0:00| lu 11↙
30
20|0.083|0.539|2.5e-08|7.8e-12|2.6e+00| 2.325462e+00 -2.372500e-01| 0:0:00| lu 11 ^↙
6
21|0.270|1.000|3.1e-08|7.6e-12|2.3e+00| 2.039194e+00 -2.349700e-01| 0:0:00| lu 18↙
^22
22|0.149|0.392|2.7e-08|1.6e-11|2.0e+00| 1.815869e+00 -2.016931e-01| 0:0:00| lu 11↙
30
23|0.218|0.349|1.9e-08|2.8e-11|1.8e+00| 1.585456e+00 -1.929888e-01| 0:0:00| lu 14↙
^28
24|0.076|0.254|5.9e-08|4.6e-11|1.8e+00| 1.563538e+00 -1.883017e-01| 0:0:00| lu 30 ^↙
6
25|0.359|1.000|4.4e-08|3.8e-11|1.6e+00| 1.440361e+00 -1.881790e-01| 0:0:00| lu 16↙
^21
26|1.000|1.000|3.3e-09|5.8e-11|1.1e+00| 9.647547e-01 -1.605142e-01| 0:0:00| lu 30 ^↙
7
27|1.000|1.000|9.0e-09|8.6e-11|4.1e-01| 2.529041e-01 -1.531847e-01| 0:0:01| lu 30↙
30
28|1.000|0.818|5.3e-08|1.5e-10|1.7e-01| 3.011824e-02 -1.387704e-01| 0:0:01| lu 11↙
^26
29|0.697|0.640|1.3e-08|2.5e-10|5.1e-02|-8.586053e-02 -1.371427e-01| 0:0:01| lu 14↙
^25
30|0.225|0.906|1.0e-08|3.2e-10|4.5e-02|-9.174722e-02 -1.367158e-01| 0:0:01| lu 12 ^↙
3
31|0.696|0.295|1.7e-09|6.6e-10|3.0e-02|-1.063447e-01 -1.366444e-01| 0:0:01| lu 30↙
1
32|0.894|0.166|3.9e-09|9.0e-10|2.4e-02|-1.121214e-01 -1.365980e-01| 0:0:01| lu 11↙
30
33|0.195|0.361|5.2e-09|1.1e-09|2.0e-02|-1.167907e-01 -1.365669e-01| 0:0:01| lu 11↙
^18
34|0.019|1.000|7.7e-09|7.9e-10|2.0e-02|-1.168213e-01 -1.366491e-01| 0:0:01| lu 11↙
30
35|0.438|0.713|6.5e-09|1.4e-09|1.2e-02|-1.240083e-01 -1.364936e-01| 0:0:01| lu 12↙
^13
36|0.654|1.000|1.3e-09|1.3e-09|7.2e-03|-1.291920e-01 -1.364786e-01| 0:0:01| lu 30↙
^11
37|0.882|0.726|2.2e-09|6.1e-10|3.7e-03|-1.327226e-01 -1.364620e-01| 0:0:01| lu 11↙
^20
38|0.346|0.434|2.3e-09|7.3e-10|2.4e-03|-1.339918e-01 -1.364546e-01| 0:0:01| lu 11↙
30
39|0.174|0.855|3.1e-07|5.7e-10|2.2e-03|-1.341770e-01 -1.364548e-01| 0:0:01| lu 11↙
^25
40|0.304|0.523|2.4e-07|9.8e-10|1.8e-03|-1.345670e-01 -1.364526e-01| 0:0:01| lu 21↙
30
41|0.408|1.000|1.4e-07|1.1e-09|1.5e-03|-1.348799e-01 -1.364514e-01| 0:0:01| lu 11↙
30
42|0.445|0.725|1.0e-07|1.9e-09|8.5e-04|-1.355520e-01 -1.364477e-01| 0:0:01| lu 11↙
30
43|0.803|1.000|3.5e-08|2.4e-09|6.7e-04|-1.357297e-01 -1.364500e-01| 0:0:01| lu 14↙
30
44|0.987|0.820|6.2e-09|4.0e-09|1.4e-04|-1.362558e-01 -1.364472e-01| 0:0:01| lu 11↙
```

```
30
45|1.000|0.983|2.1e-07|1.3e-09|5.5e-05|-1.363372e-01 -1.364468e-01| 0:0:01| lu 30↙
30
46|1.000|0.932|1.8e-08|2.0e-09|1.5e-05|-1.363782e-01 -1.364465e-01| 0:0:01| lu 11↙
^21
47|0.966|0.889|7.4e-09|1.5e-09|9.9e-07|-1.363930e-01 -1.364465e-01| 0:0:01| lu 11↙
30
48|0.689|0.951|9.6e-09|7.1e-10|5.1e-07|-1.363938e-01 -1.364465e-01| 0:0:01| lu 14↙
^12
49|0.164|0.762|2.6e-09|7.9e-10|4.9e-07|-1.363936e-01 -1.364465e-01| 0:0:01| lu 13↙
30
50|0.806|0.849|6.3e-08|6.5e-10|4.3e-07|-1.363939e-01 -1.364465e-01| 0:0:01|
  stop: progress is too slow
  stop: progress is bad*
  sqlp stop: maximum number of iterations reached
-------------------------------------------------------------------
 number of iterations   = 50
 primal objective value = -1.36393835e-01
 dual   objective value = -1.36446492e-01
 gap := trace(XZ)        = 5.07e-07
 relative gap            = 3.98e-07
 actual relative gap     = 4.14e-05
 rel. primal infeas      = 9.64e-09
 rel. dual   infeas      = 7.12e-10
 norm(X), norm(y), norm(Z) = 3.7e+01, 1.6e+03, 7.5e+01
 norm(A), norm(b), norm(C) = 1.7e+03, 2.7e+03, 7.7e+01
 Total CPU time (secs)  = 1.11
 CPU time per iteration = 0.02
 termination code        = -6
 DIMACS errors: 3.3e-08  0.0e+00  1.0e-09  0.0e+00  4.1e-05  4.0e-07
-------------------------------------------------------------------


ans =

    0.1364


Iteration   6   Total error is: 0.0012305

 num. of constraints = 96
 dim. of socp   var = 87,   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|1.0e+02|2.7e+07| 4.600207e+04  0.000000e+00| 0:0:00| chol  1↙
1
 1|1.000|0.991|4.2e-08|1.1e+00|3.2e+05| 4.751717e+04 -8.495356e+01| 0:0:00| chol  1↙
1
 2|1.000|0.935|4.7e-08|1.0e-01|5.3e+04| 3.428502e+04 -1.777562e+01| 0:0:00| chol  1↙
1
```

```
 3|0.852|1.000|1.3e-08|1.0e-02|1.4e+04| 1.364099e+04 -2.796258e+01| 0:0:00| chol  1↙
1
 4|1.000|1.000|4.0e-09|3.0e-03|2.1e+03| 1.995014e+03 -2.277000e+01| 0:0:00| chol  1↙
1
 5|0.875|0.860|7.9e-09|6.8e-04|2.6e+02| 2.373248e+02 -1.794152e+01| 0:0:00| chol
   linsysolve: Schur complement matrix not positive definite
   switch to LU factor. lu 24    1
 6|0.183|0.588|6.5e-09|3.0e-04|2.4e+02| 2.270430e+02 -1.282005e+01| 0:0:00| lu 15↙
1
 7|0.331|1.000|4.3e-09|3.0e-06|2.2e+02| 2.064592e+02 -1.192943e+01| 0:0:00| lu 30↙
1
 8|1.000|0.749|1.1e-11|9.8e-07|1.4e+02| 1.343425e+02 -6.333103e+00| 0:0:00| lu 11↙
1
 9|0.345|0.385|1.0e-11|6.1e-07|9.2e+01| 8.685357e+01 -5.133077e+00| 0:0:00| lu 30↙
1
10|0.028|0.016|3.6e-11|6.0e-07|9.2e+01| 8.818466e+01 -4.182395e+00| 0:0:00| lu 30↙
1
11|0.082|0.076|2.9e-11|5.6e-07|8.9e+01| 8.162557e+01 -7.129150e+00| 0:0:00| lu 30↙
1
12|0.628|0.318|1.1e-11|3.8e-07|8.4e+01| 8.230364e+01 -2.050400e+00| 0:0:00| lu 13↙
1
13|0.866|0.209|1.6e-12|3.0e-07|1.5e+01| 1.369411e+01 -1.723446e+00| 0:0:00| lu 11↙
1
14|0.439|0.570|1.2e-12|1.3e-07|8.7e+00| 7.058578e+00 -1.688307e+00| 0:0:00| lu 11↙
1
15|0.022|1.000|2.0e-12|1.0e-12|8.5e+00| 6.887120e+00 -1.648063e+00| 0:0:00| lu 12↙
1
16|0.499|0.491|1.0e-12|1.5e-12|7.7e+00| 7.053616e+00 -6.662737e-01| 0:0:00| lu 30↙
1
17|0.663|0.902|1.4e-12|1.1e-12|3.7e+00| 3.332583e+00 -3.917078e-01| 0:0:00| lu 30↙
1
18|0.245|0.841|1.2e-12|1.2e-12|3.2e+00| 2.930359e+00 -2.985807e-01| 0:0:00| lu 11↙
1
19|0.118|0.322|9.4e-13|1.8e-12|2.8e+00| 2.582260e+00 -2.134762e-01| 0:0:00| lu 30↙
1
20|0.977|1.000|9.2e-12|1.0e-12|2.4e+00| 2.181840e+00 -2.495371e-01| 0:0:00| lu 30↙
1
21|0.718|0.761|2.0e-12|1.7e-12|1.5e+00| 1.336486e+00 -1.574679e-01| 0:0:00| lu 30↙
1
22|0.794|1.000|4.2e-12|1.0e-12|1.1e+00| 9.856008e-01 -1.526555e-01| 0:0:00| lu 12↙
1
23|0.324|0.535|2.2e-12|1.5e-12|7.6e-01| 6.341893e-01 -1.253163e-01| 0:0:00| lu 23↙
1
24|1.000|0.864|2.7e-13|1.2e-12|5.5e-01| 4.331041e-01 -1.208349e-01| 0:0:00| lu 11↙
^30
25|0.330|0.240|4.0e-11|1.9e-12|3.7e-01| 2.541527e-01 -1.182314e-01| 0:0:00| lu 11↙
1
26|0.149|0.336|3.7e-10|2.8e-12|3.4e-01| 2.253181e-01 -1.160421e-01| 0:0:00| lu 30↙
1
27|0.718|0.801|1.9e-10|2.8e-12|2.7e-01| 1.571955e-01 -1.125999e-01| 0:0:00| lu 30↙
1
28|0.497|1.000|6.6e-11|3.4e-12|2.3e-01| 1.137260e-01 -1.118460e-01| 0:0:00| lu 30↙
1
29|1.000|1.000|2.8e-12|5.1e-12|1.5e-01| 3.960970e-02 -1.095719e-01| 0:0:01| lu 11↙
```

```
1
30|0.552|0.465|6.6e-11|3.7e-12|6.7e-02|-4.181490e-02 -1.088062e-01| 0:0:01| lu 11✔
30
31|0.067|0.802|1.1e-11|2.2e-12|6.2e-02|-4.624365e-02 -1.085679e-01| 0:0:01| lu 13✔
1
32|0.552|1.000|5.2e-11|2.2e-12|5.5e-02|-5.315573e-02 -1.086175e-01| 0:0:01| lu 26✔
30
33|1.000|0.652|1.1e-09|4.1e-12|3.8e-02|-7.042955e-02 -1.081862e-01| 0:0:01| lu 30✔
1
34|0.847|1.000|1.5e-10|5.0e-12|2.3e-02|-8.502360e-02 -1.080723e-01| 0:0:01| lu 11✔
2
35|0.396|0.622|7.0e-11|9.5e-12|1.4e-02|-9.407388e-02 -1.079487e-01| 0:0:01| lu 11✔
30
36|0.150|1.000|5.9e-11|1.1e-11|1.2e-02|-9.610163e-02 -1.079260e-01| 0:0:01| lu 30✔
1
37|0.048|0.714|1.7e-10|1.5e-11|1.2e-02|-9.617937e-02 -1.079523e-01| 0:0:01| lu 30✔
1
38|0.936|1.000|1.1e-10|1.8e-11|7.0e-03|-1.009699e-01 -1.079402e-01| 0:0:01| lu 11✔
30
39|0.422|0.612|2.3e-11|2.8e-11|4.0e-03|-1.038922e-01 -1.079091e-01| 0:0:01| lu 11✔
30
40|0.133|0.467|2.6e-11|2.0e-11|3.5e-03|-1.044210e-01 -1.079039e-01| 0:0:01| lu 11✔
1
41|0.006|1.000|1.6e-10|5.1e-12|3.5e-03|-1.044257e-01 -1.079251e-01| 0:0:01|
  stop: progress is bad
-------------------------------------------------------------------
 number of iterations   = 41
 primal objective value = -1.03892237e-01
 dual   objective value = -1.07909112e-01
 gap := trace(XZ)       = 4.02e-03
 relative gap           = 3.31e-03
 actual relative gap    = 3.31e-03
 rel. primal infeas     = 2.28e-11
 rel. dual   infeas     = 2.82e-11
 norm(X), norm(y), norm(Z) = 3.7e+01, 1.0e+02, 7.5e+01
 norm(A), norm(b), norm(C) = 1.7e+03, 2.8e+03, 7.7e+01
 Total CPU time (secs)  = 0.74
 CPU time per iteration = 0.02
 termination code       = -5
 DIMACS errors: 7.8e-11  0.0e+00  4.0e-11  0.0e+00  3.3e-03  3.3e-03
-------------------------------------------------------------------

ans =

    0.1079


Iteration   7   Total error is: 0.001027

 num. of constraints = 96
 dim. of socp  var = 87,   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|1.0e+02|2.7e+07| 4.618010e+04  0.000000e+00| 0:0:00| chol  1↙
1
 1|1.000|0.991|4.2e-08|1.1e+00|3.2e+05| 4.769921e+04 -8.563668e+01| 0:0:00| chol  1↙
1
 2|1.000|0.934|4.7e-08|1.0e-01|5.3e+04| 3.446153e+04 -1.817185e+01| 0:0:00| chol  1↙
1
 3|0.845|1.000|1.3e-08|1.0e-02|1.5e+04| 1.412704e+04 -2.882174e+01| 0:0:00| chol  1↙
1
 4|1.000|1.000|4.0e-09|3.0e-03|2.1e+03| 2.082967e+03 -2.339962e+01| 0:0:00| chol  1↙
1
 5|0.879|0.864|7.9e-09|6.7e-04|2.6e+02| 2.389540e+02 -1.847399e+01| 0:0:00| chol
  linsysolve: Schur complement matrix not positive definite
  switch to LU factor. lu 30    1
 6|0.176|0.807|6.5e-09|1.5e-04|2.4e+02| 2.312662e+02 -1.164510e+01| 0:0:00| lu 30↙
1
 7|0.422|1.000|3.7e-09|3.0e-06|2.3e+02| 2.103108e+02 -1.656365e+01| 0:0:00| lu 30↙
1
 8|1.000|1.000|7.7e-12|3.0e-07|1.4e+02| 1.296341e+02 -8.257417e+00| 0:0:00| lu 14↙
1
 9|0.840|0.800|2.5e-12|8.4e-08|5.9e+01| 5.571161e+01 -3.292018e+00| 0:0:00| lu 11↙
1
10|0.300|0.289|1.8e-12|6.1e-08|4.1e+01| 3.892499e+01 -2.433480e+00| 0:0:00| lu 11↙
1
11|0.085|0.060|6.4e-12|5.7e-08|3.8e+01| 3.616760e+01 -2.321212e+00| 0:0:00| lu 30↙
1
12|0.076|0.034|9.6e-10|5.5e-08|3.8e+01| 3.556330e+01 -2.439947e+00| 0:0:00| lu 11↙
1
13|0.023|1.000|9.3e-10|4.9e-12|3.7e+01| 3.470017e+01 -2.140751e+00| 0:0:00| lu 11↙
1
14|0.623|0.573|3.6e-10|5.2e-12|2.8e+01| 2.590282e+01 -1.789724e+00| 0:0:00| lu 30↙
1
15|0.221|0.176|4.3e-10|8.6e-12|2.7e+01| 2.487166e+01 -1.781233e+00| 0:0:00| lu 11↙
1
16|0.074|1.000|4.0e-10|6.5e-12|2.5e+01| 2.326818e+01 -1.511548e+00| 0:0:00| lu 11↙
1
17|0.044|0.311|3.8e-10|1.4e-11|2.3e+01| 2.234255e+01 -1.083202e+00| 0:0:00| lu 12↙
1
18|0.684|0.482|2.3e-10|2.2e-11|2.1e+01| 1.934430e+01 -1.318826e+00| 0:0:00| lu 30↙
1
19|0.115|1.000|1.9e-10|2.2e-11|2.0e+01| 1.886291e+01 -1.149274e+00| 0:0:00| lu 13↙
1
20|0.446|0.377|3.6e-10|4.6e-11|1.1e+01| 1.055514e+01 -7.503949e-01| 0:0:00| lu 11↙
30
21|0.231|0.876|3.4e-10|5.5e-11|9.9e+00| 9.321007e+00 -6.095857e-01| 0:0:00| lu 12↙
1
22|1.000|0.304|3.7e-10|1.1e-10|7.2e+00| 6.687178e+00 -5.315890e-01| 0:0:00| lu 30↙
1
23|0.257|0.935|3.3e-10|8.1e-11|6.4e+00| 5.922856e+00 -4.505315e-01| 0:0:00| lu 11↙
1
24|0.081|0.103|3.1e-10|1.4e-10|6.0e+00| 5.566411e+00 -4.224641e-01| 0:0:00| lu 12↙
```

```
1
25|0.935|0.119|3.6e-10|1.8e-10|4.9e+00| 4.543211e+00 -3.971292e-01| 0:0:00| lu 11 ^↙
2
26|0.123|1.000|3.8e-10|7.3e-11|4.4e+00| 4.017777e+00 -3.864094e-01| 0:0:00| lu 11↙
^22
27|0.068|0.357|4.9e-10|1.2e-10|4.2e+00| 3.847319e+00 -3.392773e-01| 0:0:01| lu 18↙
1
28|1.000|0.348|1.8e-10|1.8e-10|3.6e+00| 3.381135e+00 -2.641976e-01| 0:0:01| lu 11 ^↙
5
29|0.352|0.328|2.1e-07|1.5e-10|2.4e+00| 2.108052e+00 -2.551558e-01| 0:0:01| lu 14↙
30
30|0.005|0.865|2.2e-07|7.4e-11|2.3e+00| 2.106326e+00 -1.934488e-01| 0:0:01| lu 11↙
30
31|0.218|0.322|1.8e-07|1.3e-10|2.0e+00| 1.833207e+00 -1.636901e-01| 0:0:01| lu 30 ^↙
4
32|0.215|0.873|1.3e-07|1.4e-10|2.0e+00| 1.752619e+00 -2.021902e-01| 0:0:01| lu 30↙
^30
33|0.391|0.476|6.8e-08|2.5e-10|1.8e+00| 1.630365e+00 -1.568162e-01| 0:0:01| lu 14↙
30
34|0.539|0.721|3.2e-08|3.4e-10|1.3e+00| 1.151529e+00 -1.455471e-01| 0:0:01| lu 30↙
30
35|0.073|0.457|2.7e-08|5.8e-10|1.3e+00| 1.138809e+00 -1.329508e-01| 0:0:01| lu 11↙
^27
36|0.182|0.265|2.2e-08|1.0e-09|1.0e+00| 9.198096e-01 -1.219770e-01| 0:0:01| lu 13↙
30
37|0.299|1.000|2.8e-08|9.0e-10|9.5e-01| 8.292256e-01 -1.238735e-01| 0:0:01| lu 11↙
^13
38|0.146|0.258|2.3e-08|2.0e-09|8.1e-01| 6.944486e-01 -1.170500e-01| 0:0:01| lu 11↙
30
39|0.194|1.000|1.5e-08|2.0e-09|7.5e-01| 6.319689e-01 -1.172334e-01| 0:0:01| lu 11↙
^23
40|0.115|0.277|1.4e-08|4.5e-09|6.6e-01| 5.524424e-01 -1.113902e-01| 0:0:01| lu 26↙
30
41|0.163|1.000|4.4e-08|2.7e-09|6.4e-01| 5.326944e-01 -1.110018e-01| 0:0:01| lu 30↙
^12
42|0.956|1.000|4.2e-08|4.1e-09|4.8e-01| 3.716105e-01 -1.044465e-01| 0:0:01| lu 11↙
30
43|0.209|0.512|1.3e-08|8.2e-09|3.7e-01| 2.748392e-01 -9.905603e-02| 0:0:01| lu 11↙
1
44|0.616|1.000|5.0e-09|2.6e-09|2.0e-01| 1.009254e-01 -9.879905e-02| 0:0:01| lu 11↙
30
45|0.135|0.773|5.2e-09|1.6e-09|1.7e-01| 7.798527e-02 -9.738091e-02| 0:0:01| lu 11↙
^13
46|0.084|0.520|5.9e-09|1.8e-09|1.6e-01| 6.543175e-02 -9.589258e-02| 0:0:01| lu 11↙
^29
47|0.062|0.321|6.4e-09|2.4e-09|1.5e-01| 5.610650e-02 -9.572299e-02| 0:0:01| lu 12↙
30
48|0.021|0.789|4.4e-09|1.8e-09|1.5e-01| 5.559398e-02 -9.591221e-02| 0:0:01| lu 11↙
30
49|0.173|0.255|2.6e-09|2.2e-09|1.2e-01| 2.992152e-02 -9.538807e-02| 0:0:01| lu 30↙
30
50|0.074|1.000|6.7e-09|5.2e-10|1.2e-01| 2.861091e-02 -9.634058e-02| 0:0:01|
  sqlp stop: maximum number of iterations reached
-----------------------------------------------------------------
```

```
 number of iterations   = 50
 primal objective value =  5.61064996e-02
 dual   objective value = -9.57229856e-02
 gap := trace(XZ)       = 1.51e-01
 relative gap           = 1.31e-01
 actual relative gap    = 1.32e-01
 rel. primal infeas     = 6.44e-09
 rel. dual   infeas     = 2.40e-09
 norm(X), norm(y), norm(Z) = 3.7e+01, 4.1e+03, 7.5e+01
 norm(A), norm(b), norm(C) = 1.7e+03, 2.8e+03, 7.7e+01
 Total CPU time (secs)  = 0.87
 CPU time per iteration = 0.02
 termination code       = -6
 DIMACS errors: 2.2e-08  0.0e+00  3.4e-09  0.0e+00  1.3e-01  1.3e-01
-------------------------------------------------------------------

ans =

    0.0954


Iteration   8   Total error is: 0.00093063
The total representation error of the testing signals is: 0.0099864
>>
```