

```
>> load('testdata.mat', 'W')
>> demo_Polynomial_Dictionary_Learning
Starting to train the dictionary
solving the quadratic problem with YALMIP...
```

```
num. of constraints = 45
dim. of socp var = 46, 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|2.9e+00|5.1e+01|1.7e+06| 2.263033e+04  0.000000e+00| 0:0:00| chol 1✓
1
1|1.000|1.000|5.1e-05|3.0e-01|3.2e+04| 2.179087e+04 -2.858187e+00| 0:0:00| chol 1✓
1
2|1.000|1.000|5.4e-07|9.0e-02|1.3e+03| 1.126621e+03 -6.474426e-01| 0:0:00| chol 1✓
1
3|0.994|0.999|1.2e-06|9.0e-03|2.1e+01| 2.003946e+01 -5.788220e-01| 0:0:00| chol 1✓
1
4|0.889|1.000|4.0e-07|9.0e-04|1.1e+01| 9.975540e+00 -5.570486e-01| 0:0:00| chol 1✓
1
5|1.000|1.000|2.3e-10|9.0e-05|5.6e+00| 5.047618e+00 -5.346837e-01| 0:0:00| chol 1✓
1
6|0.760|0.765|1.5e-10|2.8e-05|2.1e+00| 1.586195e+00 -5.094174e-01| 0:0:00| chol 1✓
1
7|1.000|1.000|4.5e-10|9.0e-07|1.5e+00| 1.045311e+00 -4.947162e-01| 0:0:00| chol 1✓
1
8|1.000|1.000|1.4e-11|9.0e-08|6.8e-01| 2.020093e-01 -4.809899e-01| 0:0:00| chol 1✓
1
9|1.000|1.000|7.3e-12|9.0e-09|3.0e-01|-1.660328e-01 -4.699701e-01| 0:0:00| chol 1✓
1
10|1.000|1.000|2.5e-15|9.0e-10|1.3e-01|-3.308899e-01 -4.641158e-01| 0:0:00| chol 1✓
1
11|1.000|1.000|3.1e-15|9.1e-11|5.4e-02|-4.061462e-01 -4.605476e-01| 0:0:00| chol 1✓
1
12|1.000|1.000|1.9e-16|1.0e-11|2.2e-02|-4.365294e-01 -4.583963e-01| 0:0:00| chol 1✓
1
13|1.000|1.000|1.5e-15|1.9e-12|9.0e-03|-4.483694e-01 -4.573865e-01| 0:0:00| chol 1✓
1
14|1.000|1.000|1.2e-15|1.1e-12|3.9e-03|-4.529383e-01 -4.568803e-01| 0:0:00| chol 1✓
1
15|1.000|1.000|4.6e-16|1.0e-12|1.4e-03|-4.552199e-01 -4.566401e-01| 0:0:00| chol 1✓
1
16|1.000|1.000|5.1e-17|1.0e-12|4.8e-04|-4.560185e-01 -4.565013e-01| 0:0:00| chol 1✓
1
17|1.000|1.000|9.6e-15|1.0e-12|2.2e-04|-4.562463e-01 -4.564700e-01| 0:0:00| chol 1✓
1
18|1.000|1.000|4.1e-15|1.0e-12|9.1e-05|-4.563539e-01 -4.564453e-01| 0:0:00| chol 1✓
1
19|1.000|1.000|2.0e-15|1.0e-12|3.5e-05|-4.564033e-01 -4.564379e-01| 0:0:01| chol 1✓
```

```

1
20|1.000|1.000|2.9e-15|1.0e-12|1.4e-05|-4.564198e-01 -4.564334e-01| 0:0:01| chol 1✓
1
21|1.000|1.000|1.4e-15|1.0e-12|4.8e-06|-4.564274e-01 -4.564321e-01| 0:0:01| chol 1✓
1
22|1.000|1.000|3.5e-15|1.0e-12|1.9e-06|-4.564296e-01 -4.564315e-01| 0:0:01| chol 1✓
1
23|1.000|1.000|2.2e-15|1.0e-12|6.4e-07|-4.564306e-01 -4.564313e-01| 0:0:01| chol 1✓
1
24|1.000|1.000|2.5e-15|1.0e-12|2.5e-07|-4.564309e-01 -4.564312e-01| 0:0:01| chol 1✓
1
25|1.000|1.000|3.4e-15|1.0e-12|8.6e-08|-4.564311e-01 -4.564312e-01| 0:0:01|
    stop: max(relative gap, infeasibilities) < 1.00e-07

```

```

-----
number of iterations    = 25
primal objective value = -4.56431084e-01
dual   objective value = -4.56431169e-01
gap := trace(XZ)       = 8.55e-08
relative gap           = 4.47e-08
actual relative gap    = 4.47e-08
rel. primal infeas     = 3.35e-15
rel. dual   infeas     = 1.00e-12
norm(X), norm(y), norm(Z) = 7.6e-01, 1.6e+00, 2.0e+01
norm(A), norm(b), norm(C) = 1.5e+02, 2.0e+00, 2.1e+01
Total CPU time (secs)   = 0.54
CPU time per iteration = 0.02
termination code        = 0
DIMACS errors: 3.4e-15  0.0e+00  8.2e-12  0.0e+00  4.5e-08  4.5e-08
-----

```

```
ans =
```

```
0.4564
```

```

num. of constraints = 45
dim. of socp var   = 46,   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|2.7e+00|5.1e+01|1.7e+06| 2.263033e+04  0.000000e+00| 0:0:00| chol 1✓
1
1|1.000|1.000|4.8e-05|3.0e-01|3.2e+04| 2.179112e+04 -4.667177e+00| 0:0:00| chol 1✓
1
2|1.000|1.000|1.0e-06|9.0e-02|1.3e+03| 1.126431e+03 -1.163139e+00| 0:0:00| chol 1✓
1
3|0.987|0.999|2.7e-06|9.1e-03|2.9e+01| 2.717139e+01 -1.089969e+00| 0:0:00| chol 1✓
1
4|0.177|0.898|8.3e-06|1.7e-03|2.7e+01| 2.615134e+01 -7.582081e-01| 0:0:00| chol 1✓

```

```

1
5|0.481|1.000|4.3e-06|9.0e-05|2.4e+01| 2.277206e+01 -7.319500e-01| 0:0:00| chol 1✓
1
6|1.000|0.890|5.6e-10|1.9e-05|7.9e+00| 7.403386e+00 -5.122457e-01| 0:0:00| chol 1✓
1
7|0.981|1.000|5.0e-10|9.0e-07|5.2e+00| 4.694547e+00 -4.557338e-01| 0:0:00| chol 1✓
1
8|1.000|1.000|2.3e-11|9.0e-08|2.5e+00| 2.145356e+00 -3.411981e-01| 0:0:00| chol 1✓
1
9|1.000|1.000|8.9e-12|9.0e-09|1.2e+00| 8.857797e-01 -3.140460e-01| 0:0:00| chol 1✓
1
10|1.000|1.000|5.1e-15|9.0e-10|4.2e-01| 1.439175e-01 -2.766596e-01| 0:0:00| chol 1✓
1
11|1.000|1.000|4.0e-15|9.1e-11|1.6e-01|-1.005512e-01 -2.651752e-01| 0:0:00| chol 1✓
1
12|1.000|1.000|1.8e-15|1.0e-11|6.1e-02|-1.971850e-01 -2.577345e-01| 0:0:00| chol 1✓
1
13|1.000|1.000|1.8e-15|1.9e-12|2.2e-02|-2.330321e-01 -2.552200e-01| 0:0:00| chol 1✓
1
14|1.000|1.000|1.4e-14|1.1e-12|9.3e-03|-2.445420e-01 -2.538487e-01| 0:0:00| chol 1✓
1
15|1.000|1.000|1.1e-14|1.0e-12|4.2e-03|-2.493256e-01 -2.535484e-01| 0:0:00| chol 1✓
1
16|1.000|1.000|5.4e-14|1.0e-12|1.8e-03|-2.513756e-01 -2.532161e-01| 0:0:00| chol 1✓
1
17|1.000|1.000|3.6e-14|1.0e-12|6.1e-04|-2.525036e-01 -2.531097e-01| 0:0:00| chol 1✓
1
18|1.000|1.000|4.4e-14|1.0e-12|2.9e-04|-2.527598e-01 -2.530507e-01| 0:0:00| chol 1✓
1
19|1.000|1.000|2.9e-14|1.0e-12|1.1e-04|-2.529219e-01 -2.530334e-01| 0:0:00| chol 1✓
1
20|1.000|1.000|2.8e-13|1.0e-12|4.7e-05|-2.529732e-01 -2.530202e-01| 0:0:00| chol 1✓
1
21|1.000|1.000|8.5e-15|1.0e-12|1.7e-05|-2.529996e-01 -2.530164e-01| 0:0:00| chol 1✓
1
22|1.000|1.000|3.9e-13|1.0e-12|6.7e-06|-2.530075e-01 -2.530141e-01| 0:0:00| chol 1✓
1
23|1.000|1.000|1.5e-14|1.0e-12|2.3e-06|-2.530112e-01 -2.530135e-01| 0:0:00| chol 1✓
1
24|1.000|1.000|1.2e-13|1.0e-12|9.0e-07|-2.530123e-01 -2.530132e-01| 0:0:00| chol 1✓
1
25|1.000|1.000|7.5e-14|1.0e-12|3.1e-07|-2.530128e-01 -2.530131e-01| 0:0:00| chol 1✓
1
26|1.000|1.000|1.8e-13|1.0e-12|1.2e-07|-2.530129e-01 -2.530130e-01| 0:0:00|
stop: max(relative gap, infeasibilities) < 1.00e-07
-----
number of iterations    = 26
primal objective value = -2.53012903e-01
dual  objective value = -2.53013022e-01
gap := trace(XZ)       = 1.20e-07
relative gap           = 7.95e-08
actual relative gap    = 7.95e-08
rel. primal infeas     = 1.82e-13
rel. dual  infeas      = 1.00e-12

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norm(X), norm(y), norm(Z) = 9.2e-01, 2.2e+00, 2.0e+01
norm(A), norm(b), norm(C) = 1.5e+02, 2.2e+00, 2.1e+01
Total CPU time (secs) = 0.23
CPU time per iteration = 0.01
termination code = 0
DIMACS errors: 2.0e-13 0.0e+00 8.2e-12 0.0e+00 8.0e-08 8.0e-08
-----

```

```
ans =
```

```
0.2530
```

```
Iteration 2 Total error is: 0.001874
```

```

num. of constraints = 45
dim. of socp var = 46, 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|2.6e+00|5.1e+01|1.7e+06| 2.263033e+04 0.000000e+00| 0:0:00| chol 1✓
1
1|1.000|1.000|4.7e-05|3.0e-01|3.2e+04| 2.179107e+04 -6.250554e+00| 0:0:00| chol 1✓
1
2|1.000|1.000|1.4e-06|9.0e-02|1.3e+03| 1.131989e+03 -1.726590e+00| 0:0:00| chol 1✓
1
3|0.982|0.998|2.2e-06|9.2e-03|3.5e+01| 3.254826e+01 -1.631278e+00| 0:0:00| chol 1✓
1
4|0.920|0.488|4.6e-05|5.1e-03|3.0e+01| 2.896401e+01 -1.080658e+00| 0:0:00| chol 1✓
1
5|0.764|0.690|1.1e-05|1.7e-03|2.5e+01| 2.415548e+01 -7.360576e-01| 0:0:00| chol 1✓
1
6|0.376|1.000|6.8e-06|1.0e-05|2.3e+01| 2.162061e+01 -1.015500e+00| 0:0:00| chol 1✓
1
7|0.874|1.000|8.6e-07|2.3e-06|9.4e+00| 8.833820e+00 -5.442020e-01| 0:0:00| chol 1✓
1
8|1.000|1.000|9.4e-11|2.6e-07|5.1e+00| 4.756070e+00 -3.718915e-01| 0:0:00| chol 1✓
1
9|1.000|1.000|1.5e-11|9.0e-09|2.0e+00| 1.640331e+00 -3.171950e-01| 0:0:00| chol 1✓
1
10|1.000|1.000|5.7e-15|9.0e-10|9.3e-01| 6.705645e-01 -2.560023e-01| 0:0:00| chol 1✓
1
11|1.000|1.000|6.9e-15|9.1e-11|3.2e-01| 8.318344e-02 -2.335967e-01| 0:0:00| chol 1✓
1
12|1.000|1.000|2.5e-15|1.0e-11|1.3e-01|-9.498765e-02 -2.214939e-01| 0:0:00| chol 1✓
1
13|1.000|1.000|3.3e-15|1.9e-12|4.2e-02|-1.755852e-01 -2.171064e-01| 0:0:00| chol 1✓
1
14|1.000|1.000|3.1e-15|1.1e-12|1.8e-02|-1.975368e-01 -2.150853e-01| 0:0:00| chol 1✓
1

```

```

15|1.000|1.000|2.0e-15|1.0e-12|7.3e-03|-2.071506e-01 -2.144380e-01| 0:0:00| chol 1✓
1
16|1.000|1.000|1.0e-14|1.0e-12|3.4e-03|-2.105999e-01 -2.139973e-01| 0:0:00| chol 1✓
1
17|1.000|1.000|5.5e-15|1.0e-12|1.2e-03|-2.126397e-01 -2.138437e-01| 0:0:00| chol 1✓
1
18|1.000|1.000|5.1e-15|1.0e-12|4.8e-04|-2.132495e-01 -2.137337e-01| 0:0:00| chol 1✓
1
19|1.000|1.000|2.4e-14|1.0e-12|1.9e-04|-2.135124e-01 -2.137050e-01| 0:0:00| chol 1✓
1
20|1.000|1.000|1.0e-14|1.0e-12|8.4e-05|-2.136002e-01 -2.136842e-01| 0:0:00| chol 1✓
1
21|1.000|1.000|1.2e-14|1.0e-12|3.1e-05|-2.136469e-01 -2.136779e-01| 0:0:00| chol 1✓
1
22|1.000|1.000|2.2e-14|1.0e-12|1.2e-05|-2.136616e-01 -2.136739e-01| 0:0:00| chol 1✓
1
23|1.000|1.000|1.4e-15|1.0e-12|4.3e-06|-2.136684e-01 -2.136727e-01| 0:0:00| chol 1✓
1
24|1.000|1.000|8.7e-15|1.0e-12|1.7e-06|-2.136705e-01 -2.136721e-01| 0:0:00| chol 1✓
1
25|1.000|1.000|3.5e-15|1.0e-12|5.8e-07|-2.136714e-01 -2.136720e-01| 0:0:00| chol 1✓
1
26|1.000|1.000|1.2e-14|1.0e-12|2.2e-07|-2.136717e-01 -2.136719e-01| 0:0:00| chol 1✓
1
27|1.000|1.000|6.2e-15|1.0e-12|7.7e-08|-2.136718e-01 -2.136719e-01| 0:0:00|
stop: max(relative gap, infeasibilities) < 1.00e-07

```

```

-----
number of iterations    = 27
primal objective value = -2.13671781e-01
dual   objective value = -2.13671858e-01
gap := trace(XZ)       = 7.68e-08
relative gap           = 5.38e-08
actual relative gap    = 5.38e-08
rel. primal infeas     = 6.20e-15
rel. dual   infeas     = 1.00e-12
norm(X), norm(y), norm(Z) = 9.7e-01, 2.4e+00, 2.0e+01
norm(A), norm(b), norm(C) = 1.5e+02, 2.2e+00, 2.1e+01
Total CPU time (secs)   = 0.20
CPU time per iteration = 0.01
termination code        = 0
DIMACS errors: 7.0e-15  0.0e+00  8.2e-12  0.0e+00  5.4e-08  5.4e-08
-----

```

ans =

0.2137

Iteration 3 Total error is: 0.0016531

```

num. of constraints = 45
dim. of socp var   = 46,   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	2.5e+00	5.1e+01	1.7e+06	2.263033e+04	0.000000e+00	0:0:00	chol 1✓
1	1	1	4.6e-05	3.0e-01	3.2e+04	2.179086e+04	-7.150865e+00	0:0:00	chol 1✓
2	1	1	2.2e-06	9.0e-02	1.3e+03	1.135949e+03	-2.177292e+00	0:0:00	chol 1✓
3	1	1	2.8e-06	9.0e-03	4.3e+01	3.995221e+01	-2.054399e+00	0:0:00	chol 1✓
4	1	1	5.8e-05	7.0e-03	3.8e+01	3.659393e+01	-1.491294e+00	0:0:00	chol 1✓
5	1	1	4.6e-05	2.4e-03	3.6e+01	3.216570e+01	-3.213046e+00	0:0:00	chol 1✓
6	1	1	2.5e-05	1.8e-04	3.1e+01	3.034894e+01	-7.975906e-01	0:0:00	chol 1✓
7	1	1	5.0e-11	2.8e-06	1.7e+01	1.599509e+01	-7.170224e-01	0:0:00	chol 1✓
8	1	1	8.0e-11	3.3e-07	5.6e+00	5.192614e+00	-4.015221e-01	0:0:00	chol 1✓
9	1	1	4.6e-11	9.0e-09	3.6e+00	3.217443e+00	-3.468244e-01	0:0:00	chol 1✓
10	1	1	2.7e-14	9.1e-10	9.7e-01	7.187820e-01	-2.464274e-01	0:0:00	chol 1✓
11	1	1	1.0e-14	9.1e-11	5.0e-01	2.720656e-01	-2.261719e-01	0:0:00	chol 1✓
12	1	1	1.7e-15	1.0e-11	1.3e-01	-7.909595e-02	-2.066009e-01	0:0:00	chol 1✓
13	1	1	2.0e-14	1.9e-12	6.0e-02	-1.430142e-01	-2.026724e-01	0:0:00	chol 1✓
14	1	1	1.9e-15	1.1e-12	1.9e-02	-1.808100e-01	-1.998883e-01	0:0:00	chol 1✓
15	1	1	8.0e-15	1.0e-12	8.5e-03	-1.905711e-01	-1.990373e-01	0:0:00	chol 1✓
16	1	1	9.0e-15	1.0e-12	3.7e-03	-1.949669e-01	-1.986179e-01	0:0:00	chol 1✓
17	1	1	1.2e-14	1.0e-12	1.2e-03	-1.972106e-01	-1.984307e-01	0:0:00	chol 1✓
18	1	1	3.7e-15	1.0e-12	5.0e-04	-1.978274e-01	-1.983304e-01	0:0:00	chol 1✓
19	1	1	1.9e-14	1.0e-12	2.2e-04	-1.980794e-01	-1.983037e-01	0:0:00	chol 1✓
20	1	1	1.7e-14	1.0e-12	9.3e-05	-1.981873e-01	-1.982803e-01	0:0:00	chol 1✓
21	1	1	3.3e-14	1.0e-12	3.5e-05	-1.982387e-01	-1.982735e-01	0:0:00	chol 1✓
22	1	1	4.3e-14	1.0e-12	1.4e-05	-1.982552e-01	-1.982691e-01	0:0:00	chol 1✓
23	1	1	3.2e-14	1.0e-12	4.8e-06	-1.982630e-01	-1.982678e-01	0:0:00	chol 1✓
24	1	1	2.3e-14	1.0e-12	1.9e-06	-1.982652e-01	-1.982671e-01	0:0:00	chol 1✓

```

1
25|1.000|1.000|6.4e-14|1.0e-12|6.5e-07|-1.982663e-01 -1.982669e-01| 0:0:00| chol 1✓
1
26|1.000|1.000|8.7e-14|1.0e-12|2.5e-07|-1.982666e-01 -1.982668e-01| 0:0:00| chol 1✓
1
27|1.000|1.000|3.6e-14|1.0e-12|8.7e-08|-1.982667e-01 -1.982668e-01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.00e-07
-----
number of iterations    = 27
primal objective value = -1.98266732e-01
dual  objective value = -1.98266819e-01
gap := trace(XZ)        = 8.68e-08
relative gap            = 6.22e-08
actual relative gap     = 6.22e-08
rel. primal infeas      = 3.55e-14
rel. dual  infeas       = 1.00e-12
norm(X), norm(y), norm(Z) = 9.9e-01, 2.4e+00, 2.0e+01
norm(A), norm(b), norm(C) = 1.5e+02, 2.3e+00, 2.1e+01
Total CPU time (secs)   = 0.20
CPU time per iteration = 0.01
termination code        = 0
DIMACS errors: 4.1e-14  0.0e+00  8.2e-12  0.0e+00  6.2e-08  6.2e-08
-----

ans =

    0.1983

Iteration    4    Total error is: 0.0015869

num. of constraints = 45
dim. of socp var   = 46,    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|2.4e+00|5.1e+01|1.7e+06| 2.263033e+04  0.000000e+00| 0:0:00| chol 1✓
1
1|1.000|1.000|4.5e-05|3.0e-01|3.2e+04| 2.179054e+04 -7.994306e+00| 0:0:00| chol 1✓
1
2|1.000|1.000|3.0e-06|9.0e-02|1.3e+03| 1.140741e+03 -2.720813e+00| 0:0:00| chol 1✓
1
3|0.970|1.000|3.9e-06|9.0e-03|4.9e+01| 4.593043e+01 -2.552386e+00| 0:0:00| chol 1✓
1
4|1.000|0.209|6.2e-05|7.3e-03|4.5e+01| 4.256669e+01 -1.861405e+00| 0:0:00| chol 1✓
1
5|0.259|0.855|4.6e-05|1.1e-03|4.0e+01| 3.569655e+01 -4.257474e+00| 0:0:00| chol 1✓
1
6|0.407|0.812|2.7e-05|2.2e-04|3.5e+01| 3.437351e+01 -9.915984e-01| 0:0:00| chol 1✓
1

```

```

7|0.995|1.000|1.4e-07|3.5e-06|1.9e+01| 1.838231e+01 -8.461197e-01| 0:0:00| chol 1✓
1
8|0.958|0.928|5.7e-09|3.6e-07|6.1e+00| 5.654082e+00 -4.249136e-01| 0:0:00| chol 1✓
1
9|1.000|1.000|5.4e-11|1.0e-08|3.9e+00| 3.529666e+00 -3.471383e-01| 0:0:00| chol 1✓
1
10|1.000|1.000|1.6e-14|9.1e-10|1.1e+00| 8.199537e-01 -2.395724e-01| 0:0:00| chol 1✓
1
11|1.000|1.000|7.6e-15|9.1e-11|5.3e-01| 3.133352e-01 -2.132343e-01| 0:0:00| chol 1✓
1
12|1.000|1.000|2.7e-15|1.0e-11|1.4e-01|-5.761660e-02 -1.940287e-01| 0:0:00| chol 1✓
1
13|1.000|1.000|1.3e-13|1.9e-12|6.3e-02|-1.263343e-01 -1.892758e-01| 0:0:00| chol 1✓
1
14|1.000|1.000|7.2e-15|1.1e-12|2.0e-02|-1.663940e-01 -1.868075e-01| 0:0:00| chol 1✓
1
15|1.000|1.000|4.4e-14|1.0e-12|8.7e-03|-1.769807e-01 -1.857061e-01| 0:0:00| chol 1✓
1
16|1.000|1.000|2.7e-14|1.0e-12|4.0e-03|-1.814725e-01 -1.854553e-01| 0:0:00| chol 1✓
1
17|1.000|1.000|4.4e-14|1.0e-12|1.6e-03|-1.835597e-01 -1.851790e-01| 0:0:00| chol 1✓
1
18|1.000|1.000|3.9e-14|1.0e-12|5.6e-04|-1.845265e-01 -1.850870e-01| 0:0:00| chol 1✓
1
19|1.000|1.000|1.8e-14|1.0e-12|2.8e-04|-1.847543e-01 -1.850374e-01| 0:0:00| chol 1✓
1
20|1.000|1.000|1.9e-13|1.0e-12|1.1e-04|-1.849111e-01 -1.850204e-01| 0:0:00| chol 1✓
1
21|1.000|1.000|1.3e-14|1.0e-12|4.5e-05|-1.849626e-01 -1.850080e-01| 0:0:00| chol 1✓
1
22|1.000|1.000|4.3e-14|1.0e-12|1.6e-05|-1.849879e-01 -1.850042e-01| 0:0:00| chol 1✓
1
23|1.000|1.000|4.1e-14|1.0e-12|6.4e-06|-1.849956e-01 -1.850021e-01| 0:0:00| chol 1✓
1
24|1.000|1.000|1.1e-14|1.0e-12|2.2e-06|-1.849992e-01 -1.850014e-01| 0:0:00| chol 1✓
1
25|1.000|1.000|2.7e-14|1.0e-12|8.7e-07|-1.850003e-01 -1.850011e-01| 0:0:00| chol 1✓
1
26|1.000|1.000|3.7e-14|1.0e-12|3.0e-07|-1.850007e-01 -1.850010e-01| 0:0:00| chol 1✓
1
27|1.000|1.000|1.7e-14|1.0e-12|1.2e-07|-1.850009e-01 -1.850010e-01| 0:0:00|
stop: max(relative gap, infeasibilities) < 1.00e-07

```

```

-----
number of iterations    = 27
primal objective value = -1.85000885e-01
dual   objective value = -1.85001000e-01
gap := trace(XZ)        = 1.16e-07
relative gap            = 8.43e-08
actual relative gap     = 8.43e-08
rel. primal infeas      = 1.70e-14
rel. dual   infeas      = 1.00e-12
norm(X), norm(y), norm(Z) = 1.0e+00, 2.3e+00, 2.0e+01
norm(A), norm(b), norm(C) = 1.5e+02, 2.4e+00, 2.1e+01
Total CPU time (secs)   = 0.23

```



```

CPU time per iteration = 0.01
termination code       = 0
DIMACS errors: 2.0e-14  0.0e+00  8.2e-12  0.0e+00  8.4e-08  8.4e-08
-----

```

```
ans =
```

```
0.1850
```

```
Iteration    5    Total error is: 0.0015347
```

```

num. of constraints = 45
dim. of socp var   = 46,   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|2.4e+00|5.1e+01|1.7e+06| 2.263033e+04  0.000000e+00| 0:0:00| chol 1✓
1
1|1.000|1.000|4.4e-05|3.0e-01|3.2e+04| 2.179010e+04 -8.647312e+00| 0:0:00| chol 1✓
1
2|1.000|1.000|3.8e-06|9.0e-02|1.3e+03| 1.146531e+03 -3.337394e+00| 0:0:00| chol 1✓
1
3|0.970|1.000|6.1e-06|9.0e-03|5.1e+01| 4.741574e+01 -3.105484e+00| 0:0:00| chol 1✓
1
4|1.000|0.213|6.5e-05|7.3e-03|4.7e+01| 4.464348e+01 -2.198381e+00| 0:0:00| chol 1✓
1
5|0.471|1.000|3.4e-05|9.2e-05|3.6e+01| 3.330902e+01 -2.593225e+00| 0:0:00| chol 1✓
1
6|1.000|0.777|4.7e-09|3.0e-05|2.3e+01| 2.219814e+01 -9.320739e-01| 0:0:00| chol 1✓
1
7|0.781|1.000|1.4e-09|9.0e-07|1.2e+01| 1.074982e+01 -7.544215e-01| 0:0:00| chol 1✓
1
8|1.000|1.000|9.3e-11|9.0e-08|5.9e+00| 5.480692e+00 -3.726662e-01| 0:0:00| chol 1✓
1
9|1.000|1.000|2.1e-11|9.0e-09|2.1e+00| 1.829613e+00 -2.988138e-01| 0:0:00| chol 1✓
1
10|1.000|1.000|5.8e-15|9.0e-10|9.6e-01| 7.447101e-01 -2.200720e-01| 0:0:00| chol 1✓
1
11|1.000|1.000|1.2e-14|9.1e-11|2.9e-01| 9.736571e-02 -1.918270e-01| 0:0:00| chol 1✓
1
12|1.000|1.000|4.0e-14|1.0e-11|1.2e-01|-6.142288e-02 -1.807006e-01| 0:0:00| chol 1✓
1
13|1.000|1.000|2.1e-14|1.9e-12|3.9e-02|-1.378499e-01 -1.766922e-01| 0:0:00| chol 1✓
1
14|0.862|1.000|4.6e-14|1.1e-12|1.9e-02|-1.559986e-01 -1.748021e-01| 0:0:00| chol 1✓
1
15|0.986|1.000|3.9e-14|1.0e-12|7.4e-03|-1.669706e-01 -1.743219e-01| 0:0:00| chol 1✓
1
16|1.000|1.000|2.2e-14|1.0e-12|3.7e-03|-1.702218e-01 -1.739000e-01| 0:0:00| chol 1✓

```

```

1
17|1.000|1.000|7.4e-14|1.0e-12|1.3e-03|-1.724053e-01 -1.737405e-01| 0:0:00| chol 1✓
1
18|1.000|1.000|2.6e-14|1.0e-12|5.2e-04|-1.731097e-01 -1.736344e-01| 0:0:00| chol 1✓
1
19|1.000|1.000|2.1e-13|1.0e-12|2.3e-04|-1.733775e-01 -1.736047e-01| 0:0:00| chol 1✓
1
20|1.000|1.000|2.2e-13|1.0e-12|9.6e-05|-1.734853e-01 -1.735817e-01| 0:0:00| chol 1✓
1
21|1.000|1.000|2.7e-14|1.0e-12|3.6e-05|-1.735386e-01 -1.735746e-01| 0:0:00| chol 1✓
1
22|1.000|1.000|2.3e-13|1.0e-12|1.4e-05|-1.735558e-01 -1.735701e-01| 0:0:00| chol 1✓
1
23|1.000|1.000|5.3e-13|1.0e-12|5.0e-06|-1.735637e-01 -1.735687e-01| 0:0:00| chol 1✓
1
24|1.000|1.000|6.3e-13|1.0e-12|2.0e-06|-1.735661e-01 -1.735681e-01| 0:0:00| chol 1✓
1
25|1.000|1.000|9.7e-13|1.0e-12|6.7e-07|-1.735672e-01 -1.735679e-01| 0:0:00| chol 1✓
1
26|1.000|1.000|3.6e-13|1.0e-12|2.6e-07|-1.735675e-01 -1.735678e-01| 0:0:00| chol 1✓
1
27|1.000|1.000|2.0e-12|1.0e-12|9.0e-08|-1.735677e-01 -1.735677e-01| 0:0:00|
    stop: max(relative gap, infeasibilities) < 1.00e-07

```

```

-----
number of iterations    = 27
primal objective value = -1.73567654e-01
dual   objective value = -1.73567744e-01
gap := trace(XZ)        = 8.99e-08
relative gap           = 6.67e-08
actual relative gap    = 6.67e-08
rel. primal infeas     = 2.04e-12
rel. dual   infeas     = 1.00e-12
norm(X), norm(y), norm(Z) = 1.0e+00, 2.3e+00, 2.0e+01
norm(A), norm(b), norm(C) = 1.6e+02, 2.5e+00, 2.1e+01
Total CPU time (secs)   = 0.22
CPU time per iteration = 0.01
termination code        = 0
DIMACS errors: 2.4e-12  0.0e+00  8.2e-12  0.0e+00  6.7e-08  6.7e-08
-----

```

ans =

0.1736

Iteration 6 Total error is: 0.0014769

```

num. of constraints = 45
dim. of socp var   = 46,   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	1	1	0.000	0.000	2.3e+00	5.1e+01	1.7e+06	2.263033e+04	0.000000e+00	0:0:00	chol 1 ✓
1	1	1	1.000	1.000	4.4e-05	3.0e-01	3.2e+04	2.178943e+04	-9.141610e+00	0:0:00	chol 1 ✓
2	1	1	1.000	1.000	4.5e-06	9.0e-02	1.3e+03	1.155326e+03	-4.118567e+00	0:0:00	chol 1 ✓
3	1	1	0.971	1.000	1.0e-05	9.0e-03	5.4e+01	4.933216e+01	-3.777817e+00	0:0:00	chol 1 ✓
4	1	1	1.000	0.248	8.3e-05	7.0e-03	5.0e+01	4.678433e+01	-2.535468e+00	0:0:00	chol 1 ✓
5	1	1	0.472	1.000	4.4e-05	9.2e-05	4.0e+01	3.730192e+01	-2.393459e+00	0:0:00	chol 1 ✓
6	1	1	1.000	0.766	5.1e-09	3.1e-05	2.5e+01	2.438904e+01	-1.004183e+00	0:0:00	chol 1 ✓
7	1	1	0.798	1.000	1.5e-09	9.0e-07	1.4e+01	1.317649e+01	-8.577913e-01	0:0:00	chol 1 ✓
8	1	1	1.000	1.000	9.6e-11	9.0e-08	7.1e+00	6.656062e+00	-4.167079e-01	0:0:00	chol 1 ✓
9	1	1	1.000	1.000	2.6e-11	9.0e-09	2.8e+00	2.528439e+00	-3.108771e-01	0:0:00	chol 1 ✓
10	1	1	1.000	1.000	1.1e-14	9.1e-10	1.1e+00	8.854609e-01	-2.149526e-01	0:0:00	chol 1 ✓
11	1	1	1.000	1.000	7.9e-15	9.1e-11	3.5e-01	1.651501e-01	-1.831800e-01	0:0:00	chol 1 ✓
12	1	1	1.000	1.000	1.2e-13	1.0e-11	1.4e-01	-3.125975e-02	-1.695657e-01	0:0:00	chol 1 ✓
13	1	1	1.000	1.000	6.3e-15	1.9e-12	4.2e-02	-1.225596e-01	-1.649509e-01	0:0:00	chol 1 ✓
14	1	1	0.908	1.000	1.3e-13	1.1e-12	1.8e-02	-1.446966e-01	-1.630348e-01	0:0:00	chol 1 ✓
15	1	1	0.905	1.000	3.5e-14	1.0e-12	9.2e-03	-1.535176e-01	-1.626939e-01	0:0:00	chol 1 ✓
16	1	1	1.000	1.000	3.5e-13	1.0e-12	4.8e-03	-1.573827e-01	-1.622172e-01	0:0:00	chol 1 ✓
17	1	1	1.000	1.000	4.7e-13	1.0e-12	1.8e-03	-1.602293e-01	-1.620393e-01	0:0:00	chol 1 ✓
18	1	1	1.000	1.000	3.4e-13	1.0e-12	7.2e-04	-1.611935e-01	-1.619172e-01	0:0:00	chol 1 ✓
19	1	1	1.000	1.000	9.7e-13	1.0e-12	2.9e-04	-1.615834e-01	-1.618723e-01	0:0:00	chol 1 ✓
20	1	1	1.000	1.000	1.5e-12	1.0e-12	1.3e-04	-1.617165e-01	-1.618474e-01	0:0:00	chol 1 ✓
21	1	1	1.000	1.000	5.2e-13	1.0e-12	4.9e-05	-1.617893e-01	-1.618378e-01	0:0:00	chol 1 ✓
22	1	1	1.000	1.000	2.4e-12	1.0e-12	1.9e-05	-1.618128e-01	-1.618322e-01	0:0:00	chol 1 ✓
23	1	1	1.000	1.000	1.8e-13	1.0e-12	6.9e-06	-1.618235e-01	-1.618304e-01	0:0:00	chol 1 ✓
24	1	1	1.000	1.000	1.4e-12	1.0e-12	2.7e-06	-1.618268e-01	-1.618295e-01	0:0:00	chol 1 ✓
25	1	1	1.000	1.000	5.8e-13	1.0e-12	9.2e-07	-1.618283e-01	-1.618292e-01	0:0:00	chol 1 ✓

```
26|1.000|1.000|8.8e-13|1.0e-12|3.6e-07|-1.618287e-01 -1.618291e-01| 0:0:00| chol 1✓
1
```

```
27|1.000|1.000|3.5e-13|1.0e-12|1.2e-07|-1.618289e-01 -1.618291e-01| 0:0:00|
stop: max(relative gap, infeasibilities) < 1.00e-07
```

```
-----
number of iterations    = 27
primal objective value = -1.61828936e-01
dual   objective value = -1.61829059e-01
gap := trace(XZ)        = 1.23e-07
relative gap            = 9.30e-08
actual relative gap     = 9.30e-08
rel. primal infeas      = 3.47e-13
rel. dual   infeas      = 1.00e-12
norm(X), norm(y), norm(Z) = 1.1e+00, 2.3e+00, 2.0e+01
norm(A), norm(b), norm(C) = 1.6e+02, 2.6e+00, 2.1e+01
Total CPU time (secs)    = 0.21
CPU time per iteration   = 0.01
termination code         = 0
DIMACS errors: 4.0e-13  0.0e+00  8.2e-12  0.0e+00  9.3e-08  9.3e-08
-----
```

```
ans =
```

```
0.1618
```

```
Iteration    7    Total error is: 0.0013998
```

```
num. of constraints = 45
dim. of socp var   = 46,   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|2.2e+00|5.1e+01|1.7e+06| 2.263033e+04  0.000000e+00| 0:0:00| chol 1✓
1
1|1.000|1.000|4.4e-05|3.0e-01|3.2e+04| 2.178880e+04 -1.005469e+01| 0:0:00| chol 1✓
1
2|1.000|0.998|5.5e-06|9.0e-02|1.3e+03| 1.169898e+03 -5.178888e+00| 0:0:00| chol 1✓
1
3|0.976|1.000|1.3e-05|9.0e-03|7.0e+01| 6.465688e+01 -4.648421e+00| 0:0:00| chol 1✓
1
4|0.962|0.387|7.1e-05|5.9e-03|5.8e+01| 5.515348e+01 -2.800038e+00| 0:0:00| chol 1✓
1
5|1.000|0.457|1.5e-07|3.2e-03|4.8e+01| 4.595279e+01 -1.477142e+00| 0:0:00| chol 1✓
1
6|0.454|1.000|5.9e-08|9.0e-06|3.3e+01| 2.854103e+01 -4.126690e+00| 0:0:00| chol 1✓
1
7|1.000|0.953|1.3e-09|1.3e-06|2.1e+01| 2.032310e+01 -5.549437e-01| 0:0:00| chol 1✓
1
8|0.917|0.936|1.7e-10|1.7e-07|1.8e+00| 1.552211e+00 -2.584856e-01| 0:0:00| chol 1✓
```

```

1
 9|1.000|1.000|4.4e-11|9.0e-09|1.0e+00| 8.350301e-01 -2.051769e-01| 0:0:00| chol 1✓
1
10|1.000|1.000|1.0e-12|9.1e-10|5.5e-01| 3.668717e-01 -1.809312e-01| 0:0:00| chol 1✓
1
11|1.000|0.948|5.2e-15|1.3e-10|1.2e-01|-3.633361e-02 -1.584440e-01| 0:0:00| chol 1✓
1
12|0.654|1.000|2.4e-13|1.0e-11|7.8e-02|-7.509169e-02 -1.535850e-01| 0:0:00| chol 1✓
1
13|1.000|1.000|8.7e-15|1.9e-12|2.5e-02|-1.272252e-01 -1.520514e-01| 0:0:00| chol 1✓
1
14|1.000|0.969|3.1e-14|1.1e-12|1.0e-02|-1.405375e-01 -1.506703e-01| 0:0:00| chol 1✓
1
15|1.000|1.000|3.1e-13|1.0e-12|4.1e-03|-1.462541e-01 -1.503094e-01| 0:0:00| chol 1✓
1
16|1.000|1.000|6.6e-13|1.0e-12|2.0e-03|-1.480790e-01 -1.500998e-01| 0:0:00| chol 1✓
1
17|1.000|1.000|1.1e-12|1.0e-12|6.8e-04|-1.493160e-01 -1.499973e-01| 0:0:00| chol 1✓
1
18|1.000|1.000|8.2e-13|1.0e-12|3.2e-04|-1.496208e-01 -1.499413e-01| 0:0:00| chol 1✓
1
19|1.000|1.000|9.3e-13|1.0e-12|1.3e-04|-1.497964e-01 -1.499233e-01| 0:0:00| chol 1✓
1
20|1.000|1.000|3.4e-13|1.0e-12|5.3e-05|-1.498562e-01 -1.499093e-01| 0:0:00| chol 1✓
1
21|1.000|1.000|1.2e-12|1.0e-12|1.9e-05|-1.498859e-01 -1.499051e-01| 0:0:00| chol 1✓
1
22|1.000|1.000|1.0e-12|1.0e-12|7.6e-06|-1.498950e-01 -1.499026e-01| 0:0:00| chol 1✓
1
23|1.000|1.000|1.6e-12|1.0e-12|2.6e-06|-1.498992e-01 -1.499018e-01| 0:0:00| chol 1✓
1
24|1.000|1.000|4.1e-13|1.0e-12|1.0e-06|-1.499004e-01 -1.499015e-01| 0:0:00| chol 1✓
1
25|1.000|1.000|1.2e-12|1.0e-12|3.5e-07|-1.499010e-01 -1.499014e-01| 0:0:00| chol 1✓
1
26|1.000|1.000|3.9e-13|1.0e-12|1.4e-07|-1.499012e-01 -1.499013e-01| 0:0:00| chol 1✓
1
27|1.000|1.000|3.9e-13|1.0e-12|4.7e-08|-1.499013e-01 -1.499013e-01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.00e-07
-----
number of iterations    = 27
primal objective value = -1.49901258e-01
dual   objective value = -1.49901305e-01
gap := trace(XZ)       = 4.69e-08
relative gap           = 3.61e-08
actual relative gap    = 3.61e-08
rel. primal infeas     = 3.85e-13
rel. dual   infeas     = 1.00e-12
norm(X), norm(y), norm(Z) = 1.1e+00, 2.3e+00, 2.0e+01
norm(A), norm(b), norm(C) = 1.6e+02, 2.7e+00, 2.1e+01
Total CPU time (secs)   = 0.19
CPU time per iteration = 0.01
termination code        = 0
DIMACS errors: 4.4e-13  0.0e+00  8.2e-12  0.0e+00  3.6e-08  3.6e-08

```

ans =

0.1499

Iteration 8 Total error is: 0.0013293

num. of constraints = 45

dim. of socp var = 46, 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	2.1e+00	5.1e+01	1.7e+06	2.263033e+04	0.000000e+00	0:0:00	chol	1✓
1	1.000	1.000	4.3e-05	3.0e-01	3.2e+04	2.178825e+04	-1.126926e+01	0:0:00	chol	1✓
2	1.000	0.997	6.7e-06	9.1e-02	1.4e+03	1.202147e+03	-6.468963e+00	0:0:00	chol	1✓
3	1.000	1.000	1.3e-05	9.0e-03	1.1e+02	1.043221e+02	-5.676903e+00	0:0:00	chol	1✓
4	0.483	0.586	2.3e-05	4.3e-03	9.1e+01	8.715792e+01	-3.211612e+00	0:0:00	chol	1✓
5	0.740	1.000	5.9e-06	9.3e-05	6.8e+01	6.648158e+01	-1.951904e+00	0:0:00	chol	1✓
6	1.000	1.000	2.4e-09	1.0e-05	4.1e+01	4.006169e+01	-1.352853e+00	0:0:00	chol	1✓
7	1.000	1.000	7.2e-10	9.0e-07	1.7e+01	1.641551e+01	-8.611655e-01	0:0:00	chol	1✓
8	1.000	1.000	1.4e-10	9.0e-08	7.3e+00	6.824710e+00	-4.440451e-01	0:0:00	chol	1✓
9	1.000	1.000	3.1e-11	9.0e-09	2.7e+00	2.459239e+00	-2.855740e-01	0:0:00	chol	1✓
10	1.000	1.000	1.7e-14	9.1e-10	1.0e+00	8.483277e-01	-1.915387e-01	0:0:00	chol	1✓
11	1.000	1.000	1.7e-14	9.1e-11	3.1e-01	1.487480e-01	-1.583745e-01	0:0:00	chol	1✓
12	1.000	1.000	1.6e-13	1.0e-11	1.3e-01	-2.049664e-02	-1.466163e-01	0:0:00	chol	1✓
13	1.000	1.000	5.1e-14	1.9e-12	3.9e-02	-1.037611e-01	-1.423327e-01	0:0:00	chol	1✓
14	0.875	1.000	9.6e-14	1.1e-12	1.8e-02	-1.225755e-01	-1.406495e-01	0:0:00	chol	1✓
15	0.923	1.000	2.6e-13	1.0e-12	8.4e-03	-1.318756e-01	-1.403045e-01	0:0:00	chol	1✓
16	1.000	1.000	8.6e-14	1.0e-12	4.4e-03	-1.354734e-01	-1.398523e-01	0:0:00	chol	1✓
17	1.000	1.000	1.6e-12	1.0e-12	1.6e-03	-1.380987e-01	-1.396890e-01	0:0:00	chol	1✓

```

18|1.000|1.000|2.0e-13|1.0e-12|6.5e-04|-1.389284e-01 -1.395758e-01| 0:0:00| chol 1✓
1
19|1.000|1.000|8.4e-13|1.0e-12|2.6e-04|-1.392748e-01 -1.395377e-01| 0:0:00| chol 1✓
1
20|1.000|1.000|4.4e-12|1.0e-12|1.2e-04|-1.393967e-01 -1.395136e-01| 0:0:00| chol 1✓
1
21|1.000|1.000|4.2e-13|1.0e-12|4.3e-05|-1.394618e-01 -1.395051e-01| 0:0:00| chol 1✓
1
22|1.000|1.000|1.2e-12|1.0e-12|1.7e-05|-1.394826e-01 -1.394999e-01| 0:0:00| chol 1✓
1
23|1.000|1.000|1.9e-12|1.0e-12|6.1e-06|-1.394922e-01 -1.394983e-01| 0:0:00| chol 1✓
1
24|1.000|1.000|5.1e-12|1.0e-12|2.4e-06|-1.394951e-01 -1.394975e-01| 0:0:00| chol 1✓
1
25|1.000|1.000|6.3e-13|1.0e-12|8.2e-07|-1.394964e-01 -1.394972e-01| 0:0:00| chol 1✓
1
26|1.000|1.000|1.5e-12|1.0e-12|3.2e-07|-1.394968e-01 -1.394971e-01| 0:0:00| chol 1✓
1
27|1.000|1.000|3.0e-12|1.0e-12|1.1e-07|-1.394970e-01 -1.394971e-01| 0:0:00|
stop: max(relative gap, infeasibilities) < 1.00e-07

```

```

-----
number of iterations    = 27
primal objective value = -1.39496988e-01
dual   objective value = -1.39497097e-01
gap := trace(XZ)        = 1.09e-07
relative gap            = 8.53e-08
actual relative gap     = 8.53e-08
rel. primal infeas      = 3.02e-12
rel. dual   infeas      = 1.00e-12
norm(X), norm(y), norm(Z) = 1.2e+00, 2.3e+00, 2.0e+01
norm(A), norm(b), norm(C) = 1.6e+02, 2.9e+00, 2.1e+01
Total CPU time (secs)   = 0.19
CPU time per iteration = 0.01
termination code        = 0
DIMACS errors: 3.4e-12  0.0e+00  8.2e-12  0.0e+00  8.5e-08  8.5e-08
-----

```

ans =

0.1395

Iteration 9 Total error is: 0.0012754

```

num. of constraints = 45
dim. of socp var = 46, 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|2.0e+00|5.1e+01|1.7e+06| 2.263033e+04  0.000000e+00| 0:0:00| chol 1✓

```

```
1
1|1.000|1.000|4.3e-05|3.0e-01|3.2e+04| 2.178761e+04 -1.253395e+01| 0:0:00| chol 1✓
1
2|1.000|1.000|8.0e-06|9.0e-02|1.5e+03| 1.296360e+03 -8.051892e+00| 0:0:00| chol 1✓
1
3|1.000|1.000|1.3e-05|9.0e-03|1.3e+02| 1.219696e+02 -6.878002e+00| 0:0:00| chol 1✓
1
4|0.515|0.590|2.5e-05|4.2e-03|1.1e+02| 1.013716e+02 -3.790327e+00| 0:0:00| chol 1✓
1
5|0.844|1.000|4.0e-06|9.4e-05|7.6e+01| 7.417313e+01 -2.239542e+00| 0:0:00| chol 1✓
1
6|1.000|1.000|2.9e-09|9.8e-06|4.7e+01| 4.545345e+01 -1.557784e+00| 0:0:00| chol 1✓
1
7|1.000|1.000|7.4e-10|9.0e-07|1.9e+01| 1.762382e+01 -9.637337e-01| 0:0:00| chol 1✓
1
8|1.000|1.000|1.6e-10|9.0e-08|8.0e+00| 7.580799e+00 -4.626144e-01| 0:0:00| chol 1✓
1
9|1.000|1.000|3.5e-11|9.0e-09|2.9e+00| 2.636688e+00 -2.937785e-01| 0:0:00| chol 1✓
1
10|1.000|1.000|2.3e-14|9.1e-10|1.2e+00| 9.906338e-01 -1.888923e-01| 0:0:00| chol 1✓
1
11|1.000|1.000|2.3e-14|9.1e-11|3.3e-01| 1.780965e-01 -1.512476e-01| 0:0:00| chol 1✓
1
12|1.000|1.000|2.8e-13|1.0e-11|1.4e-01| 3.114379e-03 -1.386043e-01| 0:0:00| chol 1✓
1
13|1.000|1.000|4.2e-14|1.9e-12|4.2e-02|-9.139355e-02 -1.337581e-01| 0:0:00| chol 1✓
1
14|1.000|1.000|1.1e-13|1.1e-12|1.8e-02|-1.143088e-01 -1.318293e-01| 0:0:00| chol 1✓
1
15|0.973|1.000|1.6e-13|1.0e-12|7.3e-03|-1.239837e-01 -1.312395e-01| 0:0:00| chol 1✓
1
16|1.000|1.000|1.7e-13|1.0e-12|3.8e-03|-1.270958e-01 -1.308993e-01| 0:0:00| chol 1✓
1
17|1.000|1.000|7.1e-12|1.0e-12|1.4e-03|-1.293376e-01 -1.307486e-01| 0:0:00| chol 1✓
1
18|1.000|1.000|5.4e-13|1.4e-12|5.7e-04|-1.300738e-01 -1.306443e-01| 0:0:00| chol 1✓
1
19|1.000|1.000|8.4e-12|1.0e-12|2.4e-04|-1.303723e-01 -1.306114e-01| 0:0:00| chol 1✓
1
20|1.000|1.000|1.6e-12|1.5e-12|1.0e-04|-1.304853e-01 -1.305884e-01| 0:0:00| chol 1✓
1
21|1.000|1.000|6.9e-12|1.0e-12|3.8e-05|-1.305423e-01 -1.305808e-01| 0:0:00| chol 1✓
1
22|1.000|1.000|3.2e-12|1.4e-12|1.5e-05|-1.305608e-01 -1.305761e-01| 0:0:00| chol 1✓
1
23|1.000|1.000|2.6e-12|1.0e-12|5.4e-06|-1.305692e-01 -1.305746e-01| 0:0:00| chol 1✓
1
24|1.000|1.000|2.2e-12|1.0e-12|2.1e-06|-1.305718e-01 -1.305739e-01| 0:0:00| chol 1✓
1
25|1.000|1.000|2.1e-12|1.0e-12|7.2e-07|-1.305729e-01 -1.305737e-01| 0:0:00| chol 1✓
1
26|1.000|1.000|2.5e-12|1.0e-12|2.8e-07|-1.305733e-01 -1.305736e-01| 0:0:00| chol 1✓
1
27|1.000|1.000|1.8e-13|1.0e-12|9.6e-08|-1.305734e-01 -1.305735e-01| 0:0:00|
```



```
stop: max(relative gap, infeasibilities) < 1.00e-07
-----
number of iterations    = 27
primal objective value = -1.30573440e-01
dual   objective value = -1.30573536e-01
gap := trace(XZ)        = 9.62e-08
relative gap           = 7.62e-08
actual relative gap    = 7.62e-08
rel. primal infeas     = 1.78e-13
rel. dual   infeas     = 1.00e-12
norm(X), norm(y), norm(Z) = 1.2e+00, 2.3e+00, 2.0e+01
norm(A), norm(b), norm(C) = 1.6e+02, 3.1e+00, 2.1e+01
Total CPU time (secs)   = 0.21
CPU time per iteration = 0.01
termination code        = 0
DIMACS errors: 1.9e-13  0.0e+00  8.2e-12  0.0e+00  7.6e-08  7.6e-08
-----

ans =

    0.1306

Iteration   10   Total error is: 0.0012149
The total representation error of the testing signals is: 0.15449
>>
```