clear

N = 10^6

ip = rand(1,N)>0.5;

s = 2\*ip-1;

n = 1/sqrt(2)\*[randn(1,N) + j\*randn(1,N)];

Eb\_N0\_dB = [-3:10];

for ii = 1:length(Eb\_N0\_dB)

y = s + 10^(-Eb\_N0\_dB(ii)/20)\*n;

ipHat = real(y)>0;

nErr(ii) = size(find([ip- ipHat]),2);

end

simBer = nErr/N;

theoryBer = 0.5\*erfc(sqrt(10.^(Eb\_N0\_dB/10)));

close all

figure

semilogy(Eb\_N0\_dB,theoryBer,'b.-');

hold on

semilogy(Eb\_N0\_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');

N = 1000000