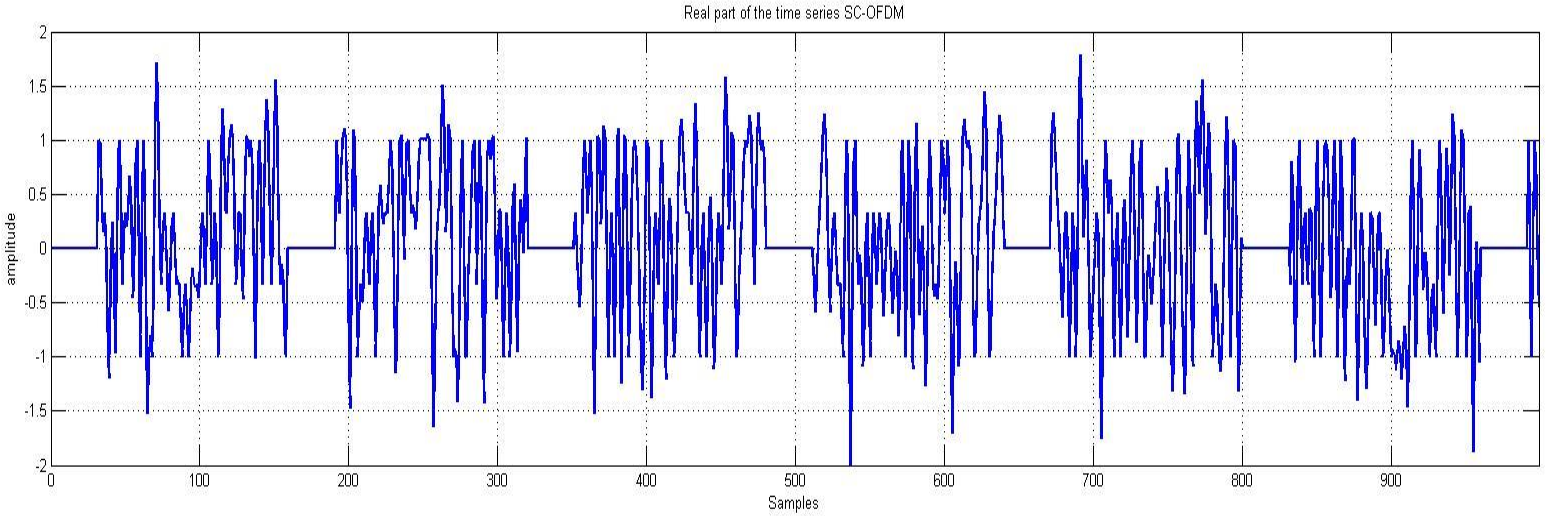
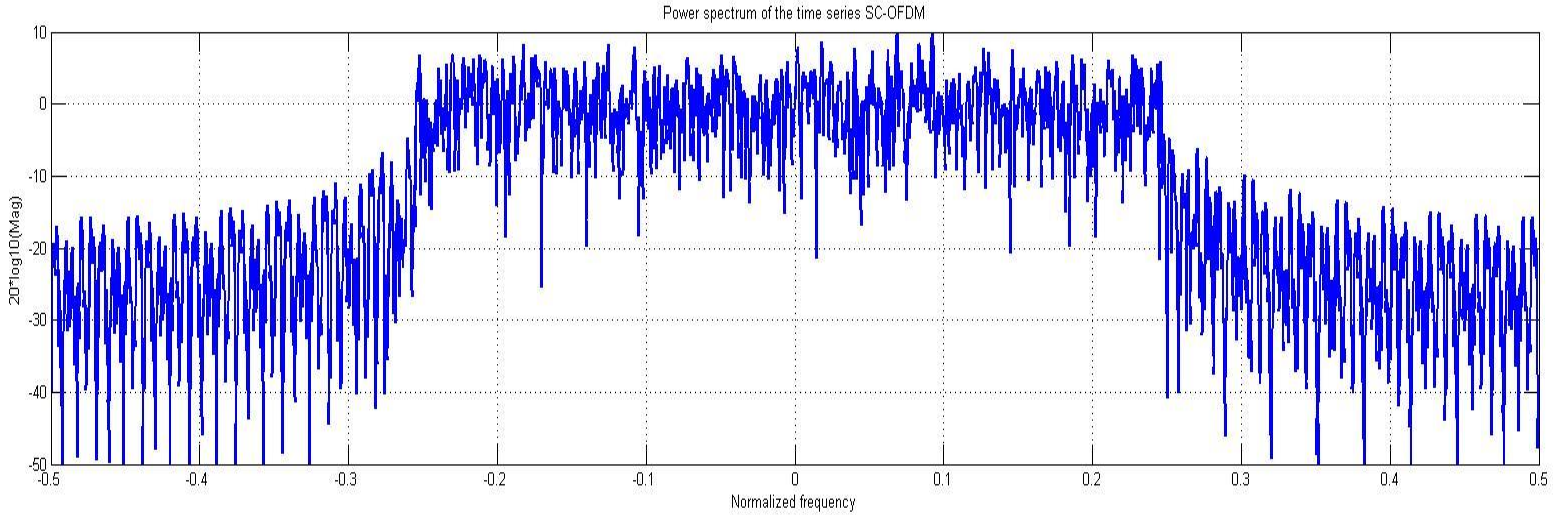
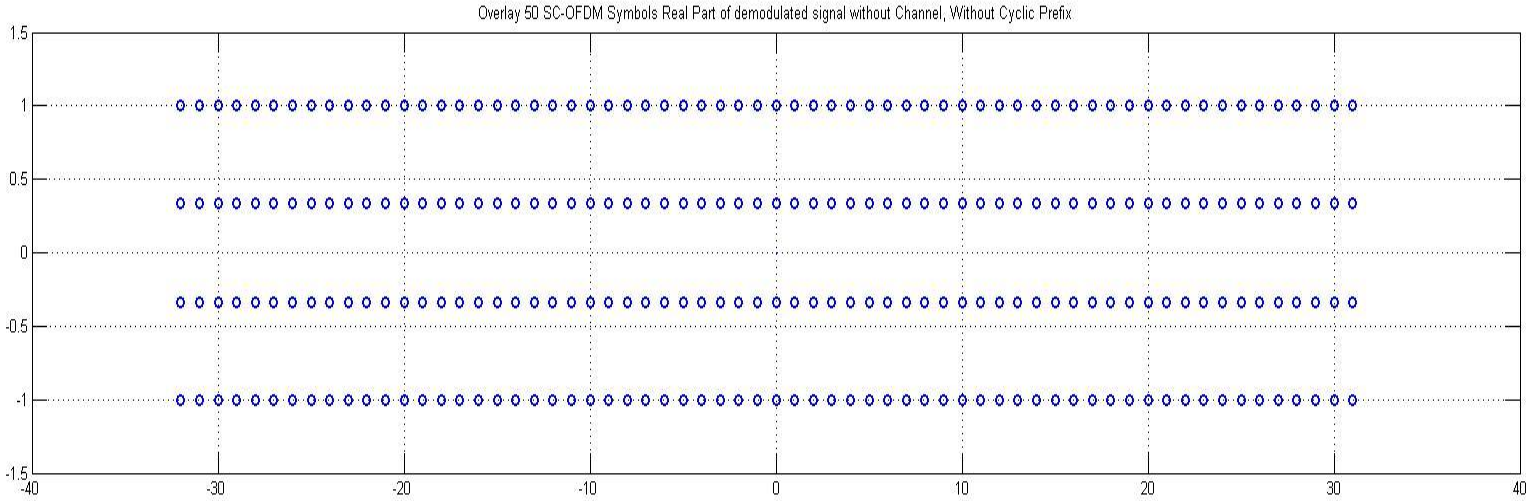
QUESTION 2

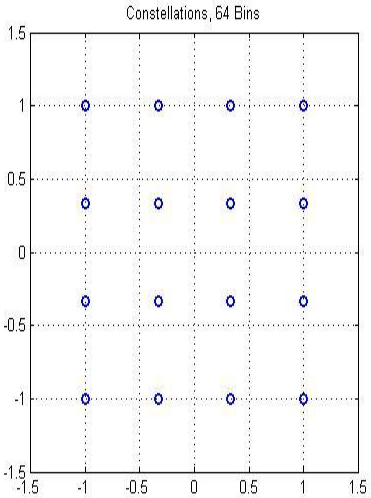
PART A and PART B

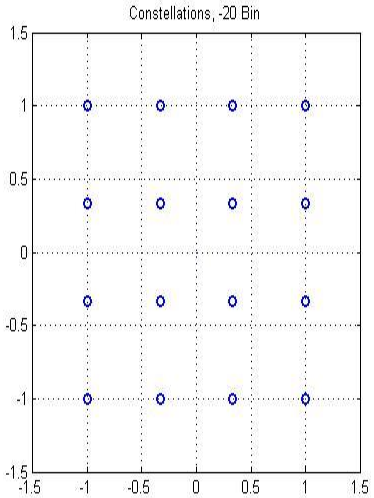


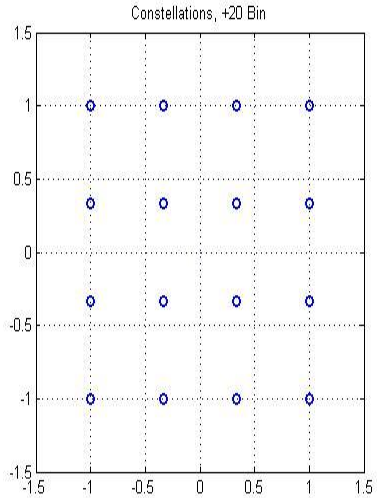


PART C

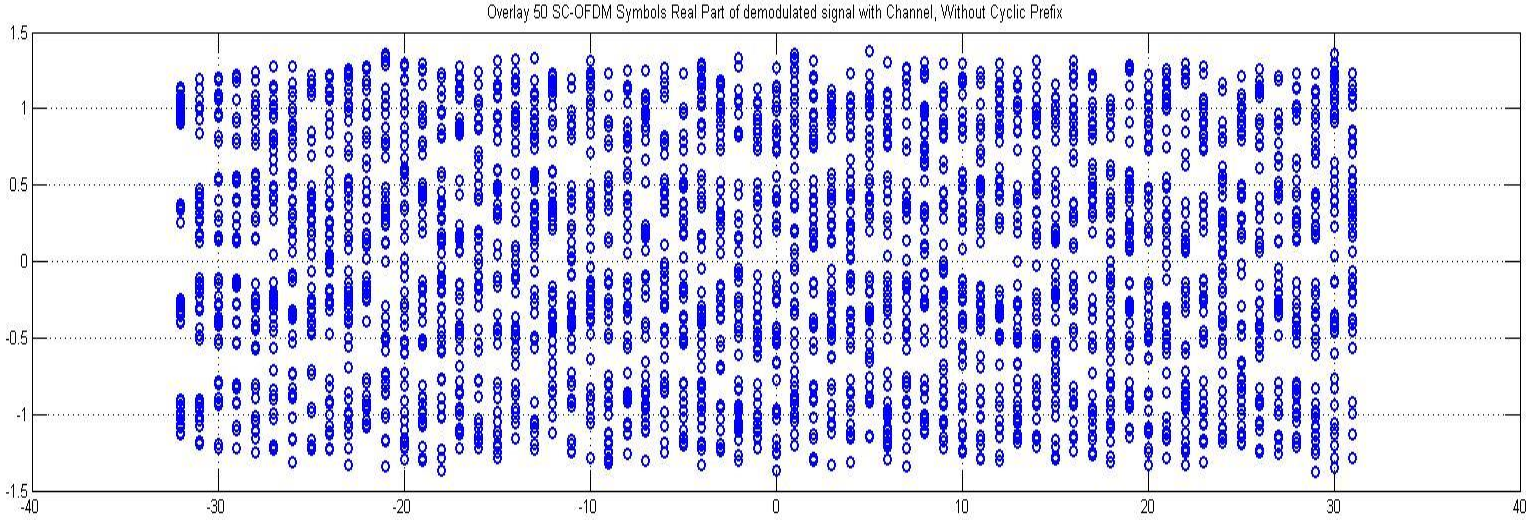

Overlay 50 SC-OFDM Symbols Real Part of demodulated signal without Channel, Without Cyclic Prefix
1.5
1
0.5
0
-0.5
-1
-1.5
-40
-30
-20
-10
0
10
20
30
40

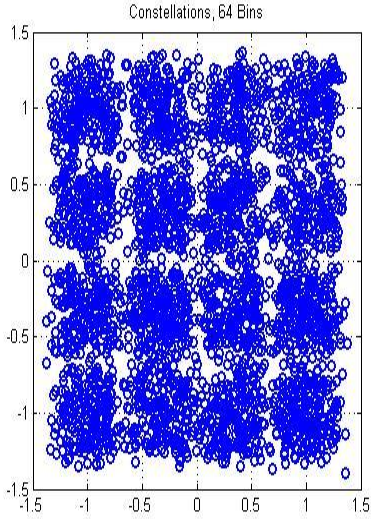

Constellations, 64 Bins
1.5
1
0.5
0
-0.5
-1
-1.5
-1.5
-1
-0.5
0
0.5
1
1.5


Constellations, -20 Bin
1.5
1
0.5
0
-0.5
-1
-1.5
-1.5
-1
-0.5
0
0.5
1
1.5

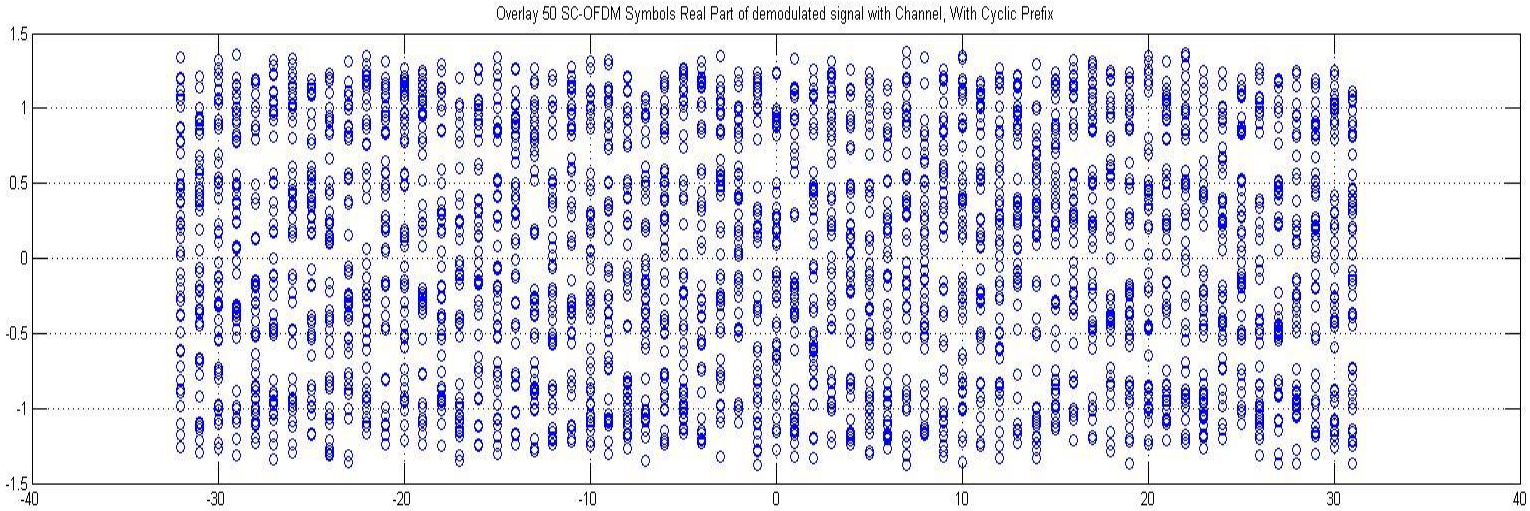

Constellations, +20 Bin
1.5
1
0.5
0
-0.5
-1
-1.5
-1.5
-1
-0.5
0
0.5
1
1.5

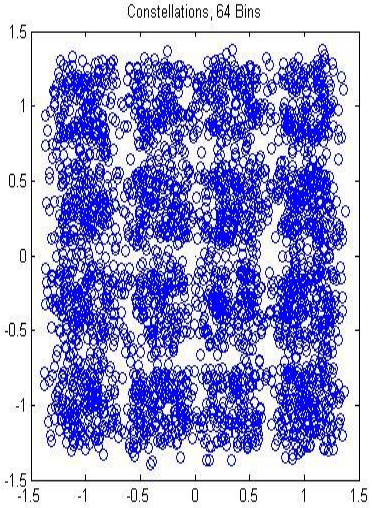
PART D


Overlay 50 SC-OFDM Symbols Real Part of demodulated signal with Channel, Without Cyclic Prefix
1.5
1
0.5
0
-0.5
-1
-1.5
-40
-30
-20
-10
0
10
20
30
40

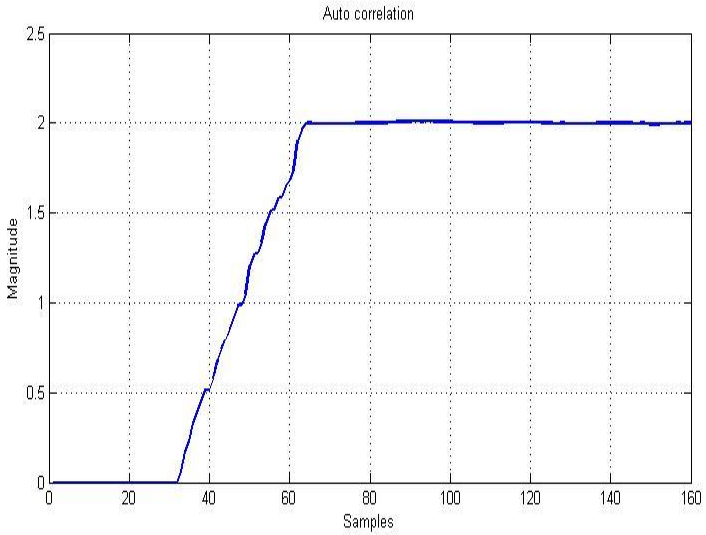

Constellations, 64 Bins
1.5
1
0.5
0
-0.5
-1
-1.5
-1.5
-1
-0.5
0
0.5
1
1.5

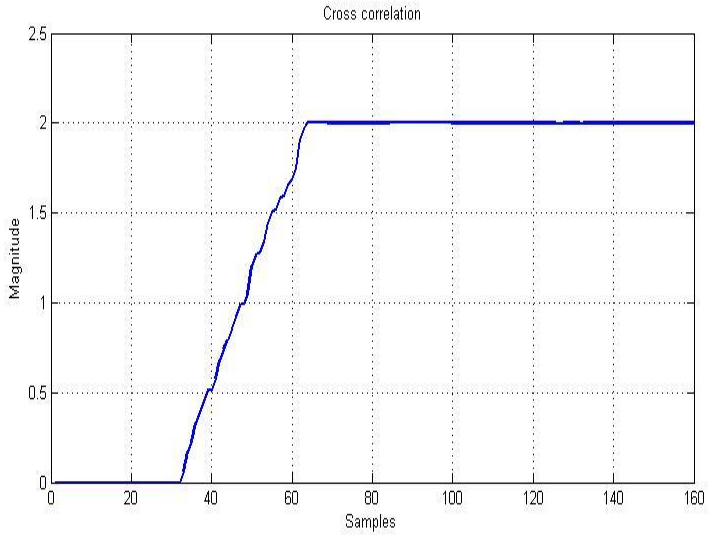
PART E

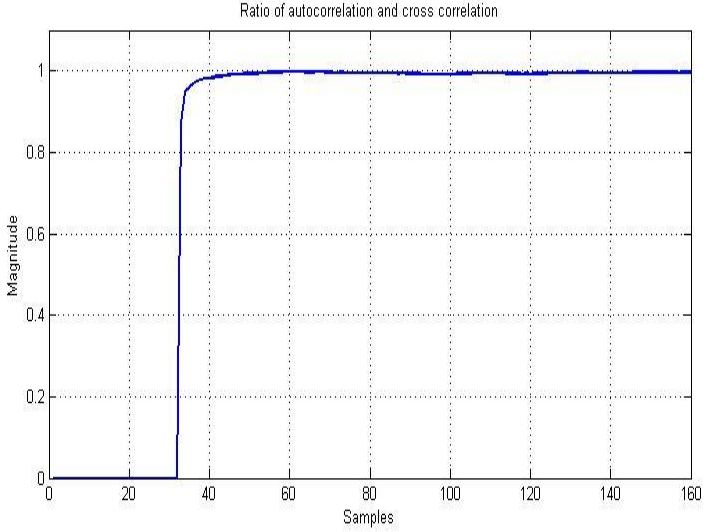

Overlay 50 SC-OFDM Symbols Real Part of demodulated signal with Channel, With Cyclic Prefix
1.5
1
0.5
0
-0.5
-1
-1.5
-40
-30
-20
-10
0
10
20
30
40

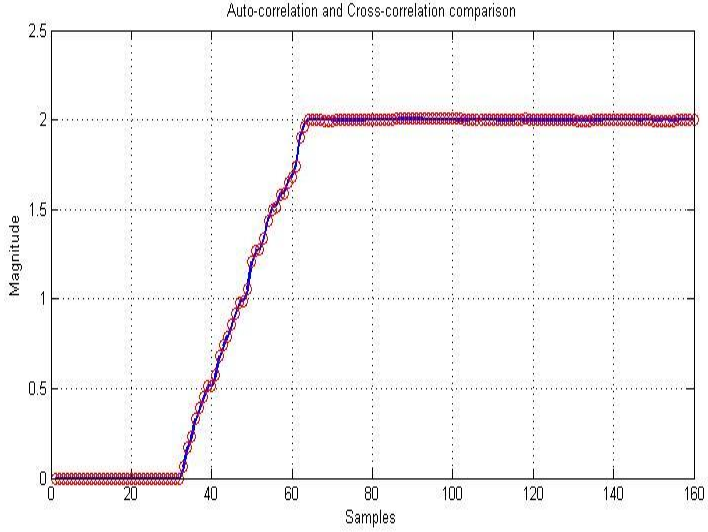

Constellations, 64 Bins
1.5
1
0.5
0
-0.5
-1
-1.5
-1.5
-1
-0.5
0
0.5
1
1.5

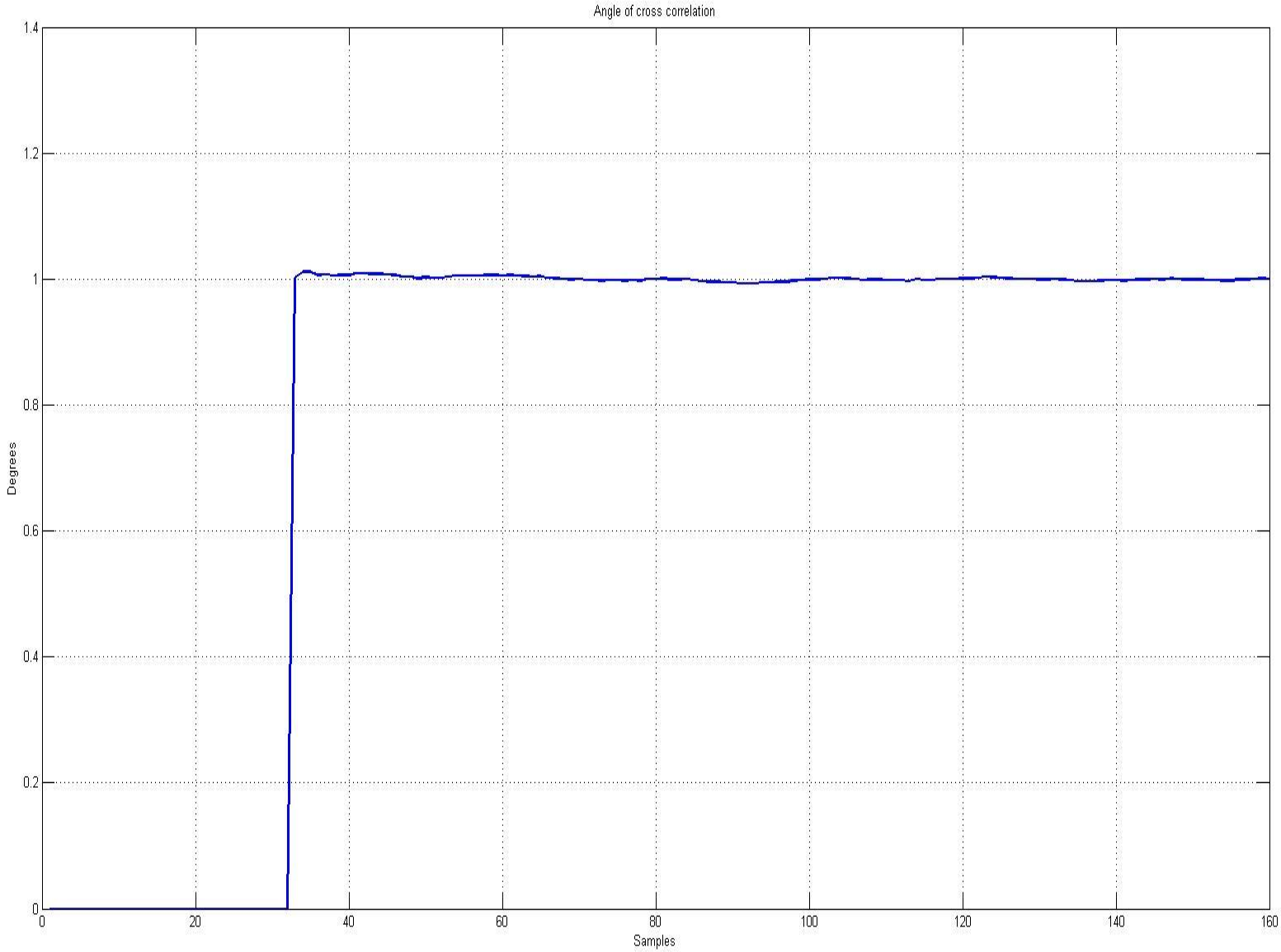
PART F


Auto correlation
Magnitude
Samples
0
0.5
1
1.5
2
2.5
0
20
40
60
80
100
120
140
160

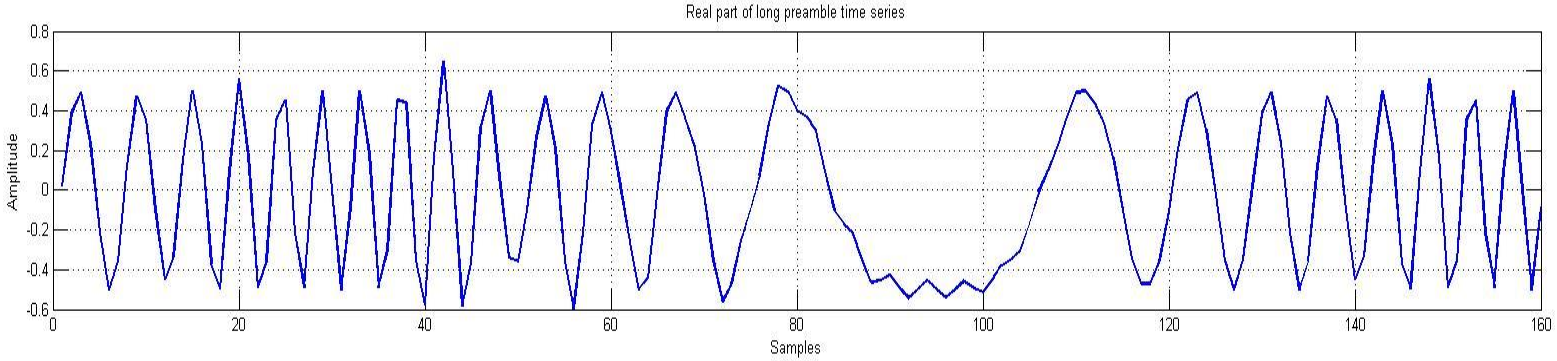

Cross correlation
Magnitude
Samples
0
0.5
1
1.5
2
2.5
0
20
40
60
80
100
120
140
160

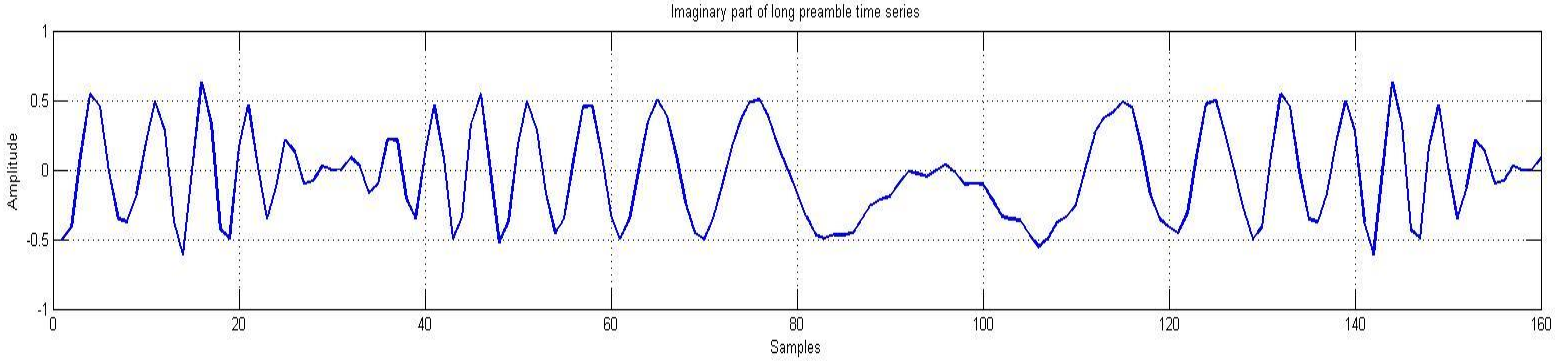

Ratio of autocorrelation and cross correlation
Magnitude
Samples
0
0.2
0.4
0.6
0.8
1
0
20
40
60
80
100
120
140
160

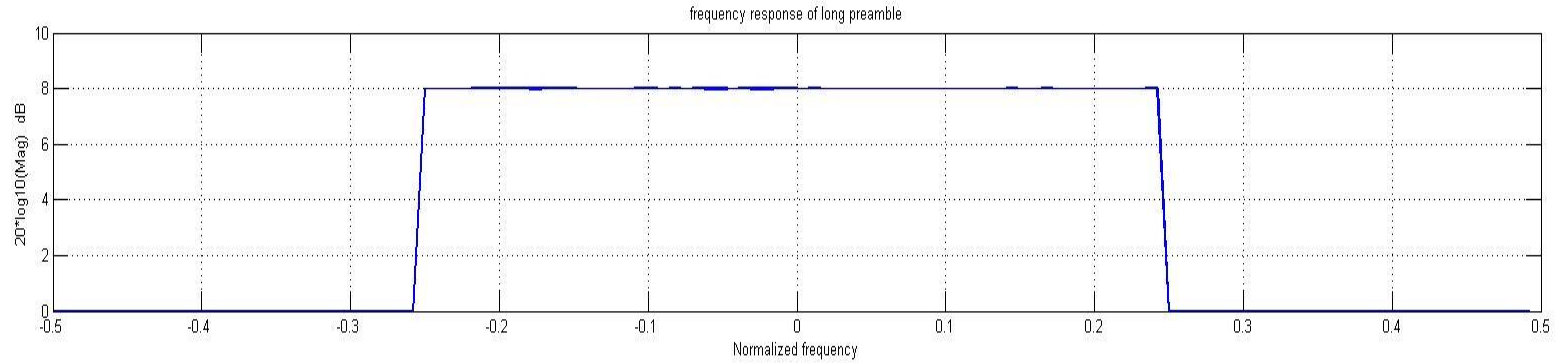

Auto-correlation and Cross-correlation comparison
Magnitude
Samples
0
0.5
1
1.5
2
2.5
0
20
40
60
80
100
120
140
160


Angle of cross correlation
Degrees
Samples
0
0.2
0.4
0.6
0.8
1
1.2
1.4
0
20
40
60
80
100
120
140
160

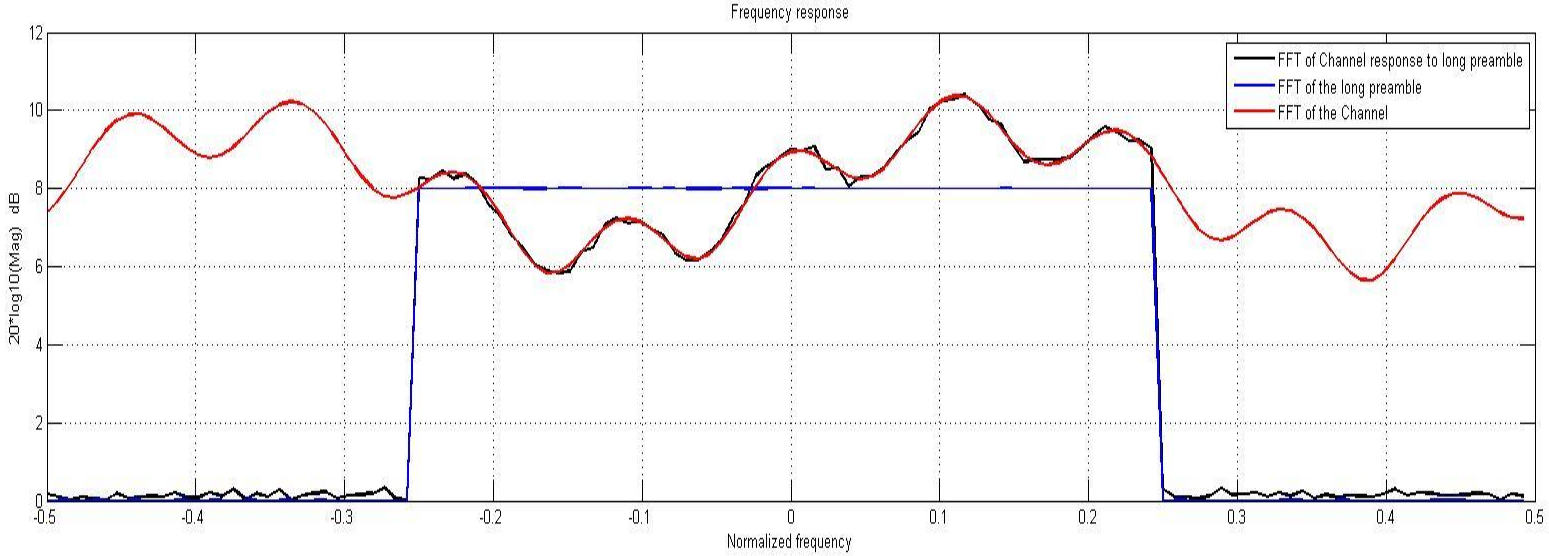
PART G

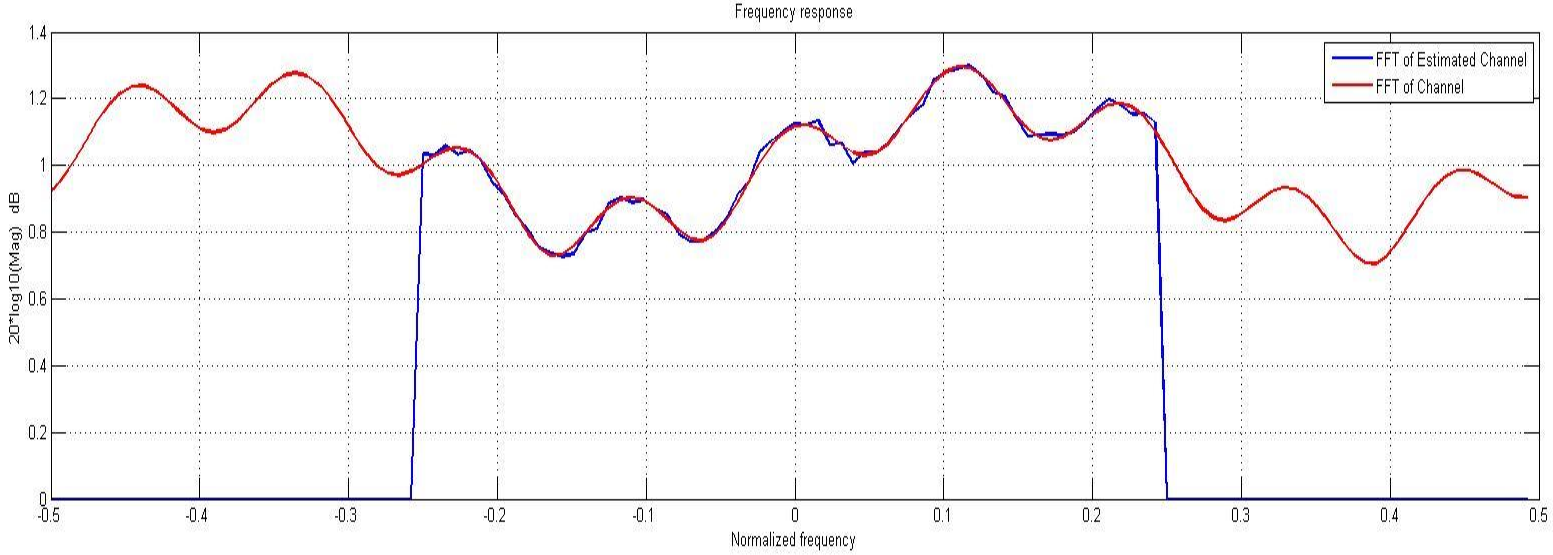

Real part of long preamble time series
Amplitude
Samples
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
0
20
40
60
80
100
120
140
160


Imaginary part of long preamble time series
Amplitude
Samples
1
0.5
0
-0.5
-1
0
20
40
60
80
100
120
140
160

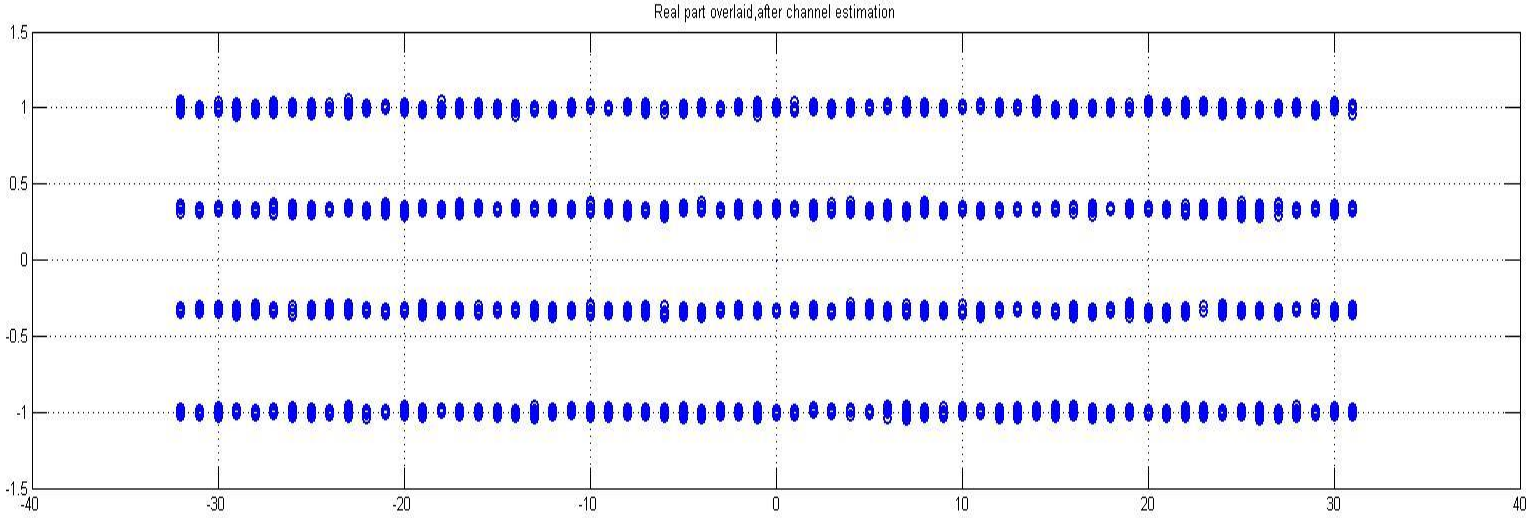

frequency response of long preamble
20*log10(Mag) dB
Normalized frequency
10
8
6
4
2
0
-0.5
-0.4
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
0.4
0.5

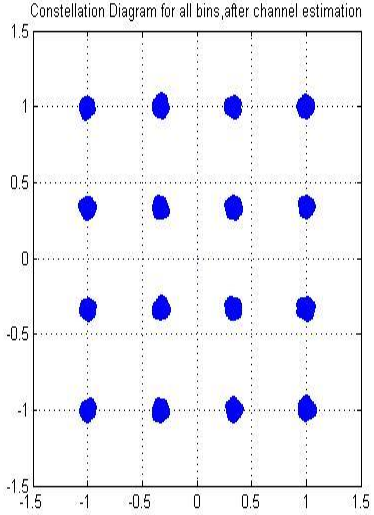
PART H


Frequency response
FFT of Channel response to long preamble
FFT of the long preamble
FFT of the Channel
20*log10(Mag) dB
Normalized frequency


Frequency response
FFT of Estimated Channel
FFT of Channel
20*log10(Mag) dB
Normalized frequency

PART I


Real part overlaid,after channel estimation
1.5
1
0.5
0
-0.5
-1
-1.5
-40
-30
-20
-10
0
10
20
30
40


Constellation Diagram for all bins,after channel estimation
1.5
1
0.5
0
-0.5
-1
-1.5
-1.5
-1
-0.5
0
0.5
1
1.5