
HW03 - Q03a - System

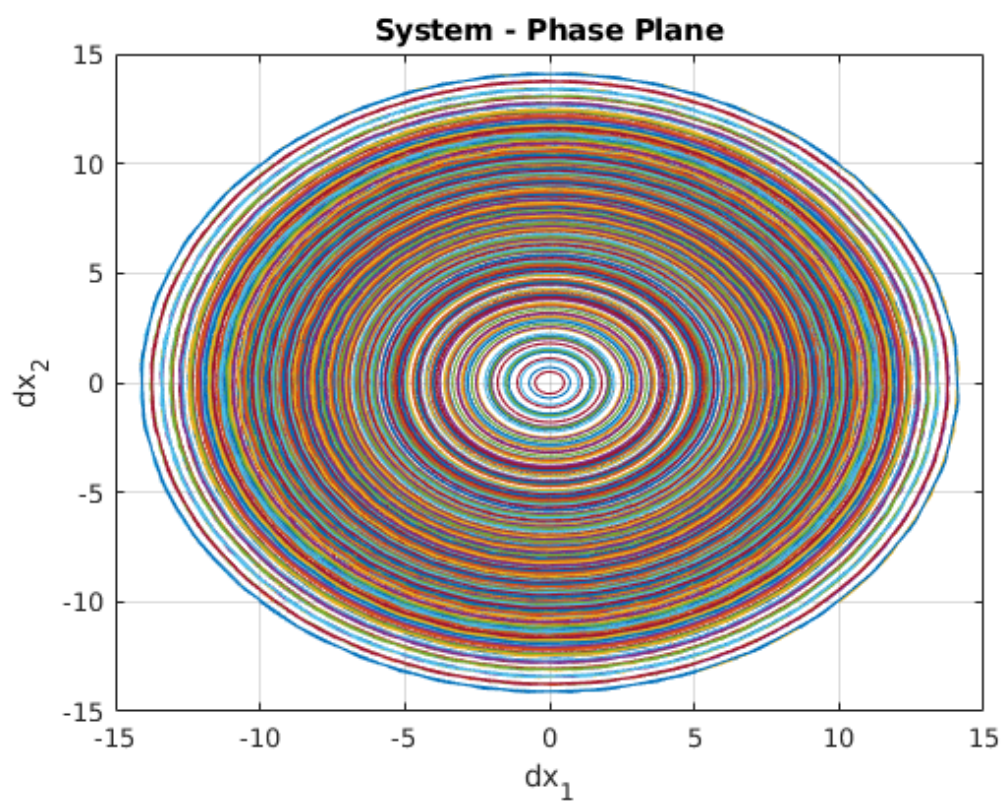
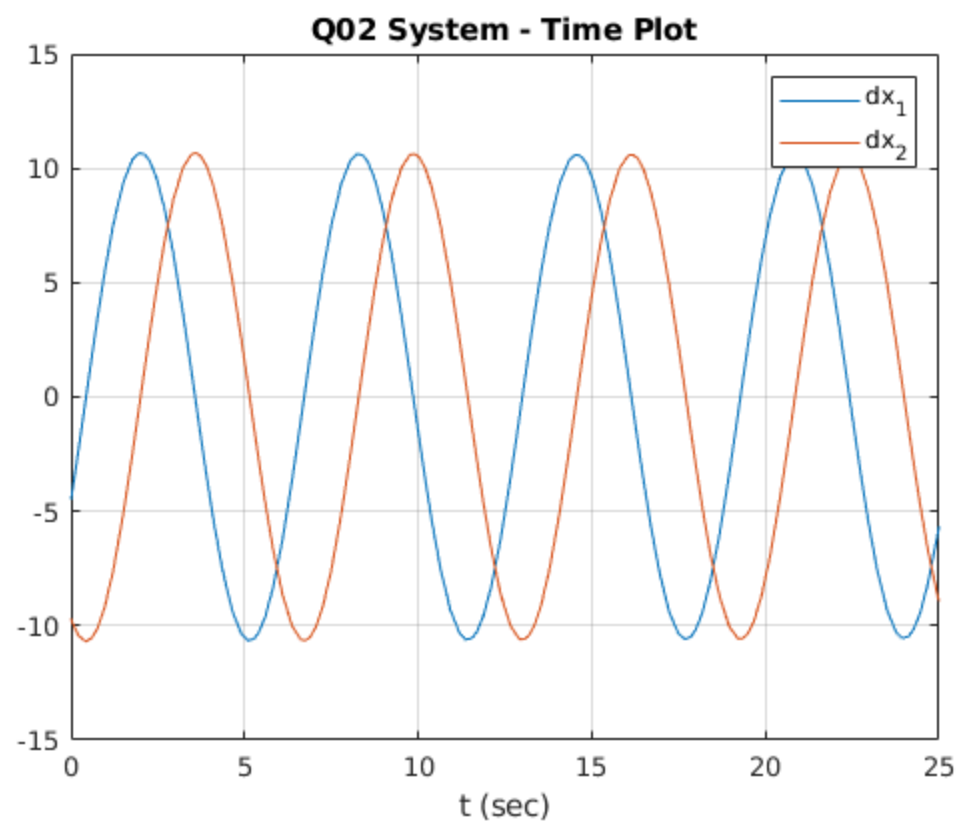
@author: Bardia Mojra @date: 09/28/2021 @title HW03 - Q02 - System @class ee5323 - Nonlinear Systems @professor - Dr. Frank Lewis

```
clc
close all
%warning('off','all')
%warning

x0_set = -10:.5:10;
t_intv= [0 25];
x_0= [-4.5; -9.7]; % initial conditions for x(t)
%t = t_intv;

figure
[t, x] = ode23(@System, t_intv, x_0);
plot(t,x)
hold on;
grid on;
title('Q02 System - Time Plot');
xlabel('t (sec)');
legend('dx_1', 'dx_2');

t_intv= [0 25];
figure
for i=x0_set
    for j=x0_set
        x0 = [i; j];
        [t,x]= ode45(@System, t_intv, x0);
        plot(x(:,1),x(:,2))
        hold on;
    end
end
title('System - Phase Plane');
ylabel('dx_2');
xlabel('dx_1');
axis([-15 15 -15 15]);
grid on;
```



```
function xdot = System(t,x) xdot = [-x(2); x(1)]; end
```

Published with MATLAB® R2021a