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demo_Polynomial_Dictionary_Learning
Starting to train the dictionary
solving the quadratic problem with YALMIP...
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```
num. of constraints = 25
dim. of socp var = 26, num. of socp blk = 1
dim. of linear var = 670
*****
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|2.0e+00|2.4e+01|6.7e+06| 1.136333e+05  0.000000e+00| 0:0:00| chol 1 1
1|1.000|0.991|1.9e-06|2.6e-01|1.6e+05| 9.490038e+04 -6.844736e+01| 0:0:00| chol 1 1
2|0.992|1.000|6.9e-07|1.1e-02|2.2e+04| 1.924902e+04 -8.042068e+01| 0:0:00| chol 1 1
3|0.797|0.863|3.7e-07|4.5e-03|4.5e+03| 4.122536e+03 -6.643815e+01| 0:0:00| chol 1 1
4|0.621|1.000|2.9e-08|3.4e-04|3.1e+03| 2.991100e+03 -7.256358e+01| 0:0:00| chol 1 1
5|1.000|0.369|3.6e-08|2.5e-04|2.3e+03| 2.081078e+03 -8.718842e+01| 0:0:00| chol 1 1
6|0.644|1.000|1.6e-08|5.1e-05|1.7e+03| 1.545944e+03 -1.020556e+02| 0:0:00| chol 1 1
7|1.000|1.000|7.2e-10|2.6e-05|1.3e+03| 1.183771e+03 -8.978647e+01| 0:0:00| chol 1 1
8|1.000|1.000|2.3e-10|1.3e-05|4.7e+02| 3.912905e+02 -7.916706e+01| 0:0:00| chol 1 1
9|1.000|0.932|5.2e-11|6.8e-06|2.5e+02| 1.890303e+02 -5.724504e+01| 0:0:00| chol 1 1
10|1.000|1.000|5.1e-15|1.9e-06|1.2e+02| 5.950759e+01 -5.571416e+01| 0:0:00| chol 1 1
11|1.000|1.000|9.1e-16|5.7e-07|5.9e+01| 8.626146e+00 -4.983418e+01| 0:0:00| chol 1 1
12|1.000|1.000|2.7e-15|1.7e-07|1.5e+01| -3.321367e+01 -4.848740e+01| 0:0:00| chol 1 1
13|1.000|1.000|1.3e-15|5.2e-08|7.1e+00| -4.076293e+01 -4.781394e+01| 0:0:00| chol 1 1
14|0.955|1.000|1.3e-15|5.2e-09|1.1e+00| -4.653781e+01 -4.764037e+01| 0:0:00| chol 1 1
15|1.000|1.000|7.5e-15|5.2e-10|2.5e-01| -4.737976e+01 -4.762819e+01| 0:0:00| chol 1 1
16|0.980|0.980|7.5e-15|6.2e-11|1.1e-02| -4.761504e+01 -4.762646e+01| 0:0:00| chol 1 1
17|0.987|0.987|2.3e-13|6.9e-12|1.4e-04| -4.762627e+01 -4.762641e+01| 0:0:00| chol 1 1
18|0.991|0.991|2.4e-13|1.1e-12|2.9e-06| -4.762641e+01 -4.762641e+01| 0:0:00|
stop: max(relative gap, infeasibilities) < 1.00e-07
-----
number of iterations = 18
primal objective value = -4.76264077e+01
dual objective value = -4.76264105e+01
gap := trace(XZ) = 2.86e-06
relative gap = 2.97e-08
actual relative gap = 2.97e-08
rel. primal infeas = 2.41e-13
rel. dual infeas = 1.06e-12
norm(X), norm(y), norm(Z) = 3.5e+00, 7.3e+01, 1.9e+02
norm(A), norm(b), norm(C) = 3.1e+00, 2.1e+00, 2.1e+02
Total CPU time (secs) = 0.23
CPU time per iteration = 0.01
termination code = 0
DIMACS errors: 2.6e-13 0.0e+00 4.1e-12 0.0e+00 3.0e-08 3.0e-08
-----

num. of constraints = 25
dim. of socp var = 26, num. of socp blk = 1
dim. of linear var = 670
*****
```

## SDPT3: Infeasible path-following algorithms

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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	2.3e+00	2.4e+01	7.0e+06	1.192165e+05	0.000000e+00	0:0:00
1	1.000	0.959	2.2e-06	1.0e+00	3.9e+05	9.981796e+04	-3.539724e+01	0:0:00
2	1.000	0.963	5.9e-07	4.8e-02	5.4e+04	3.917766e+04	-1.206691e+02	0:0:00
3	1.000	0.915	2.8e-07	7.2e-03	1.1e+04	9.549257e+03	-8.879935e+01	0:0:00
4	1.000	1.000	5.6e-08	1.0e-03	4.2e+03	3.930150e+03	-9.389680e+01	0:0:00
5	1.000	1.000	9.0e-09	3.1e-04	1.7e+03	1.514801e+03	-8.446357e+01	0:0:00
6	0.980	0.979	4.1e-09	9.6e-05	3.4e+02	2.658000e+02	-5.822599e+01	0:0:00
7	1.000	1.000	1.1e-09	2.8e-05	2.2e+02	1.628082e+02	-5.222360e+01	0:0:00
8	1.000	1.000	1.1e-10	8.3e-06	6.3e+01	1.653537e+01	-4.559777e+01	0:0:00
9	1.000	1.000	4.0e-11	2.5e-06	2.9e+01	-1.529715e+01	-4.416829e+01	0:0:00
10	1.000	1.000	5.4e-16	7.4e-07	6.8e+00	-3.625261e+01	-4.301432e+01	0:0:00
11	1.000	1.000	1.2e-14	2.2e-07	2.8e+00	-3.988626e+01	-4.272615e+01	0:0:00
12	1.000	1.000	7.3e-15	2.2e-08	1.3e+00	-4.135796e+01	-4.266282e+01	0:0:00
13	1.000	1.000	5.1e-15	2.2e-09	3.5e-01	-4.226510e+01	-4.261339e+01	0:0:00
14	1.000	1.000	5.3e-15	2.2e-10	1.5e-01	-4.245464e+01	-4.260397e+01	0:0:00
15	1.000	1.000	6.6e-16	2.3e-11	3.2e-02	-4.256642e+01	-4.259864e+01	0:0:00
16	1.000	1.000	8.1e-15	3.2e-12	1.4e-02	-4.258375e+01	-4.259789e+01	0:0:00
17	1.000	1.000	3.9e-15	1.2e-12	3.3e-03	-4.259425e+01	-4.259751e+01	0:0:00
18	1.000	1.000	4.8e-15	1.0e-12	1.5e-03	-4.259590e+01	-4.259745e+01	0:0:00
19	1.000	1.000	1.1e-15	1.0e-12	3.7e-04	-4.259705e+01	-4.259742e+01	0:0:00
20	1.000	1.000	2.0e-15	1.0e-12	1.7e-04	-4.259724e+01	-4.259741e+01	0:0:00
21	1.000	1.000	3.8e-15	1.0e-12	4.9e-05	-4.259736e+01	-4.259741e+01	0:0:00
22	1.000	1.000	6.0e-14	1.0e-12	1.5e-05	-4.259739e+01	-4.259741e+01	0:0:00
23	1.000	1.000	3.8e-14	1.0e-12	2.9e-06	-4.259741e+01	-4.259741e+01	0:0:00

stop: max(relative gap, infeasibilities) &lt; 1.00e-07

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-----
number of iterations      = 23
primal objective value   = -4.25974050e+01
dual  objective value   = -4.25974079e+01
gap := trace(XZ)         = 2.88e-06
relative gap             = 3.34e-08
actual relative gap      = 3.34e-08
rel. primal infeas       = 3.77e-14
rel. dual  infeas        = 1.00e-12
norm(X), norm(y), norm(Z) = 7.1e+00, 6.8e+01, 1.9e+02
norm(A), norm(b), norm(C) = 3.2e+00, 3.4e+00, 2.1e+02
Total CPU time (secs)    = 0.17
CPU time per iteration   = 0.01
termination code         = 0
DIMACS errors: 4.1e-14  0.0e+00  3.8e-12  0.0e+00  3.3e-08  3.3e-08
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Iteration 2 Total error is: 0.026563

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num. of constraints = 25
dim. of socp var   = 26,   num. of socp blk = 1
dim. of linear var  = 670

```

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## SDPT3: Infeasible path-following algorithms

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```

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|2.3e+00|2.4e+01|7.3e+06| 1.245769e+05  0.000000e+00| 0:0:00| chol  1  1
1|1.000|0.954|2.1e-06|1.1e+00|4.4e+05| 1.043094e+05 -3.167805e+01| 0:0:00| chol  1  1
2|1.000|0.936|7.3e-07|8.4e-02|8.2e+04| 5.225389e+04 -1.732965e+02| 0:0:00| chol  1  1
3|0.808|0.748|4.3e-07|2.4e-02|3.6e+04| 2.848410e+04 -1.722950e+02| 0:0:00| chol  1  1
4|0.792|0.764|1.0e-07|6.4e-03|8.0e+03| 6.856267e+03 -1.382495e+02| 0:0:00| chol  1  1
5|0.250|0.187|1.1e-06|5.2e-03|7.6e+03| 6.419065e+03 -1.690877e+02| 0:0:00| chol  1  1
6|0.201|0.192|6.2e-07|4.2e-03|7.2e+03| 6.158669e+03 -1.213752e+02| 0:0:00| chol  1  1
7|0.522|0.933|3.1e-07|3.1e-04|5.0e+03| 4.806948e+03 -1.496985e+02| 0:0:00| chol  1  1
8|1.000|1.000|5.4e-10|8.3e-06|2.9e+03| 2.686455e+03 -1.631928e+02| 0:0:00| chol  1  1
9|1.000|1.000|1.3e-10|4.1e-06|1.5e+03| 1.335641e+03 -1.450985e+02| 0:0:00| chol  1  1
10|1.000|1.000|2.3e-14|2.1e-06|4.0e+02| 3.214023e+02 -7.292385e+01| 0:0:00| chol  1  1
11|1.000|1.000|8.6e-15|1.0e-06|2.0e+02| 1.421580e+02 -5.784571e+01| 0:0:00| chol  1  1
12|1.000|1.000|9.4e-15|5.2e-07|6.7e+01| 2.003232e+01 -4.735496e+01| 0:0:00| chol  1  1
13|1.000|1.000|1.3e-14|1.6e-07|2.7e+01| -1.717375e+01 -4.442334e+01| 0:0:00| chol  1  1
14|1.000|1.000|1.9e-15|4.7e-08|8.4e+00| -3.446995e+01 -4.282629e+01| 0:0:00| chol  1  1
15|1.000|1.000|1.2e-15|1.4e-08|3.1e+00| -3.940249e+01 -4.246835e+01| 0:0:00| chol  1  1
16|1.000|1.000|3.3e-15|4.2e-09|9.1e-01| -4.140921e+01 -4.231483e+01| 0:0:00| chol  1  1
17|1.000|1.000|1.8e-15|4.2e-10|2.5e-01| -4.203350e+01 -4.228402e+01| 0:0:00| chol  1  1
18|1.000|1.000|2.9e-15|4.3e-11|8.0e-02| -4.219610e+01 -4.227560e+01| 0:0:00| chol  1  1
19|0.944|1.000|4.0e-15|5.2e-12|1.7e-02| -4.225635e+01 -4.227375e+01| 0:0:00| chol  1  1
20|1.000|1.000|2.4e-14|1.4e-12|8.3e-03| -4.226526e+01 -4.227353e+01| 0:0:00| chol  1  1
21|0.992|1.000|2.0e-15|1.0e-12|1.6e-03| -4.227177e+01 -4.227342e+01| 0:0:00| chol  1  1
22|1.000|1.000|2.3e-14|1.0e-12|7.3e-04| -4.227267e+01 -4.227340e+01| 0:0:00| chol  1  1
23|0.963|0.974|1.0e-14|1.0e-12|7.0e-05| -4.227333e+01 -4.227340e+01| 0:0:00| chol  1  1
24|1.000|1.000|6.4e-13|1.0e-12|9.3e-06| -4.227339e+01 -4.227340e+01| 0:0:00| chol  1  1
25|1.000|1.000|2.7e-12|1.0e-12|6.6e-07| -4.227340e+01 -4.227340e+01| 0:0:00|
stop: max(relative gap, infeasibilities) < 1.00e-07

```

```

-----
number of iterations      = 25
primal objective value    = -4.22733982e+01
dual   objective value    = -4.22733989e+01
gap := trace(XZ)          = 6.62e-07
relative gap              = 7.73e-09
actual relative gap       = 7.73e-09
rel. primal infeas        = 2.66e-12
rel. dual   infeas        = 1.00e-12
norm(X), norm(y), norm(Z) = 7.3e+00, 6.9e+01, 1.9e+02
norm(A), norm(b), norm(C) = 4.7e+00, 3.5e+00, 2.1e+02
Total CPU time (secs)     = 0.17
CPU time per iteration    = 0.01
termination code          = 0
DIMACS errors: 2.9e-12  0.0e+00  3.8e-12  0.0e+00  7.7e-09  7.7e-09

```

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-----
Iteration   3   Total error is: 0.026449

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```

num. of constraints = 25
dim. of socp var   = 26,   num. of socp blk = 1
dim. of linear var  = 670

```

```

*****
SDPT3: Infeasible path-following algorithms
*****

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```

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|1.5e+00|2.4e+01|1.3e+07| 2.190470e+05  0.000000e+00| 0:0:00| chol  1  1
1|1.000|0.960|1.2e-06|1.0e+00|6.9e+05| 1.831140e+05 -3.506905e+01| 0:0:00| chol  1  1
2|0.758|0.930|7.9e-07|8.0e-02|1.6e+05| 1.085051e+05 -2.319133e+02| 0:0:00| chol  1  1
3|0.720|0.628|8.0e-07|3.2e-02|8.9e+04| 6.706139e+04 -1.994231e+02| 0:0:00| chol  1  1
4|1.000|0.880|3.4e-07|4.7e-03|1.4e+04| 1.167145e+04 -2.754116e+02| 0:0:00| chol  1  1
5|1.000|0.986|4.6e-07|3.7e-04|8.7e+03| 8.263993e+03 -1.935972e+02| 0:0:00| chol  1  1
6|1.000|1.000|5.4e-09|1.5e-04|2.9e+03| 2.616376e+03 -2.210926e+02| 0:0:00| chol  1  1
7|1.000|1.000|2.2e-09|7.7e-05|1.3e+03| 1.122114e+03 -1.014846e+02| 0:0:00| chol  1  1
8|0.895|1.000|6.0e-10|3.8e-05|3.3e+02| 2.552765e+02 -6.099910e+01| 0:0:00| chol  1  1
9|1.000|1.000|6.6e-11|1.1e-05|1.9e+02| 1.346839e+02 -5.277700e+01| 0:0:00| chol  1  1
10|1.000|1.000|5.0e-14|3.4e-06|6.0e+01| 1.217871e+01 -4.672039e+01| 0:0:00| chol  1  1
11|1.000|1.000|1.4e-14|1.0e-06|2.5e+01| -1.849821e+01 -4.374132e+01| 0:0:00| chol  1  1
12|1.000|1.000|1.2e-14|3.1e-07|6.3e+00| -3.630267e+01 -4.258380e+01| 0:0:00| chol  1  1
13|1.000|1.000|7.9e-15|9.3e-08|3.1e+00| -3.917753e+01 -4.228829e+01| 0:0:00| chol  1  1
14|0.992|1.000|1.2e-15|2.8e-08|7.2e-01| -4.144548e+01 -4.216546e+01| 0:0:00| chol  1  1
15|1.000|1.000|2.2e-14|8.4e-09|3.5e-01| -4.179412e+01 -4.214379e+01| 0:0:00| chol  1  1
16|0.961|0.989|3.7e-15|9.2e-10|5.4e-02| -4.207916e+01 -4.213344e+01| 0:0:00| chol  1  1
17|1.000|1.000|3.0e-15|8.5e-11|1.3e-02| -4.211991e+01 -4.213288e+01| 0:0:00| chol  1  1
18|1.000|0.984|1.2e-13|1.1e-11|8.7e-04| -4.213190e+01 -4.213277e+01| 0:0:00| chol  1  1
19|0.986|0.987|4.6e-13|1.1e-12|1.2e-05| -4.213275e+01 -4.213277e+01| 0:0:00| chol  1  1
20|0.989|0.993|7.7e-12|1.0e-12|3.0e-07| -4.213277e+01 -4.213277e+01| 0:0:00|
stop: max(relative gap, infeasibilities) < 1.00e-07

```

```

-----
number of iterations      = 20
primal objective value    = -4.21327654e+01
dual  objective value     = -4.21327657e+01
gap := trace(XZ)          = 2.98e-07
relative gap              = 3.50e-09
actual relative gap       = 3.49e-09
rel. primal infeas        = 7.69e-12
rel. dual  infeas         = 1.01e-12
norm(X), norm(y), norm(Z) = 7.4e+00, 6.9e+01, 1.9e+02
norm(A), norm(b), norm(C) = 2.3e+01, 6.4e+00, 2.1e+02
Total CPU time (secs)     = 0.14
CPU time per iteration    = 0.01
termination code          = 0
DIMACS errors: 8.6e-12  0.0e+00  3.9e-12  0.0e+00  3.5e-09  3.5e-09

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-----
Iteration   4   Total error is: 0.026402

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```

num. of constraints = 25
dim. of socp var   = 26,   num. of socp blk = 1
dim. of linear var = 670
*****
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|2.4e+01|3.2e+07| 5.459344e+05  0.000000e+00| 0:0:00| chol  1  1

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```

1|1.000|0.957|4.0e-07|1.1e+00|1.8e+06| 4.548264e+05 -4.229167e+01| 0:0:00| chol 1 1
2|0.460|0.355|1.4e-06|7.1e-01|1.3e+06| 3.471603e+05 -2.069353e+02| 0:0:00| chol 1 1
3|0.149|0.469|7.9e-07|3.8e-01|8.5e+05| 3.192799e+05 -2.513741e+02| 0:0:00| chol 1 1
4|0.673|0.972|4.1e-07|1.8e-02|2.3e+05| 2.069919e+05 -3.559600e+02| 0:0:00| chol 1 1
5|0.586|0.698|1.9e-07|8.3e-03|1.4e+05| 1.298792e+05 -4.211348e+02| 0:0:00| chol 1 1
6|0.714|1.000|6.5e-08|2.0e-03|8.5e+04| 8.000227e+04 -6.834907e+02| 0:0:00| chol 1 1
7|0.448|0.933|5.3e-08|1.1e-03|7.3e+04| 6.848022e+04 -1.225919e+03| 0:0:00| chol 1 1
8|0.292|0.483|2.0e-08|7.8e-04|6.9e+04| 6.470362e+04 -6.673954e+02| 0:0:00| chol 1 1
9|0.218|1.000|1.8e-08|2.5e-04|6.3e+04| 6.016872e+04 -1.807375e+03| 0:0:00| chol 1 1
10|0.889|1.000|2.0e-09|1.2e-04|4.8e+04| 4.497400e+04 -1.655038e+03| 0:0:00| chol 1 1
11|1.000|1.000|1.8e-13|6.2e-05|3.1e+04| 2.841762e+04 -1.652784e+03| 0:0:00| chol 1 1
12|1.000|1.000|2.9e-11|3.1e-05|9.7e+03| 8.990631e+03 -5.187932e+02| 0:0:00| chol 1 1
13|1.000|1.000|1.4e-12|1.5e-05|4.2e+03| 3.791271e+03 -2.953038e+02| 0:0:00| chol 1 1
14|1.000|1.000|2.2e-12|7.7e-06|1.1e+03| 9.996330e+02 -1.157066e+02| 0:0:00| chol 1 1
15|1.000|1.000|6.3e-14|3.8e-06|4.4e+02| 3.681849e+02 -7.126875e+01| 0:0:00| chol 1 1
16|1.000|1.000|6.8e-14|1.9e-06|2.1e+02| 1.582641e+02 -5.441054e+01| 0:0:00| chol 1 1
17|1.000|1.000|3.4e-14|9.6e-07|6.6e+01| 1.881143e+01 -4.623221e+01| 0:0:00| chol 1 1
18|1.000|1.000|4.5e-15|4.8e-07|2.9e+01| -1.436798e+01 -4.323018e+01| 0:0:00| chol 1 1
19|1.000|1.000|1.2e-15|2.4e-07|7.1e+00| -3.496562e+01 -4.201983e+01| 0:0:00| chol 1 1
20|1.000|1.000|1.1e-14|2.4e-08|3.3e+00| -3.850457e+01 -4.175515e+01| 0:0:00| chol 1 1
21|0.970|1.000|1.3e-15|2.4e-09|6.5e-01| -4.100068e+01 -4.164666e+01| 0:0:00| chol 1 1
22|1.000|1.000|1.3e-15|2.4e-10|2.8e-01| -4.135291e+01 -4.163671e+01| 0:0:00| chol 1 1
23|0.972|0.987|2.7e-15|2.8e-11|3.2e-02| -4.159985e+01 -4.163197e+01| 0:0:00| chol 1 1
24|0.964|0.981|2.0e-14|3.9e-12|2.1e-03| -4.162973e+01 -4.163179e+01| 0:0:00| chol 1 1
25|0.975|0.986|1.7e-13|1.1e-12|5.3e-05| -4.163173e+01 -4.163178e+01| 0:0:00| chol 1 1
26|0.992|1.000|2.3e-11|1.0e-12|2.2e-06| -4.163178e+01 -4.163178e+01| 0:0:00|
stop: max(relative gap, infeasibilities) < 1.00e-07

```

```

-----
number of iterations    = 26
primal objective value = -4.16317798e+01
dual   objective value = -4.16317820e+01
gap := trace(XZ)        = 2.21e-06
relative gap           = 2.62e-08
actual relative gap    = 2.62e-08
rel. primal infeas     = 2.29e-11
rel. dual   infeas     = 1.00e-12
norm(X), norm(y), norm(Z) = 7.7e+00, 6.8e+01, 1.9e+02
norm(A), norm(b), norm(C) = 1.4e+02, 1.5e+01, 2.1e+02
Total CPU time (secs)   = 0.14
CPU time per iteration = 0.01
termination code        = 0
DIMACS errors: 2.4e-11  0.0e+00  3.8e-12  0.0e+00  2.6e-08  2.6e-08

```

```

-----
Iteration   5   Total error is: 0.026252

```

```

num. of constraints = 25
dim. of socp var   = 26,   num. of socp blk = 1
dim. of linear var = 670
*****
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|9.9e-01|2.4e+01|2.5e+08| 4.231215e+06  0.000000e+00| 0:0:00| chol 1 1
1|1.000|0.946|1.7e-07|1.3e+00|1.7e+07| 3.529838e+06 -6.651174e+01| 0:0:00| chol 1 1
2|0.202|0.210|5.3e-07|1.1e+00|1.5e+07| 3.285650e+06 -1.506064e+03| 0:0:00| chol 1 1
3|0.086|0.261|3.3e-07|7.9e-01|1.2e+07| 3.128819e+06 -1.751680e+03| 0:0:00| chol 1 1
4|0.426|0.958|2.3e-07|4.1e-02|2.9e+06| 2.459503e+06 -2.959055e+03| 0:0:00| chol 1 1
5|0.467|0.548|1.2e-07|2.1e-02|2.1e+06| 1.769854e+06 -2.858865e+03| 0:0:00| chol 1 1
6|0.833|0.849|2.3e-08|4.8e-03|7.7e+05| 7.080635e+05 -4.486124e+03| 0:0:00| chol 1 1
7|0.461|1.000|1.1e-07|9.8e-04|6.3e+05| 6.053908e+05 -8.647810e+03| 0:0:00| chol 1 1
8|0.412|0.695|4.2e-08|6.4e-04|5.9e+05| 5.614578e+05 -4.325322e+03| 0:0:00| chol 1 1
9|0.257|0.732|3.9e-08|3.5e-04|5.4e+05| 5.148555e+05 -1.590069e+04| 0:0:00| chol 1 1
10|0.599|1.000|1.6e-08|1.2e-04|4.6e+05| 4.387342e+05 -1.104429e+04| 0:0:00| chol 1 1
11|1.000|1.000|1.7e-11|6.2e-05|2.8e+05| 2.607741e+05 -1.473016e+04| 0:0:00| chol 1 1
12|1.000|1.000|3.8e-10|3.1e-05|1.2e+05| 1.078661e+05 -6.254728e+03| 0:0:00| chol 1 1
13|0.955|0.981|1.9e-12|1.6e-05|2.8e+04| 2.579988e+04 -1.736861e+03| 0:0:00| chol 1 1
14|1.000|1.000|1.0e-11|7.7e-06|1.7e+04| 1.547155e+04 -9.635298e+02| 0:0:00| chol 1 1
15|1.000|1.000|1.1e-12|3.8e-06|4.8e+03| 4.440514e+03 -3.197288e+02| 0:0:00| chol 1 1
16|1.000|1.000|6.8e-14|1.9e-06|2.0e+03| 1.862114e+03 -1.767613e+02| 0:0:00| chol 1 1
17|0.984|0.987|2.5e-13|9.7e-07|4.5e+02| 3.752582e+02 -7.685280e+01| 0:0:00| chol 1 1
18|1.000|1.000|5.1e-14|4.8e-07|2.6e+02| 2.066339e+02 -5.701847e+01| 0:0:00| chol 1 1
19|1.000|1.000|9.1e-15|2.4e-07|8.6e+01| 3.990770e+01 -4.588717e+01| 0:0:00| chol 1 1
20|1.000|1.000|4.0e-14|2.4e-08|3.5e+01|-7.686307e+00 -4.239937e+01| 0:0:00| chol 1 1
21|1.000|1.000|4.3e-16|2.4e-09|1.0e+01|-3.067703e+01 -4.074935e+01| 0:0:00| chol 1 1
22|1.000|1.000|2.2e-16|2.4e-10|3.4e+00|-3.694066e+01 -4.036933e+01| 0:0:00| chol 1 1
23|1.000|1.000|3.1e-15|2.5e-11|8.6e-01|-3.938750e+01 -4.024489e+01| 0:0:00| chol 1 1
24|1.000|1.000|9.9e-15|3.4e-12|2.7e-01|-3.995813e+01 -4.022719e+01| 0:0:00| chol 1 1
25|1.000|1.000|3.6e-15|1.2e-12|3.6e-02|-4.018606e+01 -4.022245e+01| 0:0:00| chol 1 1
26|0.980|0.992|5.7e-13|1.0e-12|2.5e-03|-4.021978e+01 -4.022224e+01| 0:0:00| chol 1 1
27|0.979|0.985|1.5e-12|1.0e-12|5.2e-05|-4.022219e+01 -4.022224e+01| 0:0:00| chol 1 1
28|0.992|0.998|3.5e-11|1.0e-12|1.5e-06|-4.022224e+01 -4.022224e+01| 0:0:00|
stop: max(relative gap, infeasibilities) < 1.00e-07

```

```

-----
number of iterations      = 28
primal objective value    = -4.02222363e+01
dual   objective value    = -4.02222378e+01
gap := trace(XZ)          = 1.48e-06
relative gap              = 1.82e-08
actual relative gap       = 1.82e-08
rel. primal infeas        = 3.54e-11
rel. dual   infeas        = 1.00e-12
norm(X), norm(y), norm(Z) = 8.7e+00, 6.7e+01, 1.9e+02
norm(A), norm(b), norm(C) = 1.0e+02, 1.2e+02, 2.1e+02
Total CPU time (secs)     = 0.18
CPU time per iteration    = 0.01
termination code          = 0
DIMACS errors: 3.7e-11  0.0e+00  3.8e-12  0.0e+00  1.8e-08  1.8e-08

```

```

-----
Iteration   6   Total error is: 0.025817

```

```

num. of constraints = 25
dim. of socp var   = 26,   num. of socp blk = 1
dim. of linear var = 670
*****
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	9.9e-01	2.4e+01	3.4e+08	5.789608e+06	0.000000e+00	0:0:00	chol	1	1	
1	1.000	0.948	1.5e-07	1.3e+00	2.2e+07	4.833133e+06	-8.593316e+01	0:0:00	chol	1	1	
2	0.220	0.237	4.8e-07	1.0e+00	1.9e+07	4.446009e+06	-2.215150e+03	0:0:00	chol	1	1	
3	0.118	0.276	2.5e-07	7.3e-01	1.5e+07	4.150687e+06	-2.324226e+03	0:0:00	chol	1	1	
4	0.394	0.940	1.9e-07	5.1e-02	4.2e+06	3.367787e+06	-4.261326e+03	0:0:00	chol	1	1	
5	0.525	0.632	8.4e-08	2.1e-02	2.7e+06	2.302036e+06	-3.669490e+03	0:0:00	chol	1	1	
6	1.000	1.000	2.6e-09	2.0e-03	2.8e+05	2.589718e+05	-3.769633e+03	0:0:00	chol	1	1	
7	1.000	1.000	7.8e-09	9.8e-04	1.7e+05	1.563530e+05	-3.859098e+03	0:0:00	chol	1	1	
8	1.000	1.000	1.1e-09	4.9e-04	5.3e+04	4.752372e+04	-1.874081e+03	0:0:00	chol	1	1	
9	1.000	1.000	2.3e-10	2.5e-04	1.9e+04	1.734731e+04	-6.575928e+02	0:0:00	chol	1	1	
10	1.000	1.000	2.7e-12	1.2e-04	8.7e+03	7.925498e+03	-4.046794e+02	0:0:00	chol	1	1	
11	1.000	1.000	2.9e-13	6.2e-05	2.8e+03	2.489941e+03	-1.644905e+02	0:0:00	chol	1	1	
12	1.000	1.000	4.8e-14	3.1e-05	8.0e+02	6.764760e+02	-8.919190e+01	0:0:00	chol	1	1	
13	1.000	1.000	1.2e-15	1.5e-05	3.5e+02	2.887677e+02	-5.586016e+01	0:0:00	chol	1	1	
14	1.000	1.000	2.5e-14	7.7e-06	1.5e+02	9.683883e+01	-4.934599e+01	0:0:00	chol	1	1	
15	1.000	1.000	4.3e-14	3.8e-06	6.3e+01	1.918217e+01	-4.290074e+01	0:0:00	chol	1	1	
16	1.000	1.000	2.8e-15	1.9e-06	1.7e+01	-2.368787e+01	-4.082126e+01	0:0:00	chol	1	1	
17	1.000	1.000	6.3e-15	5.8e-07	7.3e+00	-3.280260e+01	-4.007593e+01	0:0:00	chol	1	1	
18	0.959	1.000	2.6e-15	1.7e-07	1.8e+00	-3.804581e+01	-3.980582e+01	0:0:00	chol	1	1	
19	1.000	1.000	2.7e-14	5.2e-08	9.0e-01	-3.886218e+01	-3.976212e+01	0:0:00	chol	1	1	
20	0.992	1.000	1.3e-14	5.2e-09	2.0e-01	-3.953900e+01	-3.973542e+01	0:0:00	chol	1	1	
21	1.000	1.000	3.5e-14	5.2e-10	9.4e-02	-3.963749e+01	-3.973161e+01	0:0:00	chol	1	1	
22	0.960	0.990	2.2e-14	5.8e-11	1.6e-02	-3.971396e+01	-3.972970e+01	0:0:00	chol	1	1	
23	1.000	1.000	1.2e-13	6.2e-12	5.1e-03	-3.972453e+01	-3.972959e+01	0:0:00	chol	1	1	
24	0.993	0.984	1.8e-13	1.1e-12	3.8e-04	-3.972918e+01	-3.972955e+01	0:0:00	chol	1	1	
25	1.000	1.000	2.2e-12	1.0e-12	2.5e-05	-3.972953e+01	-3.972955e+01	0:0:00	chol	1	1	
26	0.999	0.999	4.8e-12	1.0e-12	4.2e-07	-3.972955e+01	-3.972955e+01	0:0:00				

stop: max(relative gap, infeasibilities) < 1.00e-07

```

-----
number of iterations      = 26
primal objective value   = -3.97295533e+01
dual  objective value    = -3.97295537e+01
gap := trace(XZ)         = 4.16e-07
relative gap              = 5.17e-09
actual relative gap       = 5.16e-09
rel. primal infeas        = 4.82e-12
rel. dual  infeas         = 1.00e-12
norm(X), norm(y), norm(Z) = 9.1e+00, 6.7e+01, 1.9e+02
norm(A), norm(b), norm(C) = 1.2e+02, 1.6e+02, 2.1e+02
Total CPU time (secs)    = 0.16
CPU time per iteration   = 0.01
termination code         = 0
DIMACS errors: 5.0e-12  0.0e+00  3.8e-12  0.0e+00  5.2e-09  5.2e-09
-----

```

Iteration 7 Total error is: 0.025657

```

num. of constraints = 25
dim. of socp var   = 26,   num. of socp blk = 1
dim. of linear var = 670

```

```

*****
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|2.4e+01|4.1e+08| 6.983457e+06  0.000000e+00| 0:0:00| chol  1  1
1|1.000|0.950|1.4e-07|1.2e+00|2.6e+07| 5.833167e+06 -1.047253e+02| 0:0:00| chol  1  1
2|0.227|0.232|4.5e-07|9.7e-01|2.2e+07| 5.321957e+06 -2.474791e+03| 0:0:00| chol  1  1
3|0.116|0.283|2.6e-07|7.0e-01|1.7e+07| 4.972909e+06 -2.678204e+03| 0:0:00| chol  1  1
4|0.375|0.928|2.0e-07|5.8e-02|5.2e+06| 4.095886e+06 -5.254124e+03| 0:0:00| chol  1  1
5|0.571|0.681|7.9e-08|2.1e-02|3.2e+06| 2.698647e+06 -4.418095e+03| 0:0:00| chol  1  1
6|0.987|0.916|3.1e-09|3.6e-03|2.1e+05| 1.724310e+05 -3.268276e+03| 0:0:00| chol  1  1
7|1.000|1.000|3.3e-08|9.8e-04|1.4e+05| 1.278990e+05 -4.609512e+03| 0:0:00| chol  1  1
8|1.000|0.727|2.8e-09|6.3e-04|9.1e+04| 8.228352e+04 -1.927363e+03| 0:0:00| chol  1  1
9|0.859|1.000|5.3e-10|2.5e-04|3.3e+04| 2.974883e+04 -1.655983e+03| 0:0:00| chol  1  1
10|1.000|1.000|4.9e-12|1.2e-04|1.9e+04| 1.821585e+04 -4.726800e+02| 0:0:00| chol  1  1
11|0.912|1.000|3.3e-14|6.2e-05|5.7e+03| 5.055132e+03 -4.166604e+02| 0:0:00| chol  1  1
12|1.000|1.000|3.2e-13|3.1e-05|3.0e+03| 2.796942e+03 -1.526918e+02| 0:0:00| chol  1  1
13|0.889|1.000|3.0e-13|1.5e-05|7.0e+02| 5.898430e+02 -9.288596e+01| 0:0:00| chol  1  1
14|1.000|1.000|6.5e-14|7.7e-06|3.7e+02| 3.078414e+02 -5.493996e+01| 0:0:00| chol  1  1
15|0.931|1.000|3.2e-15|3.8e-06|1.4e+02| 8.417509e+01 -5.195570e+01| 0:0:00| chol  1  1
16|1.000|1.000|1.9e-14|1.9e-06|7.4e+01| 2.944301e+01 -4.357669e+01| 0:0:00| chol  1  1
17|0.982|1.000|9.7e-15|9.6e-07|1.8e+01| -2.234653e+01 -4.064177e+01| 0:0:00| chol  1  1
18|1.000|1.000|8.5e-15|2.9e-07|9.2e+00| -3.067810e+01 -3.987397e+01| 0:0:00| chol  1  1
19|0.975|1.000|8.1e-16|8.7e-08|2.0e+00| -3.746538e+01 -3.946504e+01| 0:0:00| chol  1  1
20|1.000|1.000|7.8e-15|8.7e-09|9.7e-01| -3.843717e+01 -3.940831e+01| 0:0:00| chol  1  1
21|0.983|1.000|2.2e-14|8.7e-10|2.0e-01| -3.917839e+01 -3.937687e+01| 0:0:00| chol  1  1
22|1.000|1.000|6.1e-15|8.8e-11|9.1e-02| -3.928296e+01 -3.937366e+01| 0:0:00| chol  1  1
23|0.966|0.985|6.6e-15|1.1e-11|1.3e-02| -3.935920e+01 -3.937204e+01| 0:0:00| chol  1  1
24|1.000|1.000|3.8e-14|1.9e-12|1.9e-03| -3.937005e+01 -3.937196e+01| 0:0:00| chol  1  1
25|0.998|0.978|5.7e-12|1.0e-12|4.8e-05| -3.937190e+01 -3.937195e+01| 0:0:00| chol  1  1
26|0.994|0.992|4.2e-14|1.1e-12|9.6e-07| -3.937195e+01 -3.937195e+01| 0:0:00|
stop: max(relative gap, infeasibilities) < 1.00e-07
-----
number of iterations    = 26
primal objective value  = -3.93719499e+01
dual  objective value   = -3.93719509e+01
gap := trace(XZ)        = 9.62e-07
relative gap            = 1.21e-08
actual relative gap     = 1.21e-08
rel. primal infeas      = 4.16e-14
rel. dual  infeas       = 1.15e-12
norm(X), norm(y), norm(Z) = 9.3e+00, 6.7e+01, 1.9e+02
norm(A), norm(b), norm(C) = 1.3e+02, 1.9e+02, 2.1e+02
Total CPU time (secs)   = 0.15
CPU time per iteration  = 0.01
termination code        = 0
DIMACS errors: 4.3e-14  0.0e+00  4.4e-12  0.0e+00  1.2e-08  1.2e-08
-----
Iteration   8   Total error is: 0.025539
The total representation error of the testing signals is: 0.25189
>>

```