

```
disp('Running!')
%graficas mas bonitas...
set(0, 'defaultaxesfontsize', 26)
set(0, 'defaultlinelength', 3)
ssz=get(0, 'screensize');
set (0, 'DefaultFigurePosition', [145 135 ssz(3)*0.6 ssz(4)*.7]);

s=tf('s');
G=2.5/(s^2+0.8*s+1);
Wdelta=0.2*(s/5+1)/(s+1);

ww=0.1473;
%primera prueba
Wperf=33.333/(s/ww+1);

%acción integral, 8 veces menos error a frec muy bajas...
omegaintegral=0.025;
Wintegral=(s+omegaintegral)/(s+omegaintegral/8);
Wperf=Wperf*Wintegral;

figure(1)
bodemag(1/Wperf,logspace(-2,1)), grid on
title('Plantilla filtro: Inversa Peso error')
figure(2)
bodemag(Wdelta), grid on
title('incertidumbre aditiva')

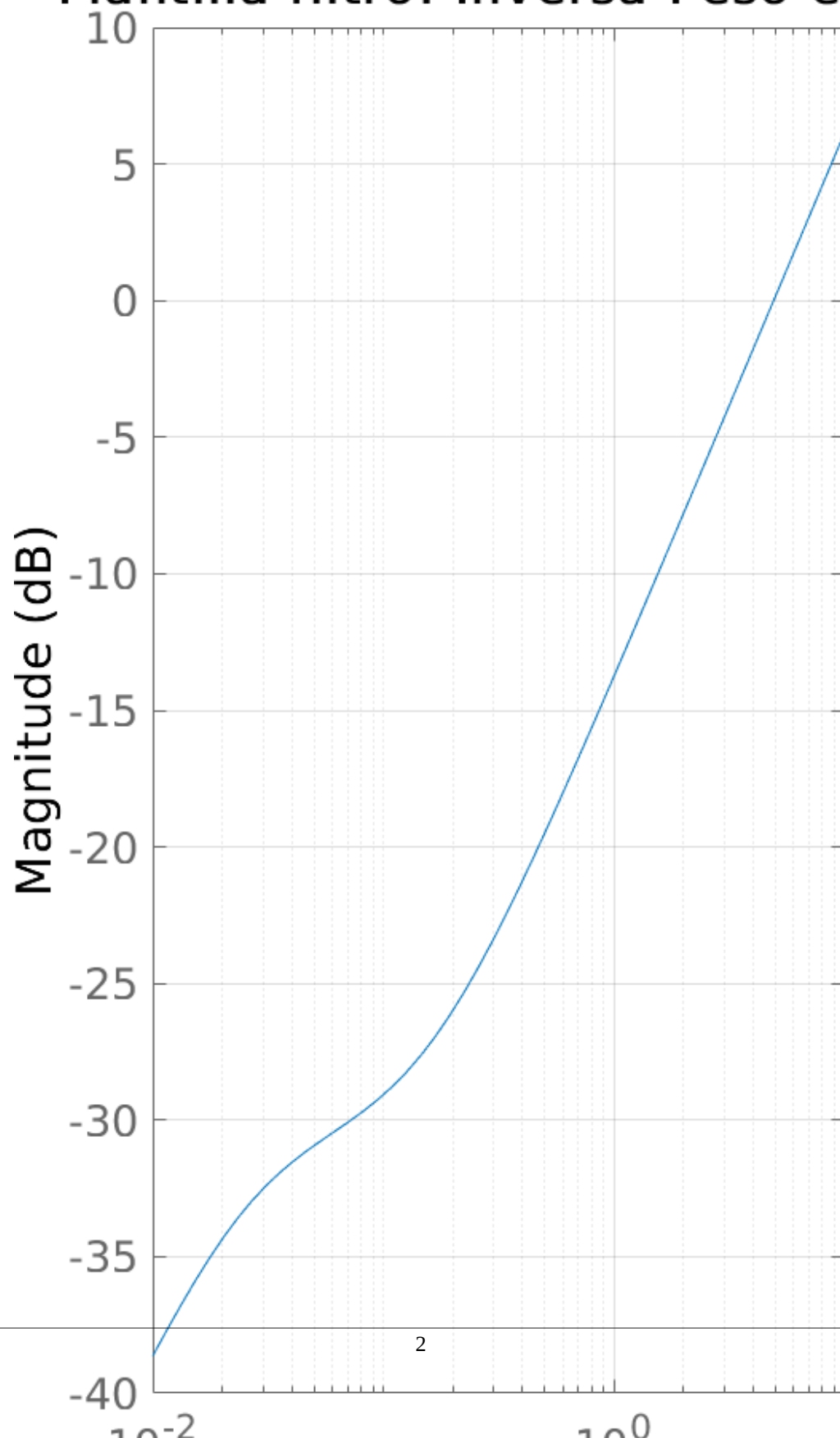
[K,CL,Gam,Info]=mixsyn(G,Wperf,Wdelta,[]);%octave no necesita el
ultimo []
Gam
% si Gam menor que 1, se garantiza error por debajo de inv(Wperf(jw))
para
%caso nominal y estabilidad para cualquier posible valor de delta con
menor que Wdelta.

Running!

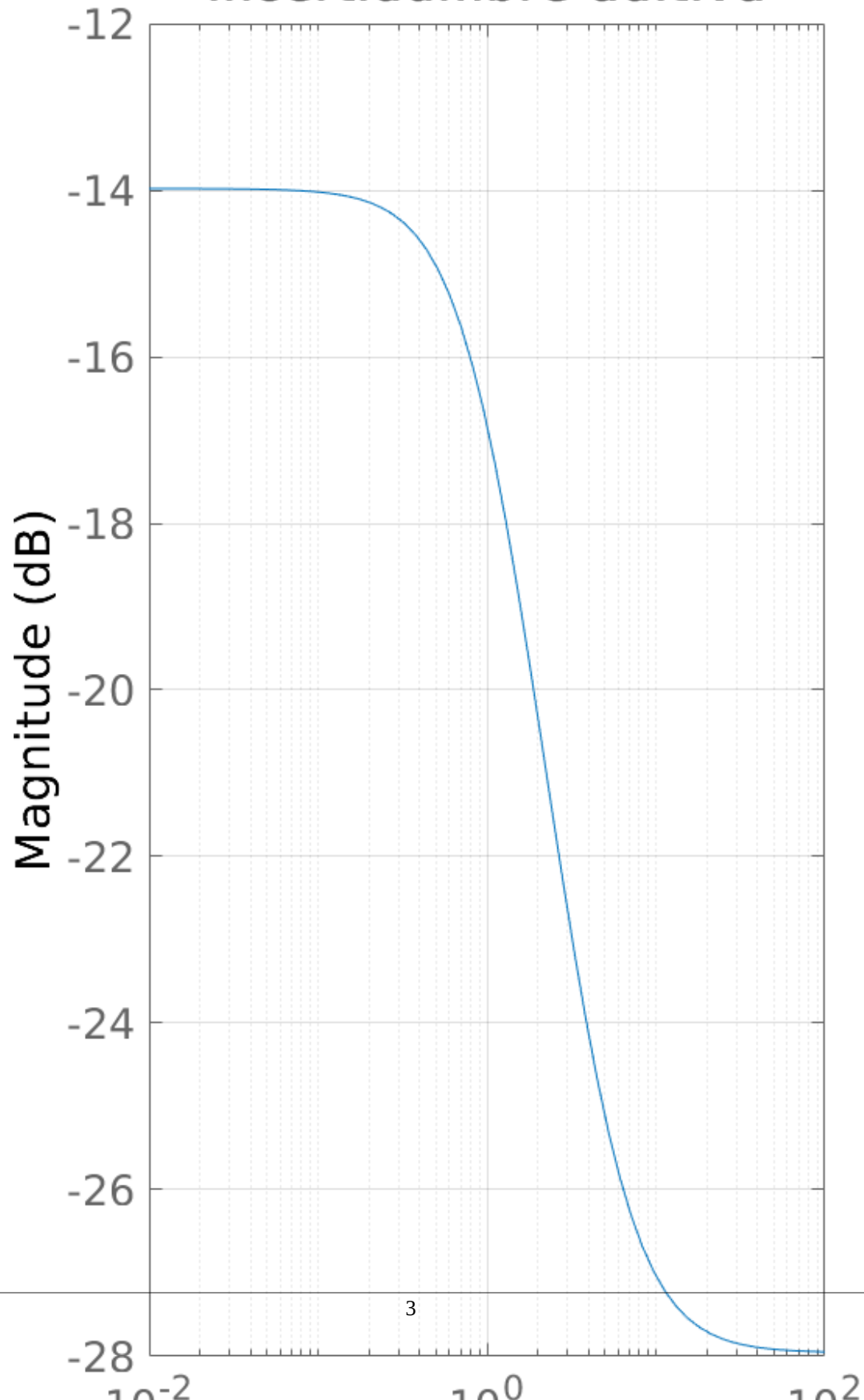
Gam =

1.0039
```

Plantilla filtro: Inversa Peso error



incertidumbre aditiva



dibujemos resultados NOMINALES:

```
tf(K) %controlador
resul=minreal(G*K/(1+G*K)); %salida
resul_u=minreal(K/(1+G*K)); %accion de control
figure(1)
step(resul,4), grid on
figure(2)
sigma(K), grid on
title('ganancia K error a control')
figure(3)
sigma(resul_u), grid on
title('ganancia referencia a control')
%comprobemos que error por debajo de su plantilla
resul_e=1-resul;
figure(4)
bodemag(1/Wperf,resul_e,logspace(-2,2))
legend('plantilla','nominal')
```

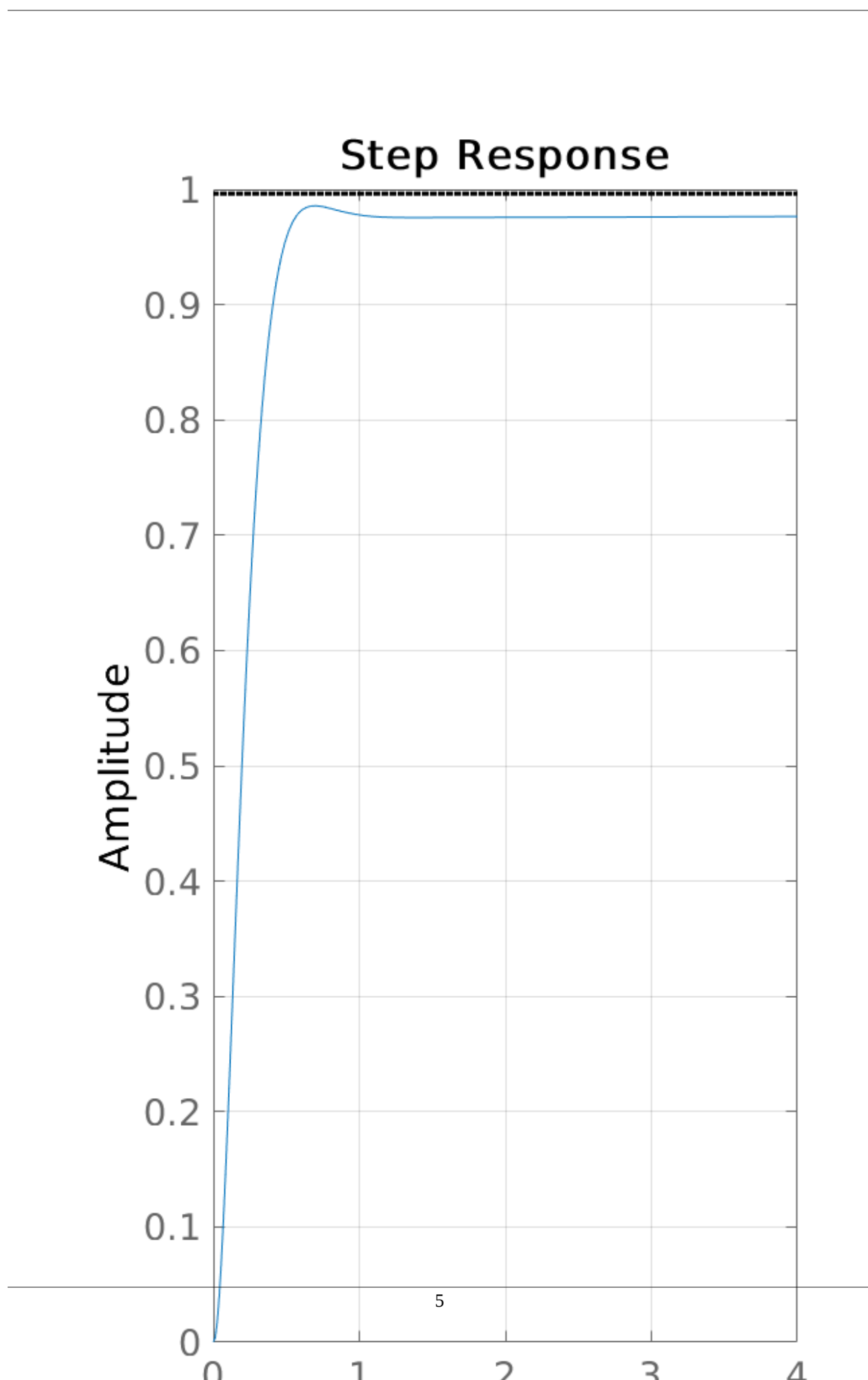
ans =

$$\frac{1.355e04 s^4 + 2.474e04 s^3 + 2.502e04 s^2 + 1.418e04 s + 346.5}{s^5 + 554.2 s^4 + 7778 s^3 + 8246 s^2 + 1070 s + 3.263}$$

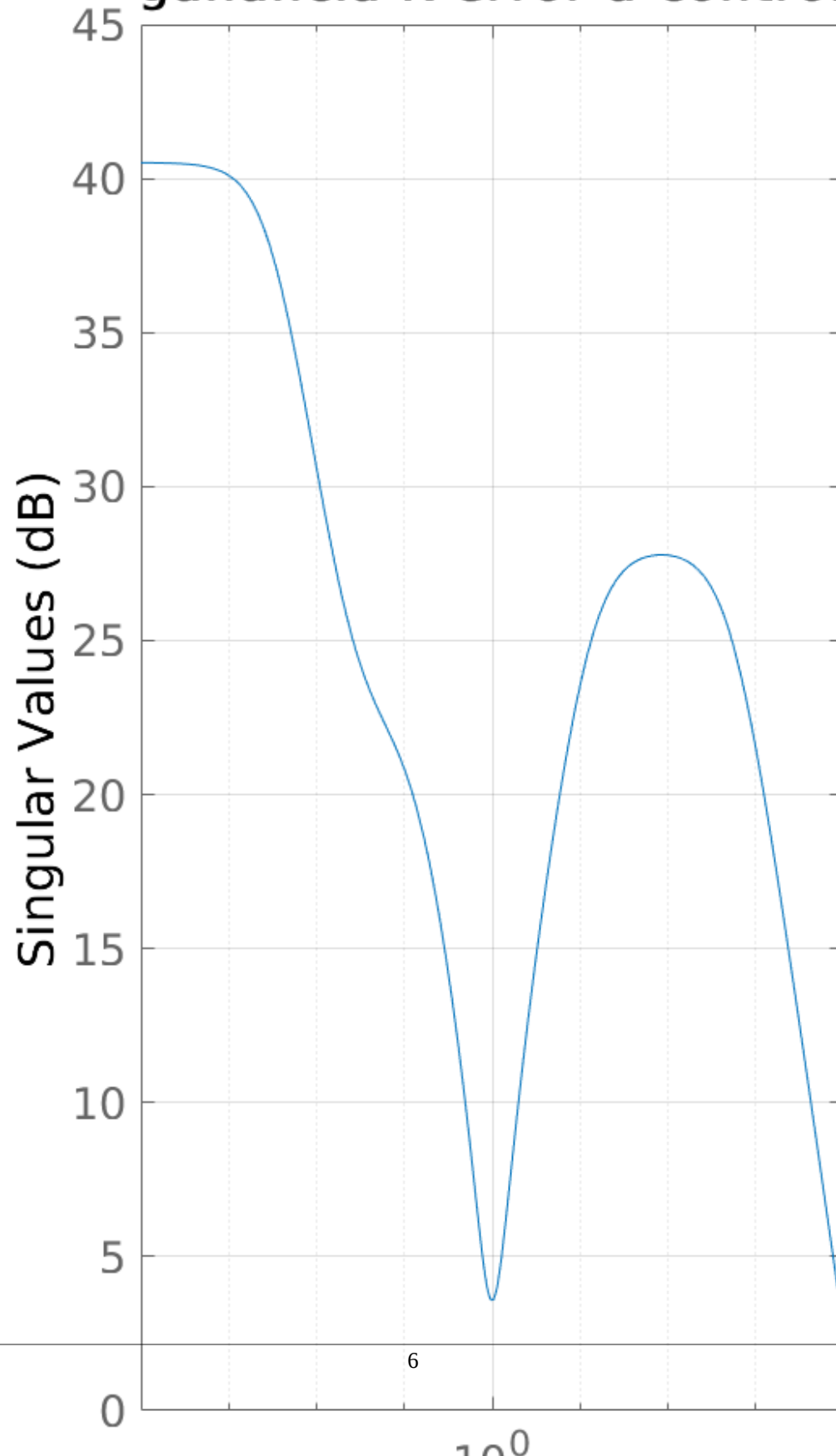
Continuous-time transfer function.

8 states removed.

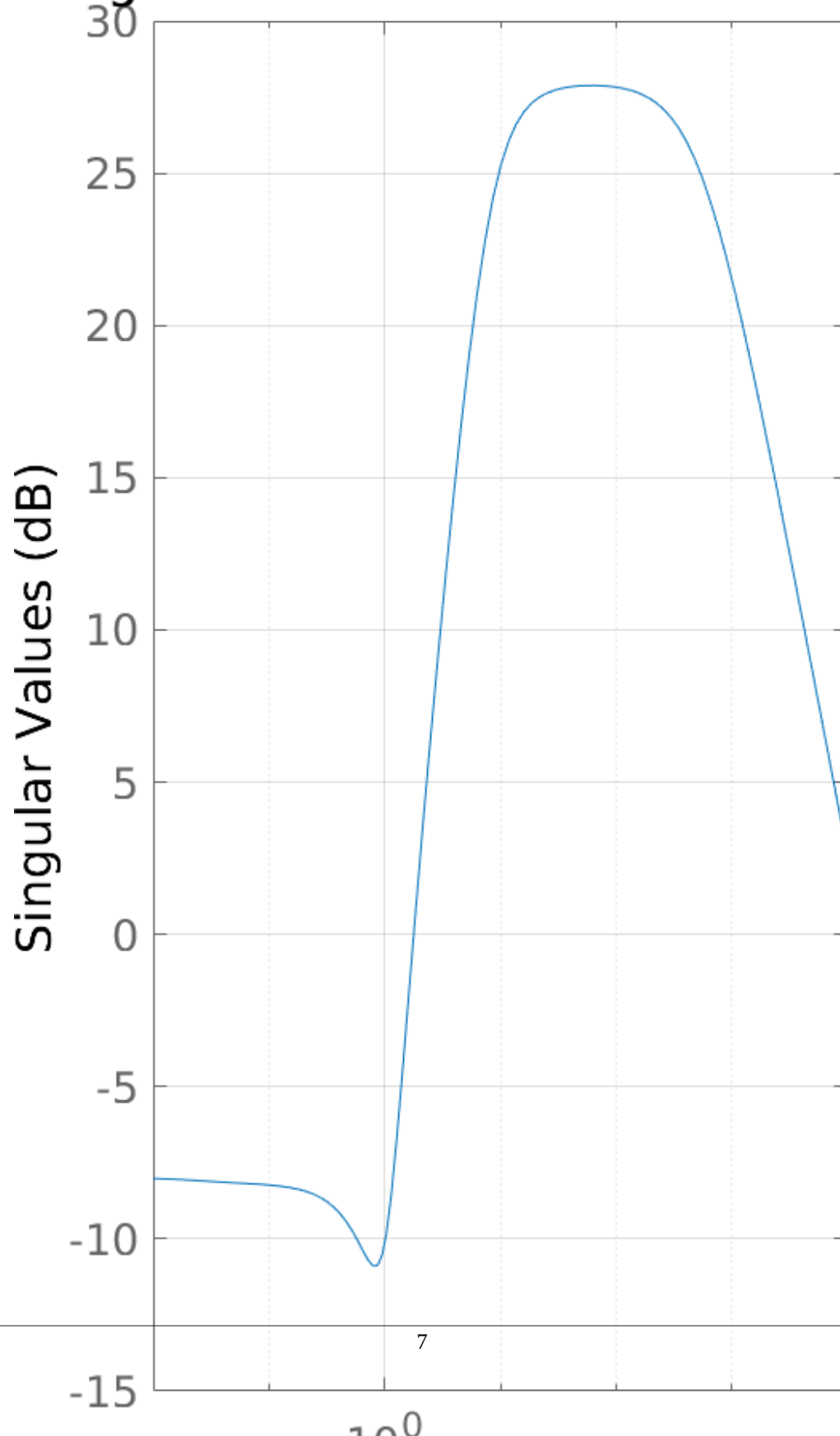
6 states removed.



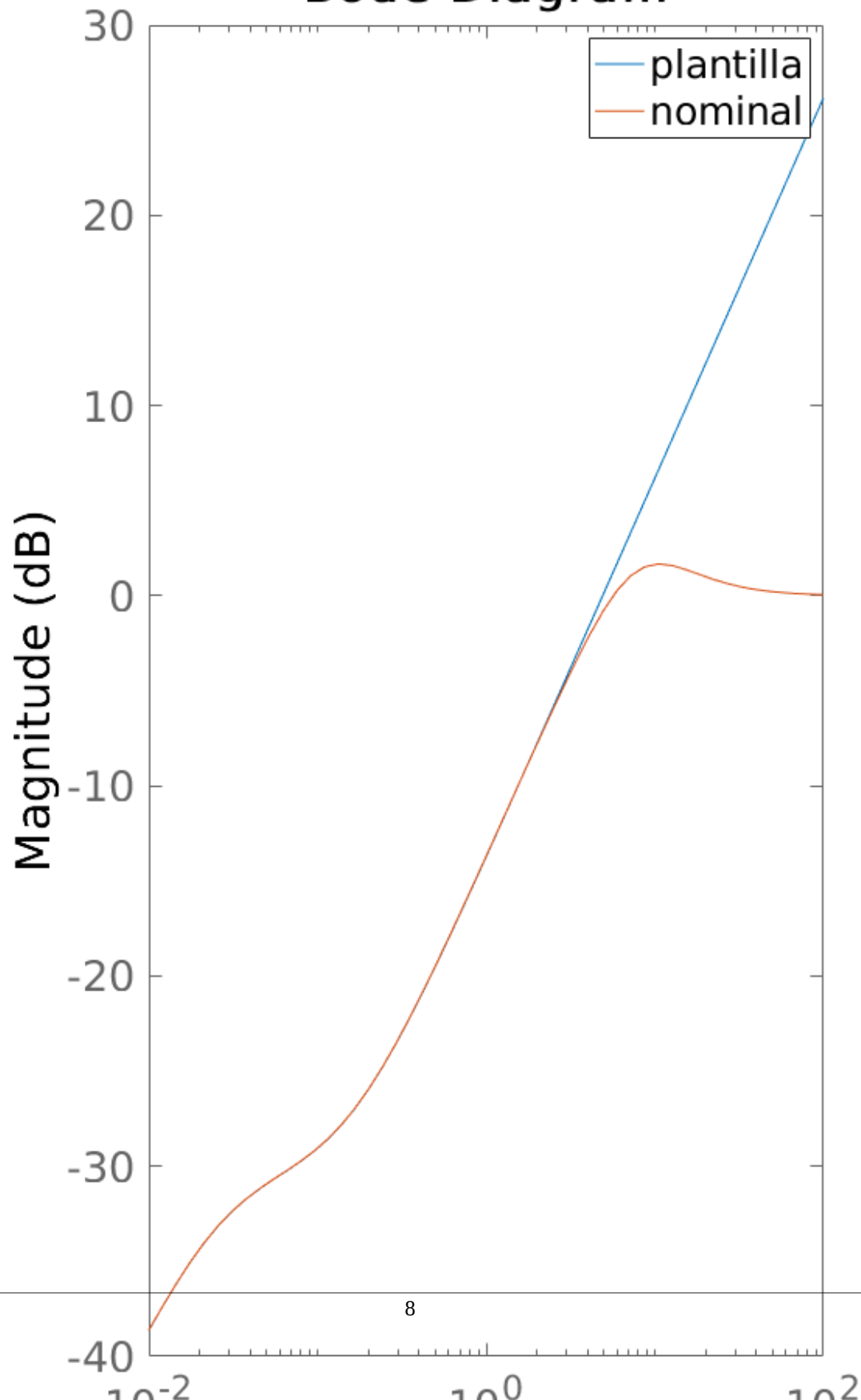
ganancia K error a control



ganancia referencia a control



Bode Diagram

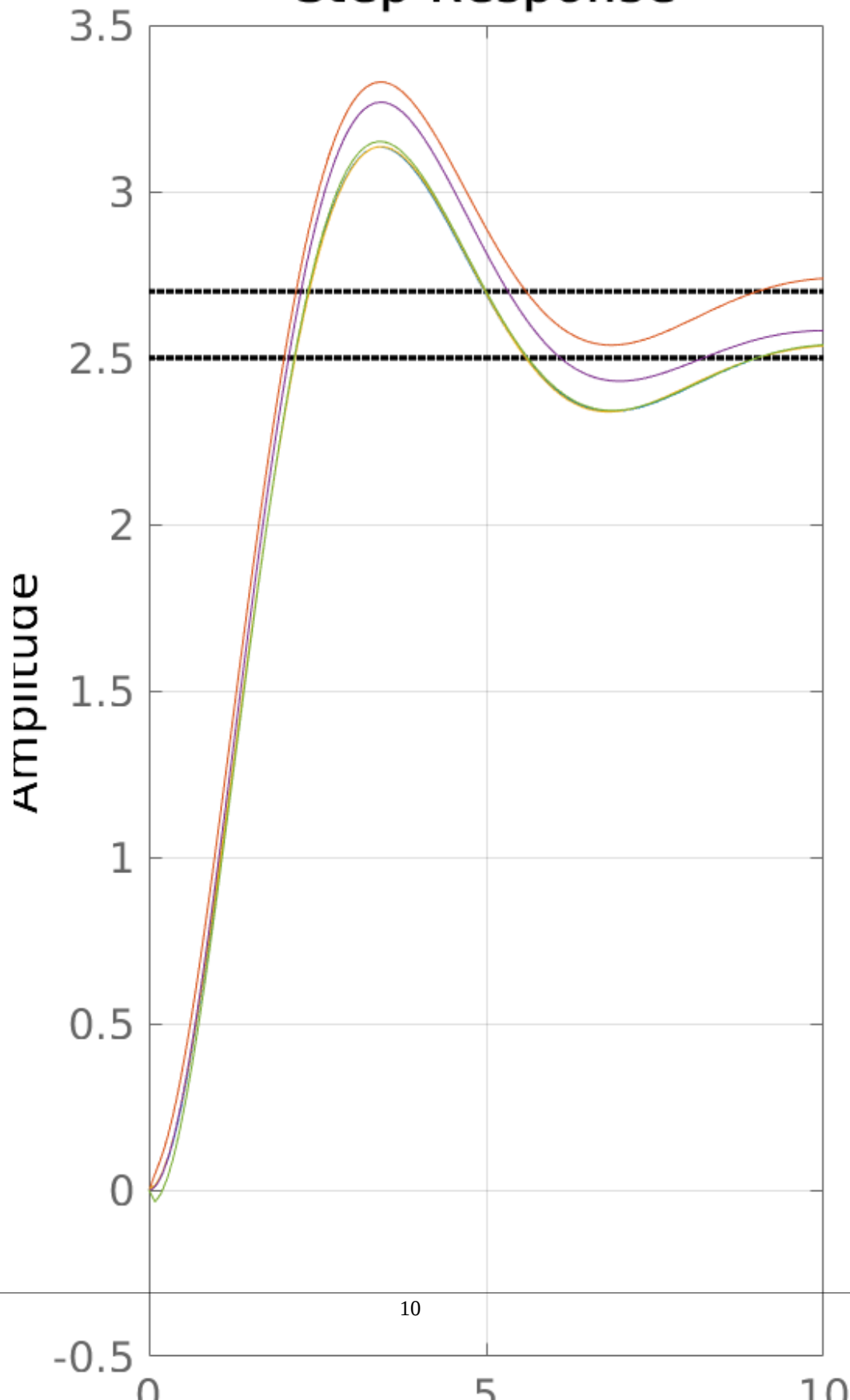


probemos resultados perturbados:

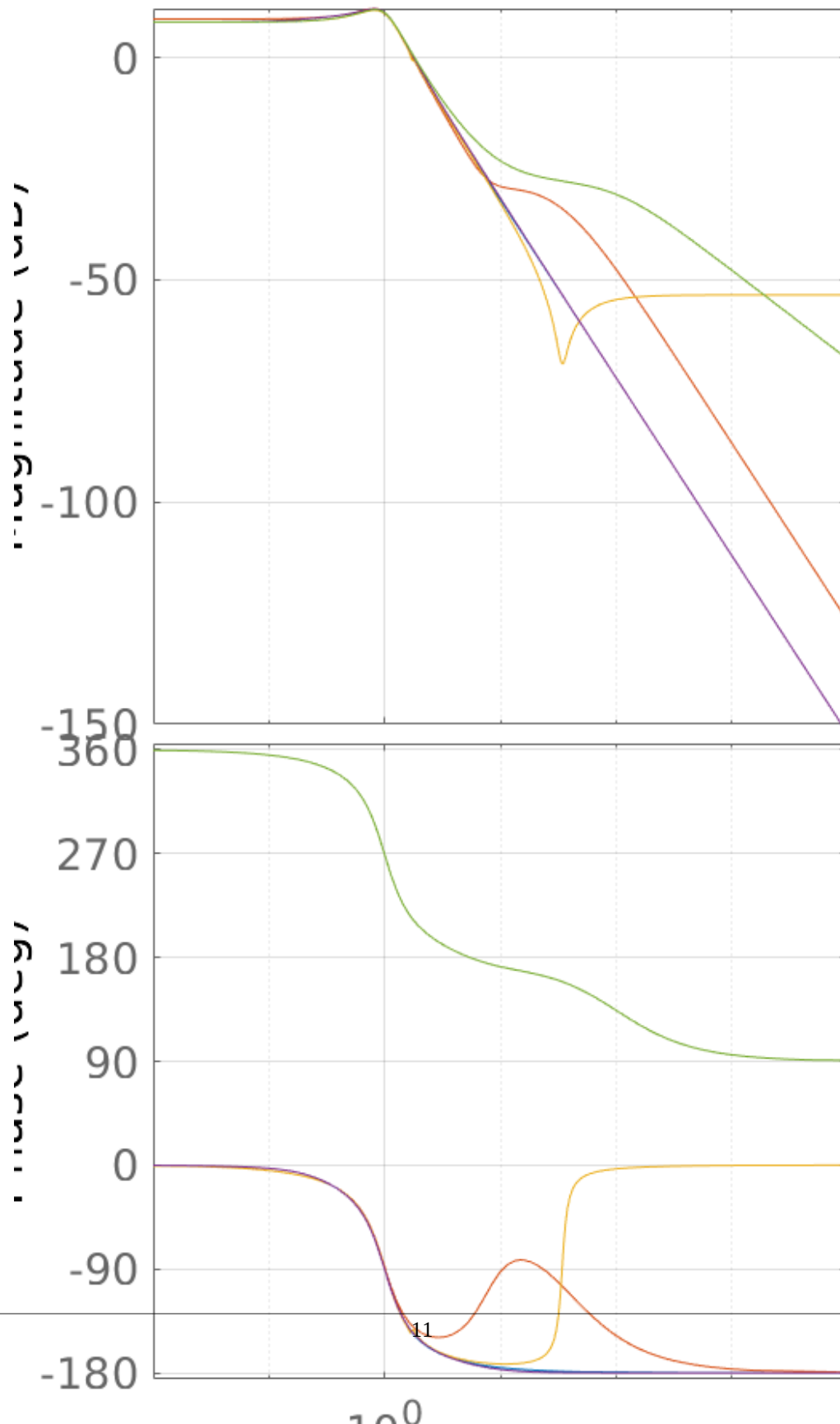
```
delta1_ne=7/(s+33)^2;
delta{1}=delta1_ne/norm(delta1_ne,inf)*Wdelta;
Ge{1}=G+delta{1};
delta1_ne=7*(2*s+1)^2/(s^2+.1*s+3);
delta{2}=delta1_ne/norm(delta1_ne,inf)*Wdelta;
Ge{2}=G+delta{2};
delta1_ne=7*s/(s^2+8*s+3)^2;
delta{3}=delta1_ne/norm(delta1_ne,inf)*Wdelta;
Ge{3}=G+delta{3};
delta1_ne=-s^2/(s+1)^2/(0.01*s+1);
delta{4}=delta1_ne/norm(delta1_ne,inf)*Wdelta;
Ge{4}=G+delta{4};
figure(5)
step(G,Ge{1},Ge{2},Ge{3},Ge{4},10), grid on
figure(6)
bode(G,Ge{1},Ge{2},Ge{3},Ge{4})
grid on
for i=1:4
    stp{i}=minreal(Ge{i}*K/(1+Ge{i}*K));
    rse{i}=1-stp{i};
end
figure(7)
step(resul,stp{1},stp{2},stp{3},stp{4},4)
legend('nom','1','2','3','4')
grid on
figure(8)
bodemag(resul_e,rse{1},rse{2},rse{3},rse{4},1/Wperf,logspace(-2,2))
legend('nom','1','2','3','4','plantilla')
grid on

13 states removed.
13 states removed.
14 states removed.
14 states removed.
```

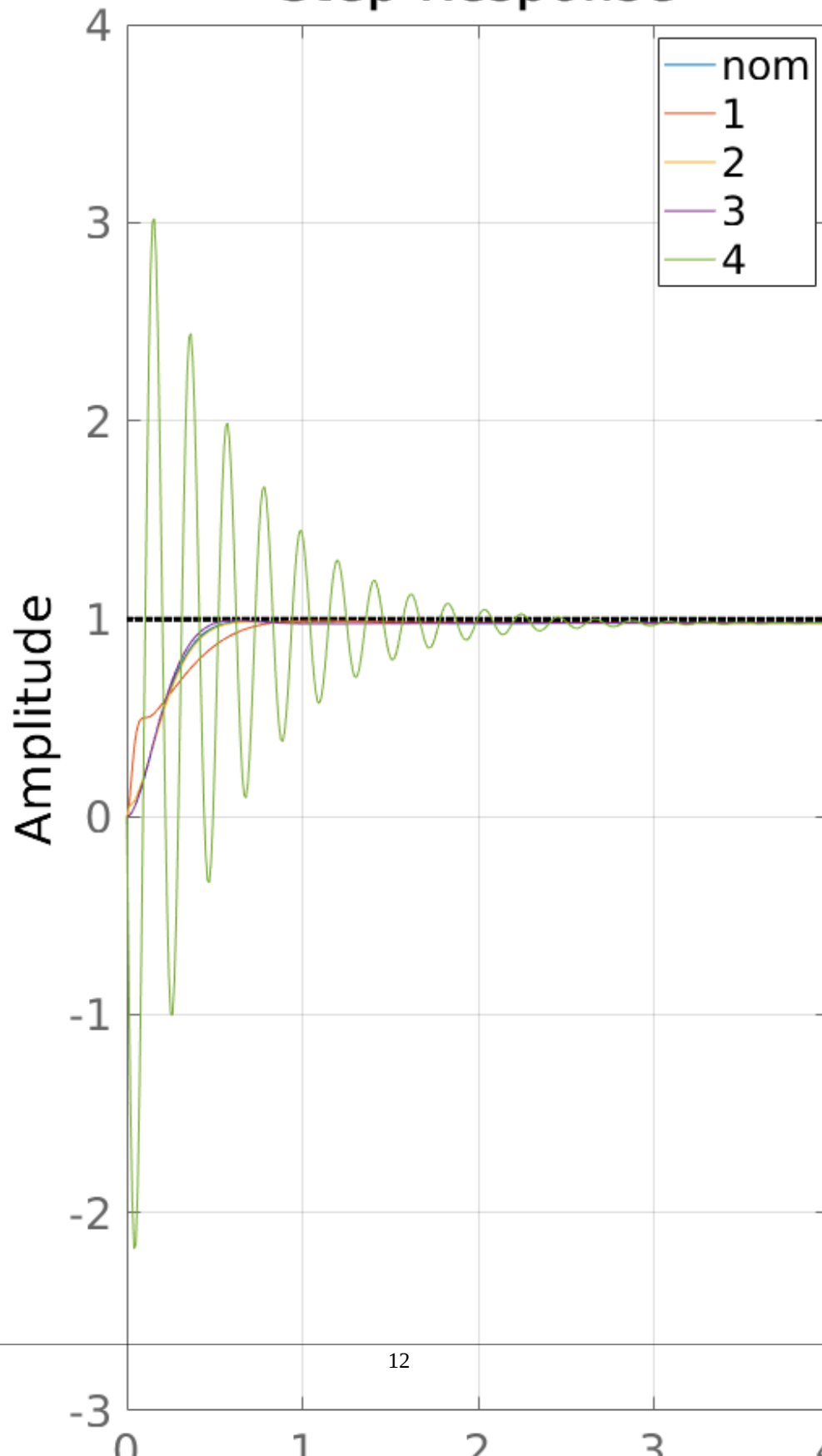
Step Response



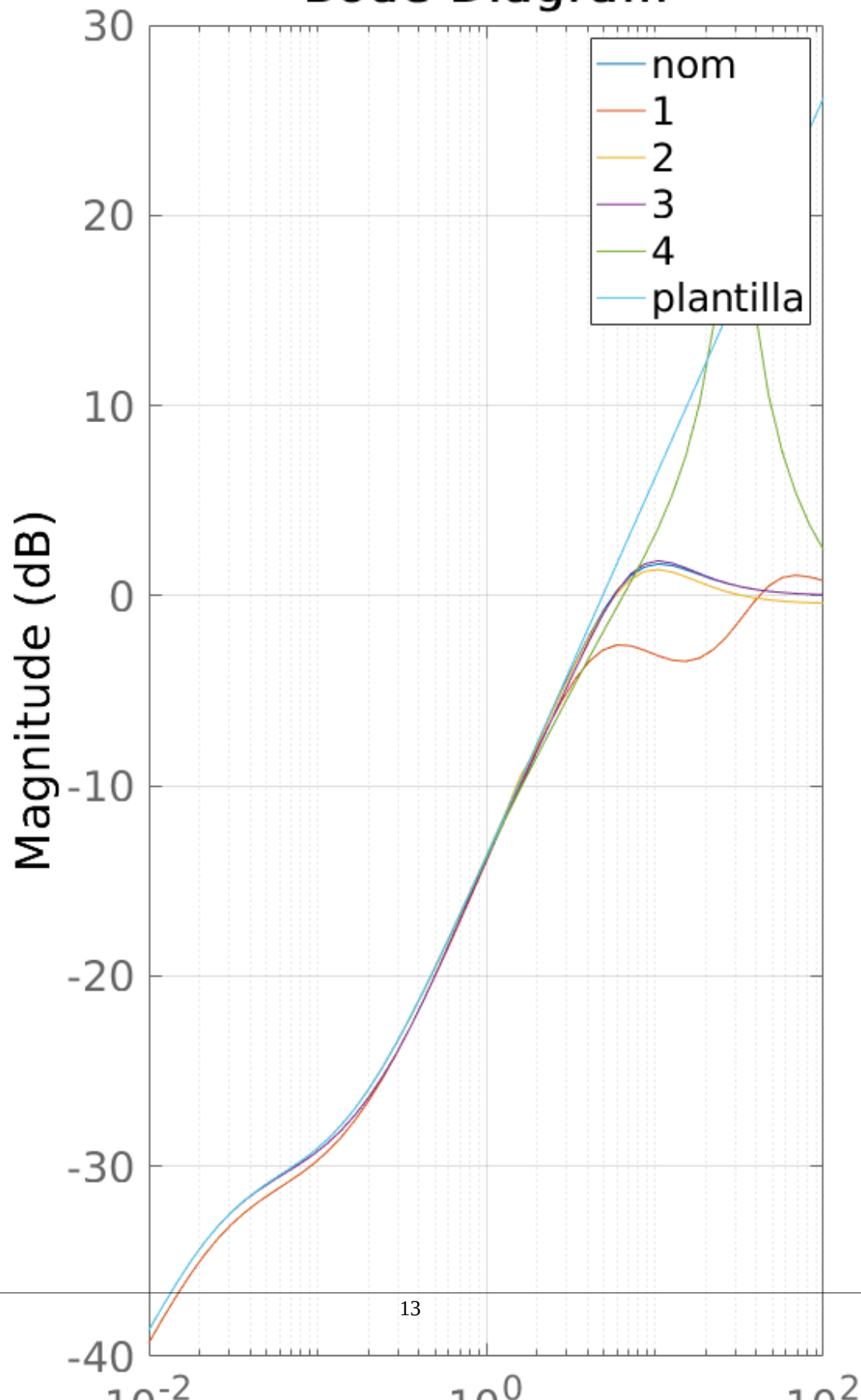
Bode Diagram



Step Response



Bode Diagram



Published with MATLAB® R2019a