

---

```

set(0,'DefaultAxesLinewidth',2,'DefaultLineLineWidth',2);
set(0,'defaultAxesFontSize',14);
set(0,'defaultAxesFontName','arial');
set(0,'defaultTextFontName','arial');

close all
clear

A = [0 1 0;0 0 1;2 -1.2 2.3];
B = [0;0;1];
B2 = [5;1;-2]
C = [-1 5 0];

setlmis([])

[gamma,n,sgamma] = lmivar(1,[1 1]);
[P,n,sP] = lmivar(1,[3 1]);
[Z,n,sZ] = lmivar(2,[1 3]);

S1 = newlmi;
lmiterm([S1 1 1 P],1,A,'s')
lmiterm([S1 1 1 Z],-B,1,'s')
lmiterm([S1 1 2 0],B2)
lmiterm([S1 1 3 P],1,C')
lmiterm([S1 2 2 gamma],-1,1)
lmiterm([S1 3 3 gamma],-1,1)
lmiterm([-S1 4 4 P],1,1)
LMIs = getlmis;
c = [1 0 0 0 0 0 0 0 0 0];

%[tmin,xopt] = feasp(LMIs);

[copt,xopt] = mincx(LMIs,c);

P1 = dec2mat(LMIs,xopt,P)
Z1 = dec2mat(LMIs,xopt,Z)
gamma1 = dec2mat(LMIs,xopt,gamma)
K = Z1*inv(P1)

eig(A - B*K)

B2 =

     5
     1
    -2

Solver for linear objective minimization under LMI constraints

Iterations      :      Best objective value so far

```

---

---

```

1
2
3          30.969659
4          29.305001
5          29.305001
6          27.228747
7          27.228747
8          26.216735
9          26.216735
10         26.033974
11         26.033974
12         26.033974
13         25.554888
14         25.554888
15         25.554888
16         25.331743
17         25.331743
18         25.331743
19         25.176988
20         25.176988
21         25.168387
22         25.168387
23         25.168387
24         25.104366
25         25.104366
26         25.104366
27         25.044321
28         25.044321
29         25.038948
***          new lower bound:      24.801078

Result:  feasible solution of required accuracy
         best objective value:      25.038948
         guaranteed relative accuracy:  9.50e-03
         f-radius saturation:  58.199% of R =  1.00e+09

```

P1 =

```

1.0e+08 *
0.0000  -0.0000  -0.0000
-0.0000  0.0000  -0.0002
-0.0000  -0.0002  1.1609

```

Z1 =

```

1.0e+08 *
-0.0000  1.1255  5.5908

```

---

*gamma1* =

25.0389

*K* =

1.0e+08 \*

4.7538    0.0308    0.0000

*ans* =

1.0e+03 \*

-0.1575 + 0.0000i

-0.2019 + 1.7256i

-0.2019 - 1.7256i

*Published with MATLAB® R2020a*