samplesPerSymbol = 128;

numSymbols = 8;

periodInput = linspace(0,2\*pi,samplesPerSymbol);

randArray = [];

for i = 1:numSymbols

if (rand()>.5)

temp = 1;

else

temp = -1;

end

randArray = [randArray temp];

end

array = [];

for i = 1:numSymbols

for j = periodInput

array = [array cos(j)\*randArray(i)];

end

end

%

% figure;

% plot(array,'o');

% title('BPSK symbols');

local\_oscillator = [];

for i = periodInput

local\_oscillator = [local\_oscillator cos(i)];

end

%

% figure;

% plot(local\_oscillator,'o');

% title('local\_oscillator ');

array = [[0 0 0 0] array(1:end-4)];

shift\_array = [];

shift = 0;

for i = 1:numSymbols-1

if (i > 1)

energy = [];

temp\_e = 0;

for j = samplesPerSymbol\*(i-1)+1:1:samplesPerSymbol\*(i+1)

for k = 1:samplesPerSymbol

temp\_e = (temp\_e + local\_oscillator(k)\*array(j+k+floor(shift)));

end

energy = [energy temp\_e];

temp\_e = 0;

end

energy = energy.^2;

error = shift - (find(energy == max(energy(:)),1) - 1);

if (abs(error) > floor(samplesPerSymbol/2))

error = mod(samplesPerSymbol, abs(error));

end

shift = ((shift + error) + shift)/2;

shift\_array = [shift\_array shift];

else

shift = 0;

error = shift;

shift = ((shift + error) + shift)/2;

shift\_array = [shift\_array shift];

end

end

% energy = [];

% temp\_e = 0;

% for i = 0:1:(size(array,2) - size(periodInput,2))

% for j = 1:size(periodInput,2)

% temp\_e = (temp\_e + local\_oscillator(j)\*array(i+j));

% end

% energy = [energy temp\_e];

% temp\_e = 0;

% end

%energy = energy.^2;

% figure;

% plot(energy,'o');

% title('Energy');

pause;

close all;