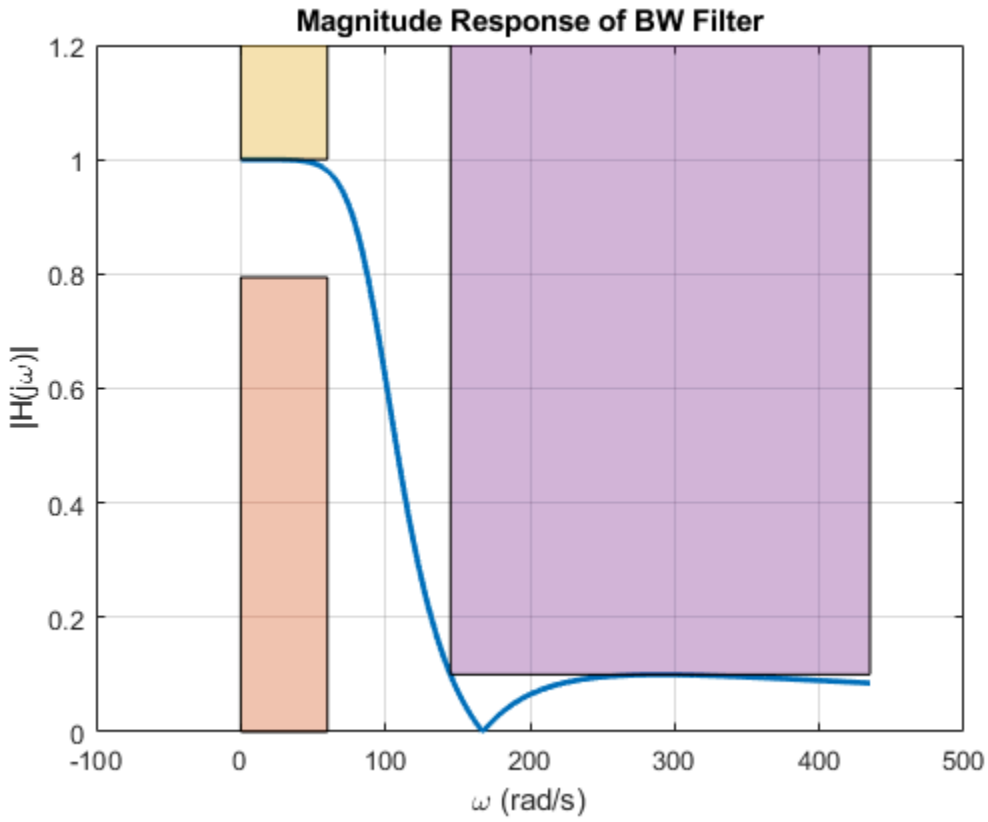
```
K=3; as=20; ws=145; wp=60; ap=2;
epsilon = 1/sqrt(10^(as/10)-1)

% Now obtain polynomials that define the TF of a prototype Chebyshev
 that
% we will later transform to an inverse Chebyshev's
k = 1:K;
H0 = (mod(K,2)==1) + (mod(K,2)==0)*(1/sqrt(1+epsilon^2));   % For even
 order, H0 always is 1; for odd, it's 1/...
pk = -wp*sinh(asinh(1/epsilon)/K)*sin(pi*(2*k-1)/(2*K)) + ...
    1j*wp*cosh(asinh(1/epsilon)/K)*cos(pi*(2*k-1)/(2*K))

% Now the inverse Chebyshev
pk = wp*ws ./ pk
zk = 1j*ws*sec(pi*(2*k-1)/(2*K))

B = prod(pk./zk)*poly(zk), A = poly(pk)

% Now the TF!
w = 0:ws*3;
H = polyval(B,1j*w) ./ (polyval(A,1j*w));
plot(w, abs(H), 'LineWidth', 2);
delta_p = 10^(-ap/20); delta_s = 10^(-as/20);
pgon1 = polyshape([0 wp wp 0], [0 0 delta_p delta_p]);
pgon2 = polyshape([0 wp wp 0], [1 1 2 2]);
pgon3 = polyshape([ws ws 3*ws 3*ws], [delta_s 2 2 delta_s]);
hold on;
plot(pgon1);
plot(pgon2);
plot(pgon3);
hold off;
grid on;
xlabel('\omega (rad/s)'), ylabel('|H(j\omega)|'), title('Magnitude
 Response of BW Filter');
ylim([0 1.2]);


epsilon =

    100.503781525921e-003


pk =

  Column 1

   -35.1515487326770e+000 + 80.0430767456955e+000i

  Column 2

   -70.3030974653540e+000 + 5.65944701518947e-015i
```

```
  Column 3

   -35.1515487326770e+000 - 80.0430767456955e+000i

pk =

  Column 1

   -40.0153684073627e+000 - 91.1184092853451e+000i

  Column 2

   -123.749881778501e+000 - 9.96194939215203e-015i

  Column 3

   -40.0153684073627e+000 + 91.1184092853451e+000i

zk =

  Column 1

    0.00000000000000e+000 + 167.431578064991e+000i

  Column 2

    0.00000000000000e+000 + 2.36802970621333e+018i

  Column 3

    0.00000000000000e+000 - 167.431578064991e+000i

B =

  Column 1

   -770.371977754894e-036 + 18.4622451521886e-018i

  Column 2

    43.7191449637757e+000 + 1.82426372815790e-015i

  Column 3

    0.00000000000000e+000 + 0.00000000000000e+000i

  Column 4

    1.22559336381785e+006 + 51.1401931793599e-012i
```

```
A =

  Column 1

    1.00000000000000e+000 + 0.00000000000000e+000i

  Column 2

    203.780618593227e+000 + 14.2108547152020e-015i

  Column 3

    19.8075884389373e+003 + 1.81898940354586e-012i

  Column 4

    1.22559336381785e+006 + 58.2076609134674e-012i
```



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