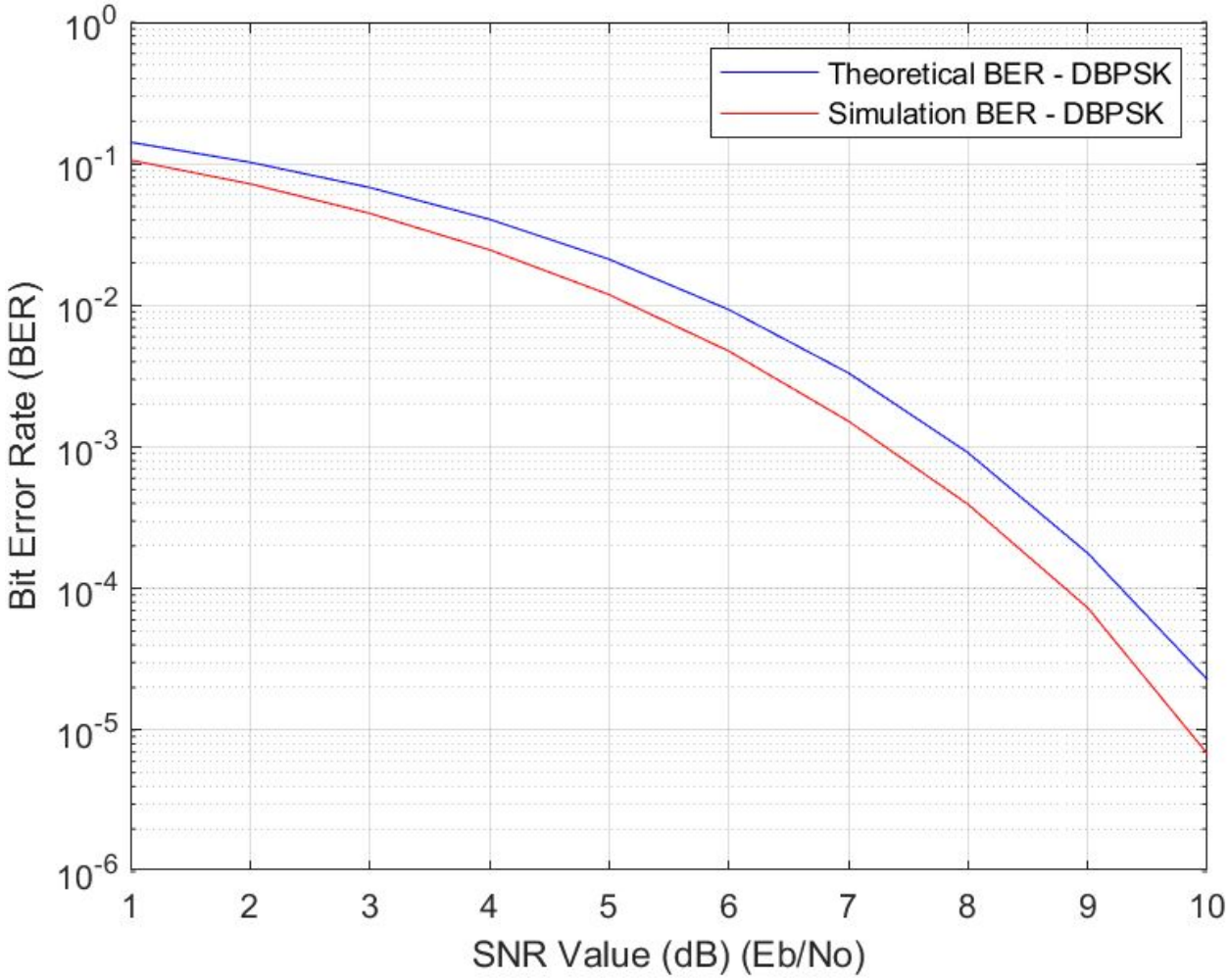
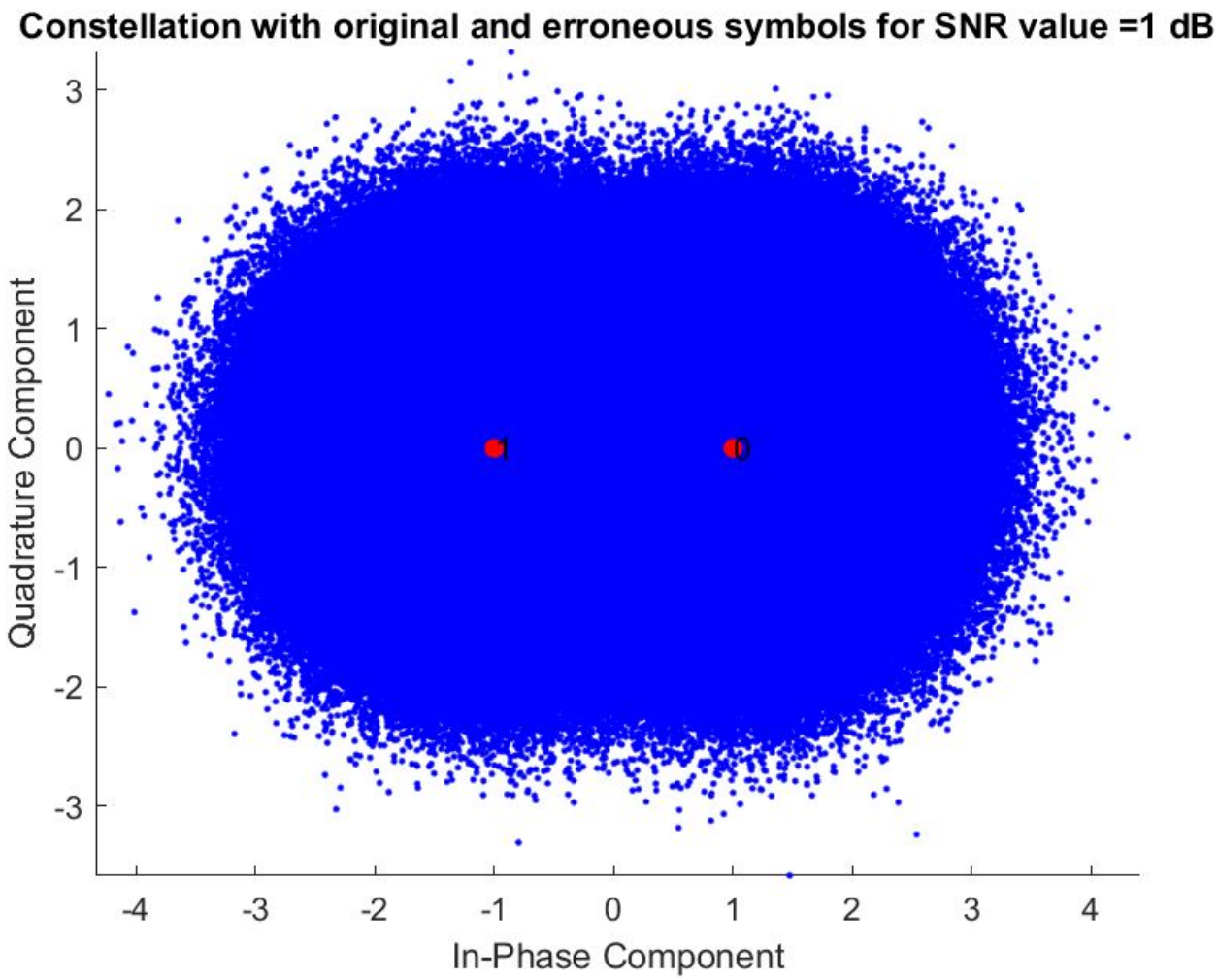
Communication Systems Lab

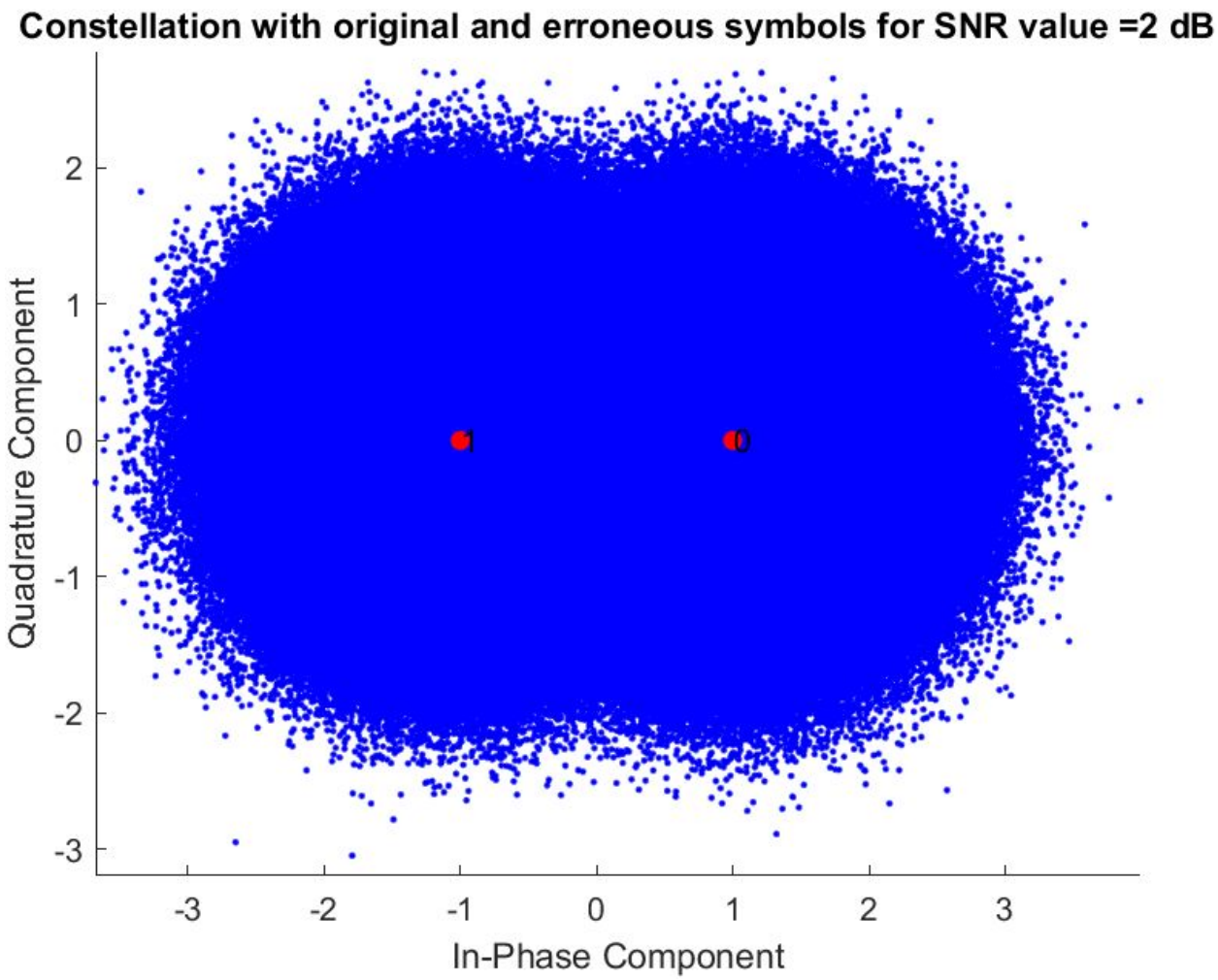
Lab Report (180030037)

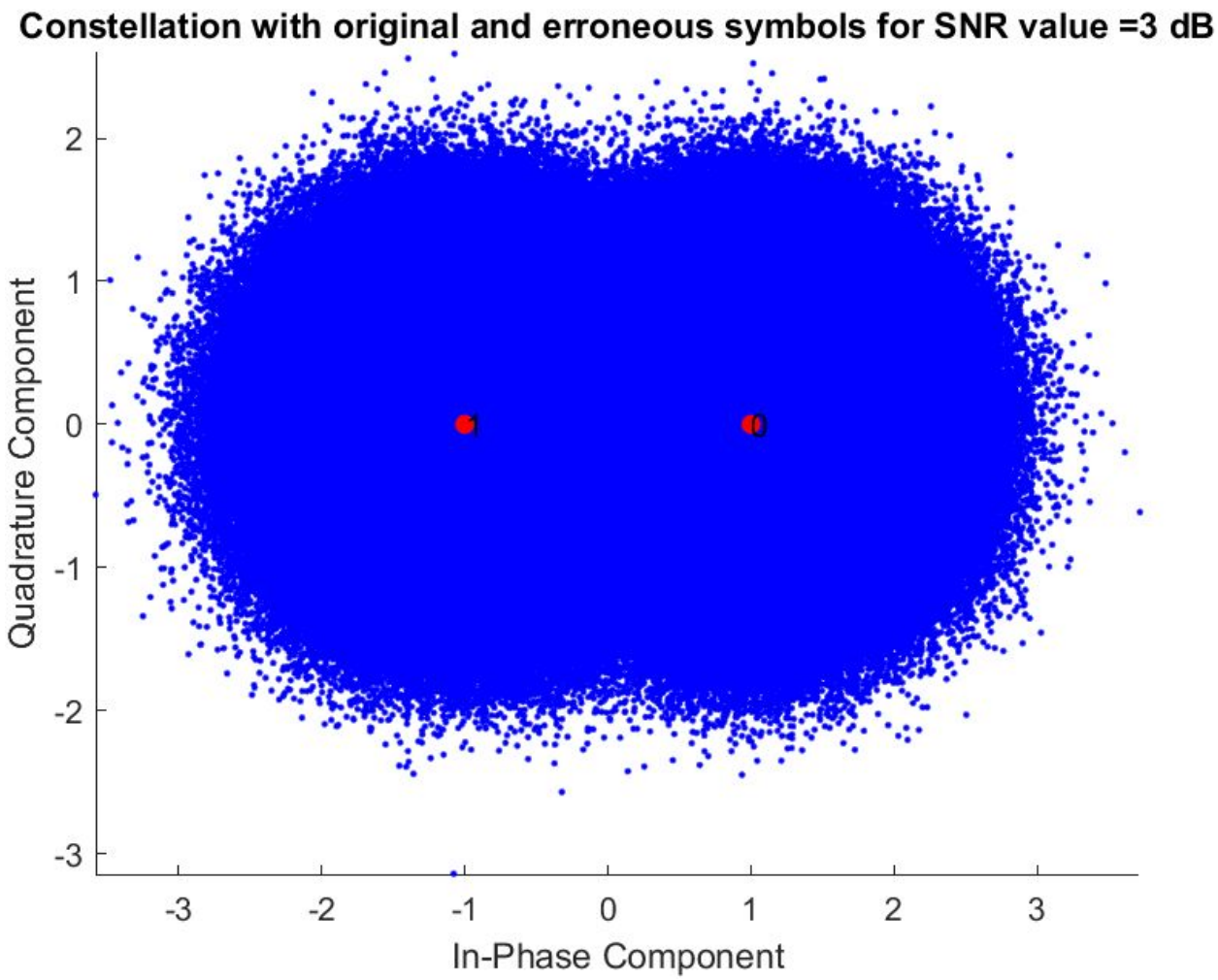
Experiment 6 : Differential BPSK and Differential QPSK BER Simulation

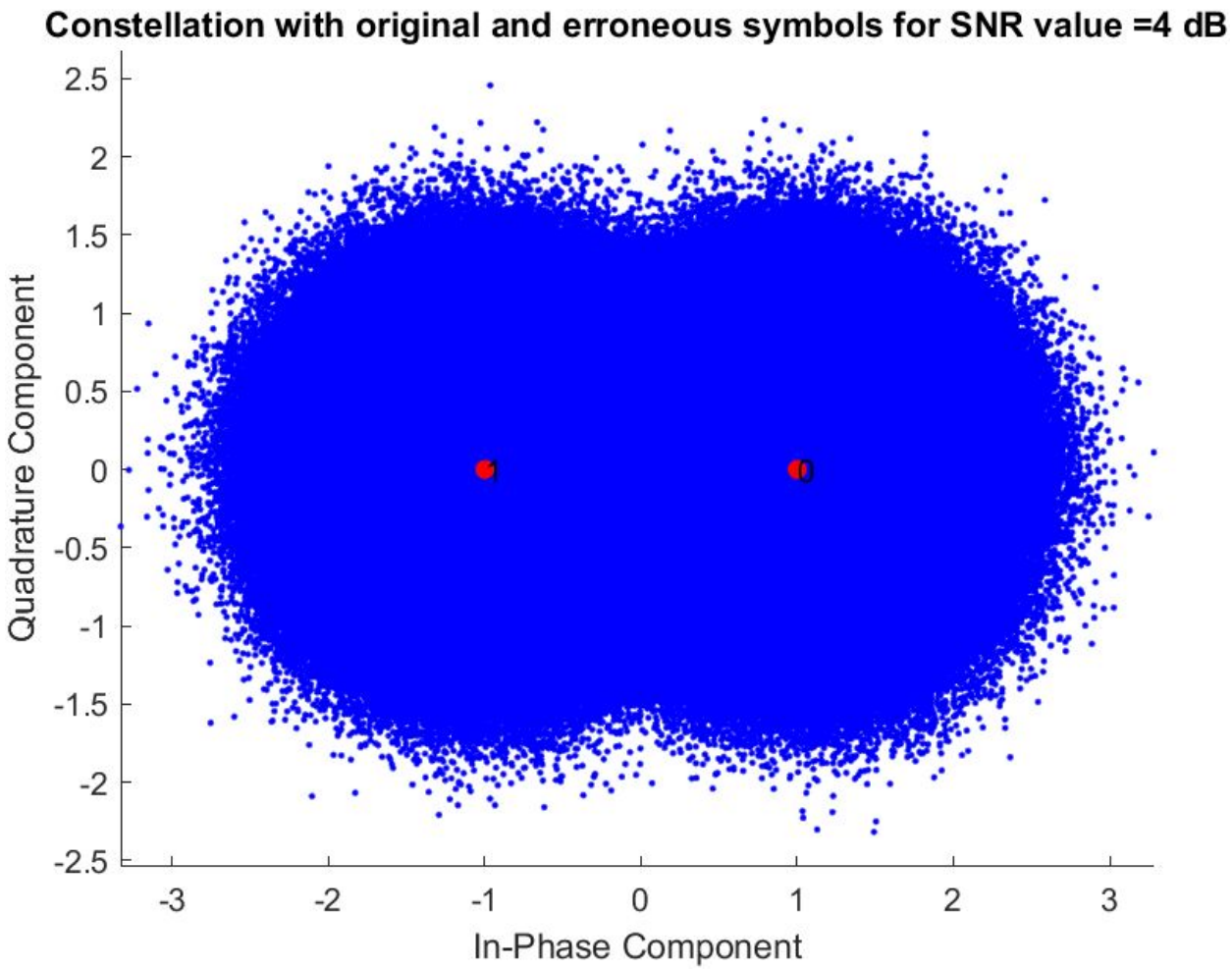
1. Differential BPSK Simulation

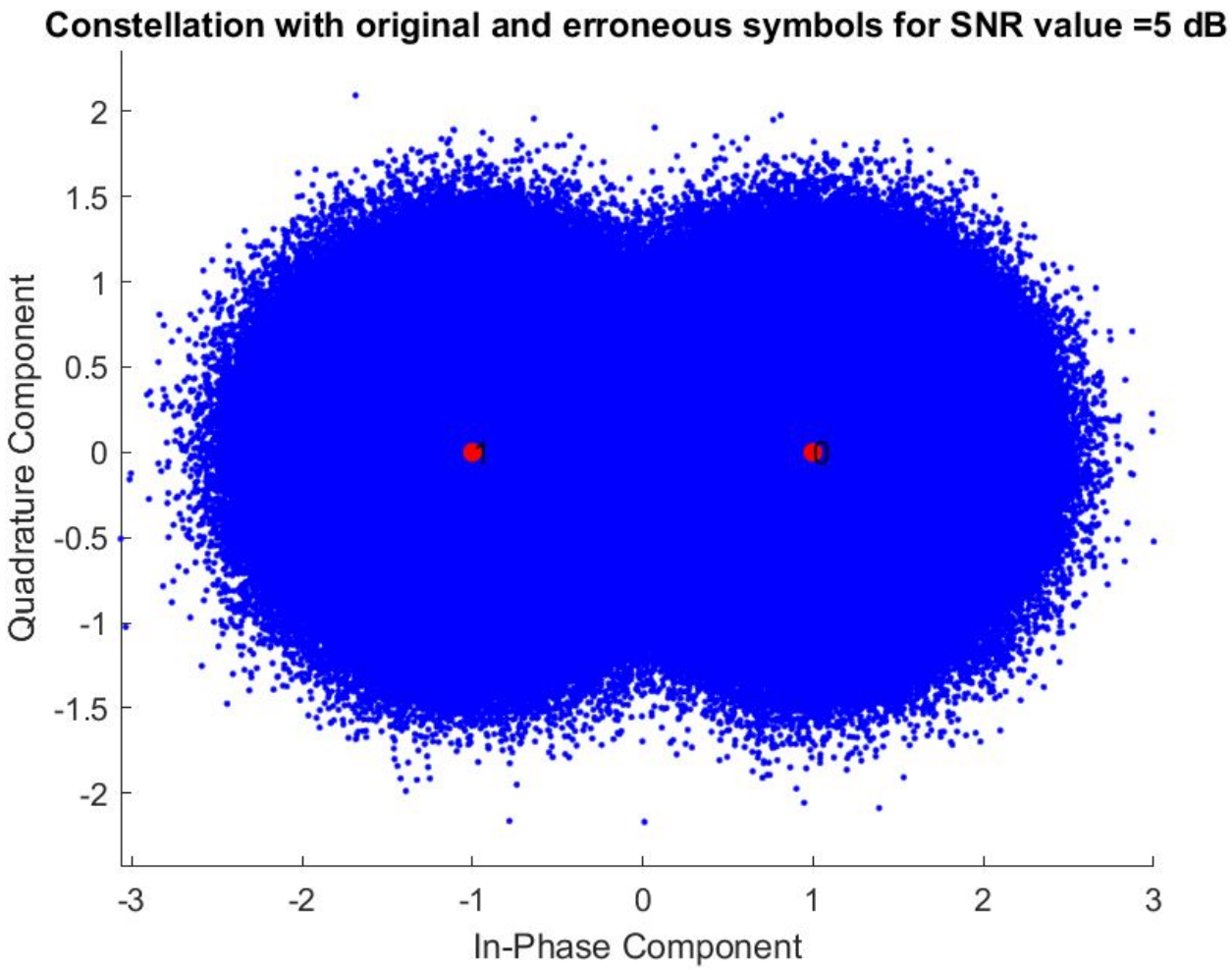


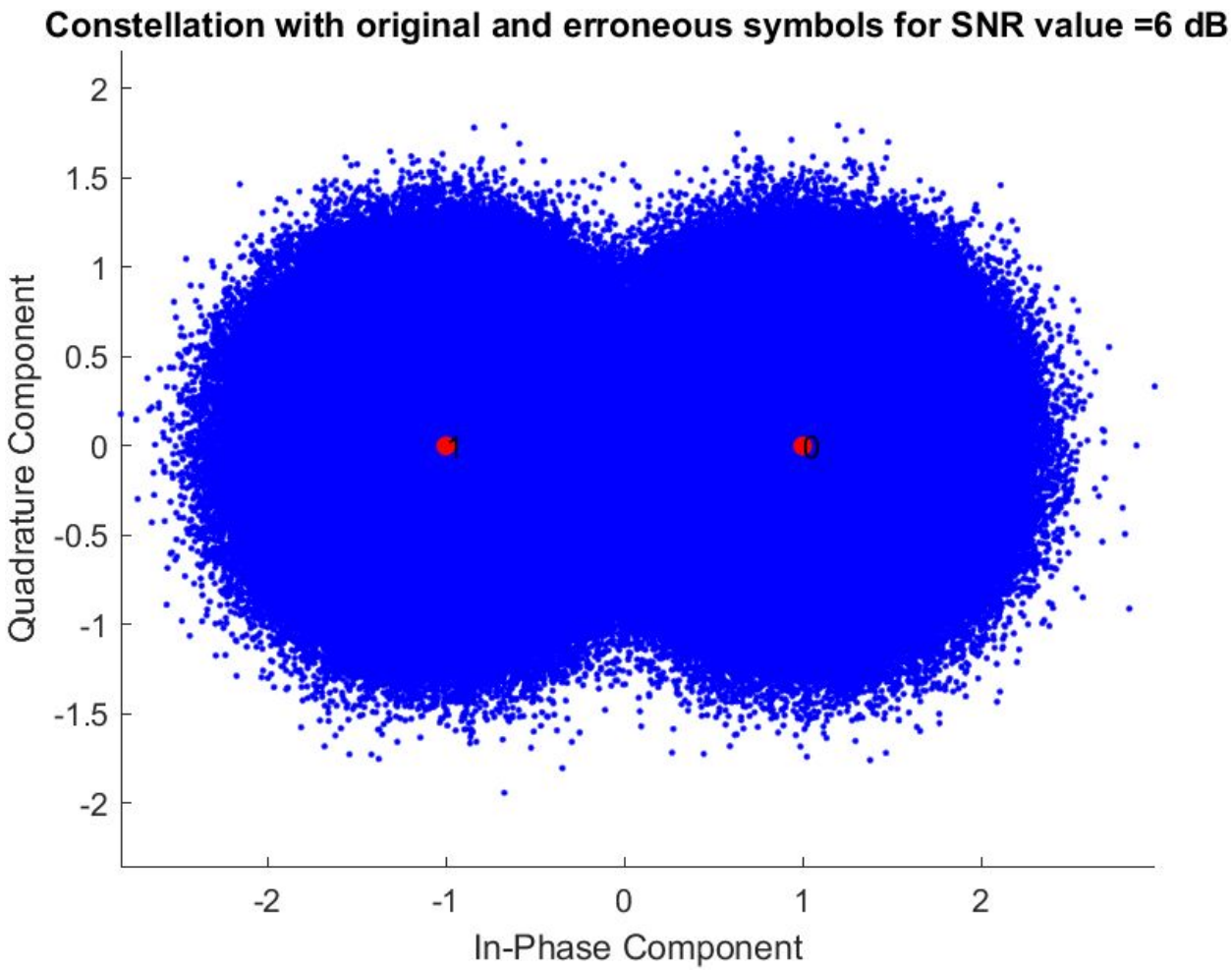

Constellation with original and erroneous symbols for SNR value =1 dB
Quadrature Component
In-Phase Component
3
2
1
0
-1
-2
-3
-4
-3
-2
-1
0
1
2
3
4
1
0

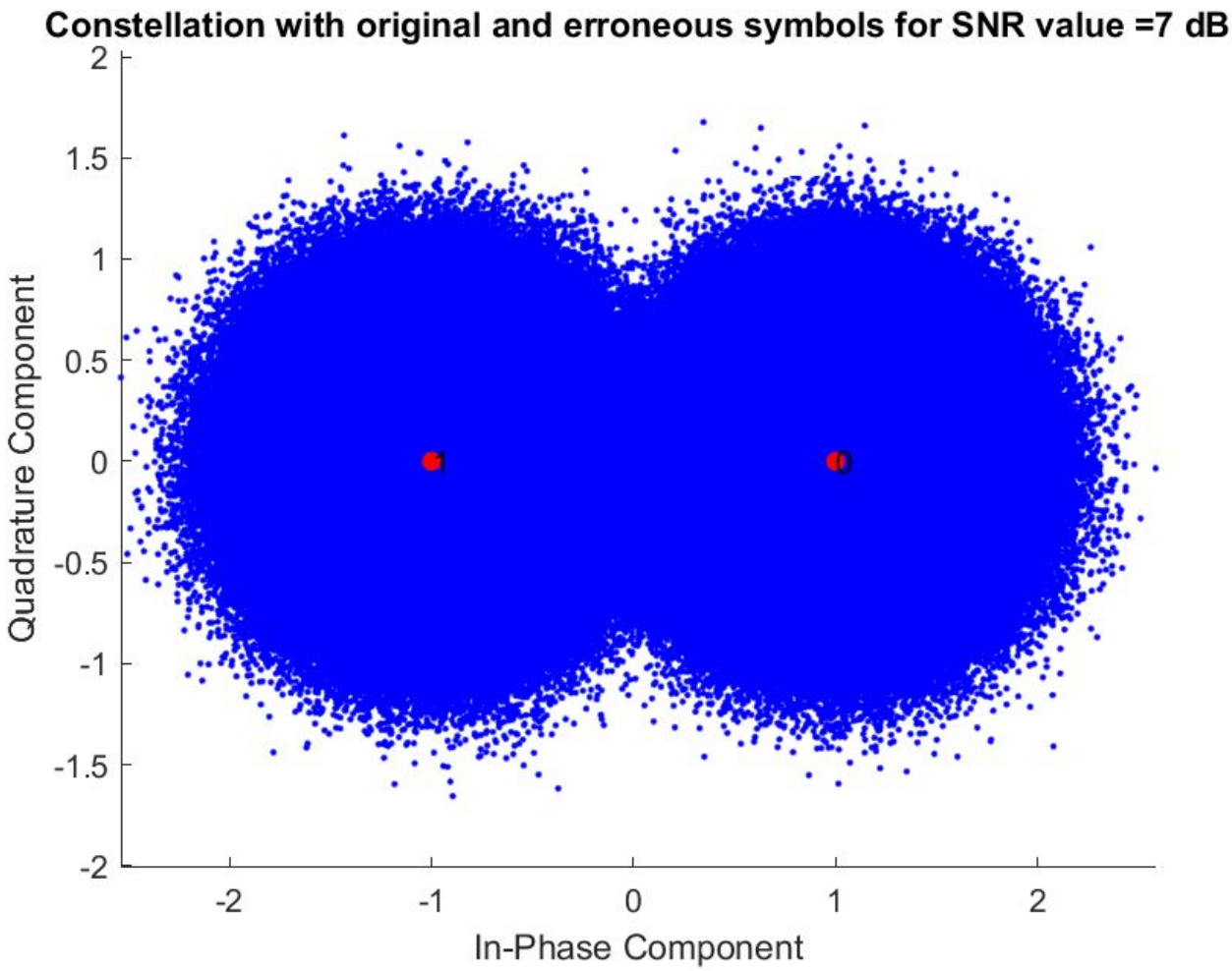

Constellation with original and erroneous symbols for SNR value =2 dB
Quadrature Component
In-Phase Component
1
0
2
1
0
-1
-2
-3
-3
-2
-1
0
1
2
3

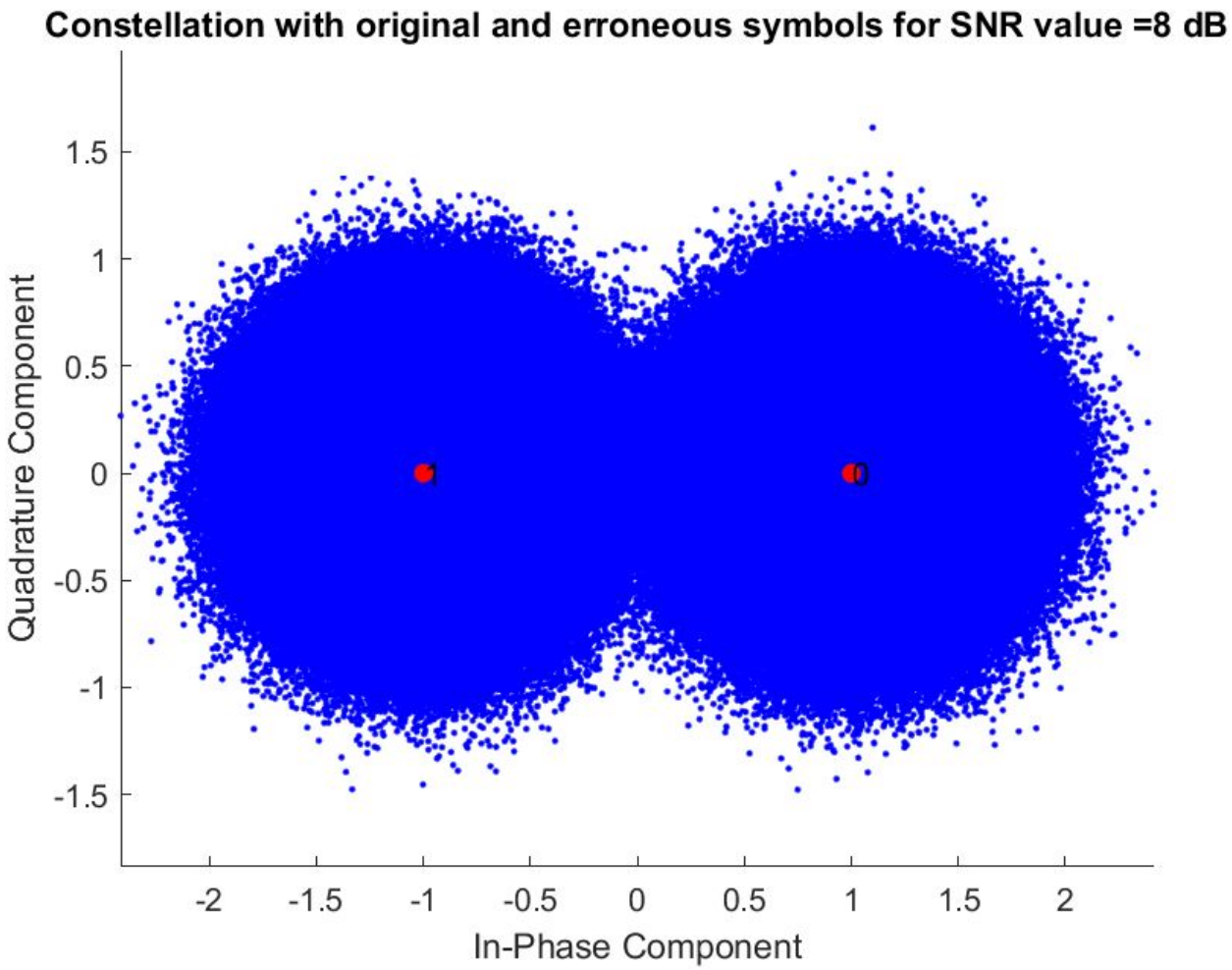

Constellation with original and erroneous symbols for SNR value =3 dB
Quadrature Component
In-Phase Component
2
1
0
-1
-2
-3
-3
-2
-1
0
1
2
3
1
0

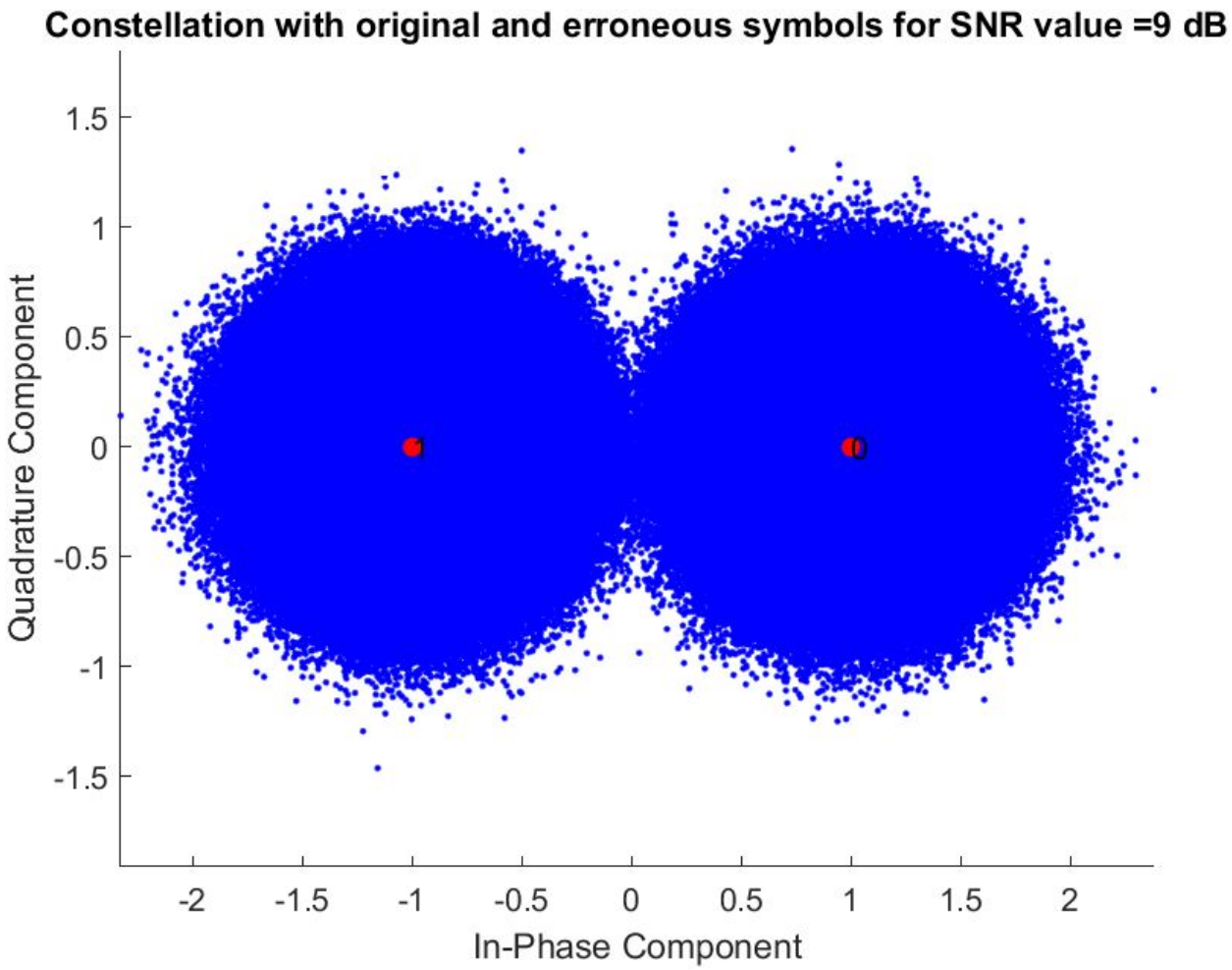

Constellation with original and erroneous symbols for SNR value =4 dB
Quadrature Component
In-Phase Component
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-2
-1
0
1
2
3
1
0

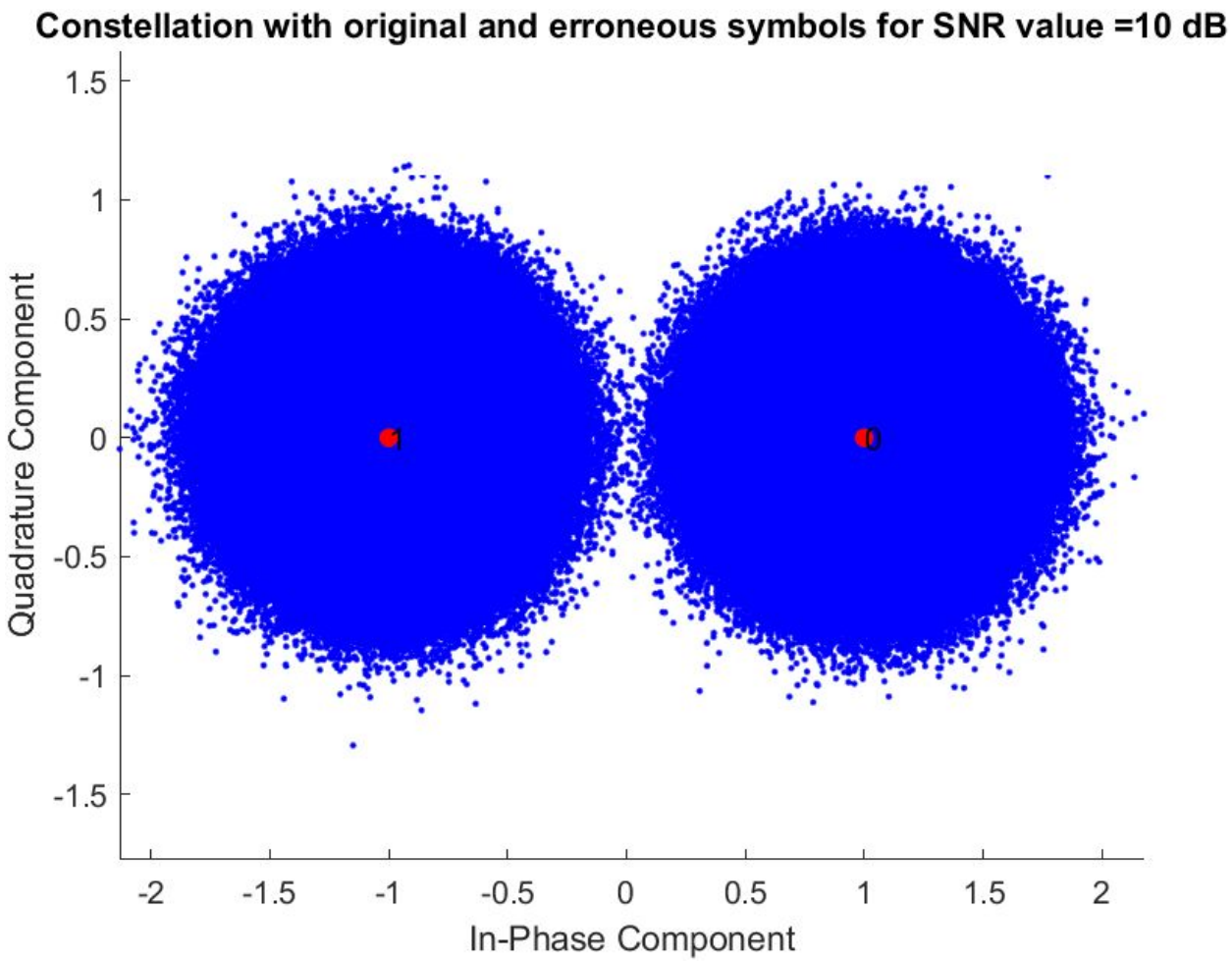

Constellation with original and erroneous symbols for SNR value =5 dB
Quadrature Component
In-Phase Component
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-3
-2
-1
0
1
2
3


Constellation with original and erroneous symbols for SNR value =6 dB
Quadrature Component
In-Phase Component
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2
-1
0
1
2

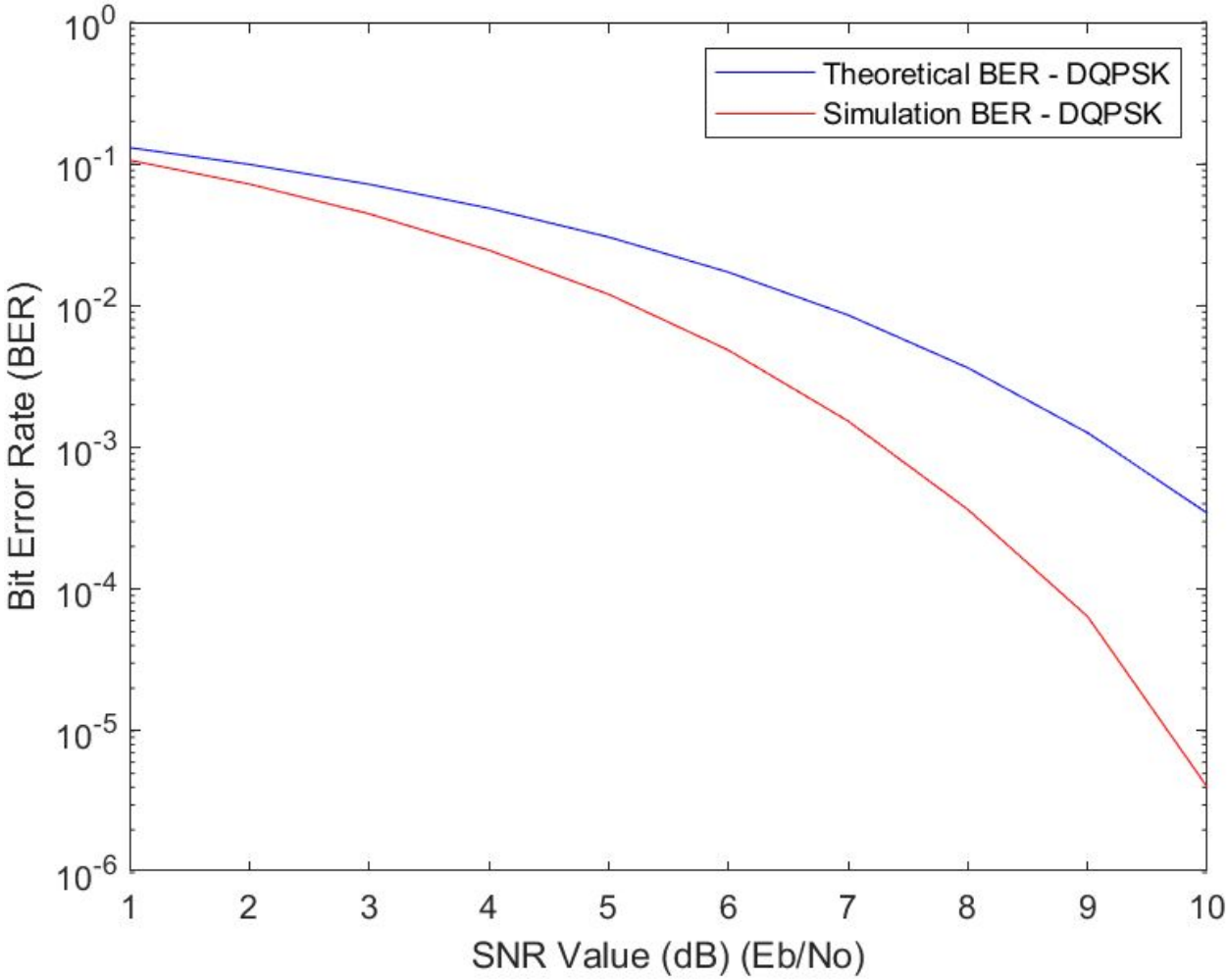

Constellation with original and erroneous symbols for SNR value =7 dB
Quadrature Component
In-Phase Component
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2
-1
0
1
2
1
0

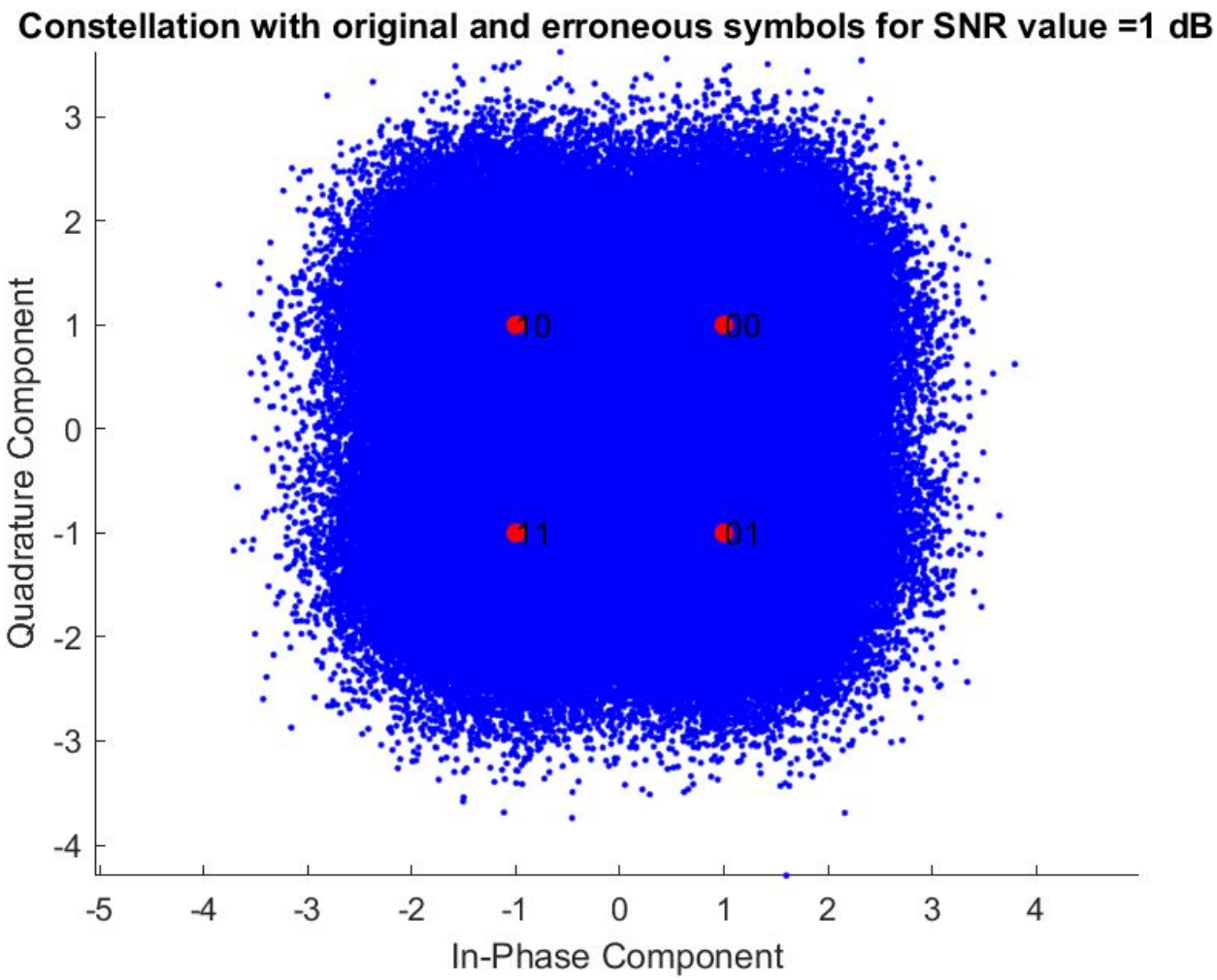

Constellation with original and erroneous symbols for SNR value =8 dB
Quadrature Component
In-Phase Component
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
1
0

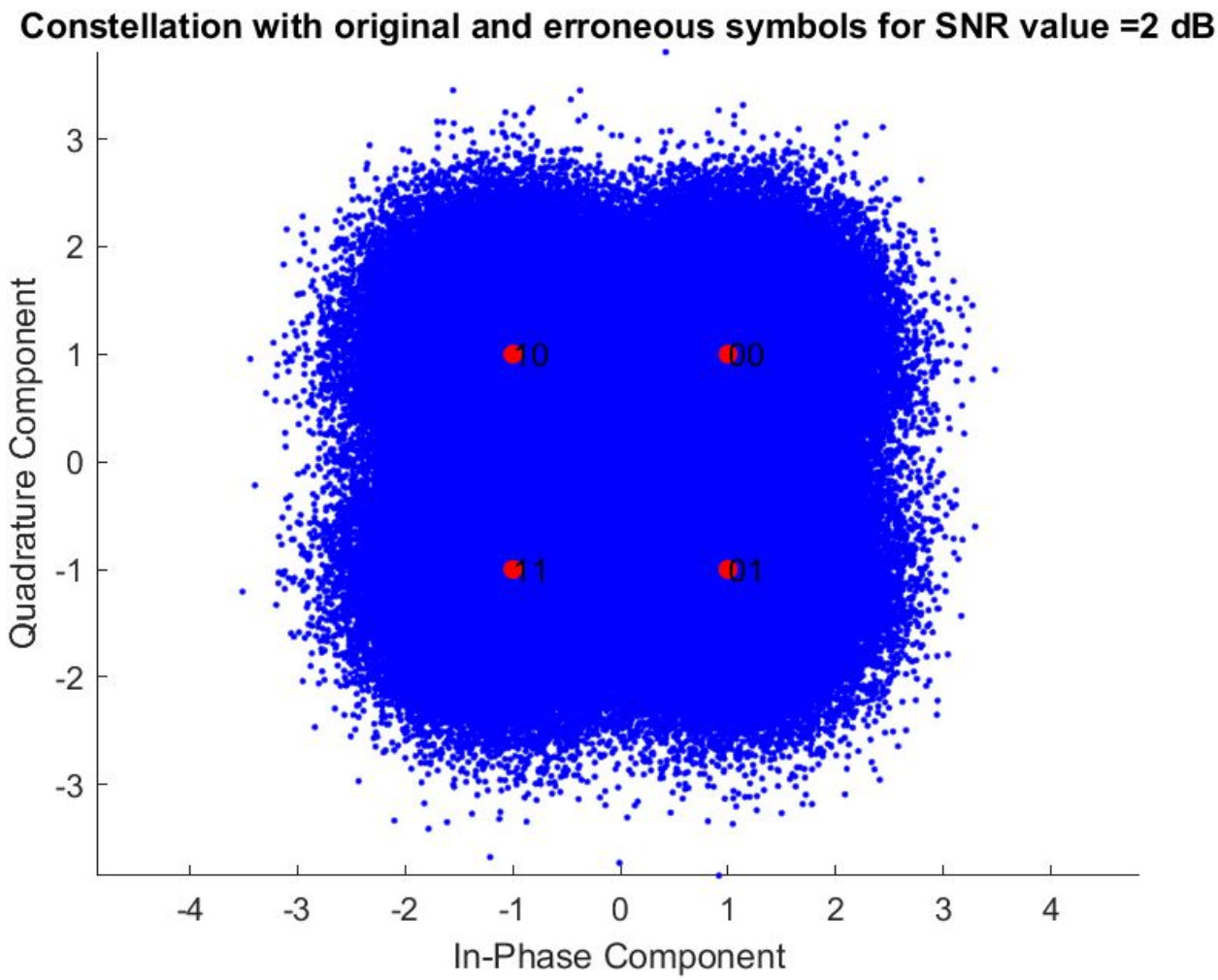

Constellation with original and erroneous symbols for SNR value =9 dB
Quadrature Component
In-Phase Component
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2

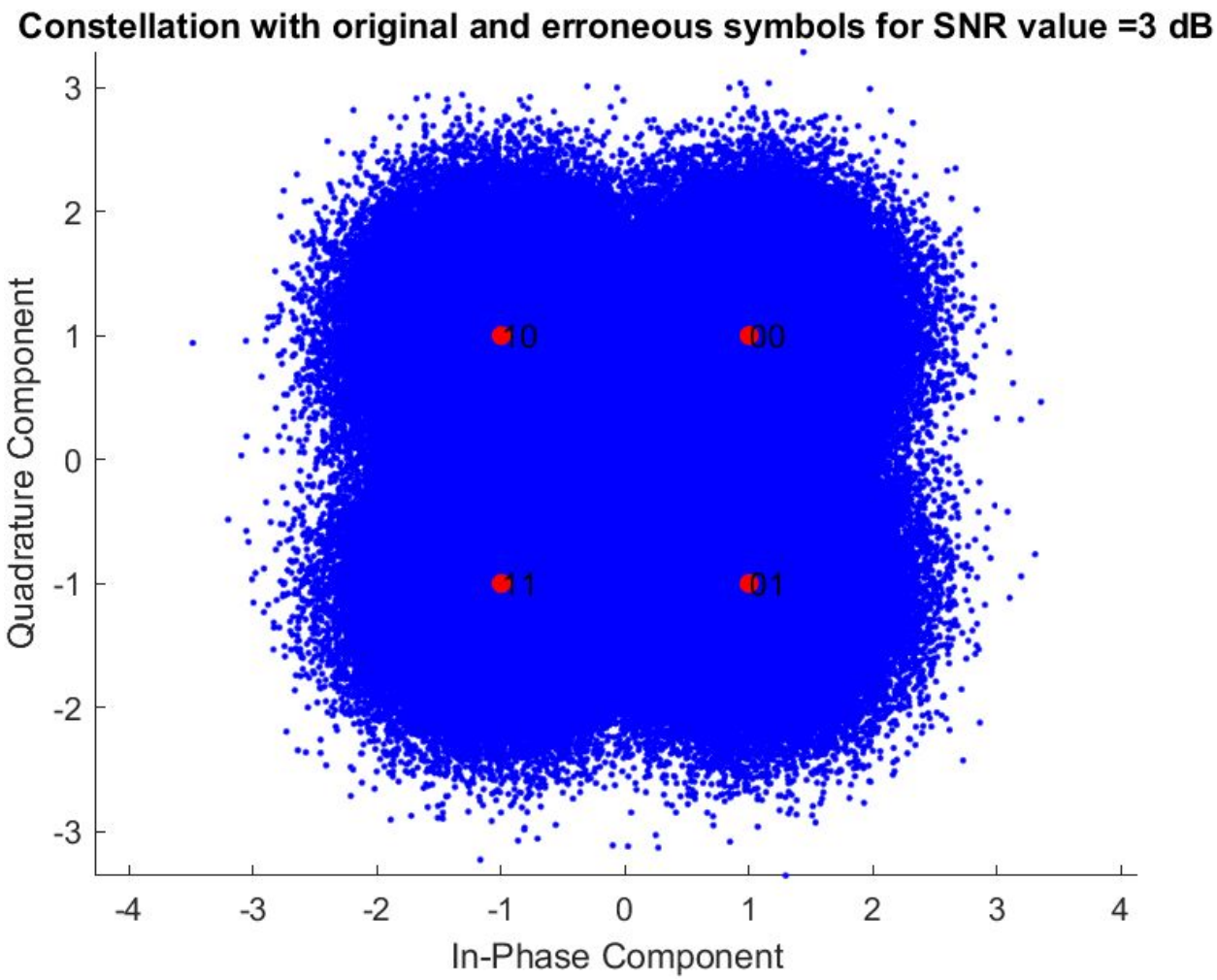


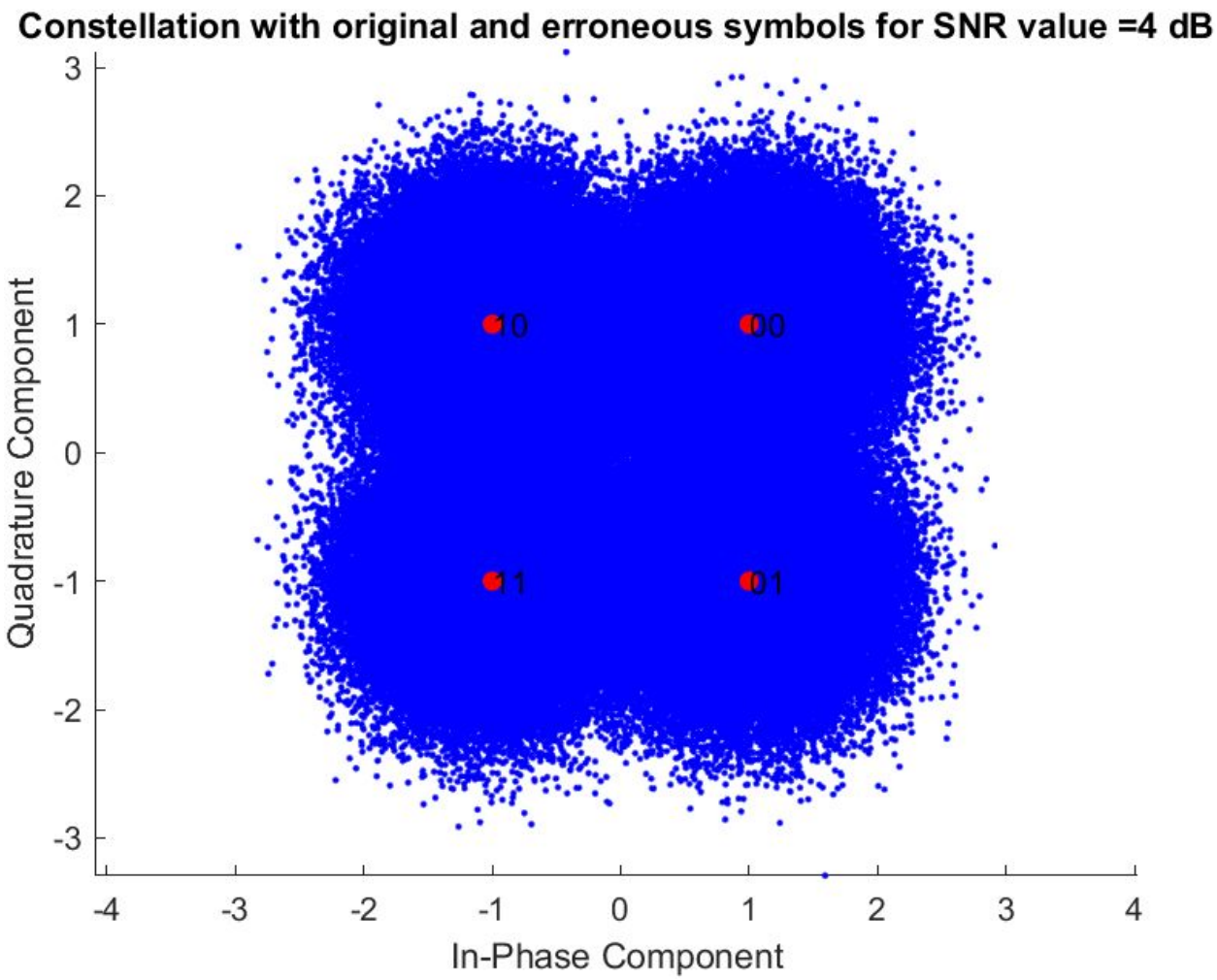
2. Differential QPSK Simulation

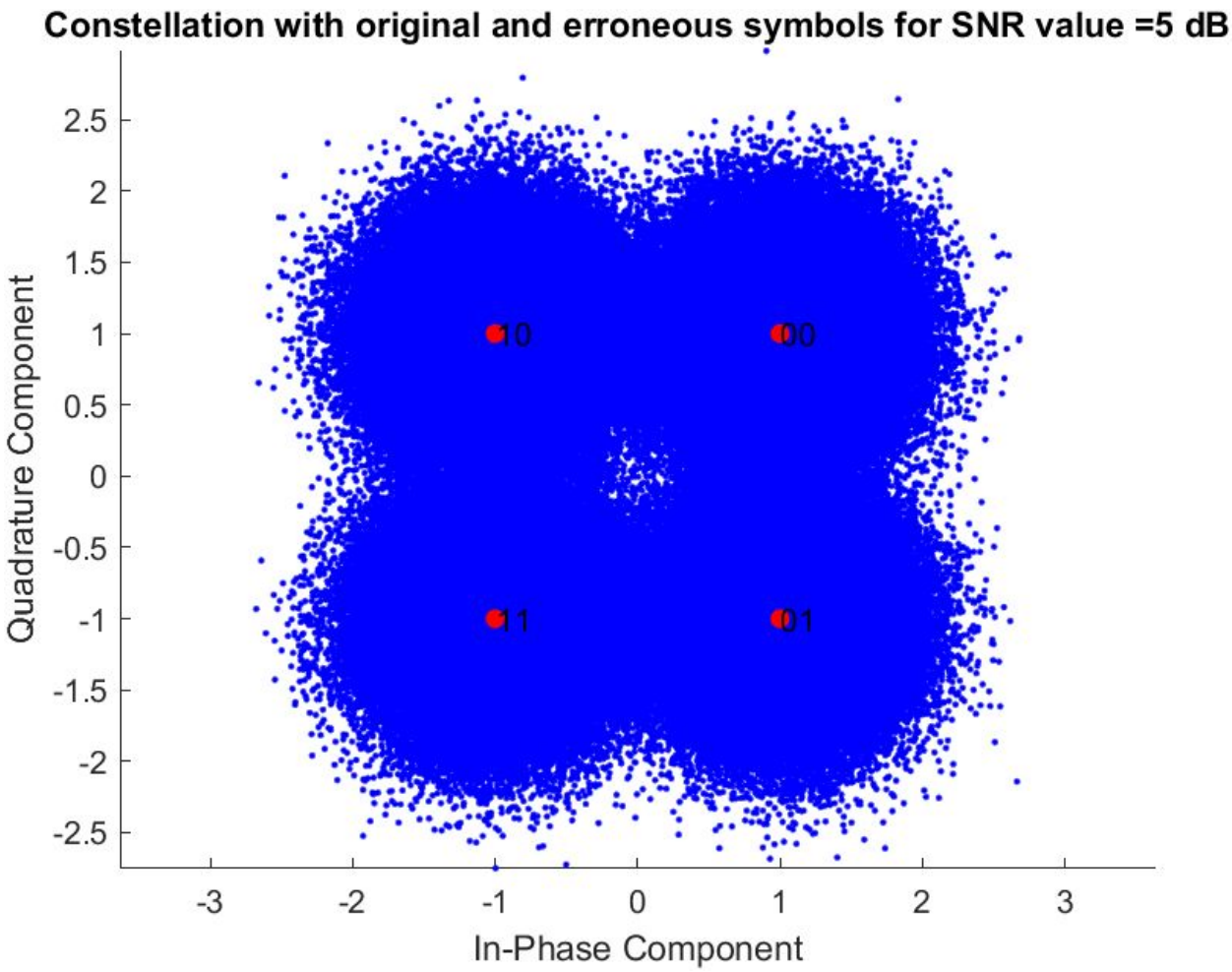

Theoretical BER - DQPSK
Simulation BER - DQPSK
Bit Error Rate (BER)
SNR Value (dB) (Eb/No)
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
1
2
3
4
5
6
7
8
9
10

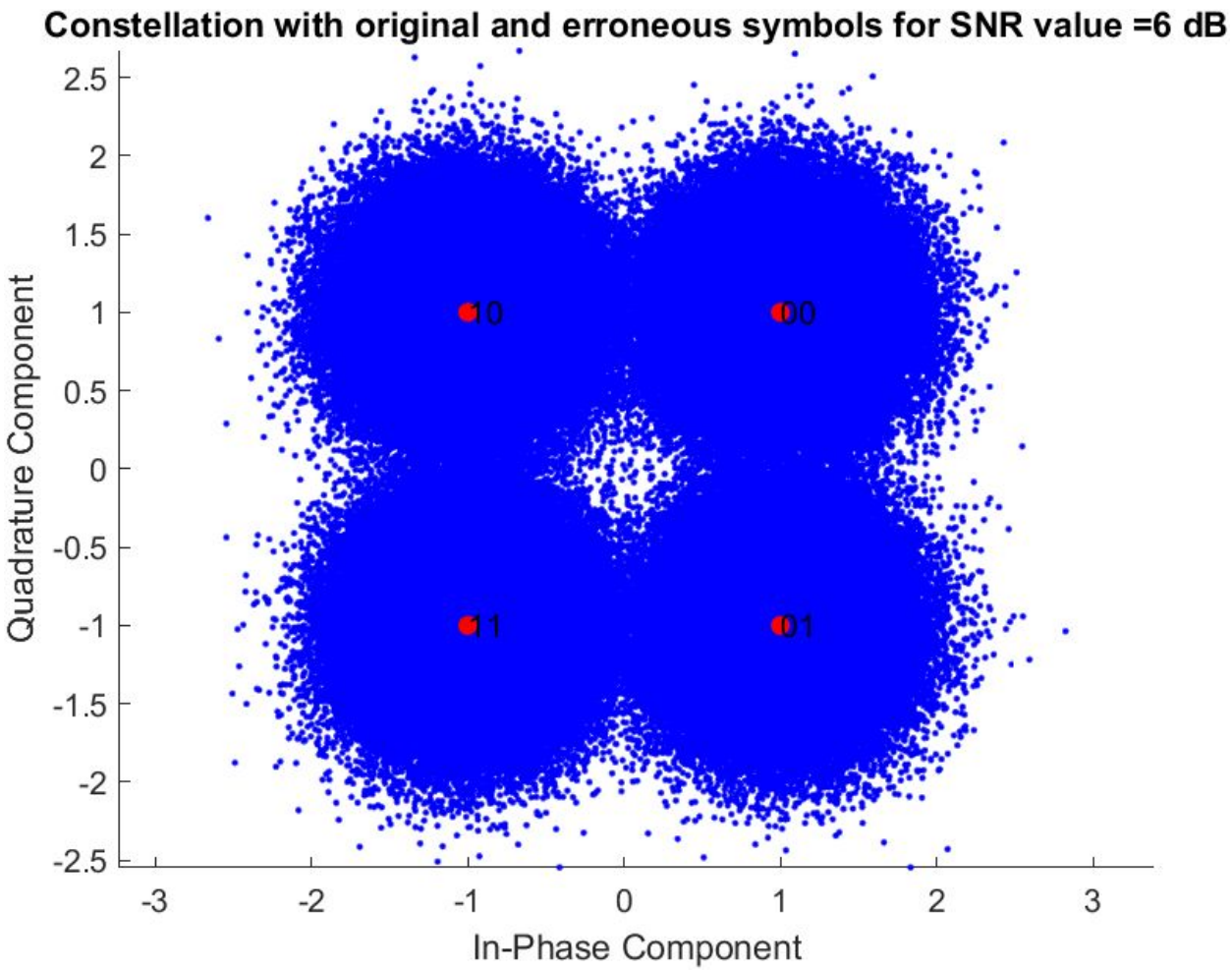

Constellation with original and erroneous symbols for SNR value =1 dB
Quadrature Component
In-Phase Component
10
00
11
01
3
2
1
0
-1
-2
-3
-4
-5
-4
-3
-2
-1
0
1
2
3
4

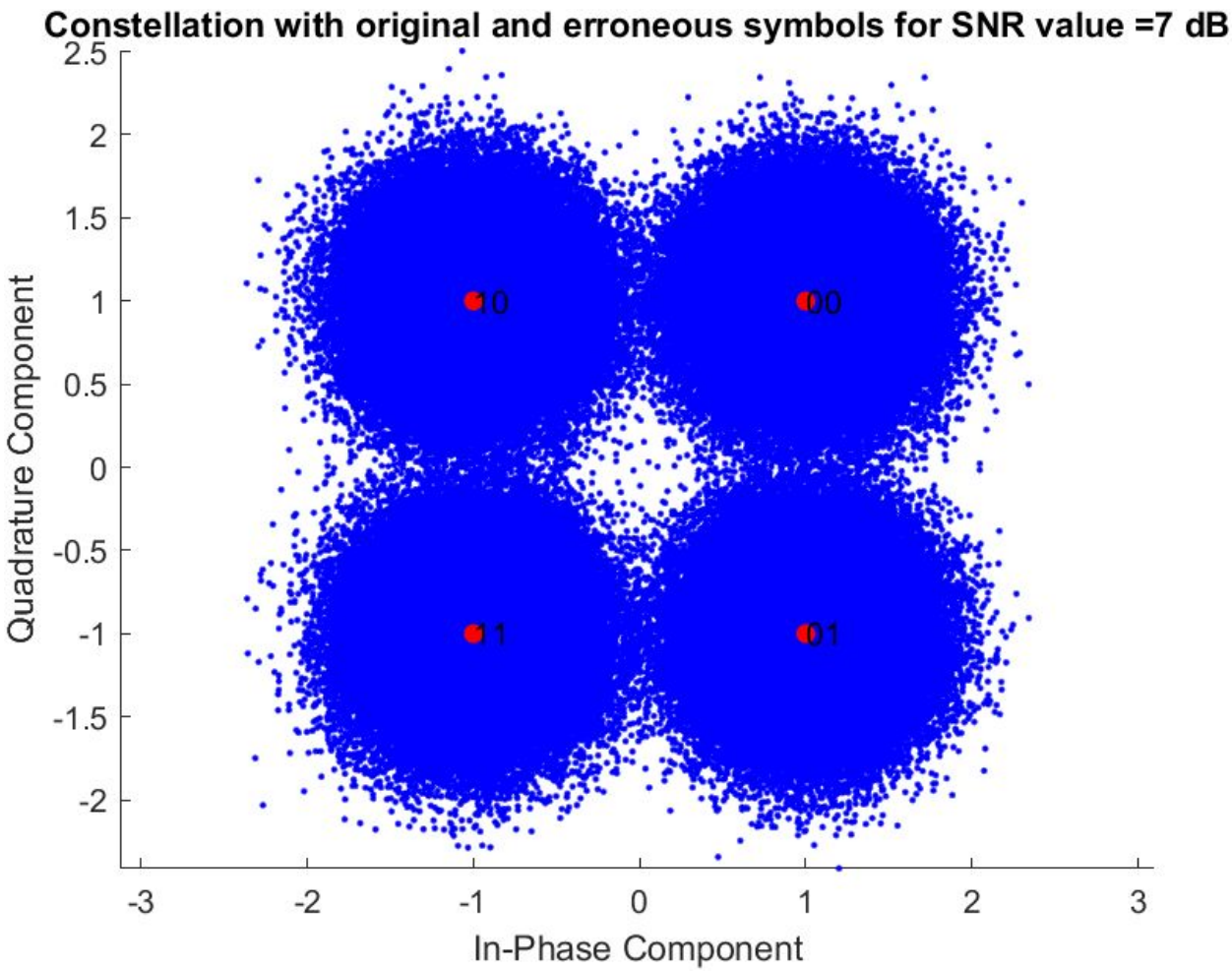

Constellation with original and erroneous symbols for SNR value =2 dB
Quadrature Component
In-Phase Component
10
00
11
01
3
2
1
0
-1
-2
-3
-4
-3
-2
-1
0
1
2
3
4

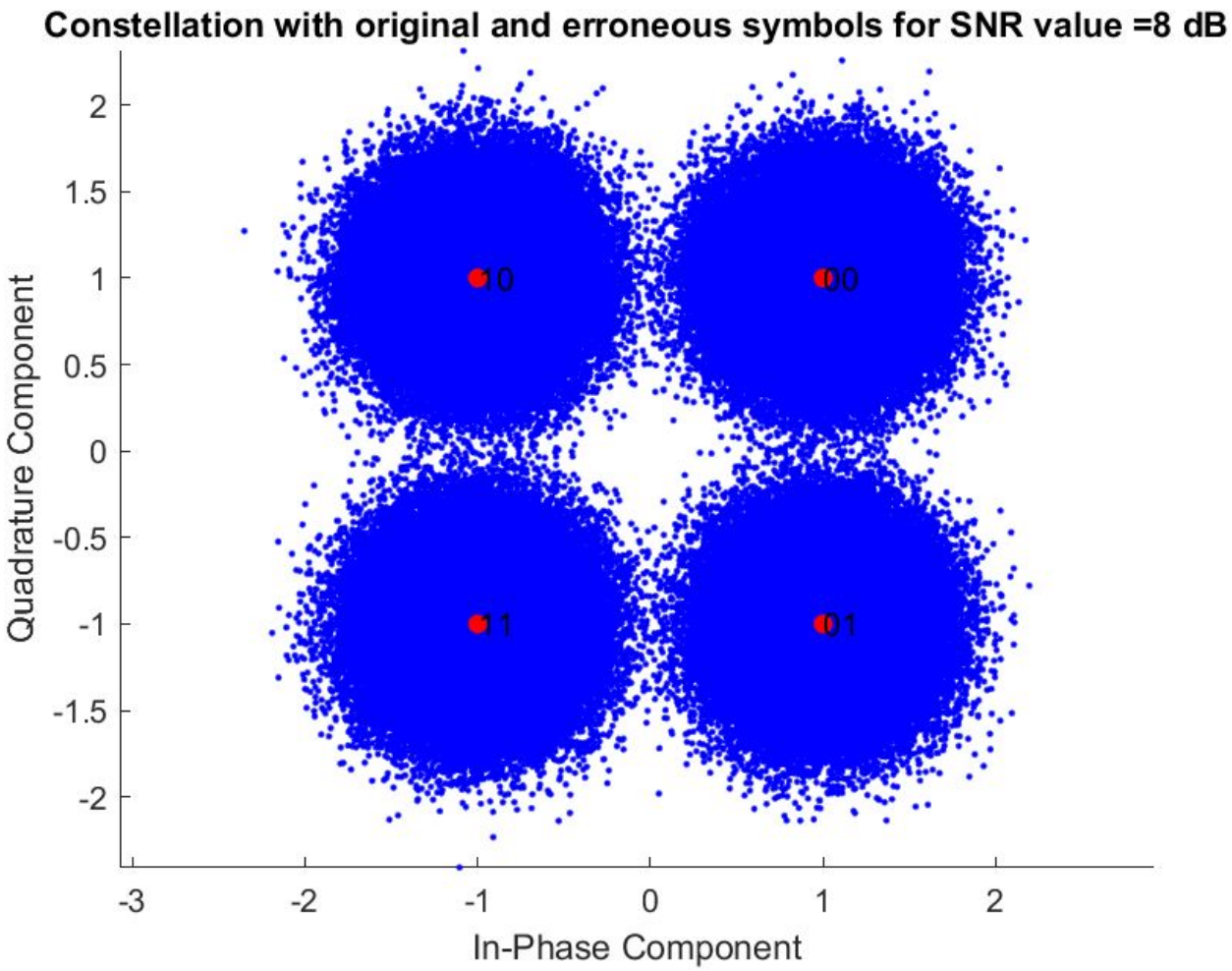

Constellation with original and erroneous symbols for SNR value =3 dB
Quadrature Component
In-Phase Component
10
00
11
01
3
2
1
0
-1
-2
-3
-4
-3
-2
-1
0
1
2
3
4

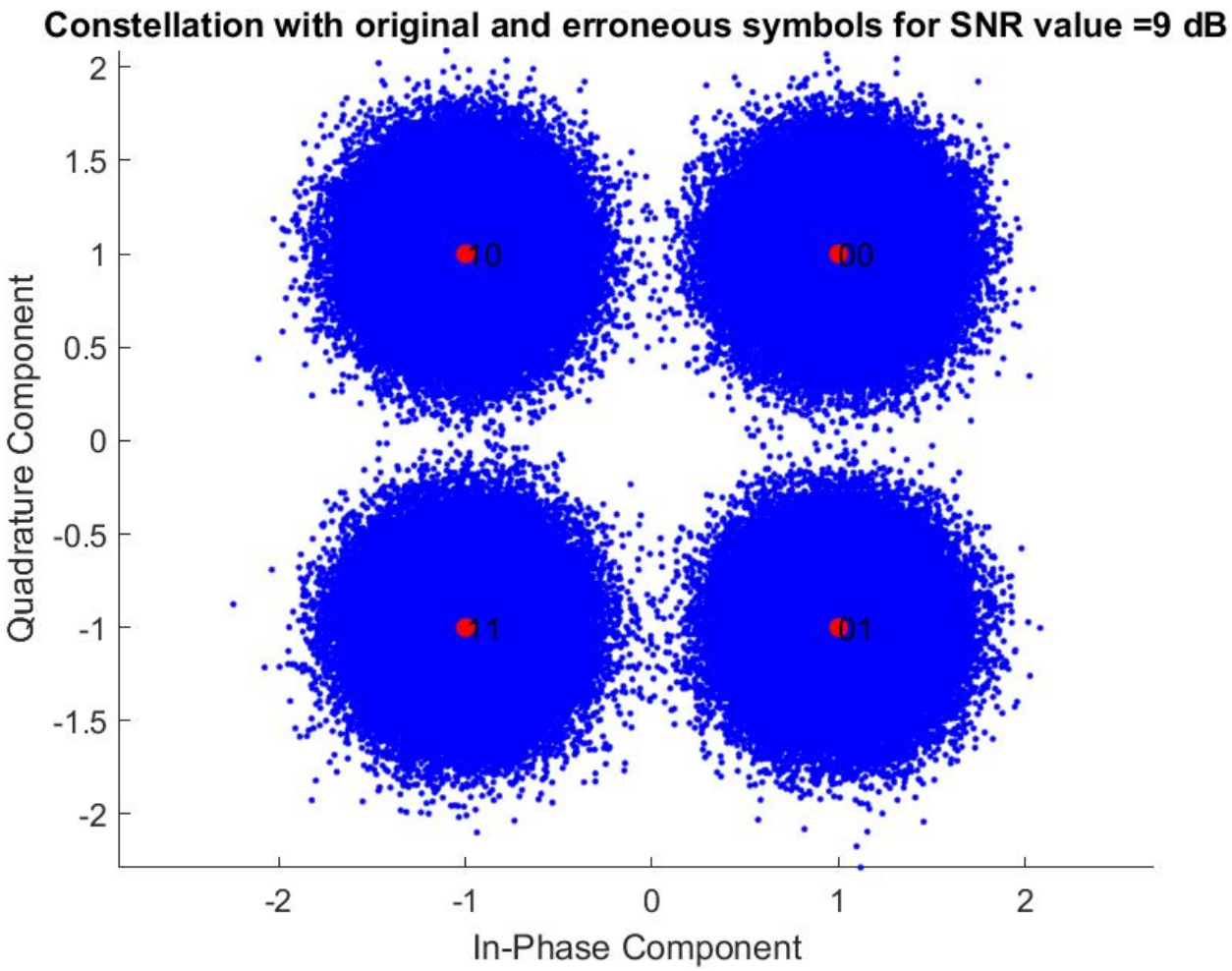

Constellation with original and erroneous symbols for SNR value =4 dB
Quadrature Component
In-Phase Component
10
00
11
01
3
2
1
0
-1
-2
-3
-4
-3
-2
-1
0
1
2
3
4

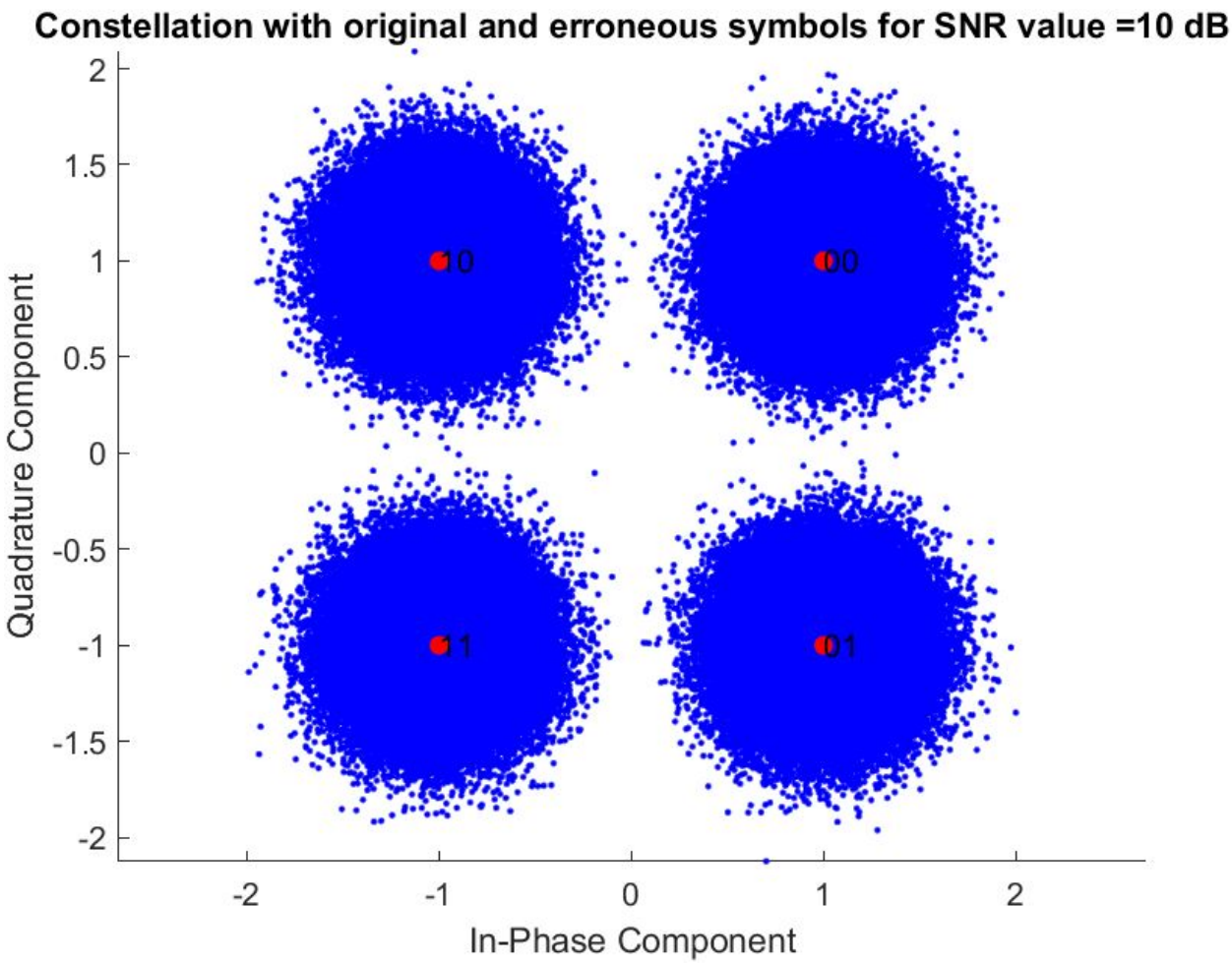

Constellation with original and erroneous symbols for SNR value =5 dB
Quadrature Component
In-Phase Component
10
00
11
01
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-2
-1
0
1
2
3


Constellation with original and erroneous symbols for SNR value =6 dB
Quadrature Component
In-Phase Component
10
00
11
01
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-2
-1
0
1
2
3


Constellation with original and erroneous symbols for SNR value =7 dB
Quadrature Component
In-Phase Component
10
00
11
01
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-3
-2
-1
0
1
2
3


Constellation with original and erroneous symbols for SNR value =8 dB
Quadrature Component
In-Phase Component
10
00
11
01
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-3
-2
-1
0
1
2


Constellation with original and erroneous symbols for SNR value =9 dB
Quadrature Component
In-Phase Component
10
00
11
01
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2
-1
0
1
2


Constellation with original and erroneous symbols for SNR value =10 dB
Quadrature Component
In-Phase Component
10
00
11
01
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2
-1
0
1
2