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>> demo_Polynomial_Dictionary_Learning
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Starting to train the dictionary
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solving the quadratic problem with YALMIP...
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num. of constraints = 85
dim. of socp var = 86, num. of socp blk = 1
dim. of linear var = 1000
*****
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SDPT3: Infeasible path-following algorithms
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```
version predcorr gam expon scale_data
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```
HKM 1 0.000 1 0
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it	pstep	dstep	pinfeas	dinfeas	gap	prim-obj	dual-obj	cputime				
0	0.000	0.000	1.0e+00	1.4e+02	4.8e+07	5.291232e+04	0.000000e+00	0:0:00	chol	1	1	
1	1.000	0.989	1.5e-07	1.7e+00	6.4e+05	5.449751e+04	-2.556664e+02	0:0:00	chol	1	1	
2	1.000	0.916	1.3e-07	1.8e-01	9.1e+04	4.111434e+04	-1.964292e+01	0:0:00	chol	1	1	
3	0.854	0.976	3.9e-08	1.5e-02	2.6e+04	2.238232e+04	-4.429142e+01	0:0:00	chol	1	1	
4	1.000	1.000	5.4e-09	3.3e-03	2.9e+03	2.658165e+03	-3.125803e+01	0:0:00	chol	1	1	
5	0.767	0.726	3.7e-08	1.6e-03	7.5e+02	6.966538e+02	-2.274300e+01	0:0:00	chol	1	1	
6	0.243	1.000	2.9e-08	9.8e-05	6.7e+02	6.559868e+02	-1.531415e+01	0:0:00	chol	1	1	
7	1.000	1.000	1.4e-09	9.8e-06	4.7e+02	4.556479e+02	-1.032464e+01	0:0:00	chol	1	1	
8	1.000	1.000	3.4e-10	9.8e-07	2.1e+02	2.016382e+02	-6.312675e+00	0:0:00	chol	1	1	
9	1.000	1.000	4.6e-11	9.8e-08	1.0e+02	9.986522e+01	-3.543154e+00	0:0:00	chol	1	1	
10	1.000	1.000	1.5e-12	9.8e-09	4.3e+01	4.182473e+01	-1.547196e+00	0:0:00	chol	1	1	
11	1.000	1.000	1.5e-13	9.8e-10	1.7e+01	1.630002e+01	-6.587258e-01	0:0:00	chol	1	1	
12	1.000	1.000	2.7e-13	9.9e-11	5.0e+00	4.824580e+00	-1.785036e-01	0:0:00	chol	1	1	
13	1.000	1.000	2.7e-13	1.1e-11	1.5e+00	1.450520e+00	-6.707777e-02	0:0:00	chol	1	1	
14	1.000	1.000	4.7e-12	2.0e-12	4.2e-01	3.853980e-01	-3.225666e-02	0:0:00	chol	2	2	
15	0.972	1.000	3.5e-12	1.1e-12	1.2e-01	9.788661e-02	-2.399296e-02	0:0:00	chol	2	2	
16	1.000	1.000	4.7e-12	1.0e-12	6.3e-02	4.127905e-02	-2.172374e-02	0:0:00	chol	2	2	
17	1.000	1.000	1.8e-12	1.0e-12	1.8e-02	-2.896006e-03	-2.087811e-02	0:0:00	chol	2	2	
18	1.000	1.000	2.7e-12	1.0e-12	8.4e-03	-1.212647e-02	-2.054387e-02	0:0:00	chol	2	2	
19	0.962	1.000	6.7e-12	1.0e-12	1.8e-03	-1.855594e-02	-2.039592e-02	0:0:00	chol	3	3	
20	1.000	1.000	5.9e-12	1.3e-12	8.0e-04	-1.956958e-02	-2.037259e-02	0:0:00	chol	3	3	
21	1.000	1.000	1.7e-11	1.2e-12	1.9e-04	-2.016936e-02	-2.036062e-02	0:0:00	chol	4	4	
22	1.000	1.000	8.6e-11	1.8e-12	5.1e-05	-2.030677e-02	-2.035804e-02	0:0:00	chol	8	7	
23	1.000	1.000	1.9e-10	2.6e-12	1.3e-05	-2.034441e-02	-2.035749e-02	0:0:00	chol			
linsysolve: Schur complement matrix not positive definite												
switch to LU factor. lu 30 3												
24	0.984	1.000	6.2e-10	4.0e-12	2.8e-06	-2.035451e-02	-2.035738e-02	0:0:00	lu 30	^ 9		
25	0.927	0.873	6.3e-09	6.5e-12	7.3e-07	-2.035712e-02	-2.035736e-02	0:0:00	lu 30	30		
26	0.880	0.599	4.1e-09	1.2e-11	4.4e-07	-2.035907e-02	-2.035735e-02	0:0:01	lu 16	30		
27	0.294	0.372	4.9e-09	2.1e-11	3.7e-07	-2.035930e-02	-2.035735e-02	0:0:01	lu 30	^23		
28	0.350	0.509	1.3e-08	3.0e-11	3.4e-07	-2.035957e-02	-2.035735e-02	0:0:01				
stop: progress is too slow												

```
-----
number of iterations = 28
primal objective value = -2.03595736e-02
dual objective value = -2.03573536e-02
gap := trace(XZ) = 3.37e-07
relative gap = 3.24e-07
actual relative gap = -2.13e-06
rel. primal infeas = 1.34e-08
rel. dual infeas = 3.02e-11
```

ans =

0.0204

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	1.4e+02	4.8e+07	5.293814e+04	0.000000e+00	0:0:00	chol	1	1
1	1.000	0.989	1.5e-07	1.7e+00	6.4e+05	5.452369e+04	-2.558039e+02	0:0:00	chol	1	1
2	1.000	0.916	1.3e-07	1.8e-01	9.1e+04	4.113316e+04	-1.963458e+01	0:0:00	chol	1	1
3	0.854	0.976	3.9e-08	1.5e-02	2.6e+04	2.239611e+04	-4.429883e+01	0:0:00	chol	1	1
4	1.000	1.000	5.4e-09	3.3e-03	2.9e+03	2.658792e+03	-3.125838e+01	0:0:00	chol	1	1
5	0.767	0.726	3.7e-08	1.6e-03	7.5e+02	6.971098e+02	-2.274027e+01	0:0:00	chol	1	1
6	0.243	1.000	2.9e-08	9.8e-05	6.7e+02	6.563856e+02	-1.531184e+01	0:0:00	chol	1	1
7	1.000	1.000	1.4e-09	9.8e-06	4.7e+02	4.558890e+02	-1.032349e+01	0:0:00	chol	1	1
8	1.000	1.000	3.5e-10	9.8e-07	2.1e+02	2.017113e+02	-6.310154e+00	0:0:00	chol	1	1
9	1.000	1.000	4.6e-11	9.8e-08	1.0e+02	9.991361e+01	-3.541761e+00	0:0:00	chol	1	1
10	1.000	1.000	4.5e-12	9.8e-09	4.3e+01	4.184280e+01	-1.545623e+00	0:0:00	chol	1	1
11	1.000	1.000	6.9e-13	9.8e-10	1.7e+01	1.630688e+01	-6.577762e-01	0:0:00	chol	1	1
12	1.000	1.000	6.2e-14	9.9e-11	5.0e+00	4.826402e+00	-1.777812e-01	0:0:00	chol	1	1
13	1.000	1.000	7.1e-13	1.1e-11	1.5e+00	1.450255e+00	-6.654646e-02	0:0:00	chol	2	2
14	1.000	1.000	1.8e-13	2.0e-12	4.2e-01	3.853865e-01	-3.187465e-02	0:0:00	chol	2	2
15	0.971	1.000	2.1e-12	1.1e-12	1.2e-01	9.756768e-02	-2.367216e-02	0:0:00	chol	2	2
16	1.000	1.000	3.5e-12	1.0e-12	6.3e-02	4.127588e-02	-2.144347e-02	0:0:00	chol	2	2
17	1.000	1.000	2.1e-12	1.0e-12	1.8e-02	-2.547891e-03	-2.062509e-02	0:0:00	chol	2	2
18	1.000	1.000	2.4e-12	1.0e-12	8.4e-03	-1.189814e-02	-2.029491e-02	0:0:00	chol	2	2
19	0.963	1.000	1.8e-12	1.0e-12	1.9e-03	-1.828336e-02	-2.015632e-02	0:0:00	chol	3	3
20	1.000	1.000	4.3e-12	1.0e-12	8.5e-04	-1.928232e-02	-2.013304e-02	0:0:00	chol	3	2
21	1.000	1.000	1.1e-11	1.0e-12	2.2e-04	-1.989813e-02	-2.012153e-02	0:0:00	chol	4	3
22	1.000	1.000	8.4e-11	1.5e-12	7.1e-05	-2.004737e-02	-2.011853e-02	0:0:00	chol	5	5
23	1.000	1.000	2.4e-10	2.3e-12	1.7e-05	-2.010040e-02	-2.011772e-02	0:0:00	chol	16	12
24	1.000	1.000	8.0e-10	3.4e-12	4.0e-06	-2.011362e-02	-2.011756e-02	0:0:00	chol		
linsysolve: Schur complement matrix not positive definite											
switch to LU factor. lu 30 ^ 2											
25	0.981	1.000	7.4e-09	5.1e-12	9.5e-07	-2.011687e-02	-2.011754e-02	0:0:00	lu 30 ^26		
26	0.442	0.384	1.7e-08	1.1e-11	6.2e-07	-2.011649e-02	-2.011753e-02	0:0:00	lu 23 ^13		
27	0.121	0.184	1.9e-08	2.0e-11	5.8e-07	-2.011636e-02	-2.011753e-02	0:0:00	lu 11 ^23		
28	0.023	0.091	2.0e-08	3.5e-11	5.8e-07	-2.011609e-02	-2.011753e-02</				

stop: progress is bad

```
-----
number of iterations    = 28
primal objective value = -2.01164892e-02
dual   objective value = -2.01175324e-02
gap := trace(XZ)       = 6.20e-07
relative gap           = 5.96e-07
actual relative gap    = 1.00e-06
rel. primal infeas     = 1.73e-08
rel. dual   infeas     = 1.07e-11
norm(X), norm(y), norm(Z) = 3.7e+01, 1.0e+02, 7.7e+01
norm(A), norm(b), norm(C) = 2.1e+03, 2.5e+03, 7.9e+01
Total CPU time (secs)   = 0.41
CPU time per iteration = 0.01
termination code        = -5
DIMACS errors: 3.4e-08  0.0e+00  1.6e-11  0.0e+00  1.0e-06  6.0e-07
-----
```

ans =

0.0201

Iteration 2 Total error is: 0.00023973

```
num. of constraints = 85
dim. of socp var   = 86,   num. of socp blk = 1
dim. of linear var = 1000
```

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	1.4e+02	4.8e+07	5.296648e+04	0.000000e+00	0:0:00	chol	1	1
1	1.000	0.989	1.6e-07	1.7e+00	6.4e+05	5.455184e+04	-2.558369e+02	0:0:00	chol	1	1
2	1.000	0.916	1.3e-07	1.8e-01	9.1e+04	4.115462e+04	-1.962292e+01	0:0:00	chol	1	1
3	0.853	0.975	3.9e-08	1.5e-02	2.6e+04	2.242073e+04	-4.431283e+01	0:0:00	chol	1	1
4	1.000	1.000	5.4e-09	3.3e-03	2.9e+03	2.662649e+03	-3.125975e+01	0:0:00	chol	1	1
5	0.767	0.727	3.7e-08	1.6e-03	7.5e+02	6.969413e+02	-2.274040e+01	0:0:00	chol	1	1
6	0.243	1.000	3.0e-08	9.8e-05	6.7e+02	6.562905e+02	-1.531335e+01	0:0:00	chol	1	1
7	1.000	1.000	1.4e-09	9.8e-06	4.7e+02	4.558711e+02	-1.031690e+01	0:0:00	chol	1	1
8	1.000	1.000	3.6e-10	9.8e-07	2.1e+02	2.017790e+02	-6.310559e+00	0:0:00	chol	1	1
9	1.000	1.000	4.7e-11	9.8e-08	1.0e+02	9.989940e+01	-3.537092e+00	0:0:00	chol	1	1
10	1.000	1.000	8.2e-12	9.8e-09	4.3e+01	4.184136e+01	-1.546180e+00	0:0:00	chol	1	1
11	1.000	1.000	2.9e-13	9.8e-10	1.7e+01	1.630815e+01	-6.568580e-01	0:0:00	chol	1	1
12	1.000	1.000	3.3e-13	9.9e-11	5.0e+00	4.818161e+00	-1.777182e-01	0:0:00	chol	1	1
13	1.000	1.000	5.9e-12	1.1e-11	1.5e+00	1.450956e+00	-6.671996e-02	0:0:00	chol	2	1
14	1.000	1.000	1.1e-12	2.2e-12	4.1e-01	3.820005e-01	-3.209753e-02	0:0:00	chol	2	2
15	0.972	1.000	7.8e-13	1.1e-12	1.2e-01	9.719875e-02	-2.394142e-02	0:0:00	chol	2	2
16	1.000	1.000	5.6e-12	1.0e-12	6.3e-02	4.101397e-02	-2.172074e-02	0:0:00	chol	2	2
17	1.000	1.000	2.1e-12	1.1e-12	1.8e-02	-2.878095e-03	-2.089872e-02	0:0:00	chol	2	2
18	1.000	1.000	6.6e-12	1.0e-12	8.4e-03	-1.217470e-02	-2.057000e-02	0:0:00	chol	2	2
19	0.963	1.000	1.9e-12	1.3e-12	1.9e-03	-1.855448e-02	-2.043072e-02	0:0:00	chol	3	2
20	1.000	1.000	5.9e-11	1.0e-12	8.6e-04	-1.955037e-02	-2.040714e-02	0:0:00	chol	3	3

```

21|1.000|1.000|1.3e-11|1.5e-12|2.3e-04|-2.016758e-02 -2.039544e-02| 0:0:00| chol 4 4
22|1.000|1.000|8.5e-11|2.3e-12|7.4e-05|-2.031787e-02 -2.039232e-02| 0:0:00| chol 5 5
23|1.000|1.000|1.6e-10|3.4e-12|1.7e-05|-2.037404e-02 -2.039152e-02| 0:0:00| chol 16 16
24|1.000|1.000|3.4e-10|5.1e-12|5.0e-06|-2.038637e-02 -2.039135e-02| 0:0:00| chol
    linsysolve: Schur complement matrix not positive definite
    switch to LU factor. lu 11 ^ 5
25|0.540|0.499|5.3e-09|1.0e-11|2.3e-06|-2.039009e-02 -2.039133e-02| 0:0:00| lu 30 ^12
26|1.000|0.536|1.8e-08|1.6e-11|1.8e-06|-2.038720e-02 -2.039132e-02| 0:0:00| lu 30 ^28
27|0.076|0.118|1.8e-08|3.1e-11|1.7e-06|-2.038725e-02 -2.039132e-02| 0:0:00| lu 30 ^22
28|0.079|0.110|1.2e-08|5.3e-11|1.7e-06|-2.038776e-02 -2.039132e-02| 0:0:00|
    stop: progress is too slow
    stop: progress is bad

```

```

-----
number of iterations    = 28
primal objective value = -2.03872033e-02
dual   objective value = -2.03913202e-02
gap := trace(XZ)       = 1.78e-06
relative gap           = 1.71e-06
actual relative gap    = 3.96e-06
rel. primal infeas     = 1.83e-08
rel. dual   infeas     = 1.61e-11
norm(X), norm(y), norm(Z) = 3.7e+01, 1.0e+02, 7.7e+01
norm(A), norm(b), norm(C) = 2.1e+03, 2.5e+03, 7.9e+01
Total CPU time (secs)   = 0.39
CPU time per iteration = 0.01
termination code        = -5
DIMACS errors: 3.6e-08  0.0e+00  2.3e-11  0.0e+00  4.0e-06  1.7e-06
-----

```

ans =

0.0204

Iteration 3 Total error is: 0.00025122

```

num. of constraints = 85
dim. of socp var   = 86,   num. of socp blk = 1
dim. of linear var = 1000

```

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|1.4e+02|4.8e+07| 5.298819e+04 0.000000e+00| 0:0:00| chol 1 1
1|1.000|0.989|1.6e-07|1.7e+00|6.4e+05| 5.457347e+04 -2.558865e+02| 0:0:00| chol 1 1
2|1.000|0.916|1.3e-07|1.8e-01|9.1e+04| 4.117096e+04 -1.962110e+01| 0:0:00| chol 1 1
3|0.853|0.975|3.9e-08|1.5e-02|2.6e+04| 2.243728e+04 -4.432632e+01| 0:0:00| chol 1 1
4|1.000|1.000|5.4e-09|3.3e-03|2.9e+03| 2.665136e+03 -3.126464e+01| 0:0:00| chol 1 1
5|0.767|0.727|3.7e-08|1.6e-03|7.5e+02| 6.969451e+02 -2.274329e+01| 0:0:00| chol 1 1
6|0.243|1.000|3.0e-08|9.8e-05|6.7e+02| 6.563304e+02 -1.531556e+01| 0:0:00| chol 1 1
7|1.000|1.000|1.4e-09|9.8e-06|4.7e+02| 4.559327e+02 -1.031412e+01| 0:0:00| chol 1 1
8|1.000|1.000|3.4e-10|9.8e-07|2.1e+02| 2.018484e+02 -6.310862e+00| 0:0:00| chol 1 1
9|1.000|1.000|4.6e-11|9.8e-08|1.0e+02| 9.990713e+01 -3.534686e+00| 0:0:00| chol 1 1

```

```

10|1.000|1.000|1.8e-11|9.8e-09|4.3e+01| 4.184737e+01 -1.546173e+00| 0:0:00| chol 1 1
11|1.000|1.000|6.1e-13|9.8e-10|1.7e+01| 1.631053e+01 -6.561621e-01| 0:0:00| chol 1 1
12|1.000|1.000|4.8e-14|9.9e-11|5.0e+00| 4.814614e+00 -1.774679e-01| 0:0:00| chol 1 1
13|1.000|1.000|3.9e-12|1.1e-11|1.5e+00| 1.451248e+00 -6.662836e-02| 0:0:00| chol 1 1
14|1.000|1.000|4.5e-12|2.0e-12|4.1e-01| 3.803853e-01 -3.206329e-02| 0:0:00| chol 2 2
15|0.973|1.000|1.0e-12|1.1e-12|1.2e-01| 9.698858e-02 -2.394618e-02| 0:0:00| chol 2 2
16|1.000|1.000|2.3e-12|1.0e-12|6.3e-02| 4.091657e-02 -2.173991e-02| 0:0:00| chol 2 2
17|1.000|1.000|4.3e-12|1.0e-12|1.8e-02| -2.953681e-03 -2.092149e-02| 0:0:00| chol 2 2
18|1.000|1.000|2.7e-12|1.0e-12|8.4e-03| -1.222458e-02 -2.059582e-02| 0:0:00| chol 2 2
19|0.963|1.000|1.6e-12|1.0e-12|1.9e-03| -1.859521e-02 -2.045786e-02| 0:0:00| chol 3 3
20|1.000|1.000|6.7e-12|1.0e-12|8.5e-04| -1.958644e-02 -2.043479e-02| 0:0:00| chol 3 3
21|1.000|1.000|1.5e-11|1.3e-12|2.2e-04| -2.020183e-02 -2.042338e-02| 0:0:00| chol 4 4
22|1.000|1.000|3.6e-11|2.0e-12|6.6e-05| -2.035426e-02 -2.042048e-02| 0:0:00| chol 5 6
23|0.976|1.000|1.0e-10|3.0e-12|1.3e-05| -2.040645e-02 -2.041987e-02| 0:0:00| chol 21 21
24|0.966|1.000|5.9e-10|4.5e-12|3.5e-06| -2.041639e-02 -2.041977e-02| 0:0:00| chol

```

linsysolve: Schur complement matrix not positive definite

switch to LU factor. lu 30 ^13

```

25|0.924|0.632|3.3e-09|8.5e-12|1.5e-06| -2.041809e-02 -2.041976e-02| 0:0:00| lu 30 30
26|1.000|0.742|2.0e-08|1.2e-11|1.0e-06| -2.041852e-02 -2.041976e-02| 0:0:00| lu 30 30
27|0.175|0.222|6.4e-09|2.5e-11|9.8e-07| -2.041855e-02 -2.041976e-02| 0:0:00| lu 18 ^16
28|0.357|0.270|8.6e-09|4.1e-11|8.6e-07| -2.041773e-02 -2.041976e-02| 0:0:00|

```

stop: progress is too slow

```

-----
number of iterations      = 28
primal objective value    = -2.04185230e-02
dual   objective value    = -2.04197586e-02
gap := trace(XZ)          = 1.05e-06
relative gap              = 1.01e-06
actual relative gap       = 1.19e-06
rel. primal infeas        = 2.03e-08
rel. dual   infeas        = 1.24e-11
norm(X), norm(y), norm(Z) = 3.7e+01, 1.0e+02, 7.7e+01
norm(A), norm(b), norm(C) = 2.1e+03, 2.5e+03, 7.9e+01
Total CPU time (secs)     = 0.39
CPU time per iteration    = 0.01
termination code          = -5
DIMACS errors: 4.0e-08   0.0e+00   1.8e-11   0.0e+00   1.2e-06   1.0e-06
-----

```

ans =

0.0204

Iteration 4 Total error is: 0.00025282

```

num. of constraints = 85
dim. of socp var   = 86,   num. of socp blk = 1
dim. of linear var = 1000

```

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|1.4e+02|4.8e+07| 5.300928e+04  0.000000e+00| 0:0:00| chol  1  1
1|1.000|0.989|1.6e-07|1.7e+00|6.4e+05| 5.459449e+04 -2.559424e+02| 0:0:00| chol  1  1
2|1.000|0.916|1.3e-07|1.8e-01|9.1e+04| 4.118675e+04 -1.962073e+01| 0:0:00| chol  1  1
3|0.853|0.975|3.9e-08|1.5e-02|2.6e+04| 2.245191e+04 -4.433868e+01| 0:0:00| chol  1  1
4|1.000|1.000|5.4e-09|3.3e-03|2.9e+03| 2.667258e+03 -3.126959e+01| 0:0:00| chol  1  1
5|0.767|0.727|3.7e-08|1.6e-03|7.5e+02| 6.969727e+02 -2.274624e+01| 0:0:00| chol  1  1
6|0.242|1.000|3.0e-08|9.8e-05|6.7e+02| 6.563877e+02 -1.531747e+01| 0:0:00| chol  1  1
7|1.000|1.000|1.4e-09|9.8e-06|4.7e+02| 4.560051e+02 -1.031187e+01| 0:0:00| chol  1  1
8|1.000|1.000|3.6e-10|9.8e-07|2.1e+02| 2.019143e+02 -6.310874e+00| 0:0:00| chol  1  1
9|1.000|1.000|4.8e-11|9.8e-08|1.0e+02| 9.991792e+01 -3.532699e+00| 0:0:00| chol  1  1
10|1.000|1.000|4.6e-12|9.8e-09|4.3e+01| 4.185366e+01 -1.545933e+00| 0:0:00| chol  1  1
11|1.000|1.000|8.5e-13|9.8e-10|1.7e+01| 1.631256e+01 -6.554635e-01| 0:0:00| chol  1  1
12|1.000|1.000|1.3e-13|9.9e-11|5.0e+00| 4.812049e+00 -1.771353e-01| 0:0:00| chol  1  1
13|1.000|1.000|6.5e-13|1.1e-11|1.5e+00| 1.451474e+00 -6.644259e-02| 0:0:00| chol  1  2
14|1.000|1.000|1.9e-13|2.0e-12|4.1e-01| 3.792236e-01 -3.194328e-02| 0:0:00| chol  2  2
15|0.974|1.000|7.5e-13|1.1e-12|1.2e-01| 9.672834e-02 -2.387454e-02| 0:0:00| chol  2  2
16|1.000|1.000|7.5e-12|1.0e-12|6.2e-02| 4.079690e-02 -2.168817e-02| 0:0:00| chol  2  2
17|1.000|1.000|1.8e-12|1.5e-12|1.8e-02| -2.988635e-03 -2.087950e-02| 0:0:00| chol  2  2
18|1.000|1.000|2.7e-12|1.0e-12|8.3e-03| -1.222825e-02 -2.055892e-02| 0:0:00| chol  2  2
19|0.963|1.000|1.2e-12|1.0e-12|1.8e-03| -1.858695e-02 -2.042373e-02| 0:0:00| chol  2  3
20|1.000|1.000|1.0e-11|1.0e-12|8.3e-04| -1.957105e-02 -2.040164e-02| 0:0:00| chol  3  3
21|1.000|1.000|9.9e-12|1.5e-12|2.1e-04| -2.018042e-02 -2.039068e-02| 0:0:00| chol  4  4
22|1.000|1.000|8.6e-11|2.0e-12|5.6e-05| -2.033199e-02 -2.038798e-02| 0:0:00| chol  5  5
23|0.807|0.970|2.5e-10|3.0e-12|1.8e-05| -2.036993e-02 -2.038756e-02| 0:0:00| chol 15 15
24|0.903|1.000|1.9e-10|4.5e-12|4.8e-06| -2.038275e-02 -2.038747e-02| 0:0:00| chol

```

linsysolve: Schur complement matrix not positive definite

switch to LU factor. lu 30 ^23

```

25|1.000|1.000|1.7e-09|6.7e-12|2.0e-06| -2.038538e-02 -2.038745e-02| 0:0:00| lu 30  30
26|0.694|0.775|7.8e-09|1.2e-11|8.6e-07| -2.038589e-02 -2.038744e-02| 0:0:00| lu 15  30
27|0.197|0.216|5.5e-09|2.4e-11|7.6e-07| -2.038646e-02 -2.038744e-02| 0:0:00| lu 29 ^24
28|0.032|0.072|5.5e-09|4.5e-11|7.6e-07| -2.038605e-02 -2.038744e-02| 0:0:00|

```

stop: progress is too slow

stop: progress is bad

```

-----
number of iterations    = 28
primal objective value  = -2.03858940e-02
dual   objective value  = -2.03874423e-02
gap := trace(XZ)        = 8.64e-07
relative gap           = 8.30e-07
actual relative gap    = 1.49e-06
rel. primal infeas     = 7.82e-09
rel. dual   infeas     = 1.16e-11
norm(X), norm(y), norm(Z) = 3.7e+01, 1.0e+02, 7.7e+01
norm(A), norm(b), norm(C) = 2.1e+03, 2.5e+03, 7.9e+01
Total CPU time (secs)   = 0.36
CPU time per iteration  = 0.01
termination code        = -5
DIMACS errors: 1.6e-08  0.0e+00  1.7e-11  0.0e+00  1.5e-06  8.3e-07
-----

```

ans =

0.0204

Iteration 5 Total error is: 0.00025209

```

num. of constraints = 85
dim. of socp var = 86, num. of socp blk = 1
dim. of linear var = 1000
*****
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|1.4e+02|4.8e+07| 5.303002e+04  0.000000e+00| 0:0:00| chol 1 1
1|1.000|0.989|1.6e-07|1.7e+00|6.4e+05| 5.461516e+04 -2.559793e+02| 0:0:00| chol 1 1
2|1.000|0.916|1.3e-07|1.8e-01|9.1e+04| 4.120229e+04 -1.961882e+01| 0:0:00| chol 1 1
3|0.853|0.975|3.9e-08|1.5e-02|2.6e+04| 2.246533e+04 -4.434807e+01| 0:0:00| chol 1 1
4|1.000|1.000|5.4e-09|3.3e-03|2.9e+03| 2.669475e+03 -3.127241e+01| 0:0:00| chol 1 1
5|0.767|0.727|3.7e-08|1.6e-03|7.5e+02| 6.969249e+02 -2.274778e+01| 0:0:00| chol 1 1
6|0.242|1.000|3.0e-08|9.8e-05|6.7e+02| 6.563777e+02 -1.531847e+01| 0:0:00| chol 1 1
7|1.000|1.000|1.4e-09|9.8e-06|4.7e+02| 4.560351e+02 -1.030886e+01| 0:0:00| chol 1 1
8|1.000|1.000|3.4e-10|9.8e-07|2.1e+02| 2.019601e+02 -6.310560e+00| 0:0:00| chol 1 1
9|1.000|1.000|4.9e-11|9.8e-08|1.0e+02| 9.991841e+01 -3.530451e+00| 0:0:00| chol 1 1
10|1.000|1.000|2.7e-12|9.8e-09|4.3e+01| 4.185608e+01 -1.545701e+00| 0:0:00| chol 1 1
11|1.000|1.000|5.0e-13|9.8e-10|1.7e+01| 1.631328e+01 -6.547893e-01| 0:0:00| chol 1 1
12|1.000|1.000|7.2e-14|9.9e-11|5.0e+00| 4.808947e+00 -1.768636e-01| 0:0:00| chol 1 2
13|1.000|1.000|2.4e-13|1.1e-11|1.5e+00| 1.451570e+00 -6.631830e-02| 0:0:00| chol 1 2
14|1.000|1.000|1.9e-13|2.0e-12|4.1e-01| 3.779382e-01 -3.188154e-02| 0:0:00| chol 2 2
15|0.974|1.000|2.0e-12|1.1e-12|1.2e-01| 9.643846e-02 -2.385813e-02| 0:0:00| chol 2 2
16|1.000|1.000|3.3e-12|1.0e-12|6.2e-02| 4.063535e-02 -2.168980e-02| 0:0:00| chol 2 2
17|1.000|1.000|3.0e-12|1.0e-12|1.8e-02| -3.088536e-03 -2.088872e-02| 0:0:00| chol 2 2
18|1.000|1.000|4.4e-12|1.0e-12|8.3e-03| -1.228717e-02 -2.057305e-02| 0:0:00| chol 2 2
19|0.962|1.000|2.9e-12|1.0e-12|1.8e-03| -1.863446e-02 -2.043981e-02| 0:0:00| chol 2 3
20|1.000|1.000|1.2e-11|1.0e-12|8.1e-04| -1.961138e-02 -2.041852e-02| 0:0:00| chol 3 3
21|1.000|1.000|1.4e-11|1.5e-12|2.0e-04| -2.021002e-02 -2.040784e-02| 0:0:00| chol 4 4
22|1.000|1.000|1.8e-11|2.3e-12|4.7e-05| -2.035842e-02 -2.040531e-02| 0:0:00| chol 7 8
23|0.704|0.925|9.3e-11|3.5e-12|1.9e-05| -2.038629e-02 -2.040507e-02| 0:0:00| chol 22 21
24|0.923|1.000|4.4e-10|5.1e-12|5.0e-06| -2.040000e-02 -2.040496e-02| 0:0:00| chol
linsysolve: Schur complement matrix not positive definite
switch to LU factor. lu 30 30
25|1.000|0.908|1.0e-09|8.1e-12|1.7e-06| -2.040325e-02 -2.040494e-02| 0:0:00| lu 30 30
26|0.984|0.820|6.7e-09|1.3e-11|9.9e-08| -2.040431e-02 -2.040493e-02| 0:0:00|
stop: max(relative gap, infeasibilities) < 1.00e-07
-----
number of iterations = 26
primal objective value = -2.04043119e-02
dual objective value = -2.04049315e-02
gap := trace(XZ) = 9.87e-08
relative gap = 9.48e-08
actual relative gap = 5.95e-07
rel. primal infeas = 6.66e-09
rel. dual infeas = 1.28e-11
norm(X), norm(y), norm(Z) = 3.7e+01, 1.0e+02, 7.7e+01
norm(A), norm(b), norm(C) = 2.1e+03, 2.5e+03, 7.9e+01
Total CPU time (secs) = 0.31
CPU time per iteration = 0.01
termination code = 0

```

DIMACS errors: 1.3e-08 0.0e+00 1.9e-11 0.0e+00 6.0e-07 9.5e-08

ans =

0.0204

Iteration 6 Total error is: 0.00025301

num. of constraints = 85
dim. of socp var = 86, num. of socp blk = 1
dim. of linear var = 1000

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	1.4e+02	4.8e+07	5.305043e+04	0.000000e+00	0:0:00	chol	1	1	
1	1.000	0.989	1.6e-07	1.7e+00	6.4e+05	5.463550e+04	-2.560076e+02	0:0:00	chol	1	1	
2	1.000	0.916	1.3e-07	1.8e-01	9.1e+04	4.121756e+04	-1.961628e+01	0:0:00	chol	1	1	
3	0.853	0.975	3.9e-08	1.5e-02	2.6e+04	2.247765e+04	-4.435562e+01	0:0:00	chol	1	1	
4	1.000	1.000	5.4e-09	3.3e-03	2.9e+03	2.671631e+03	-3.127417e+01	0:0:00	chol	1	1	
5	0.768	0.727	3.8e-08	1.6e-03	7.5e+02	6.968487e+02	-2.274859e+01	0:0:00	chol	1	1	
6	0.242	1.000	3.0e-08	9.8e-05	6.7e+02	6.563412e+02	-1.531884e+01	0:0:00	chol	1	1	
7	1.000	1.000	1.4e-09	9.8e-06	4.7e+02	4.560487e+02	-1.030555e+01	0:0:00	chol	1	1	
8	1.000	1.000	3.4e-10	9.8e-07	2.1e+02	2.019959e+02	-6.309910e+00	0:0:00	chol	1	1	
9	1.000	1.000	4.6e-11	9.8e-08	1.0e+02	9.991504e+01	-3.528148e+00	0:0:00	chol	1	1	
10	1.000	1.000	1.2e-12	9.8e-09	4.3e+01	4.185656e+01	-1.545346e+00	0:0:00	chol	1	1	
11	1.000	1.000	2.4e-13	9.8e-10	1.7e+01	1.631316e+01	-6.540836e-01	0:0:00	chol	1	1	
12	1.000	1.000	5.9e-14	9.9e-11	5.0e+00	4.805845e+00	-1.765600e-01	0:0:00	chol	1	1	
13	1.000	1.000	1.2e-12	1.1e-11	1.5e+00	1.451617e+00	-6.616286e-02	0:0:00	chol	2	2	
14	1.000	1.000	1.7e-13	2.0e-12	4.1e-01	3.767620e-01	-3.179010e-02	0:0:00	chol	2	2	
15	0.975	1.000	1.6e-12	1.1e-12	1.2e-01	9.614479e-02	-2.381397e-02	0:0:00	chol	2	2	
16	1.000	1.000	2.1e-12	1.0e-12	6.2e-02	4.047588e-02	-2.166450e-02	0:0:00	chol	2	1	
17	1.000	1.000	9.8e-12	1.0e-12	1.8e-02	-3.172740e-03	-2.087221e-02	0:0:00	chol	2	2	
18	1.000	1.000	2.0e-12	1.5e-12	8.2e-03	-1.232658e-02	-2.056187e-02	0:0:00	chol	2	2	
19	0.961	1.000	6.9e-12	1.0e-12	1.8e-03	-1.866034e-02	-2.043066e-02	0:0:00	chol	3	3	
20	1.000	1.000	8.7e-12	1.4e-12	7.8e-04	-1.962840e-02	-2.041014e-02	0:0:00	chol	3	3	
21	1.000	1.000	4.1e-12	1.7e-12	1.9e-04	-2.021273e-02	-2.039980e-02	0:0:00	chol	4	4	
22	1.000	1.000	2.5e-11	1.0e-12	4.1e-05	-2.035649e-02	-2.039744e-02	0:0:00	chol	8	8	
23	0.700	0.899	1.3e-10	1.6e-12	1.7e-05	-2.038036e-02	-2.039727e-02	0:0:00	chol	24	30	
24	0.929	1.000	6.5e-10	2.3e-12	4.6e-06	-2.039261e-02	-2.039716e-02	0:0:00	chol			

linsysolve: Schur complement matrix not positive definite

switch to LU factor. lu 30 ^ 2

25	1.000	1.000	1.2e-09	3.4e-12	1.2e-06	-2.039579e-02	-2.039714e-02	0:0:00	lu 30 ^ 3			
26	1.000	0.878	1.4e-09	5.5e-12	6.9e-08	-2.039702e-02	-2.039714e-02	0:0:00				

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

number of iterations = 26
primal objective value = -2.03970233e-02
dual objective value = -2.03971361e-02
gap := trace(XZ) = 6.91e-08
relative gap = 6.64e-08


```

actual relative gap      = 1.08e-07
rel. primal infeas       = 1.42e-09
rel. dual   infeas       = 5.47e-12
norm(X), norm(y), norm(Z) = 3.7e+01, 1.0e+02, 7.7e+01
norm(A), norm(b), norm(C) = 2.1e+03, 2.5e+03, 7.9e+01
Total CPU time (secs)    = 0.30
CPU time per iteration    = 0.01
termination code         = 0
DIMACS errors: 2.8e-09  0.0e+00  8.0e-12  0.0e+00  1.1e-07  6.6e-08
-----

```

```
ans =
```

```
0.0204
```

```
Iteration    7    Total error is: 0.00025304
```

```

num. of constraints = 85
dim. of socp var   = 86,   num. of socp blk = 1
dim. of linear var = 1000

```

```
*****
```

```
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|1.4e+02|4.8e+07| 5.307054e+04  0.000000e+00| 0:0:00| chol  1  1
1|1.000|0.989|1.6e-07|1.7e+00|6.4e+05| 5.465554e+04 -2.560314e+02| 0:0:00| chol  1  1
2|1.000|0.916|1.3e-07|1.8e-01|9.1e+04| 4.123259e+04 -1.961361e+01| 0:0:00| chol  1  1
3|0.853|0.975|3.9e-08|1.5e-02|2.6e+04| 2.248918e+04 -4.436207e+01| 0:0:00| chol  1  1
4|1.000|1.000|5.4e-09|3.3e-03|2.9e+03| 2.673732e+03 -3.127534e+01| 0:0:00| chol  2  2
5|0.768|0.728|3.8e-08|1.6e-03|7.5e+02| 6.967521e+02 -2.274902e+01| 0:0:00| chol  1  1
6|0.242|1.000|3.0e-08|9.8e-05|6.7e+02| 6.562862e+02 -1.531889e+01| 0:0:00| chol  1  1
7|1.000|1.000|1.4e-09|9.8e-06|4.7e+02| 4.560511e+02 -1.030211e+01| 0:0:00| chol  1  1
8|1.000|1.000|3.5e-10|9.8e-07|2.1e+02| 2.020251e+02 -6.309092e+00| 0:0:00| chol  1  1
9|1.000|1.000|4.7e-11|9.8e-08|1.0e+02| 9.990909e+01 -3.525856e+00| 0:0:00| chol  1  1
10|1.000|1.000|1.1e-12|9.8e-09|4.3e+01| 4.185583e+01 -1.544941e+00| 0:0:00| chol  1  1
11|1.000|1.000|1.2e-12|9.8e-10|1.7e+01| 1.631248e+01 -6.533870e-01| 0:0:00| chol  1  1
12|1.000|1.000|8.9e-14|9.9e-11|5.0e+00| 4.802752e+00 -1.762621e-01| 0:0:00| chol  1  1
13|1.000|1.000|3.1e-12|1.1e-11|1.5e+00| 1.451593e+00 -6.601170e-02| 0:0:00| chol  2  2
14|1.000|1.000|3.8e-13|2.0e-12|4.1e-01| 3.756407e-01 -3.170220e-02| 0:0:00| chol  2  2
15|0.975|1.000|1.5e-12|1.1e-12|1.2e-01| 9.585220e-02 -2.377165e-02| 0:0:00| chol  2  2
16|1.000|1.000|7.4e-12|1.0e-12|6.2e-02| 4.031427e-02 -2.164057e-02| 0:0:00| chol  2  2
17|1.000|1.000|3.1e-12|1.5e-12|1.8e-02| -3.262465e-03 -2.085657e-02| 0:0:00| chol  2  2
18|1.000|1.000|5.4e-12|1.0e-12|8.2e-03| -1.236982e-02 -2.055144e-02| 0:0:00| chol  2  2
19|0.960|1.000|2.9e-12|1.1e-12|1.7e-03| -1.868748e-02 -2.042199e-02| 0:0:00| chol  3  2
20|1.000|1.000|5.4e-12|1.0e-12|7.6e-04| -1.964538e-02 -2.040214e-02| 0:0:00| chol  3  3
21|1.000|1.000|4.6e-12|1.1e-12|1.8e-04| -2.021388e-02 -2.039212e-02| 0:0:00| chol  4  4
22|1.000|1.000|1.7e-11|1.0e-12|3.7e-05| -2.035335e-02 -2.038990e-02| 0:0:00| chol  9  9
23|0.838|0.868|8.6e-11|1.6e-12|1.1e-05| -2.037861e-02 -2.038975e-02| 0:0:00| chol

```

```
linsysolve: Schur complement matrix not positive definite
```

```
switch to LU factor. lu 30 ^ 2
```

```

24|0.744|0.655|6.3e-09|2.8e-12|4.2e-06| -2.038536e-02 -2.038966e-02| 0:0:00| lu 30 ^22
25|1.000|0.910|6.8e-09|3.6e-12|2.4e-06| -2.038701e-02 -2.038965e-02| 0:0:00| lu 16  30

```

```
26|0.112|0.173|7.7e-09|8.1e-12|2.3e-06|-2.038728e-02 -2.038965e-02| 0:0:00| lu 30 30
27|0.327|0.495|7.7e-09|1.2e-11|2.1e-06|-2.038534e-02 -2.038965e-02| 0:0:00|
```

```
stop: progress is too slow
```

```
stop: progress is bad
```

```
-----
number of iterations    = 27
primal objective value = -2.03870075e-02
dual   objective value = -2.03896474e-02
gap := trace(XZ)        = 2.41e-06
relative gap           = 2.32e-06
actual relative gap    = 2.54e-06
rel. primal infeas     = 6.78e-09
rel. dual   infeas     = 3.63e-12
norm(X), norm(y), norm(Z) = 3.7e+01, 1.0e+02, 7.7e+01
norm(A), norm(b), norm(C) = 2.1e+03, 2.5e+03, 7.9e+01
Total CPU time (secs)   = 0.36
CPU time per iteration = 0.01
termination code        = -5
DIMACS errors: 1.3e-08  0.0e+00  5.3e-12  0.0e+00  2.5e-06  2.3e-06
-----
```

```
ans =
```

```
0.0204
```

```
Iteration    8    Total error is: 0.00025307
```

```
The total representation error of the testing signals is: 0.018952
```

```
>>
```