

DC Lab Project 2 Submission

Code:

```
% Program for generation and detection of BPSK
signal

    clc;
    close all;
    clear all;
    % Number of bits or symbols

%   Initializing the rand
    function rand('state',100);

%   Initializing the rand
    function randn('state',200);

% transmitter

%   Generating 0, 1 with equal
    probability ip = rand(1,N)>0.5;

%   BPSK modulation 0 to 1, 1 to
    +1 s=2*ip-1;

%   White gaussian noise 0dB variance
    n=1/sqrt(2)*[randn(1,N)+j*randn(1,N)];

% Multiple Eb/No values

Eb_No_dB=[-4:2:10];

for ii=1:length(Eb_No_dB)

    %   Noise addition(additive white
    noise) y=s+10^( -Eb_No_dB(ii)/20)*n;

    %   receiver hard decision
    recording. ipHat=real(y)>0;

    %   counting the errors
    nErr(ii)=size(find ([ip-ipHat]),2);

end

% Simulated BER
simBER=nErr/N;
```

```
%    Theoretical BER
theoryBER=0.5*erfc(sqrt(10.^( Eb_No_dB/10)));

% plot
figure

semilogy(Eb_No_dB,theoryBER, 'b.-');

hold on

semilogy(Eb_No_dB,simBER, 'mx-');
axis([-3 10 10^-5 0.5]);

grid on
```

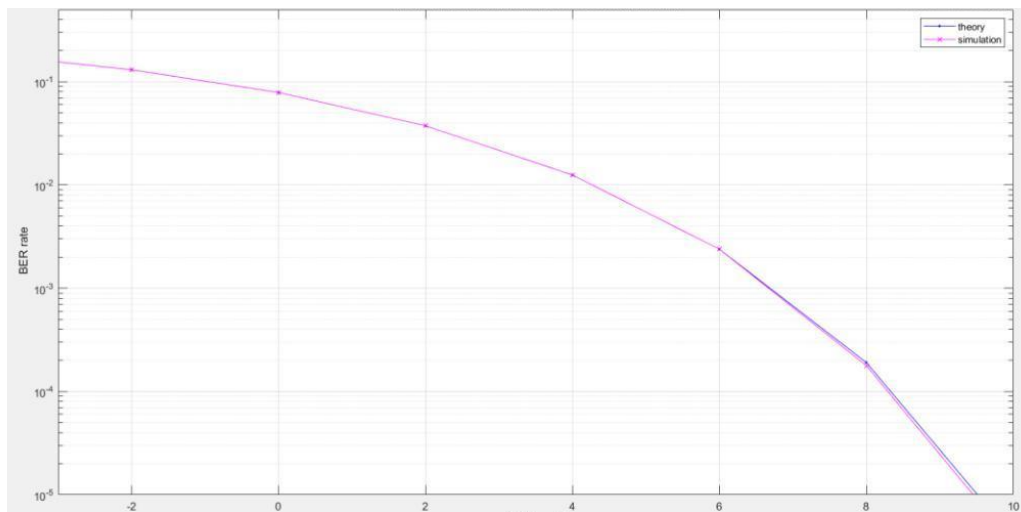
```

legend('theory','simulation');
xlabel('Eb/ No , dB');
ylabel(' BER rate');

title('Bit error rate probability curve for BPSK
modulation');
sgtitle('Jacob V Sanoj (PES1UG20EC083)');

```

Graph:



Code:

```

% Program for generation and detection of BFSK
signal

clc;
close all;

clear all;
% Number of bits or symbols

```

```
%    Initializing the rand
function rand('state',100);

%    Initializing the rand
function randn('state',200);

% transmitter
```

```

%    Generating 0, 1 with equal
probability ip = rand(1,N)>0.5;

%    BPSK modulation 0 to 1, 1 to
+1 s=2*ip-1;

%    White gaussian noise 0dB variance
n=1/sqrt(2)*[randn(1,N)+j*randn(1,N)];

% Multiple Eb/No values

Eb_No_dB=[-4:2:10];
for ii=1:length(Eb_No_dB)

    %    Noise addition(additive white
    noise) y=s+10^( -Eb_No_dB(ii)/20)*n;

    %    receiver hard decision
    recording. ipHat=real(y)>0;

    %    counting the errors
    nErr(ii)=size(find ([ip-ipHat]),2);

end

% Simulated BER
simBER=nErr/N;

% Theoretical BER

theoryBER=0.5*erfc(sqrt(10.^( Eb_No_dB/10))/2);

%    p
lot
figure

semilogy(Eb_No_dB,theoryBER, 'b.-');
hold on semilogy(Eb_No_dB,simBER,
'mx-'); axis([-3 10 10^-5 0.5]);
grid on

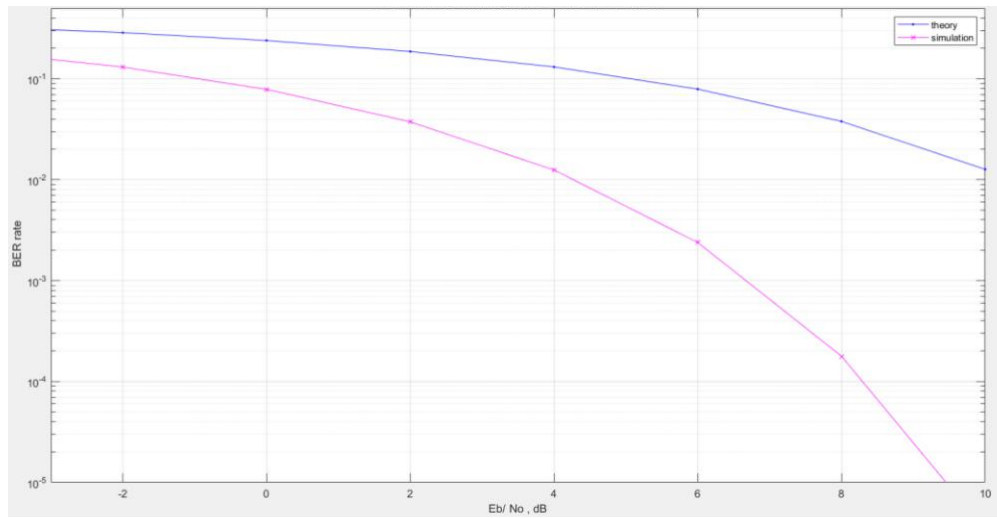
legend('theory','simulation');
xlabel('Eb/ No , dB');
ylabel(' BER rate');

title('Bit error rate probability curve for BFSK
modulation');

sgtitle('Jacob V Sanoj (PES1UG20EC083)');

```

Graph:



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SECTION: B