EECE 5430 Theory of Communication

Instructor: Prof.Dr. Jay Weitzen

Programming Project 1: AM Modulation and Demodulation

By

Pranav Bala Chandran ,M

OUTPUT GRAPHS

MESSAGE AND CARRIER SIGNAL

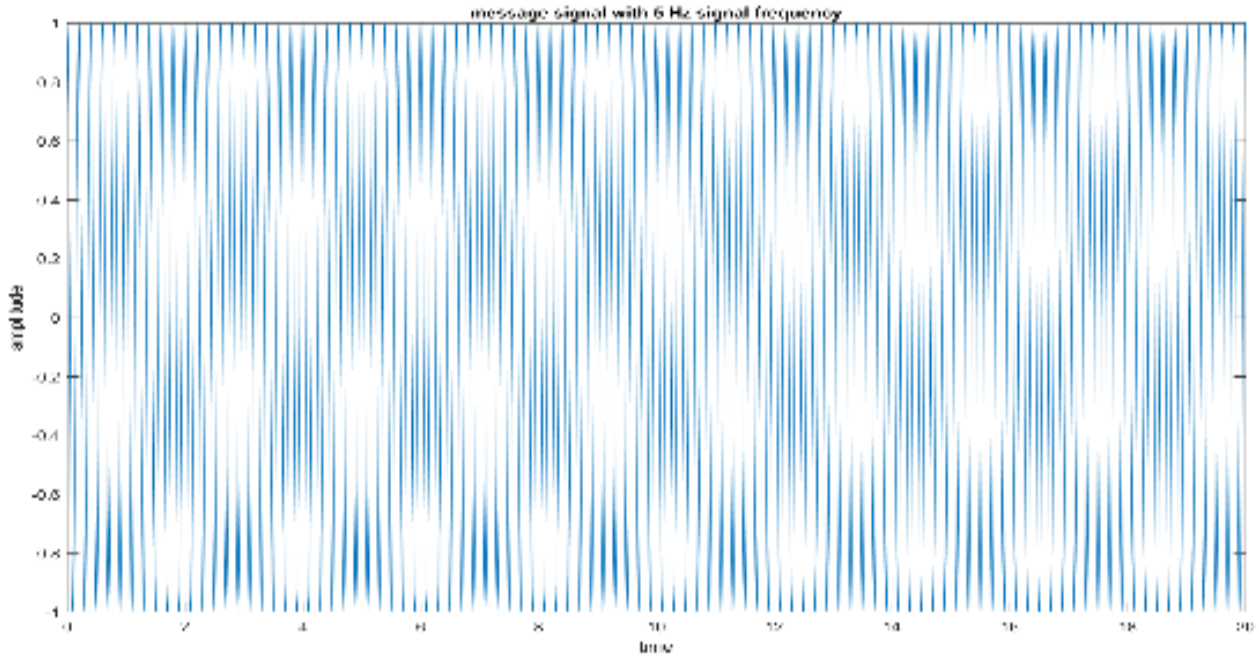


Fig1:Message signal

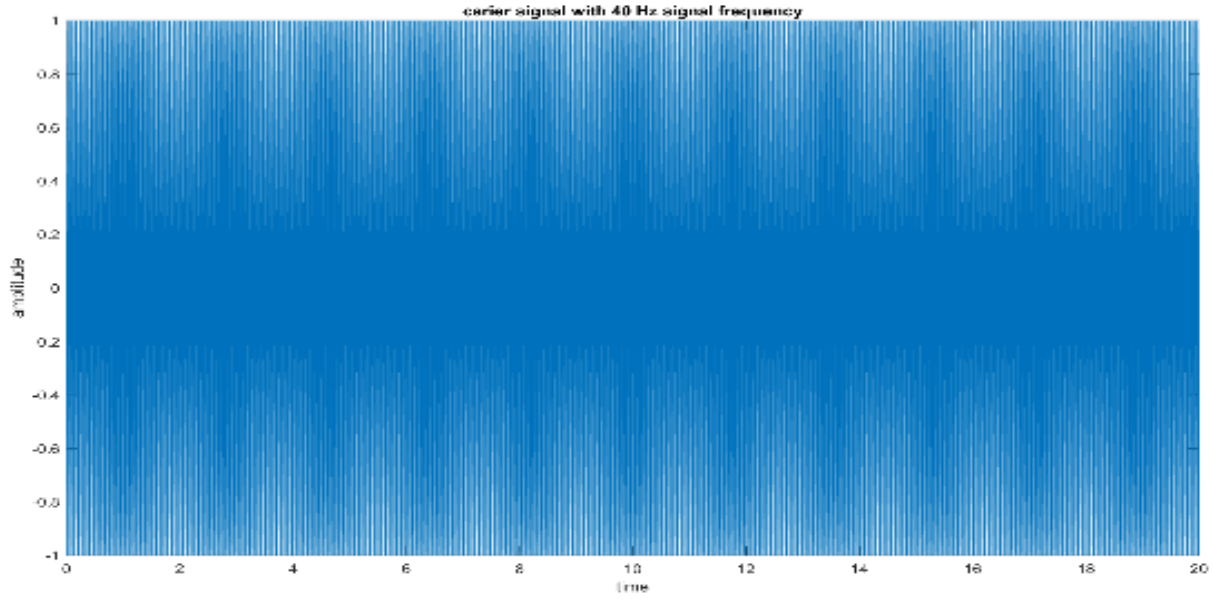
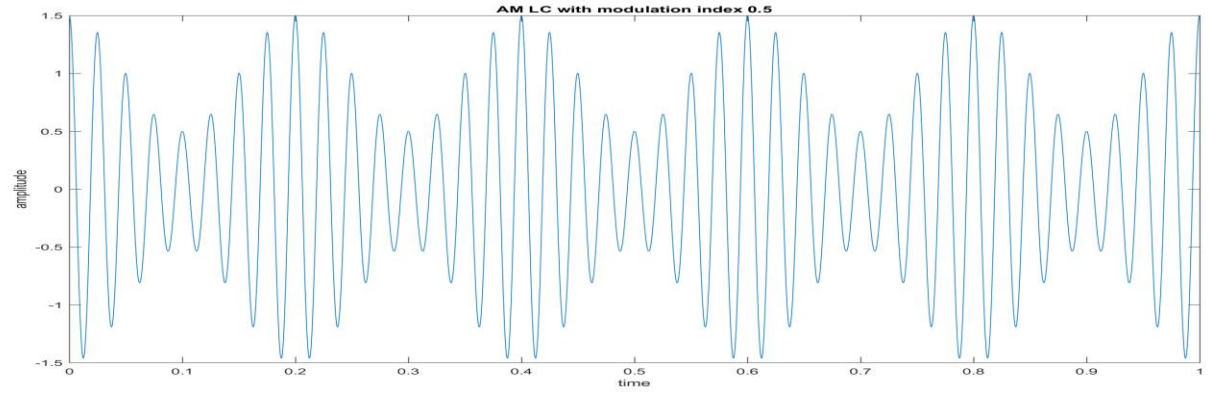
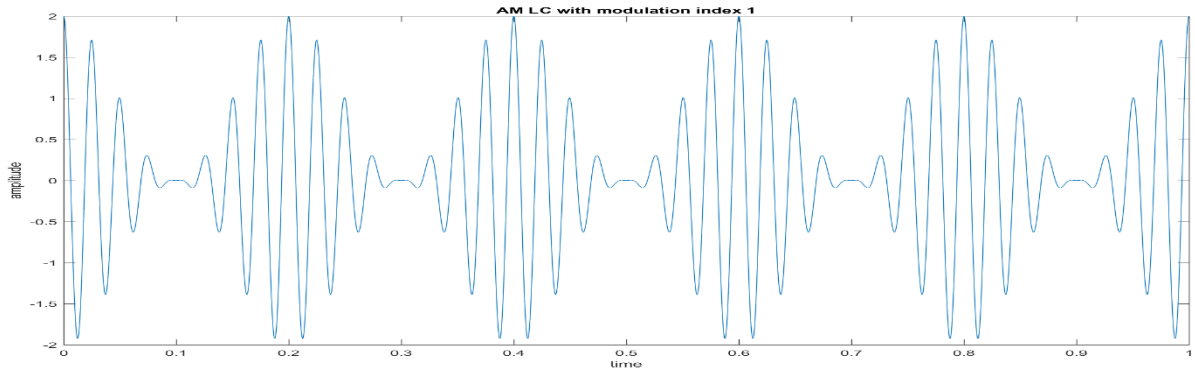


Fig2: Carrier signal

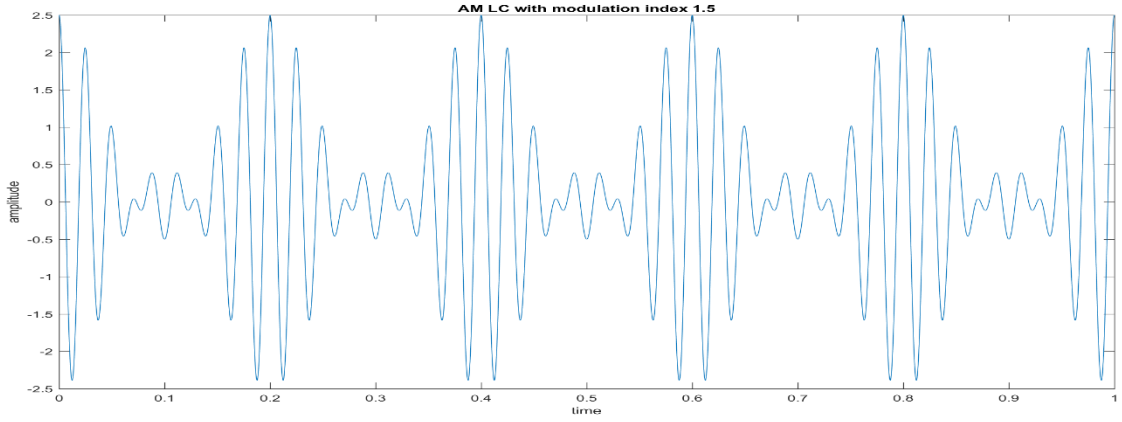
MODULATED SIGNAL:



(a)



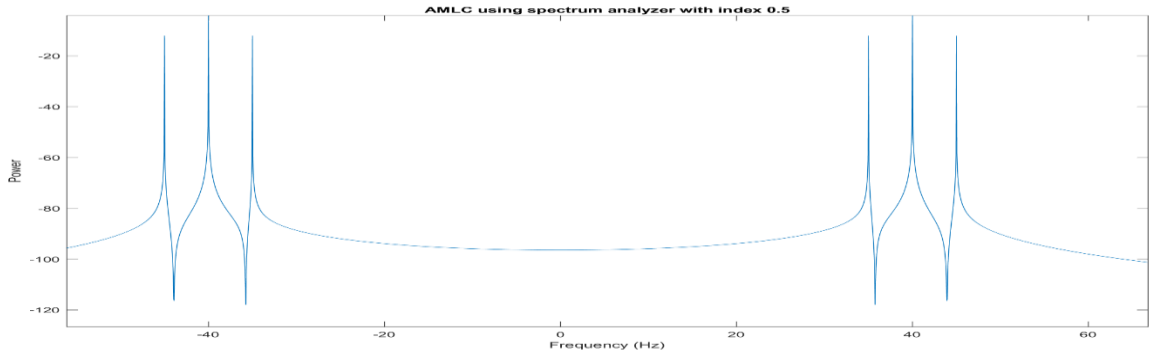
(b)



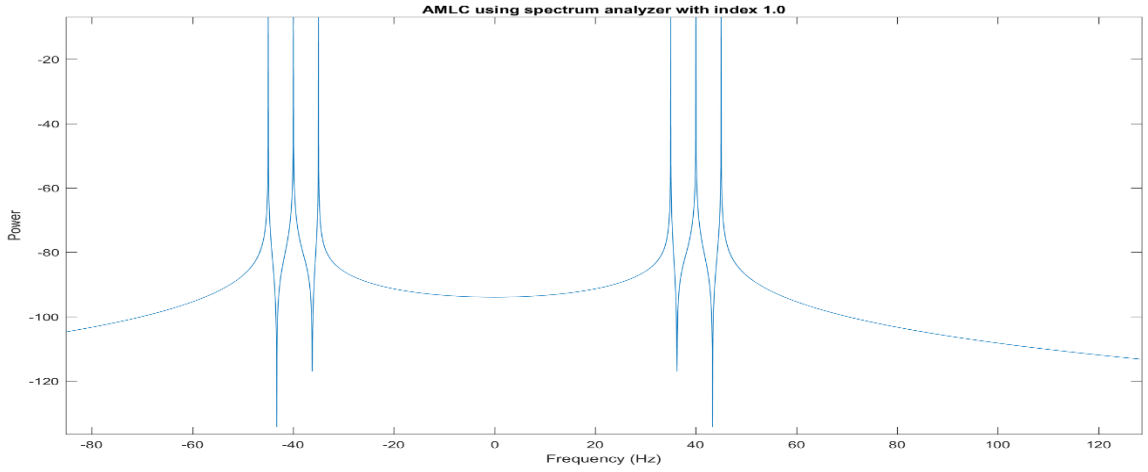
(c)

Fig3: Modulated signal with a)m=0.5 b)m=1 c)m=1.5

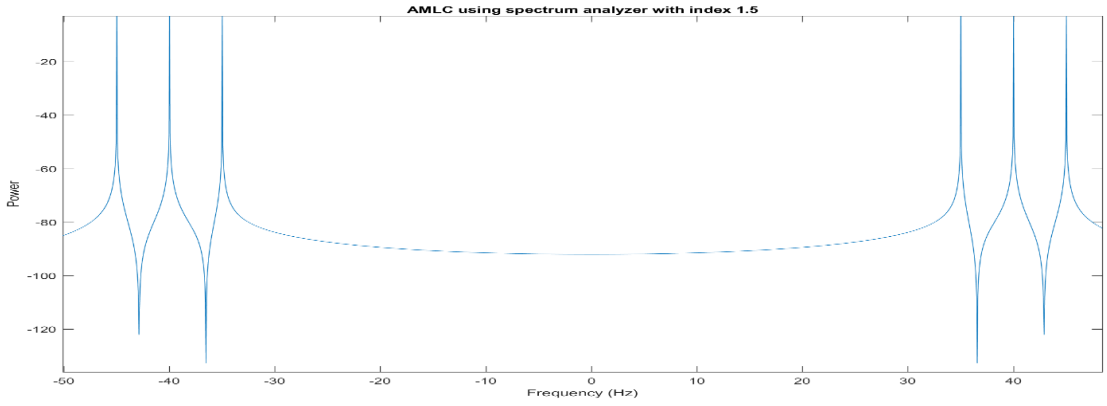
SPECTRUM ANALYZER OUTPUT FOR THE MODULATED SIGNAL:



(a)



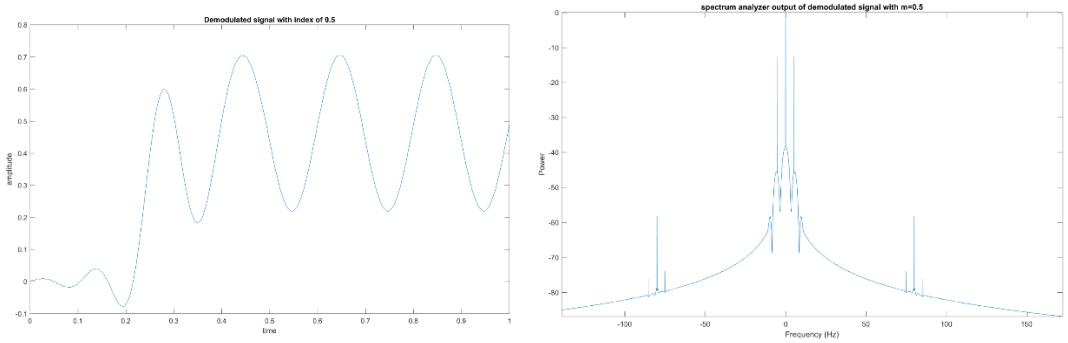
(b)



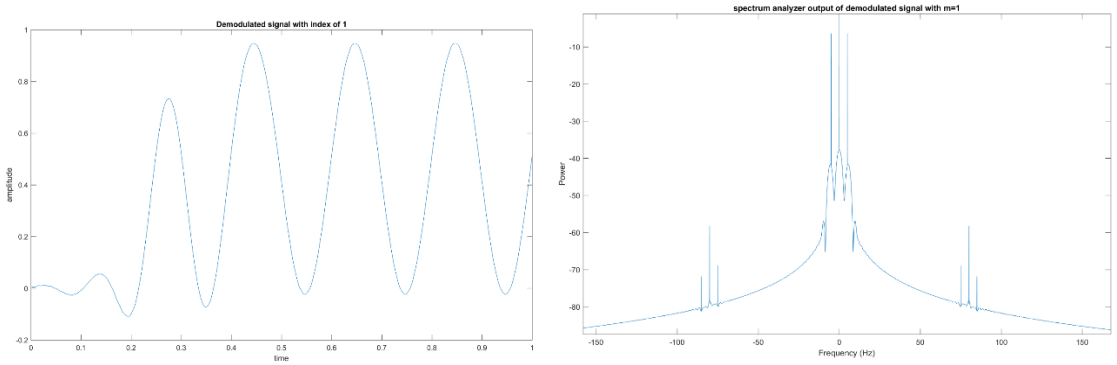
(c)

Fig 4 Modulated signal in the frequency domain with a)m=0.5 b)m=1 c)m=1

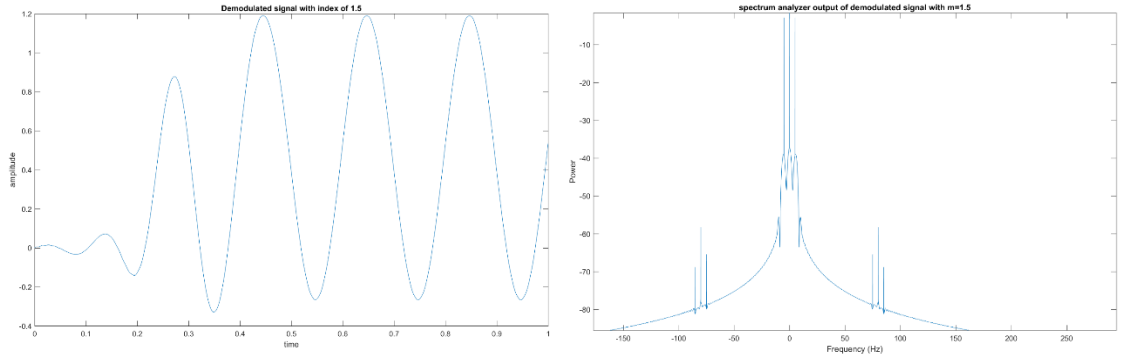
%B.Coherent demodulation



(a)



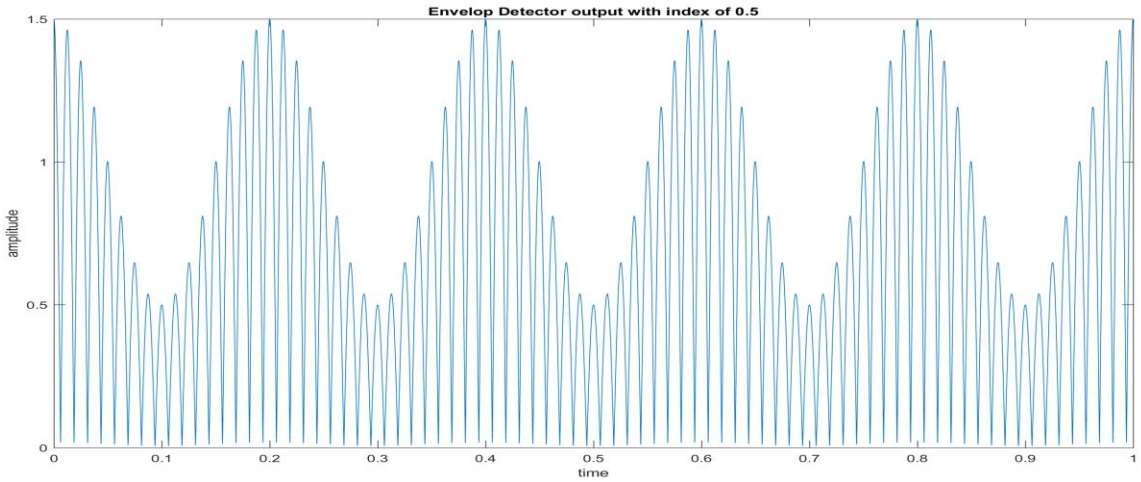
(b)



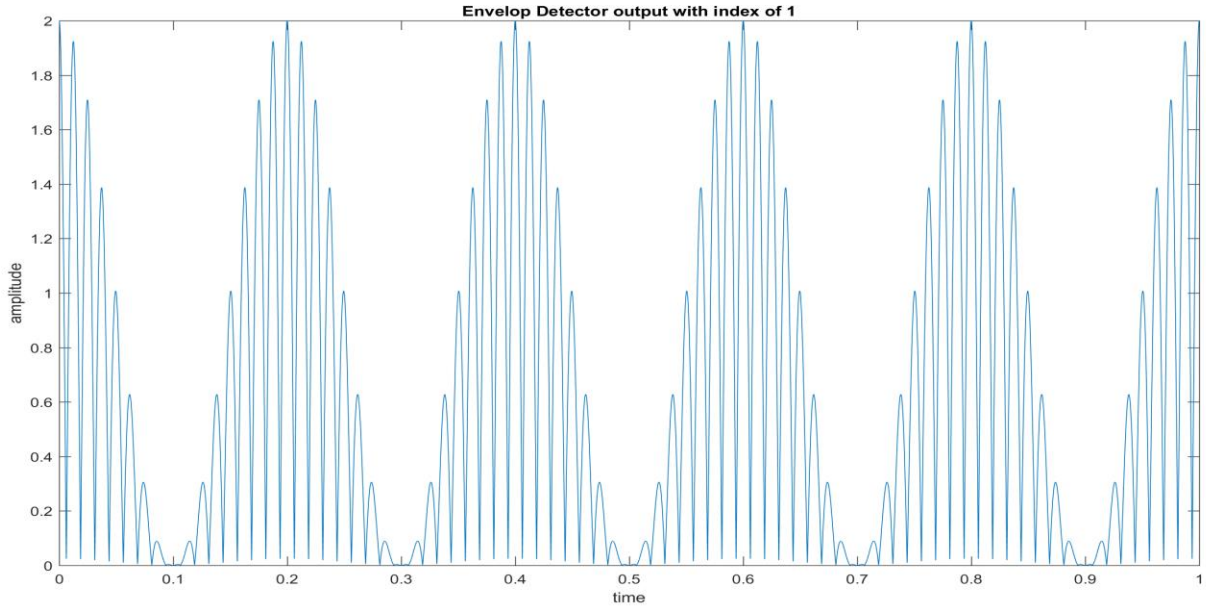
(c)

Fig.5 Coherent demodulation in time and frequency domain with modulation index (a) m=0.5,(b)m=1 (c) m=1.5

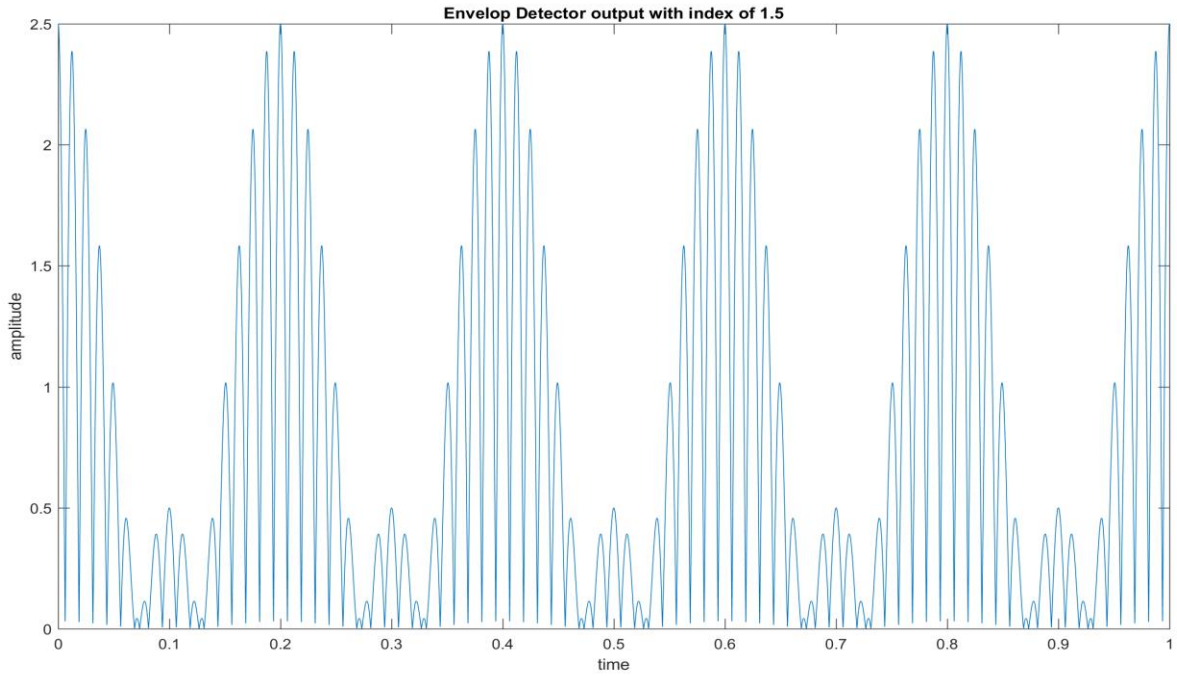
%C.Dempdulation using envelop detection


Envelop Detector output with index of 0.5
amplitude
time
0
0.5
1
1.5
0.1
0.2
0.3
0.4
0.6
0.7
0.8
0.9

(a)


Envelop Detector output with index of 1
amplitude
time
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9

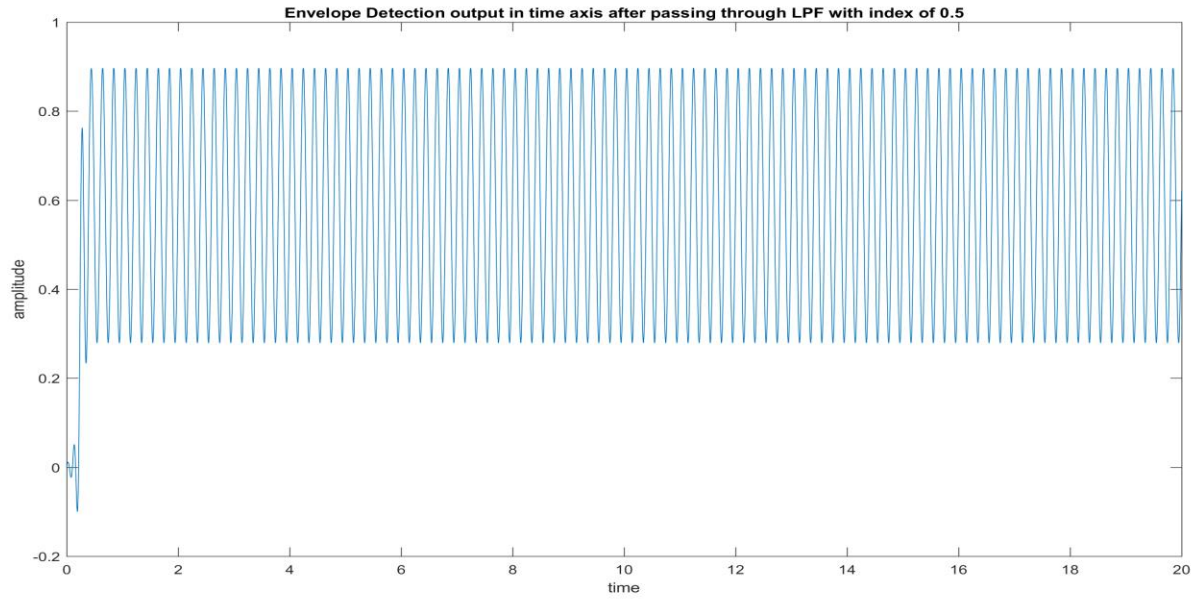
(b)



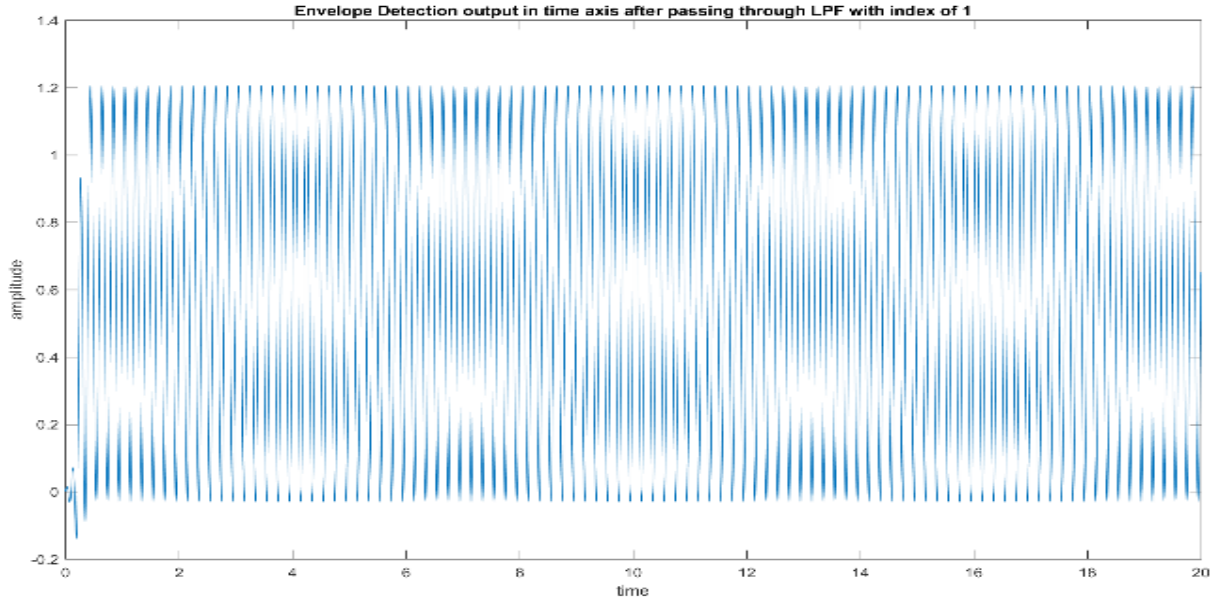
(c)

Fig.6 Envelop detection output before passing to a LPF in time and frequency domain with modulation index (a) m=0.5,(b)m=1 (c) m=1.5

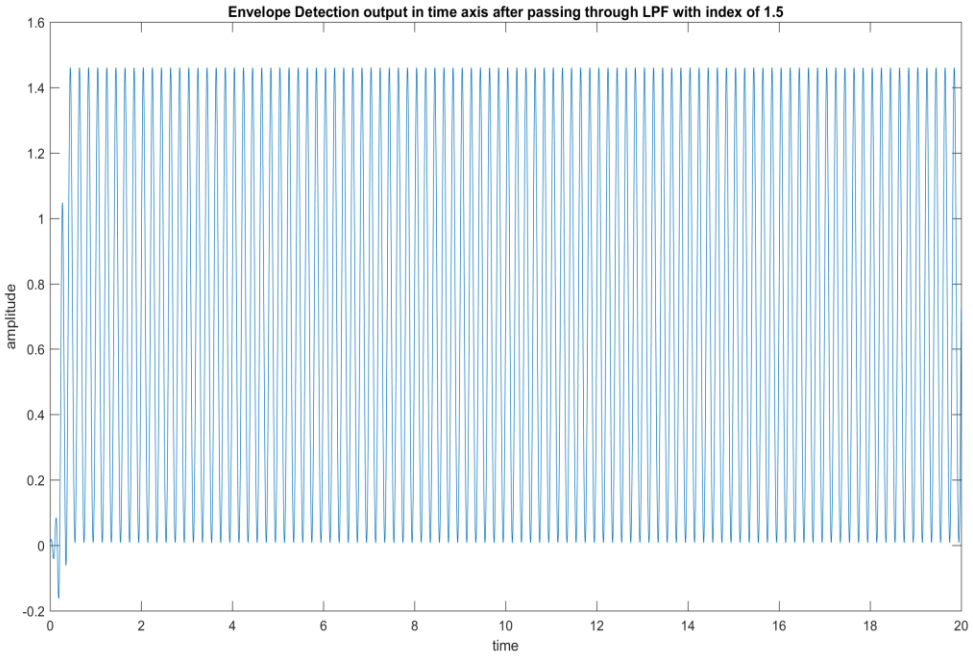
ENVELOPE DETECTOR OUTPUT IN TIME AXIS AFTER PASSING LPF:



(a)



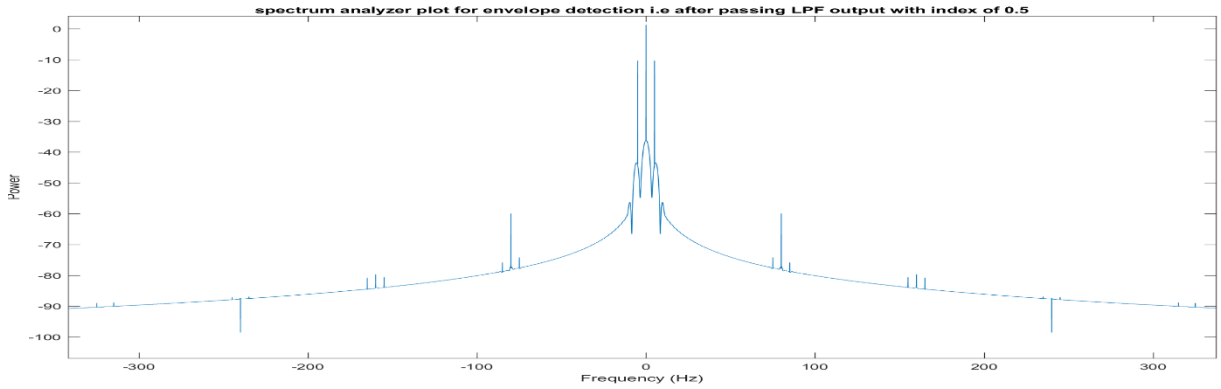
(b)



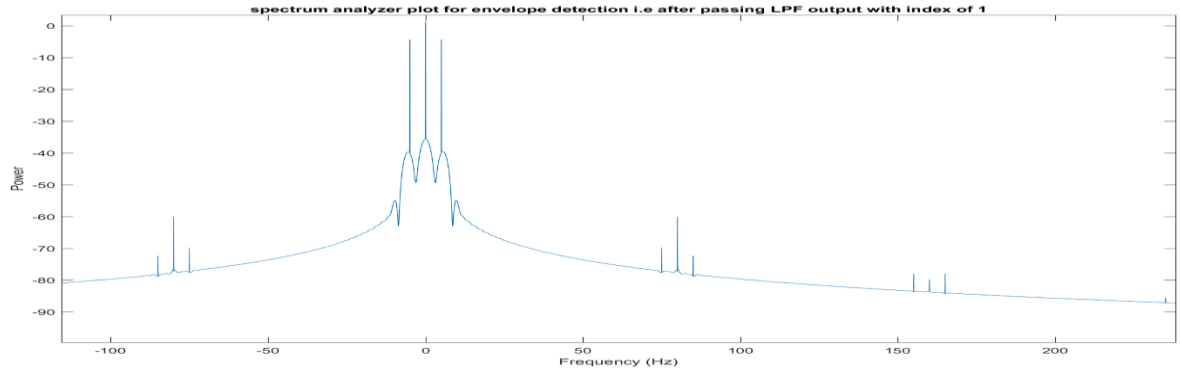
(c)

Fig.7 Envelop detection output after passing to a LPF in time and frequency domain with modulation index (a) m=0.5,(b)m=1 (c) m=1.5

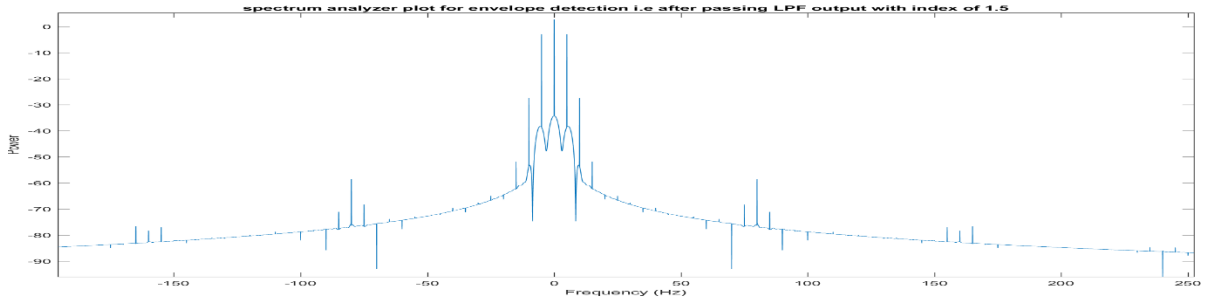
SPECTRUM ANALYZER OUTPUT FOR THE ENVELOP DETECTOR:



(a)



(b)

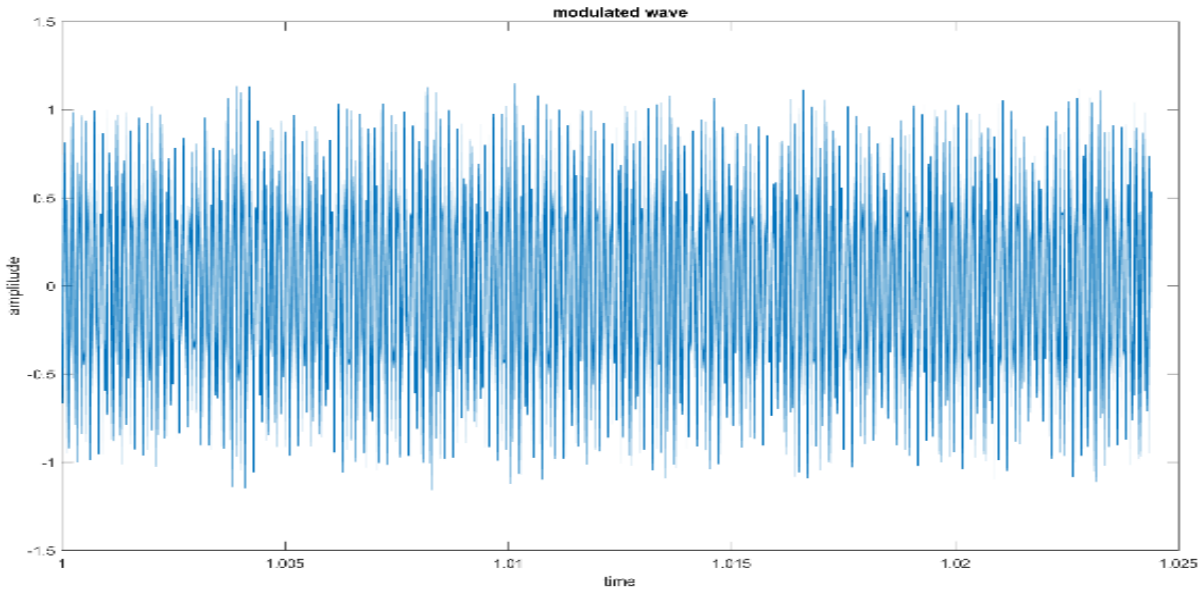


(c)

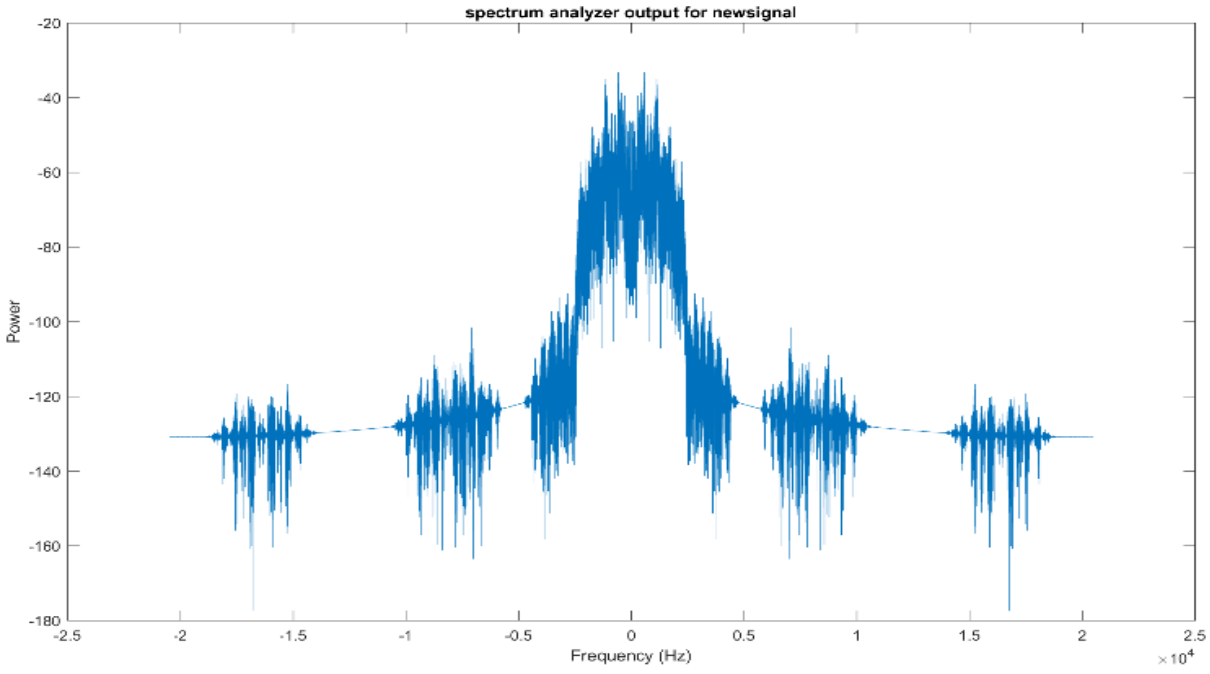
Fig.8 Envelop detection output after passing to a LPF in time and frequency domain with modulation index (a) m=0.5,(b)m=1 (c) m=1.5

D.USE REAL WAVEFORMS

OUTPUT GRAPHS:



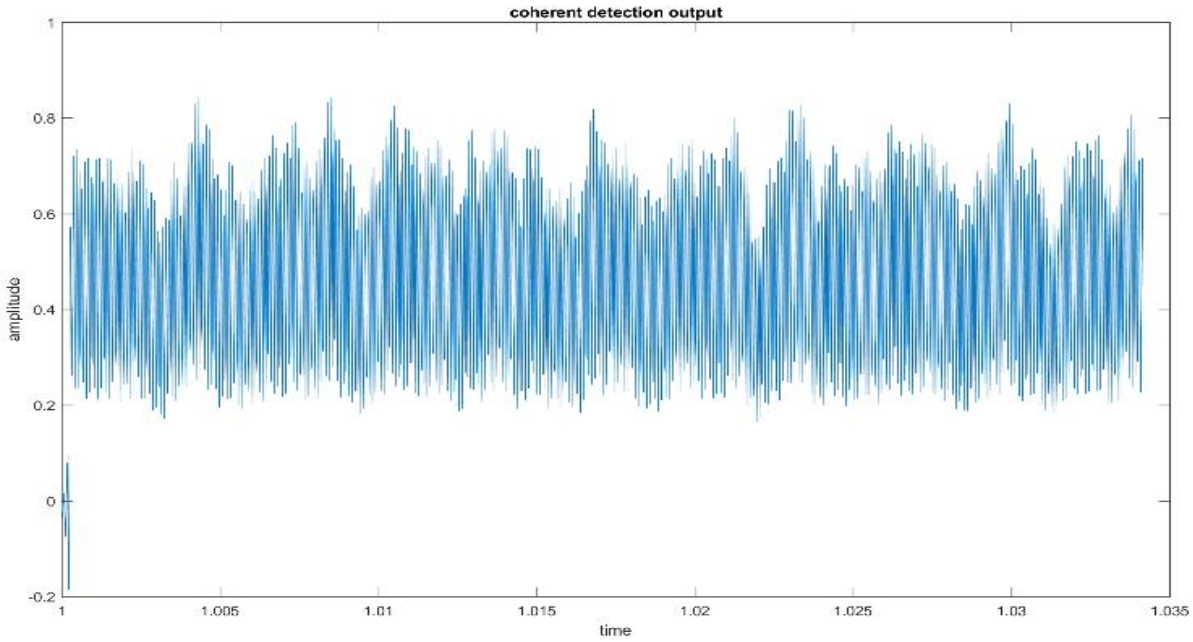
(a)



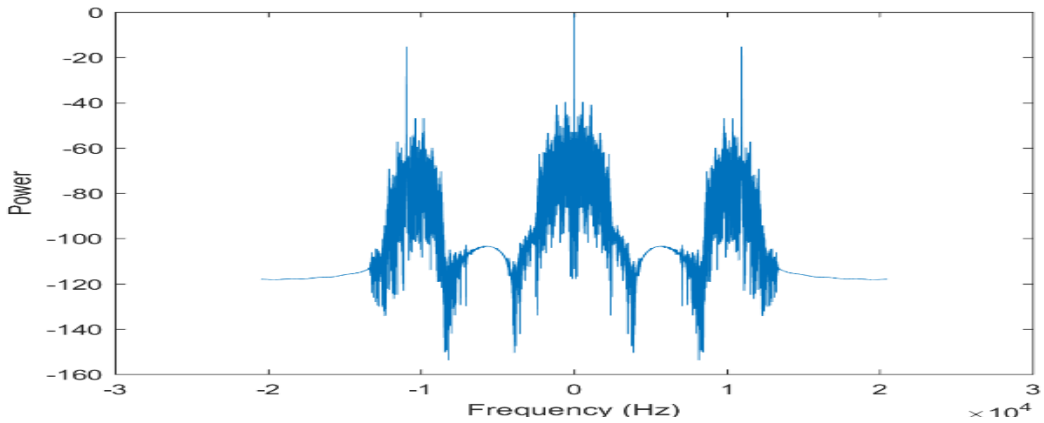
(b)

Fig9:a) Modualted Wave b) Carrier Wave

COHERENT DETECTION OUTPUT:



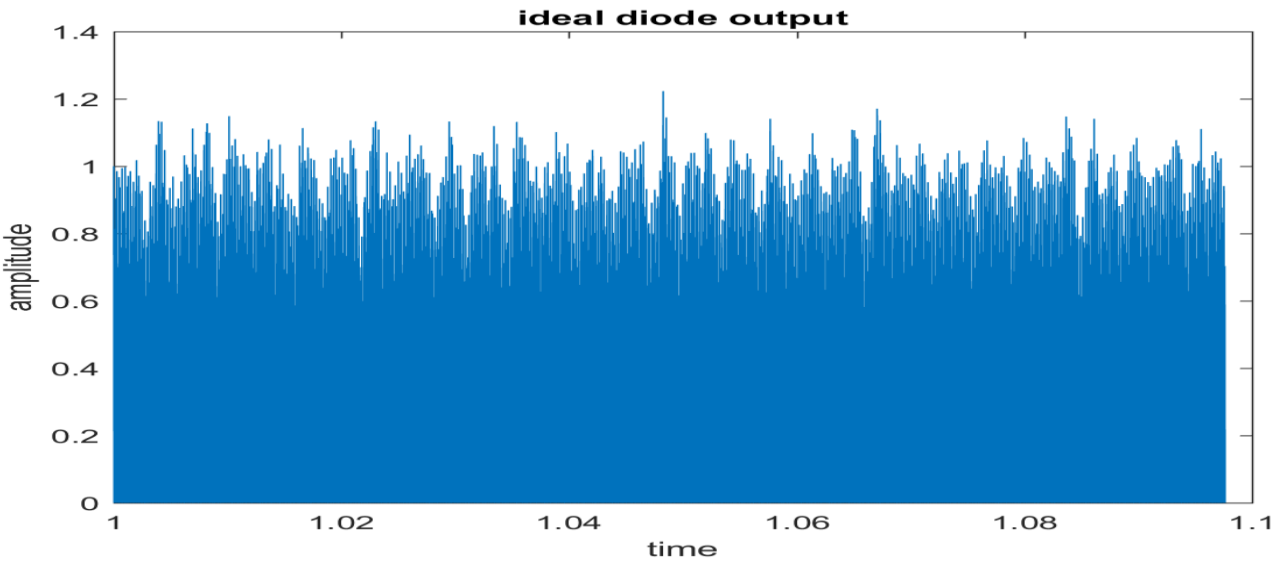
(a)



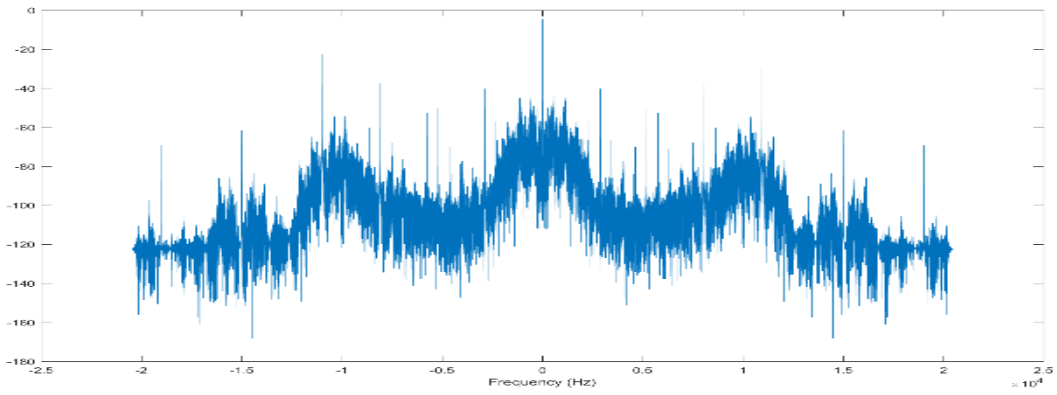
(b)

Fig10: Coherent detection output in (a) time domain (b)Frequency domain

IDEAL DIODE OUTPUT



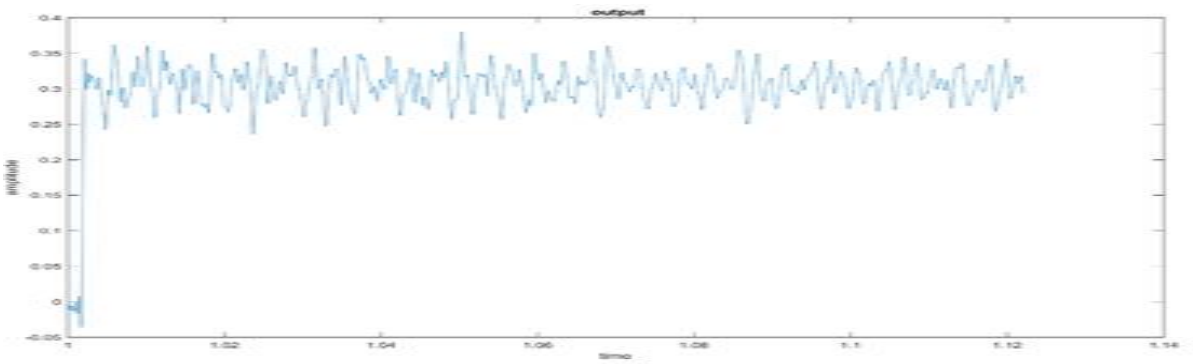
(a)



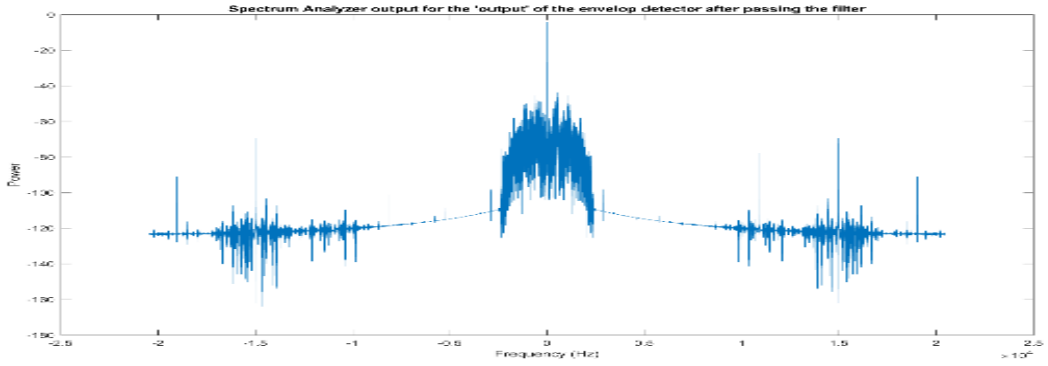
(b)

Fig11: Ideal diode output in (a) time domain (b)Frequency domain

FINAL DEMODULATETED OUTPUT:



(a)



(b)

Fig12: Demodulated signal in (a) time domain (b)Frequency domain