自動控制II-HW2

102303022 機械4A 賴言厚

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| 設一個轉移函數G(s)=1/(s^2+0.1S+10),input為impulse,畫出閉迴路頻率響應圖,再加上一個轉移函數修正G(s),避免出現共振區,使響應圖曲線較為平滑穩定。 |

%HW2 - Frequency Response Improve

clc;

clear;

t = (0.01:0.01:1000);

num1 = [1];

den1 = [1 0.1 10];

sys1 = tf (num1,den1);

T = feedback(sys1,1);

y = impulse (T,t);

yf = fft(y);

yfabs = abs(yf)/100;

yh = yfabs(1:50000)

wh = (0.01:0.01:500);

num2 = [1 0.1 10];

den2 = [1 10 10];

sys2 = tf (num2,den2); %新加的轉移矩陣，消除共振區

Tnew = feedback(sys1\*sys2,1);

y = impulse (Tnew,t);

yf = fft(y);

yfabs = abs(yf)/100;

yhnew = yfabs(1:50000);

whnew = (0.01:0.01:500);

loglog(wh,yh,whnew,yhnew)

title('Frequency response');

xlabel('Frequency(rad/s)'); ylabel('Magnitude(dB)');

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| 下圖為頻率響應圖  黑線為共振而產生部分頻率放大的圖  \*字線為改善後的頻率響應圖 |

