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%-----
% Bode
% 1次進み要素(Simulinkで実現できない)
%
%
%          programed by kizawa
%
%          2017, 8, 22
%-----

clc
clear
format long e

% Graphics data %
wb=400;
w=logspace(-2, 2, wb);    %(2, 6, wb);

%---system G0= ( s + 1)    ---
num0=[1  1];
den0=[0  1];
sys0=tf(num0, den0);

[mag0_ , phase0_ ]=bode(sys0, w);
for i=1:wb
    mag0(i, 1)=mag0_(1, 1, i);
    phase0(i, 1)=phase0_(1, 1, i);
end

% Open Loop bode plot%

figure(1)
subplot(2, 1, 1)          %subplot(1, 2, 1), subplot(1, 2, 2)の間隔

semilogx(w, 20*log10(mag0), '-k' );
axis([1.0e-2, 1.0e2 0 60])
%title(' Bode plot', ' fontsize', 10)
%set(gca, 'XTickLabel', [])
ax1 = findobj(gca, 'Type', 'Axes', 'Visible', 'on')
line1=findobj(gca, 'Type', 'Line');
%Lineオブジェクトのライン幅を2に変更
set(line1, 'LineWidth', 2)
set(ax1, 'fontsize', 14, 'xcolor', 'k', 'ycolor', 'k', 'FontWeight', 'bold') % x or y size
xlabel(' Frequency(rad/sec)', ' fontsize', 14, 'FontWeight', 'bold')
ylabel(' Gain(dB)', ' fontsize', 14, 'FontWeight', 'bold')
set(gca, 'YTick', [0 20 40 60])

grid on

figure(1)
subplot(2, 1, 2)
%semilogx(w, [phase0 phase1]);
semilogx(w, phase0, '-k');

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```
axis([1.0e-2 1.0e2 0 90])
ax2 = findobj(gca,'Type','Axes','Visible','on')
line2=findobj(gca,'Type','Line');
set(line2,'LineWidth',2)
set(ax2,'fontsize',14,'xcolor','k','ycolor','k','FontWeight','bold') % x or y size
%set(gca,'YTickLabel',[ ])
set(gca,'YTick',[ 0 45 90 ])

xlabel('Frequency(rad/sec)','fontsize',14,'FontWeight','bold')
ylabel('Phase(deg)','fontsize',14,'FontWeight','bold')
%text(1,-160,'¥downarrow before, after','fontsize',14)
grid on
```