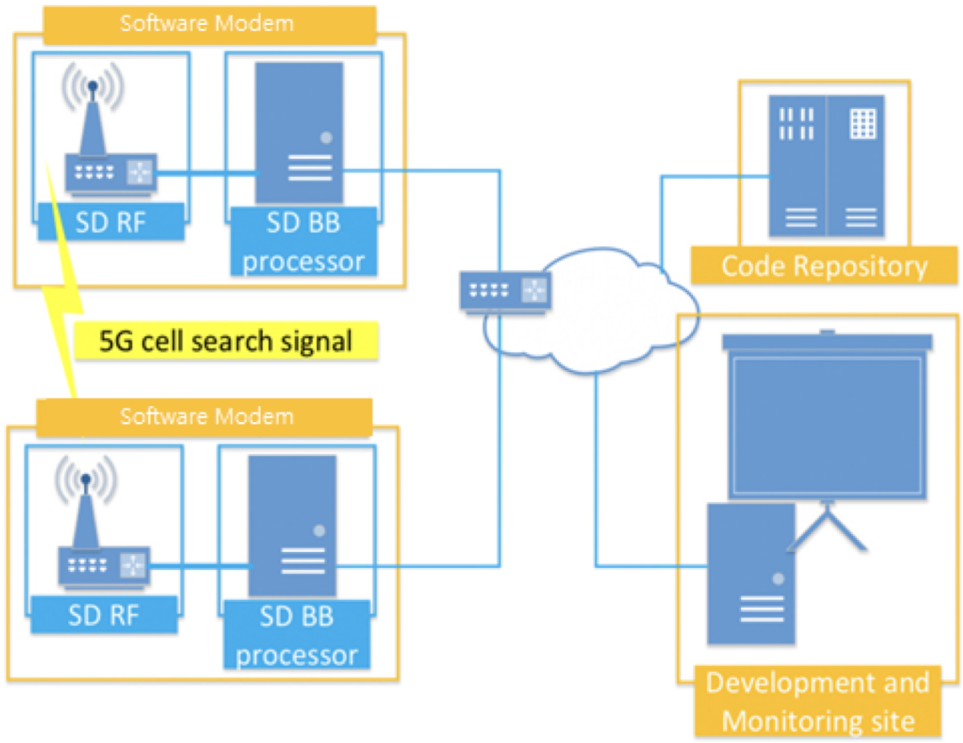
시공간 선 부호 송수신 구현을 위한 소프트웨어 모뎀 기반 시분할 이중 통신 되먹임 채널 설계

발표자 : 유제인
저자 : 유제인1, 김상은1, 정진곤2, 김주엽*

목차

1. 서론

1.1 실험 환경

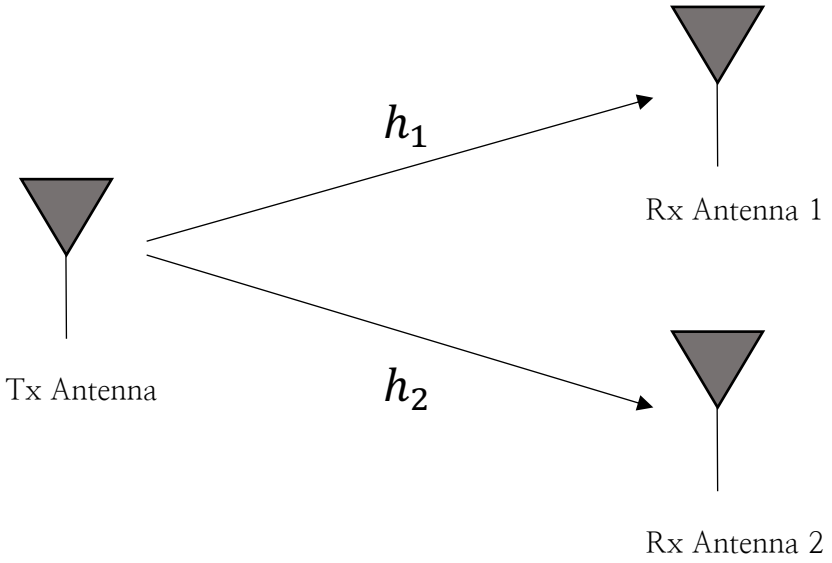

Software Modem
SD RF
SD BB processor
5G cell search signal
Software Modem
SD RF
SD BB processor
Code Repository
Development and Monitoring site


RX ANT1
RX ANT2
TX ANT1

1. 서론

1.1 STLC 알고리즘

$$s_2 = h_2^* x_1^* - h_1^* x_2$$
$$s_1 = h_1^* x_1 + h_2^* x_2^*$$



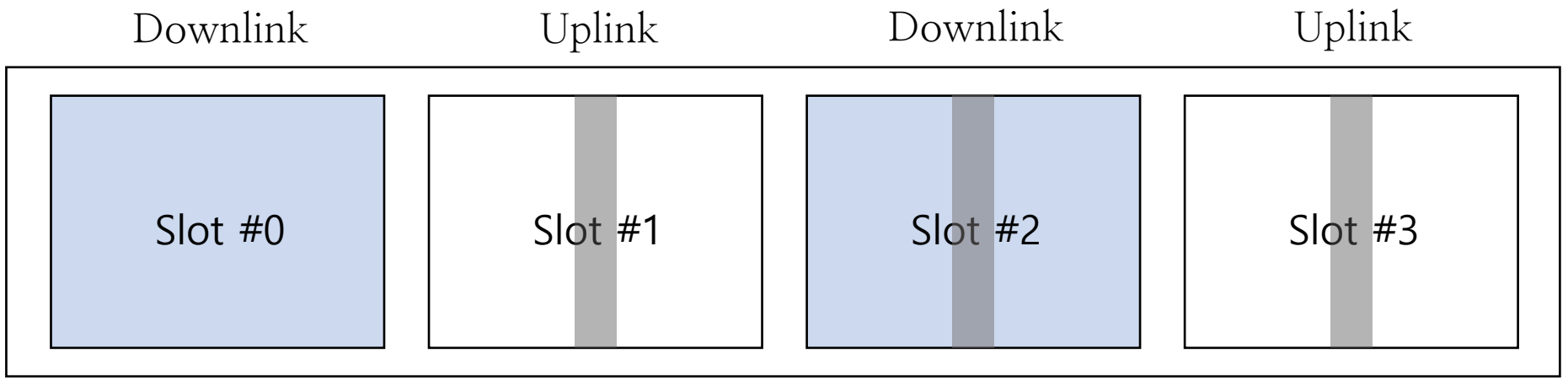
$$\begin{bmatrix} r_{1,1} & r_{1,2} \\ r_{2,1} & r_{2,2} \end{bmatrix} = \begin{bmatrix} h_1 \\ h_2 \end{bmatrix} \frac{1}{\sqrt{\gamma_2}} \begin{bmatrix} s_1 & s_2 \end{bmatrix} + \begin{bmatrix} z_{1,1} & z_{1,2} \\ z_{2,1} & z_{2,2} \end{bmatrix}$$

$$r_{1,1} + r_{2,2}^* = \sqrt{\gamma_2} x_1 + z_{1,1} + z_{2,2}^*$$
$$r_{2,1}^* - r_{1,2} = \sqrt{\gamma_2} x_2 + z_{2,1}^* - z_{1,2}$$

2.1 프레임 구조 설계

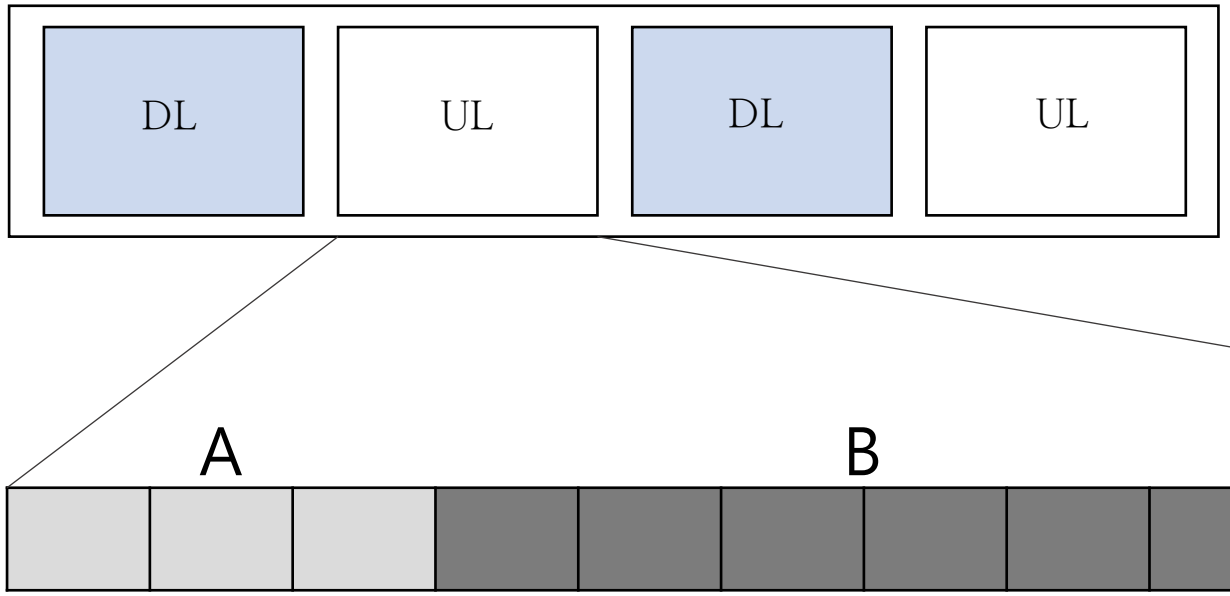
Insert Preamble for Synchronization

DL : Slot #2, Symbol #6
UL : Slot #1 & 3, Symbol #6



1 Frame = 4 slot, 1 slot = 14symbol, 1 Symbol = 1024

2.2 RF state handler

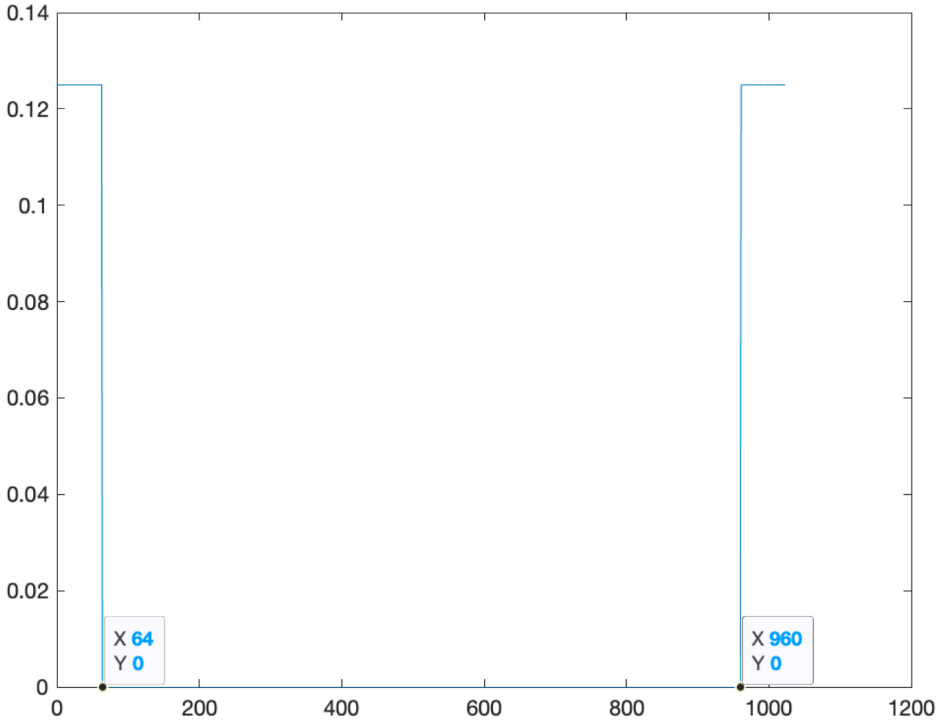


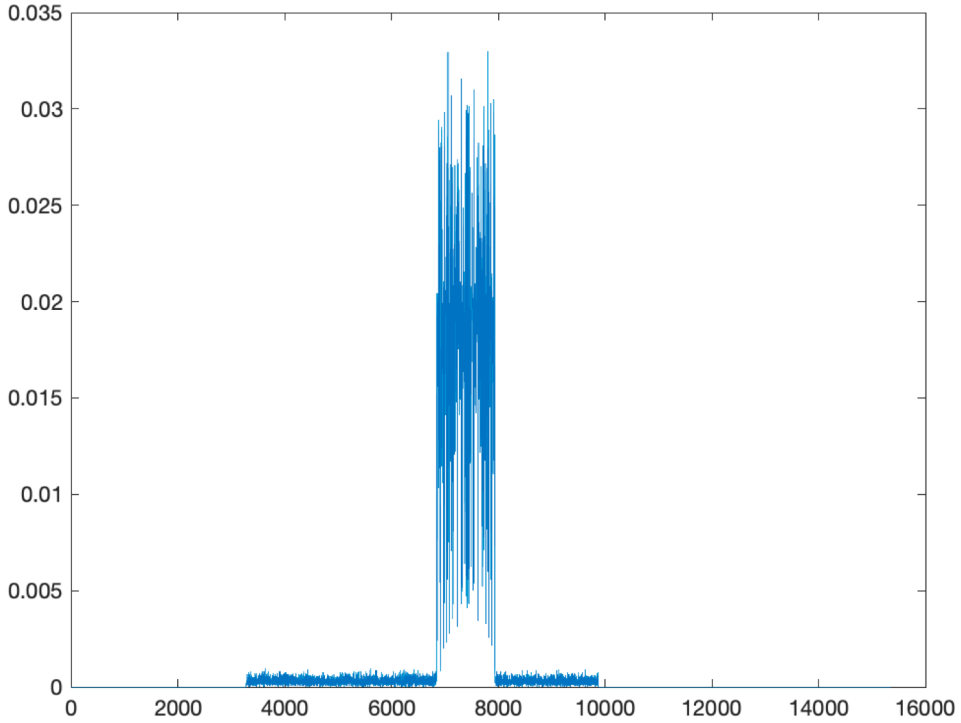
A. Changing USRP state
B. Reading received data
C. Modulation, scheduling and USRP send margin

A + B + C must be completed under 1ms

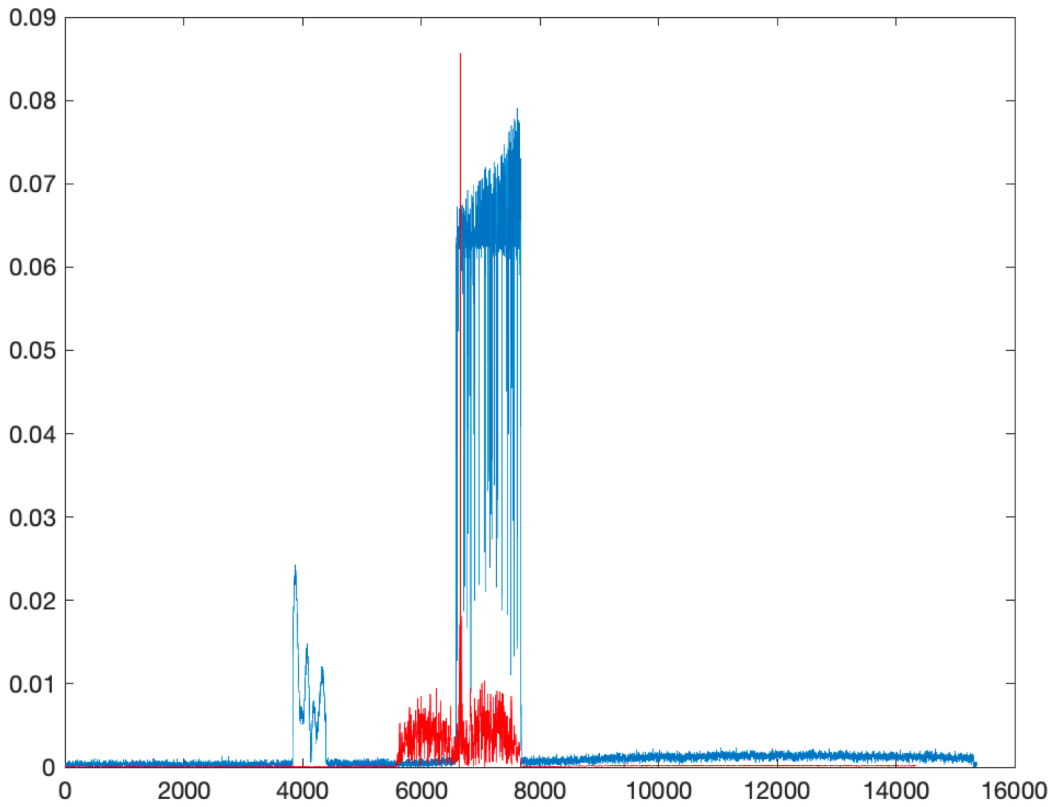
2.3 프리앰블 삽입 알고리즘

FFTSize = 1024
Preamble length = 128

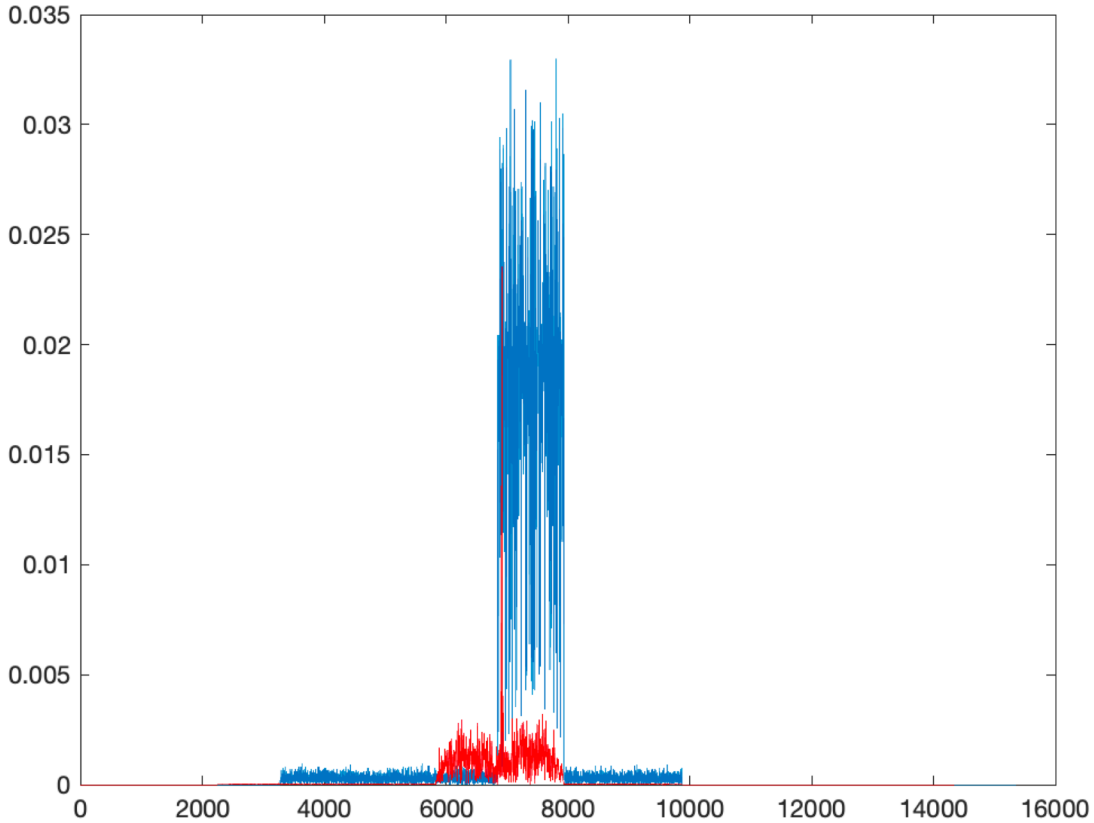




2.3 프리앰블 검출 알고리즘



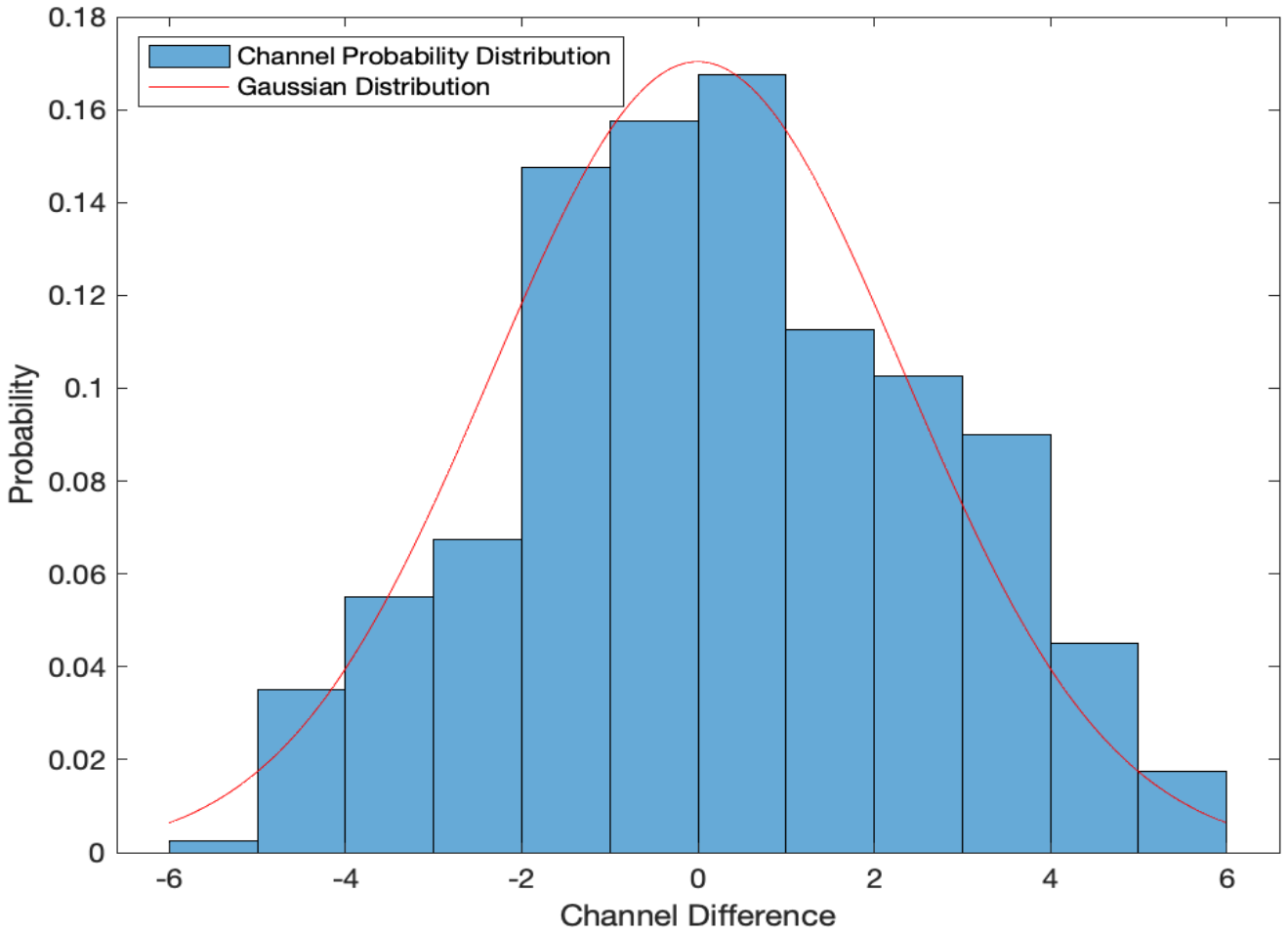
DL (Slot #2)



UL (Slot #3)

3. 결론

3.1 실험 결론 및 분석



평균 :0.2767
표준편차 : 2.3425
표본 : 400

THANK YOU!