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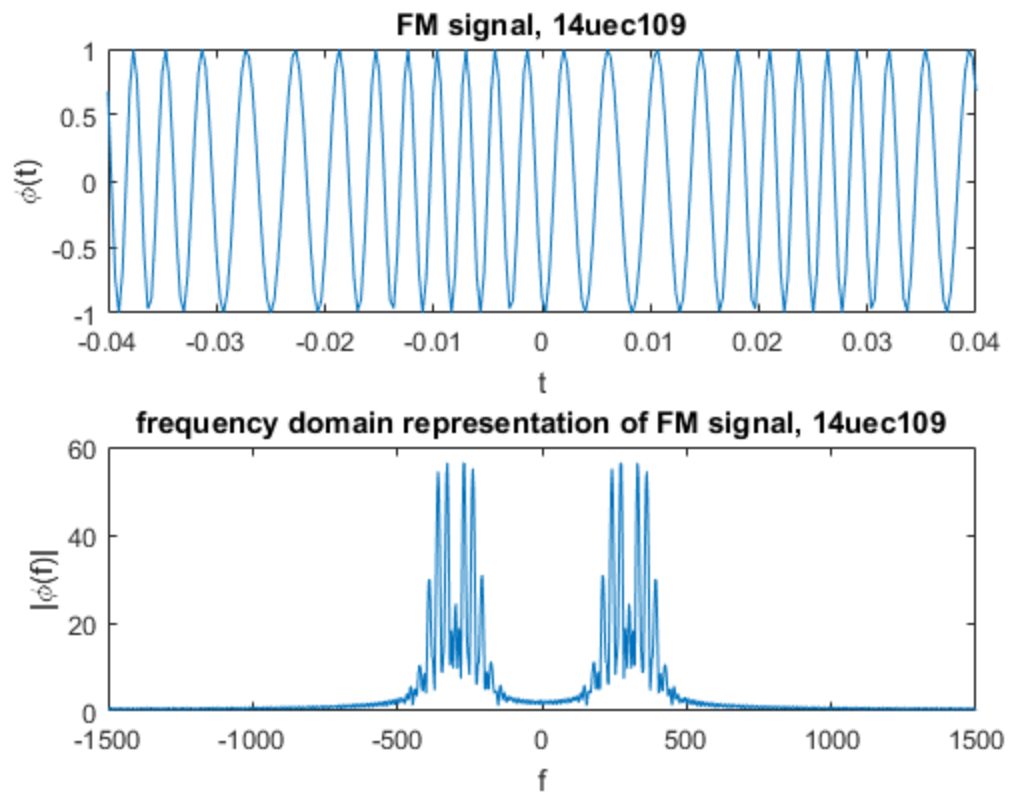
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%Exercise 3, FM Modulation and Demodulation
close all; %close figures
clear all; %clear workspace
clc; %clear command window

fc = 300; %frequency of sinusoid
kf = 80; %FM coefficient
fs=3000; % Sample frequency
t=-0.04:1/fs:0.04; %time vector
Ac=1; %Amplitude of carrier signal
Am=1; %Amplitude of message signal
del_f=kf*Am;
fm=30;

m=Am*cos(2*pi*fm.*t); %message signal
ct=cos(2*pi*fc.*t); %carrier signal
phi=Ac*cos(2*pi*fc.*t+del_f/fm*cos(2*pi*fm.*t)); %FM signal

figure; %plot
subplot(2,1,1);
plot(t,phi); %time domain plot of FM signal
xlabel('t'); %label of x-axis
ylabel('\phi(t)'); %label of y-axis
title('FM signal, 14uec109'); %title of plot
hold on;
subplot(2,1,2);
f=linspace(-fs/2,fs/2,1024);
plot(f,abs(fftshift(fft(phi,1024))));%frequency domain plot of FM
signal
xlabel('f'); %label of x-axis
ylabel('| \phi(f) |'); %label of y-axis
title('frequency domain representation of FM signal, 14uec109');%title
of plot
```

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*Published with MATLAB® R2015b*