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

 num. of constraints = 33
 dim. of socp   var  = 34,   num. of socp blk  =  1
 dim. of linear var  = 48
**********************************************************************
   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|1.6e+02|8.5e+06|-6.585860e+02  0.000000e+00| 0:0:00| chol  1  1
 1|0.983|0.944|1.7e-02|9.2e+00|4.8e+05|-1.625309e+01  8.455178e+02| 0:0:00| chol  2  2
 2|1.000|0.966|4.6e-07|3.3e-01|1.8e+04| 7.556555e+00 -2.162983e+02| 0:0:00| chol  2  2
 3|1.000|0.989|2.1e-07|8.0e-03|4.4e+02|-2.795292e+00 -9.880222e+00| 0:0:00| chol  2  2
 4|0.912|0.927|1.3e-07|1.8e-03|7.2e+01|-9.536998e+00 -8.923701e+00| 0:0:00| chol  2  2
 5|0.524|0.509|1.2e-07|1.1e-03|4.3e+01|-1.139023e+01 -1.009032e+01| 0:0:00| chol  2  2
 6|0.272|0.416|8.9e-08|6.7e-04|2.9e+01|-1.214420e+01 -1.132766e+01| 0:0:00| chol  2  2
 7|0.138|0.665|1.1e-07|2.5e-04|1.2e+01|-1.276183e+01 -1.270018e+01| 0:0:00| chol  2  2
 8|0.182|0.368|8.5e-08|1.6e-04|8.6e+00|-1.313941e+01 -1.349940e+01| 0:0:00| chol  2  2
 9|0.481|0.648|7.4e-08|5.8e-05|4.5e+00|-1.309943e+01 -1.469179e+01| 0:0:00| chol  2  2
10|0.740|0.823|1.7e-08|1.1e-05|1.5e+00|-1.394183e+01 -1.492675e+01| 0:0:00| chol  3  3
11|0.555|0.936|1.1e-08|9.8e-07|7.3e-01|-1.436317e+01 -1.505110e+01| 0:0:00| chol  3  4
12|1.000|1.000|1.0e-08|8.6e-08|1.9e-01|-1.484825e+01 -1.503935e+01| 0:0:00| chol  3  3
13|0.925|0.961|9.2e-09|3.0e-08|2.3e-02|-1.498197e+01 -1.500417e+01| 0:0:00| chol  3  4
14|0.953|0.954|1.5e-08|1.0e-08|3.5e-03|-1.499755e+01 -1.500070e+01| 0:0:00| chol  5  5
15|1.000|0.909|1.8e-08|4.4e-09|3.9e-04|-1.499982e+01 -1.500013e+01| 0:0:00| chol  7  7
16|1.000|0.986|1.0e-08|1.6e-10|2.7e-05|-1.500002e+01 -1.500007e+01| 0:0:00| chol
  linsysolve: Schur complement matrix not positive definite
  switch to LU factor. lu 11 ^14
17|1.000|0.811|3.8e-08|3.7e-11|2.0e-06|-1.500008e+01 -1.500006e+01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.00e-07
---------------------------------------------------------------------
 number of iterations   = 17
 primal objective value = -1.50000800e+01
 dual   objective value = -1.50000587e+01
 gap := trace(XZ)       = 2.00e-06
 relative gap           = 6.46e-08
 actual relative gap    = -6.87e-07
 rel. primal infeas     = 3.84e-08
 rel. dual   infeas     = 3.70e-11
 norm(X), norm(y), norm(Z) = 1.7e+03, 4.6e+01, 2.2e+01
 norm(A), norm(b), norm(C) = 3.1e+03, 1.6e+03, 4.4e+01
 Total CPU time (secs) = 0.12
 CPU time per iteration = 0.01
 termination code       =  0
 DIMACS errors: 8.3e-08  0.0e+00  5.0e-11  0.0e+00  -6.9e-07  6.5e-08
---------------------------------------------------------------------

ans =

   15.0001
```

```
 num. of constraints = 33
 dim. of socp   var = 34,    num. of socp blk  =  1
 dim. of linear var  = 48
*******************************************************************
   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|2.0e+02|7.1e+06|-6.009084e+02  0.000000e+00| 0:0:00| chol 1 1
 1|0.980|0.938|2.0e-02|1.2e+01|4.4e+05|-1.895277e+01  3.040602e+03| 0:0:00| chol 2 2
 2|1.000|0.943|3.9e-07|7.2e-01|2.8e+04| 9.609427e-01 -1.681182e+02| 0:0:00| chol 2 2
 3|1.000|0.992|1.4e-07|1.0e-02|4.4e+02|-9.692374e-01 -1.045163e+01| 0:0:00| chol 2 2
 4|0.925|0.984|2.5e-08|1.4e-03|5.0e+01|-8.614237e+00 -8.838937e+00| 0:0:00| chol 2 2
 5|0.464|0.410|2.9e-08|9.9e-04|3.3e+01|-9.885847e+00 -9.269360e+00| 0:0:00| chol 2 2
 6|0.253|0.417|2.8e-08|6.3e-04|2.2e+01|-1.039541e+01 -1.009009e+01| 0:0:00| chol 2 2
 7|0.191|0.643|2.6e-08|2.5e-04|9.3e+00|-1.109626e+01 -1.089936e+01| 0:0:00| chol 3 2
 8|0.688|0.535|3.9e-08|1.2e-04|5.4e+00|-1.166773e+01 -1.195133e+01| 0:0:00| chol 3 3
 9|0.793|0.669|1.5e-08|4.2e-05|2.5e+00|-1.202385e+01 -1.269224e+01| 0:0:00| chol 2 3
10|0.675|0.750|4.2e-09|1.1e-05|1.0e+00|-1.241895e+01 -1.298211e+01| 0:0:00| chol 3 3
11|0.380|0.559|2.8e-09|5.1e-06|7.0e-01|-1.258648e+01 -1.305988e+01| 0:0:00| chol 3 3
12|0.299|0.575|8.3e-09|2.2e-06|5.1e-01|-1.268557e+01 -1.309523e+01| 0:0:00| chol 3 3
13|0.392|1.000|8.0e-09|2.6e-08|3.1e-01|-1.280269e+01 -1.311356e+01| 0:0:00| chol 4 5
14|1.000|1.000|1.9e-08|8.8e-09|9.7e-02|-1.301550e+01 -1.311168e+01| 0:0:00| chol 4 4
15|0.999|1.000|2.0e-08|4.1e-09|1.2e-02|-1.307920e+01 -1.309104e+01| 0:0:00| chol 6 6
16|0.949|0.966|3.2e-08|3.6e-09|1.2e-03|-1.308697e+01 -1.308797e+01| 0:0:00| chol
   linsysolve: Schur complement matrix not positive definite
   switch to LU factor. lu 23   2
17|0.936|0.900|2.9e-08|7.4e-10|1.5e-04|-1.308768e+01 -1.308778e+01| 0:0:00| lu 30 ^ 3
18|1.000|1.000|4.7e-08|5.4e-11|2.1e-05|-1.308776e+01 -1.308775e+01| 0:0:00| lu 28 ^19
19|0.988|0.794|6.0e-08|1.5e-11|1.7e-06|-1.308771e+01 -1.308774e+01| 0:0:00|
   stop: max(relative gap, infeasibilities) < 1.00e-07
-------------------------------------------------------------------
 number of iterations   = 19
 primal objective value = -1.30877141e+01
 dual   objective value = -1.30877444e+01
 gap := trace(XZ)        = 1.73e-06
 relative gap            = 6.38e-08
 actual relative gap     = 1.12e-06
 rel. primal infeas      = 6.03e-08
 rel. dual   infeas      = 1.54e-11
 norm(X), norm(y), norm(Z) = 2.1e+03, 4.7e+01, 2.4e+01
 norm(A), norm(b), norm(C) = 7.4e+03, 2.7e+03, 4.4e+01
 Total CPU time (secs)  = 0.12
 CPU time per iteration = 0.01
 termination code       =  0
 DIMACS errors: 9.7e-08  0.0e+00  2.1e-11  0.0e+00  1.1e-06  6.4e-08
-------------------------------------------------------------------


ans =

   13.0877
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 Iteration   2   Total error is: 0.074008


 num. of constraints = 33
 dim. of socp   var  = 34,    num. of socp blk  =  1
 dim. of linear var  = 48
******************************************************************
   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|2.0e+02|7.3e+06|-6.205988e+02  0.000000e+00| 0:0:00| chol  1  1
 1|0.982|0.940|1.8e-02|1.2e+01|4.3e+05|-1.775192e+01  3.123831e+03| 0:0:00| chol  2  2
 2|1.000|0.944|3.1e-07|6.9e-01|2.7e+04| 1.051253e+00 -1.396162e+02| 0:0:00| chol  2  2
 3|1.000|0.992|1.2e-07|9.6e-03|4.2e+02|-8.568468e-01 -9.980188e+00| 0:0:00| chol  2  2
 4|0.923|0.987|2.6e-08|1.4e-03|4.9e+01|-8.491015e+00 -8.694762e+00| 0:0:00| chol  2  2
 5|0.470|0.389|1.6e-08|1.0e-03|3.3e+01|-9.766241e+00 -9.099710e+00| 0:0:00| chol  2  2
 6|0.247|0.410|6.1e-08|6.4e-04|2.2e+01|-1.026163e+01 -9.923038e+00| 0:0:00| chol  2  2
 7|0.193|0.633|5.1e-08|2.6e-04|9.5e+00|-1.097806e+01 -1.074085e+01| 0:0:00| chol  3  2
 8|0.704|0.542|7.8e-08|1.2e-04|5.4e+00|-1.153141e+01 -1.180274e+01| 0:0:00| chol  2  3
 9|0.806|0.665|2.6e-08|4.3e-05|2.6e+00|-1.188449e+01 -1.254752e+01| 0:0:00| chol  2  2
10|0.670|0.749|8.8e-09|1.2e-05|1.1e+00|-1.227828e+01 -1.284725e+01| 0:0:00| chol  2  3
11|0.376|0.587|5.6e-09|4.9e-06|7.0e-01|-1.244742e+01 -1.293390e+01| 0:0:00| chol  3  3
12|0.278|0.534|4.7e-09|2.3e-06|5.3e-01|-1.254217e+01 -1.296539e+01| 0:0:00| chol  3  3
13|0.360|1.000|4.8e-09|2.6e-08|3.4e-01|-1.265064e+01 -1.298947e+01| 0:0:00| chol  4  4
14|0.863|1.000|1.1e-08|8.5e-09|1.6e-01|-1.282924e+01 -1.299078e+01| 0:0:00| chol  4  5
15|1.000|1.000|1.9e-08|3.7e-09|5.8e-02|-1.291673e+01 -1.297467e+01| 0:0:00| chol  5  5
16|0.923|0.929|6.3e-08|3.1e-09|5.8e-03|-1.295543e+01 -1.296094e+01| 0:0:00| chol  9 10
17|0.954|0.940|3.4e-08|1.6e-09|4.6e-04|-1.295926e+01 -1.295962e+01| 0:0:00| chol
  linsysolve: Schur complement matrix not positive definite
  switch to LU factor. lu 22 ^10
18|0.808|0.789|2.0e-07|6.5e-10|1.3e-04|-1.295847e+01 -1.295954e+01| 0:0:00| lu 19 ^10
19|1.000|1.000|7.0e-07|1.9e-10|7.6e-05|-1.295537e+01 -1.295954e+01| 0:0:00| lu 22  30
20|1.000|0.819|9.3e-07|8.8e-11|2.1e-05|-1.295775e+01 -1.295952e+01| 0:0:00| lu 11 ^ 7
21|0.084|0.083|1.0e-06|1.3e-10|2.1e-05|-1.295774e+01 -1.295952e+01| 0:0:00| lu 11 ^18
22|0.041|0.076|1.0e-06|1.8e-10|2.2e-05|-1.295778e+01 -1.295952e+01| 0:0:00|
  stop: progress is too slow
  stop: progress is bad
-------------------------------------------------------------------
 number of iterations   = 22
 primal objective value = -1.29577453e+01
 dual   objective value = -1.29595196e+01
 gap := trace(XZ)       = 2.09e-05
 relative gap           = 7.75e-07
 actual relative gap    = 6.59e-05
 rel. primal infeas     = 9.32e-07
 rel. dual   infeas     = 8.81e-11
 norm(X), norm(y), norm(Z) = 2.2e+03, 4.7e+01, 2.4e+01
 norm(A), norm(b), norm(C) = 7.9e+03, 2.6e+03, 4.4e+01
 Total CPU time (secs)  = 0.14
 CPU time per iteration = 0.01
 termination code       = -5
 DIMACS errors: 1.6e-06  0.0e+00  1.2e-10  0.0e+00  6.6e-05  7.8e-07
```

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


   ans =

      12.9595


   Iteration    3    Total error is: 0.073688

    num. of constraints = 33
    dim. of socp    var = 34,    num. of socp blk  =  1
    dim. of linear var  = 48
   ********************************************************************
      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|2.1e+02|8.0e+06|-6.309153e+02  0.000000e+00| 0:0:00| chol  1  1
    1|0.983|0.941|1.7e-02|1.2e+01|4.7e+05|-1.696211e+01  3.257957e+03| 0:0:00| chol  2  2
    2|1.000|0.945|3.0e-07|6.8e-01|2.8e+04| 1.411313e+00 -1.438446e+02| 0:0:00| chol  2  2
    3|1.000|0.992|1.3e-07|9.2e-03|4.4e+02|-4.794849e-01 -9.898190e+00| 0:0:00| chol  2  2
    4|0.924|0.990|1.8e-08|1.4e-03|5.2e+01|-8.300236e+00 -8.566354e+00| 0:0:00| chol  2  2
    5|0.469|0.371|2.0e-08|9.9e-04|3.5e+01|-9.570396e+00 -8.951039e+00| 0:0:00| chol  2  2
    6|0.232|0.430|4.7e-08|6.2e-04|2.3e+01|-1.009243e+01 -9.823648e+00| 0:0:00| chol  2  2
    7|0.194|0.634|4.0e-08|2.5e-04|9.9e+00|-1.082907e+01 -1.067725e+01| 0:0:00| chol  3  3
    8|0.728|0.564|5.3e-08|1.1e-04|5.5e+00|-1.138676e+01 -1.178184e+01| 0:0:00| chol  3  3
    9|0.827|0.690|1.7e-08|3.7e-05|2.4e+00|-1.177880e+01 -1.250383e+01| 0:0:00| chol  3  3
   10|0.623|0.677|6.3e-09|1.3e-05|1.2e+00|-1.217067e+01 -1.275347e+01| 0:0:00| chol  3  3
   11|0.418|0.625|3.9e-09|4.9e-06|7.2e-01|-1.235705e+01 -1.285010e+01| 0:0:00| chol  3  3
   12|0.285|0.673|3.8e-09|1.7e-06|5.1e-01|-1.245434e+01 -1.288743e+01| 0:0:00| chol  3  4
   13|0.395|1.000|4.5e-09|2.6e-08|3.3e-01|-1.257815e+01 -1.290307e+01| 0:0:00| chol  5  4
   14|1.000|1.000|9.9e-09|8.5e-09|1.0e-01|-1.279715e+01 -1.290108e+01| 0:0:00| chol  4  4
   15|0.936|0.998|3.1e-08|3.6e-09|1.3e-02|-1.286576e+01 -1.287834e+01| 0:0:00| chol  8  7
   16|0.976|0.971|2.5e-08|2.2e-09|5.9e-04|-1.287550e+01 -1.287602e+01| 0:0:00| chol
      linsysolve: Schur complement matrix not positive definite
      switch to LU factor. lu 11 ^25
   17|0.947|0.790|8.9e-08|5.6e-10|3.7e-05|-1.287598e+01 -1.287591e+01| 0:0:00| lu 30 ^29
   18|0.500|0.551|6.4e-07|3.1e-10|2.3e-05|-1.287604e+01 -1.287592e+01| 0:0:00| lu 13 ^ 7
   19|0.098|0.094|6.2e-07|3.4e-10|2.4e-05|-1.287646e+01 -1.287592e+01| 0:0:00| lu 30 ^12
   20|0.203|0.409|5.1e-07|2.5e-10|2.1e-05|-1.287603e+01 -1.287592e+01| 0:0:00| lu 30  30
   21|0.065|0.108|3.7e-07|2.8e-10|2.2e-05|-1.287602e+01 -1.287592e+01| 0:0:00|
      lack of progress in infeas
   -------------------------------------------------------------------
    number of iterations   = 21
    primal objective value = -1.28760448e+01
    dual   objective value = -1.28759178e+01
    gap := trace(XZ)       = 2.26e-05
    relative gap           = 8.44e-07
    actual relative gap    = -4.75e-06
    rel. primal infeas     = 6.39e-07
    rel. dual   infeas     = 3.07e-10
    norm(X), norm(y), norm(Z) = 2.3e+03, 4.7e+01, 2.4e+01
    norm(A), norm(b), norm(C) = 8.4e+03, 2.8e+03, 4.4e+01
    Total CPU time (secs)  = 0.16
```

```
 CPU time per iteration = 0.01
 termination code      =  0
 DIMACS errors: 1.1e-06  0.0e+00  4.2e-10  0.0e+00  -4.7e-06  8.4e-07
----------------------------------------------------------------------


ans =

   12.8759


Iteration   4   Total error is: 0.073492

 num. of constraints = 33
 dim. of socp   var  = 34,   num. of socp blk  =  1
 dim. of linear var  = 48
**********************************************************************
   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|2.1e+02|8.5e+06|-6.357477e+02  0.000000e+00| 0:0:00| chol  1  1
 1|0.983|0.942|1.7e-02|1.2e+01|4.9e+05|-1.657204e+01  3.431747e+03| 0:0:00| chol  2  2
 2|1.000|0.946|2.9e-07|6.9e-01|3.0e+04| 1.644553e+00 -1.477665e+02| 0:0:00| chol  2  2
 3|1.000|0.992|1.6e-07|9.3e-03|4.7e+02|-1.793680e-01 -9.903993e+00| 0:0:00| chol  2  2
 4|0.926|0.992|1.8e-08|1.3e-03|5.4e+01|-8.113742e+00 -8.476839e+00| 0:0:00| chol  2  2
 5|0.459|0.371|1.7e-08|9.9e-04|3.7e+01|-9.367998e+00 -8.854721e+00| 0:0:00| chol  2  2
 6|0.228|0.449|1.0e-08|6.0e-04|2.3e+01|-9.922688e+00 -9.747179e+00| 0:0:00| chol  2  2
 7|0.192|0.638|8.6e-09|2.4e-04|1.0e+01|-1.065480e+01 -1.062524e+01| 0:0:00| chol  3  2
 8|0.733|0.577|2.1e-08|1.1e-04|5.5e+00|-1.122120e+01 -1.172934e+01| 0:0:00| chol  3  2
 9|0.820|0.702|1.3e-08|3.4e-05|2.4e+00|-1.163746e+01 -1.242013e+01| 0:0:00| chol  3  3
10|0.622|0.658|6.2e-09|1.2e-05|1.2e+00|-1.204317e+01 -1.264883e+01| 0:0:00| chol  3  3
11|0.478|0.700|2.9e-09|3.9e-06|6.6e-01|-1.225942e+01 -1.274965e+01| 0:0:00| chol  3  3
12|0.351|0.889|5.8e-09|5.1e-07|4.2e-01|-1.237957e+01 -1.277915e+01| 0:0:00| chol  4  4
13|0.397|1.000|1.1e-08|2.6e-08|3.0e-01|-1.248387e+01 -1.278529e+01| 0:0:00| chol  4  4
14|1.000|1.000|1.1e-08|8.9e-09|1.1e-01|-1.267293e+01 -1.278173e+01| 0:0:00| chol  4  4
15|0.961|1.000|4.3e-08|4.2e-09|1.3e-02|-1.274536e+01 -1.275889e+01| 0:0:00| chol  5  6
16|0.977|0.969|4.3e-08|2.4e-09|6.2e-04|-1.275563e+01 -1.275609e+01| 0:0:00| chol
  linsysolve: Schur complement matrix not positive definite
  switch to LU factor. lu 30  13
17|0.987|0.987|4.5e-08|5.4e-11|8.8e-06|-1.275579e+01 -1.275597e+01| 0:0:00| lu 11 ^14
18|0.363|0.358|2.0e-07|5.0e-11|5.9e-06|-1.275587e+01 -1.275597e+01| 0:0:00| lu 30 ^ 4
19|0.025|0.027|1.6e-07|6.5e-11|6.4e-06|-1.275579e+01 -1.275597e+01| 0:0:00| lu 13  30
20|0.499|0.215|1.1e-07|6.7e-11|6.1e-06|-1.275569e+01 -1.275597e+01| 0:0:00| lu 30 ^10
21|0.183|0.999|1.2e-07|9.9e-12|3.8e-06|-1.275566e+01 -1.275597e+01| 0:0:00| lu 30 ^ 5
22|0.030|0.033|2.6e-07|2.0e-11|4.1e-06|-1.275552e+01 -1.275597e+01| 0:0:00| lu 30 ^19
23|0.353|0.379|1.8e-07|2.1e-11|3.2e-06|-1.275557e+01 -1.275597e+01| 0:0:00| lu 11 ^22
24|0.011|0.022|1.6e-07|2.9e-11|3.4e-06|-1.275559e+01 -1.275597e+01| 0:0:00|
  stop: progress is bad
  lack of progress in infeas
----------------------------------------------------------------------
 number of iterations   = 24
 primal objective value = -1.27556592e+01
 dual   objective value = -1.27559686e+01
 gap := trace(XZ)       = 3.82e-06
```

```
 relative gap          = 1.44e-07
 actual relative gap   = 1.17e-05
 rel. primal infeas    = 1.17e-07
 rel. dual   infeas    = 9.93e-12
 norm(X), norm(y), norm(Z) = 2.3e+03, 4.7e+01, 2.5e+01
 norm(A), norm(b), norm(C) = 8.9e+03, 2.9e+03, 4.4e+01
 Total CPU time (secs) = 0.18
 CPU time per iteration = 0.01
 termination code      = -5
 DIMACS errors: 1.9e-07  0.0e+00  1.3e-11  0.0e+00  1.2e-05  1.4e-07
-------------------------------------------------------------------


ans =

   12.7560


Iteration   5   Total error is: 0.073173

 num. of constraints = 33
 dim. of socp  var = 34,   num. of socp blk  =  1
 dim. of linear var = 48
*********************************************************************
   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|2.3e+02|9.6e+06|-6.522122e+02  0.000000e+00| 0:0:00| chol  1  1
 1|0.984|0.944|1.6e-02|1.3e+01|5.4e+05|-1.532828e+01  3.759277e+03| 0:0:00| chol  2  1
 2|1.000|0.947|3.1e-07|6.9e-01|3.1e+04| 2.082345e+00 -1.421694e+02| 0:0:00| chol  2  2
 3|1.000|0.992|2.1e-07|9.2e-03|5.1e+02| 3.464308e-01 -9.810886e+00| 0:0:00| chol  2  2
 4|0.928|0.996|1.9e-08|1.3e-03|5.9e+01|-7.806671e+00 -8.335222e+00| 0:0:00| chol  2  2
 5|0.433|0.354|2.2e-08|9.8e-04|4.1e+01|-9.003456e+00 -8.689139e+00| 0:0:00| chol  2  2
 6|0.219|0.504|3.8e-08|5.5e-04|2.4e+01|-9.637851e+00 -9.656905e+00| 0:0:00| chol  2  2
 7|0.190|0.651|3.4e-08|2.1e-04|1.0e+01|-1.038141e+01 -1.062052e+01| 0:0:00| chol  3  2
 8|0.758|0.618|4.4e-08|8.8e-05|5.1e+00|-1.098442e+01 -1.171989e+01| 0:0:00| chol  3  3
 9|0.829|0.737|1.6e-08|2.5e-05|2.1e+00|-1.149017e+01 -1.231873e+01| 0:0:00| chol  3  3
10|0.621|0.619|7.9e-09|1.0e-05|1.1e+00|-1.189968e+01 -1.251176e+01| 0:0:00| chol  3  3
11|0.591|0.753|3.6e-09|2.7e-06|5.5e-01|-1.216848e+01 -1.259733e+01| 0:0:00| chol  3  3
12|0.436|1.000|7.2e-09|8.5e-08|3.2e-01|-1.229770e+01 -1.261440e+01| 0:0:00| chol  5  5
13|1.000|1.000|3.9e-09|2.6e-08|9.7e-02|-1.251545e+01 -1.261166e+01| 0:0:00| chol  4  4
14|0.963|1.000|1.9e-08|8.4e-09|1.2e-02|-1.258016e+01 -1.259241e+01| 0:0:00| chol  8  7
15|0.991|0.969|2.3e-08|3.6e-09|6.1e-04|-1.258922e+01 -1.258979e+01| 0:0:00| chol
  linsysolve: Schur complement matrix not positive definite
  switch to LU factor. lu 19  29
16|0.984|0.984|1.4e-07|8.9e-11|1.1e-05|-1.258984e+01 -1.258969e+01| 0:0:00| lu 30 ^24
17|0.558|0.550|2.0e-07|5.5e-11|5.8e-06|-1.259060e+01 -1.258969e+01| 0:0:00| lu 30 ^21
18|0.453|1.000|2.4e-07|8.8e-12|3.4e-06|-1.259078e+01 -1.258969e+01| 0:0:00| lu 15 ^20
19|0.061|0.061|2.8e-07|1.7e-11|3.6e-06|-1.259043e+01 -1.258969e+01| 0:0:00| lu 30 ^ 5
20|0.783|1.000|1.2e-07|5.8e-12|2.2e-06|-1.259017e+01 -1.258969e+01| 0:0:00| lu 23 ^27
21|0.158|0.331|2.6e-07|9.2e-12|2.0e-06|-1.259021e+01 -1.258969e+01| 0:0:00| lu 11  30
22|0.078|0.152|1.8e-07|1.3e-11|2.0e-06|-1.259025e+01 -1.258969e+01| 0:0:00|
  stop: progress is bad
-------------------------------------------------------------------
```

```
 number of iterations   = 22
 primal objective value = -1.25901742e+01
 dual   objective value = -1.25896887e+01
 gap := trace(XZ)       = 2.24e-06
 relative gap           = 8.57e-08
 actual relative gap    = -1.85e-05
 rel. primal infeas     = 1.24e-07
 rel. dual   infeas     = 5.83e-12
 norm(X), norm(y), norm(Z) = 2.3e+03, 4.7e+01, 2.5e+01
 norm(A), norm(b), norm(C) = 1.0e+04, 3.1e+03, 4.4e+01
 Total CPU time (secs) = 0.18
 CPU time per iteration = 0.01
 termination code       = -5
 DIMACS errors: 2.1e-07  0.0e+00  7.9e-12  0.0e+00  -1.9e-05  8.6e-08
----------------------------------------------------------------------


ans =

   12.5897


Iteration   6   Total error is: 0.072723

 num. of constraints = 33
 dim. of socp   var  = 34,   num. of socp blk  =  1
 dim. of linear var  = 48
*********************************************************************
   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|2.3e+02|1.0e+07|-6.535914e+02  0.000000e+00| 0:0:00| chol  1  1
 1|0.984|0.944|1.6e-02|1.3e+01|5.6e+05|-1.520224e+01  3.943929e+03| 0:0:00| chol  1  1
 2|1.000|0.947|2.7e-07|7.1e-01|3.3e+04| 2.308870e+00 -1.485690e+02| 0:0:00| chol  2  2
 3|1.000|0.992|5.5e-07|9.4e-03|5.4e+02| 6.482571e-01 -9.819828e+00| 0:0:00| chol  2  2
 4|0.930|0.997|4.1e-08|1.3e-03|6.2e+01|-7.597703e+00 -8.218862e+00| 0:0:00| chol  2  2
 5|0.429|0.357|2.3e-08|9.8e-04|4.3e+01|-8.810534e+00 -8.571250e+00| 0:0:00| chol  2  2
 6|0.217|0.511|5.0e-08|5.4e-04|2.4e+01|-9.467315e+00 -9.548832e+00| 0:0:00| chol  2  2
 7|0.186|0.652|4.2e-08|2.1e-04|1.1e+01|-1.022452e+01 -1.053262e+01| 0:0:00| chol  3  3
 8|0.764|0.625|4.9e-08|8.5e-05|5.2e+00|-1.084952e+01 -1.165816e+01| 0:0:00| chol  3  3
 9|0.839|0.743|1.3e-08|2.4e-05|2.1e+00|-1.138647e+01 -1.225364e+01| 0:0:00| chol  2  3
10|0.678|0.628|5.7e-09|9.6e-06|1.0e+00|-1.184713e+01 -1.244338e+01| 0:0:00| chol  3  3
11|0.790|0.868|1.7e-09|1.5e-06|3.9e-01|-1.220522e+01 -1.253102e+01| 0:0:00| chol  3  3
12|0.828|1.000|1.3e-09|8.4e-08|1.5e-01|-1.237805e+01 -1.252760e+01| 0:0:00| chol  4  4
13|1.000|1.000|1.2e-08|2.5e-08|4.6e-02|-1.247268e+01 -1.251788e+01| 0:0:00| chol  5  4
14|0.895|0.941|8.1e-09|9.0e-09|5.3e-03|-1.250332e+01 -1.250817e+01| 0:0:00| chol  6  8
15|0.946|0.981|3.1e-08|3.0e-09|4.1e-04|-1.250707e+01 -1.250727e+01| 0:0:00| chol
  linsysolve: Schur complement matrix not positive definite
  switch to LU factor. lu 30   6
16|0.965|0.978|2.3e-08|1.1e-10|1.5e-05|-1.250743e+01 -1.250729e+01| 0:0:00| lu 25 ^ 9
17|1.000|0.856|2.1e-08|2.1e-11|2.2e-06|-1.250734e+01 -1.250729e+01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.00e-07
----------------------------------------------------------------------
 number of iterations   = 17
```

```
 primal objective value = -1.25073436e+01
 dual   objective value = -1.25072866e+01
 gap := trace(XZ)       = 2.19e-06
 relative gap           = 8.43e-08
 actual relative gap    = -2.19e-06
 rel. primal infeas     = 2.14e-08
 rel. dual   infeas     = 2.12e-11
 norm(X), norm(y), norm(Z) = 2.2e+03, 4.8e+01, 2.5e+01
 norm(A), norm(b), norm(C) = 1.0e+04, 3.6e+03, 4.4e+01
 Total CPU time (secs)  = 0.12
 CPU time per iteration = 0.01
 termination code       =  0
 DIMACS errors: 3.5e-08  0.0e+00  2.9e-11  0.0e+00  -2.2e-06  8.4e-08
-------------------------------------------------------------------


ans =

   12.5073


Iteration   7   Total error is: 0.07249

 num. of constraints = 33
 dim. of socp   var  = 34,   num. of socp blk  =  1
 dim. of linear var  = 48
*********************************************************************
   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|2.3e+02|1.0e+07|-6.541606e+02  0.000000e+00| 0:0:00| chol  1  1
 1|0.984|0.944|1.6e-02|1.3e+01|5.8e+05|-1.520379e+01  3.970614e+03| 0:0:00| chol  2  2
 2|1.000|0.946|2.7e-07|7.1e-01|3.4e+04| 2.571215e+00 -1.596684e+02| 0:0:00| chol  2  2
 3|1.000|0.992|2.6e-07|9.5e-03|5.6e+02| 8.971267e-01 -9.844400e+00| 0:0:00| chol  2  2
 4|0.930|0.996|2.1e-08|1.3e-03|6.4e+01|-7.449916e+00 -8.122106e+00| 0:0:00| chol  2  2
 5|0.432|0.363|2.2e-08|9.7e-04|4.4e+01|-8.695900e+00 -8.484871e+00| 0:0:00| chol  2  2
 6|0.217|0.510|1.5e-08|5.4e-04|2.5e+01|-9.361995e+00 -9.468768e+00| 0:0:00| chol  2  2
 7|0.184|0.647|1.4e-08|2.1e-04|1.1e+01|-1.012958e+01 -1.045679e+01| 0:0:00| chol  3  3
 8|0.768|0.626|1.1e-08|8.6e-05|5.4e+00|-1.076058e+01 -1.161437e+01| 0:0:00| chol  3  3
 9|0.855|0.758|3.6e-09|2.3e-05|2.1e+00|-1.131303e+01 -1.223204e+01| 0:0:00| chol  3  3
10|0.678|0.663|4.6e-09|8.4e-06|1.0e+00|-1.179400e+01 -1.241896e+01| 0:0:00| chol  3  3
11|0.966|0.988|1.8e-09|3.8e-07|2.5e-01|-1.226357e+01 -1.249610e+01| 0:0:00| chol  4  3
12|1.000|1.000|1.2e-09|8.4e-08|8.7e-02|-1.239115e+01 -1.247557e+01| 0:0:00| chol  4  4
13|0.920|0.967|1.0e-08|2.7e-08|1.0e-02|-1.245199e+01 -1.246164e+01| 0:0:00| chol  6  6
14|0.860|0.973|2.7e-08|8.5e-09|1.8e-03|-1.245894e+01 -1.246034e+01| 0:0:00| chol 17 15
15|1.000|0.975|2.3e-07|7.8e-10|5.8e-04|-1.245943e+01 -1.246048e+01| 0:0:00| chol
   linsysolve: Schur complement matrix not positive definite
   switch to LU factor. lu 11 ^20
16|0.715|0.709|7.3e-07|7.1e-10|1.6e-04|-1.245895e+01 -1.246037e+01| 0:0:00| lu 25 ^ 3
17|0.229|1.000|5.5e-07|4.1e-10|1.4e-04|-1.245946e+01 -1.246037e+01| 0:0:00| lu 30   30
18|0.538|0.653|2.9e-07|4.3e-10|9.7e-05|-1.245938e+01 -1.246036e+01| 0:0:00| lu 21 ^ 9
19|0.596|1.000|2.3e-07|1.9e-10|6.2e-05|-1.245887e+01 -1.246035e+01| 0:0:00| lu 11 ^ 6
20|0.047|0.086|2.1e-07|3.6e-10|6.4e-05|-1.245900e+01 -1.246035e+01| 0:0:00| lu 22 ^ 7
21|0.092|0.255|1.8e-07|4.5e-10|6.2e-05|-1.245888e+01 -1.246035e+01| 0:0:00|
```

```
  stop: progress is bad
-------------------------------------------------------------------
 number of iterations   = 21
 primal objective value = -1.24588726e+01
 dual   objective value = -1.24603530e+01
 gap := trace(XZ)       = 6.23e-05
 relative gap           = 2.40e-06
 actual relative gap    = 5.71e-05
 rel. primal infeas     = 2.32e-07
 rel. dual   infeas     = 1.85e-10
 norm(X), norm(y), norm(Z) = 2.1e+03, 4.8e+01, 2.5e+01
 norm(A), norm(b), norm(C) = 1.0e+04, 3.6e+03, 4.4e+01
 Total CPU time (secs)  = 0.16
 CPU time per iteration = 0.01
 termination code       = -5
 DIMACS errors: 3.8e-07  0.0e+00  2.5e-10  0.0e+00  5.7e-05  2.4e-06
-------------------------------------------------------------------

ans =

   12.4604


Iteration   8   Total error is: 0.072346
The total representation error of the testing signals is: 0.33288
>>
```