

```

clear

N = 10^6

rand('state',100);
randn('state',200);

ip = rand(1,N)>0.5;
s = 2*ip-1;
n = 1/sqrt(2)*[randn(1,N) + j*randn(1,N)];
Eb_NO_dB = [-3:10];
for ii = 1:length(Eb_NO_dB)

y = s + 10^(-Eb_NO_dB(ii)/40)*n;

ipHat = real(y)>0;

nErr(ii) = size(find([ip- ipHat]),2);
end
simBer = nErr/N;
theoryBer = 0.5*erfc(sqrt(10.^(Eb_NO_dB/10)));

close all

figure
semilogy(Eb_NO_dB,theoryBer,'b');
hold on
semilogy(Eb_NO_dB,simBer,'mx');
axis([-3 10 10^-5 0.5])
grid on
legend('theory','simulation');
xlabel('Eb/No, dB');
ylabel('Bit Error Rate');
title('Bit error probability curve for BPSK modulation');

```