

% PSK modulation

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clc;
clear all;
close all;
%GENERATE CARRIER SIGNAL
Tb=1;
t=0:Tb/100:Tb;
fc=2;
c=sqrt(2/Tb)*sin(2*pi*fc*t);
%generate message signal
N=8;
m=rand(1,N);
t1=0;t2=Tb
for i=1:N
t=[t1:.01:t2]
if m(i)>0.5
m(i)=1;
m_s=ones(1,length(t));
else
m(i)=0;
m_s=-1*ones(1,length(t));
end
message(i,:)=m_s;
%product of carrier and message signal
bpsk_sig(i,:)=c.*m_s;
%Plot the message and BPSK modulated signal
subplot(5,1,2);axis([0 N -2 2]);plot(t,message(i,:), 'r');
title('message signal(POLAR form)');xlabel('t--->');ylabel('m(t)');
grid on; hold on;
subplot(5,1,4);plot(t,bpsk_sig(i,:));
title('BPSK signal');xlabel('t--->');ylabel('s(t)');
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grid on; hold on;
t1=t1+1.01; t2=t2+1.01;
end
hold off
%plot the input binary data and carrier signal
subplot(5,1,1);stem(m);
title('binary data bits');xlabel('n-->');ylabel('b(n)');
grid on;
subplot(5,1,3);plot(t,c);
title('carrier signal');xlabel('t-->');ylabel('c(t)');

% PSK Demodulation
t1=0;t2=Tb
for i=1:N
t=[t1:.01:t2]
%correlator
x=sum(c.*bpsk_sig(i,:));
%decision device
if x>0
demod(i)=1;
else
demod(i)=0;
end
t1=t1+1.01;
t2=t2+1.01;
end
%plot the demodulated data bits
subplot(5,1,5);stem(demod);
title('demodulated data');xlabel('n-->');ylabel('b(n)');
grid on

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