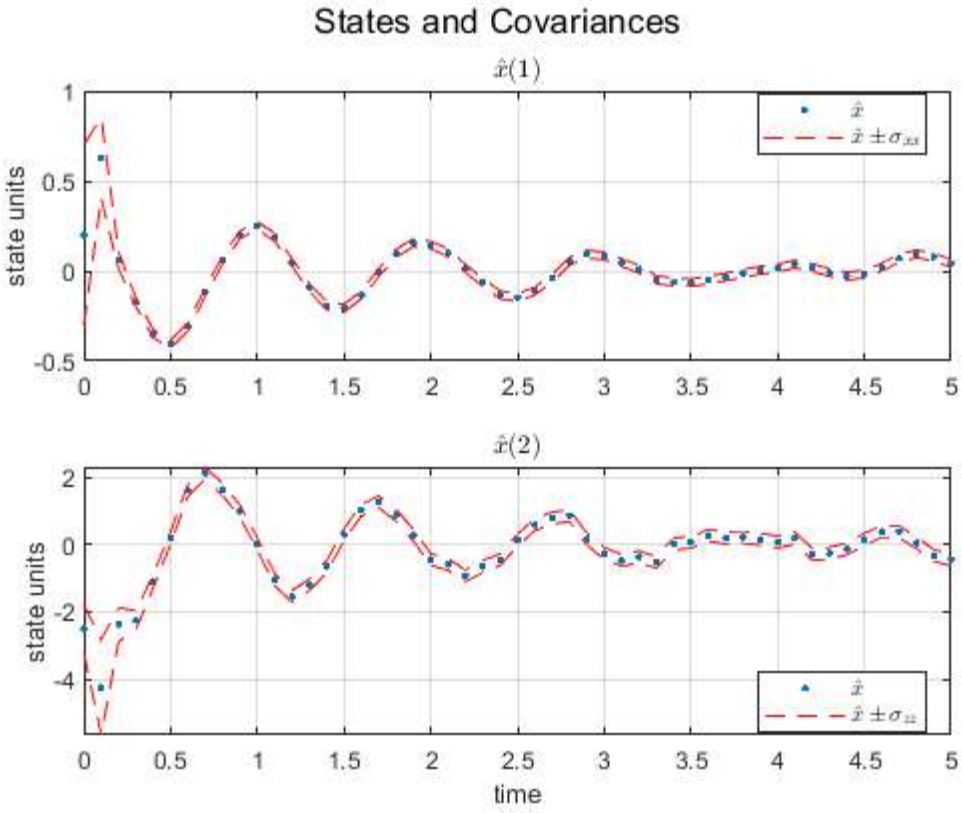
Contents


```
set5_prob3
```

```
ans =

        0.0403586781659245        -0.455082764365291


ans =

      0.000470055449723615       0.000277589725116646
      0.000277589725116646         0.0311173389992622
```



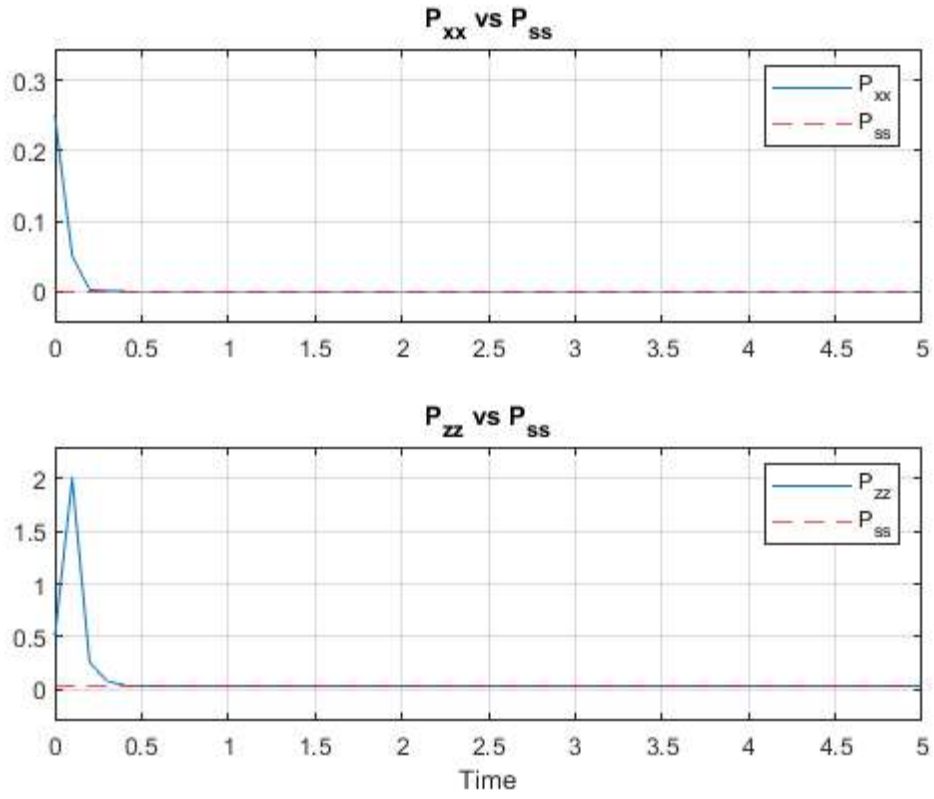
set 5 prob 4

```
sys = ss(Fk, [ Gammak ], Hk, 0, -1);
[km, L, Pbar_ss, W_ss] = kalman(sys, Qk, Rk);

% update
S = Hk * Pbar_ss * Hk' + Rk;               % innovation covariance
W = Pbar_ss * Hk' * inv(S);                % Kalman gain
P_ss = Pbar_ss - W_ss * S * W_ss';         % a posteriori covar est
```

plot

```
ftitle = 'Covariances Comparison';
figure('name', 'ftitle');
    subplot(2,1,1)
        plot( thist0, Pxx_arr); hold on; grid on;
        yline(P_ss(1,1), 'r--');
        legend( 'P_{xx}', 'P_{ss}' );
        title('P_{xx} vs P_{ss}')
        bigger_ylim
    subplot(2,1,2)
        plot( thist0, Pzz_arr); hold on; grid on;
        yline(P_ss(2,2), 'r--');
        legend( 'P_{zz}', 'P_{ss}' );
        title('P_{zz} vs P_{ss}')
        bigger_ylim
    xlabel('Time')

disp('A posteriori covariance converges to steady-state covariance');
```

```
A posteriori covariance converges to steady-state covariance
```



Stability

```
disp('Eigenvalues of [I - W_ss * H] * F ')
eig( (eye(2) - W_ss * Hk) * Fk )

disp('Eigenvalues have complex magnitudes less than 1; error transition matrix is stable');
```

```
Eigenvalues of [I - W_ss * H] * F

ans =

          0.539455278950325 +     0.3856427722909981i
          0.539455278950325 -     0.3856427722909981i

Eigenvalues have complex magnitudes less than 1; error transition matrix is stable
```

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