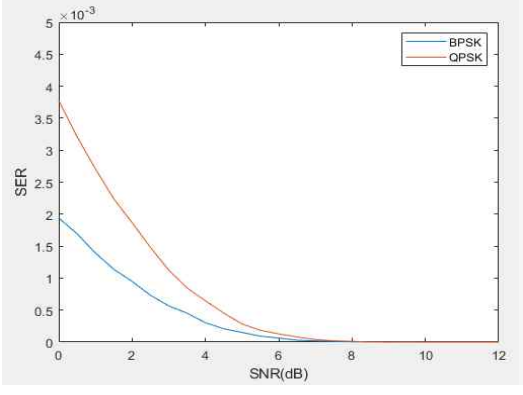
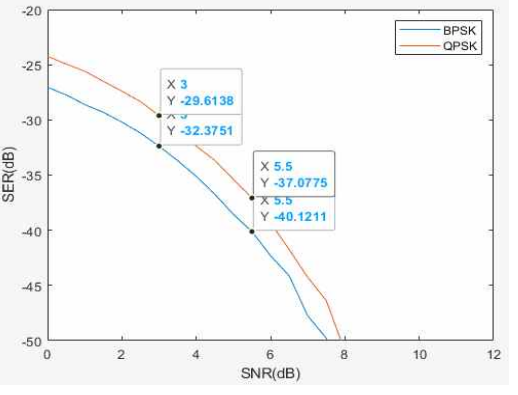
Module 3(Link level + Channel Simulator)

1조 박준모
박지원
윤철훈

SNR 대비 SER 그래프 -AWGN



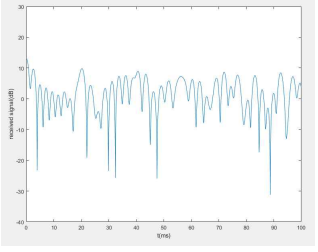
Normal scale



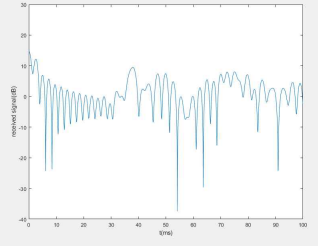
dB scale

Jakes Fading Simulator

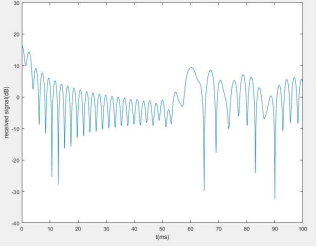
Vehicle speed = 60 km/h
Frequency = 2.4 GHz



N = 7



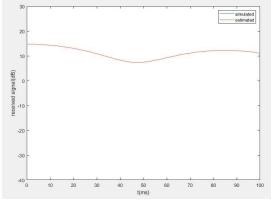
N = 13



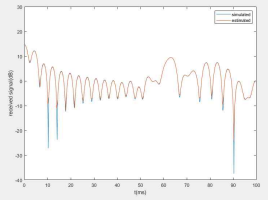
N = 21

Jakes Fading Simulator

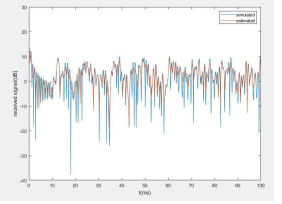
N = 13
Frequency = 2.4 GHz



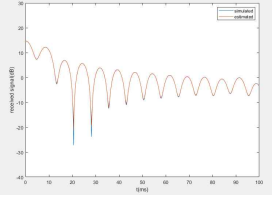
3 Km/h



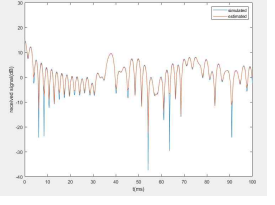
60 Km/h



300 Km/h



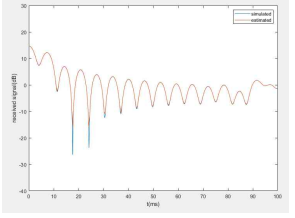
30 Km/h



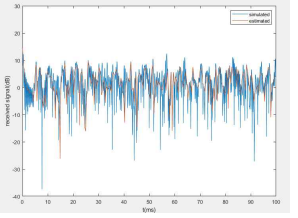
100 Km/h

Jakes Fading Simulator

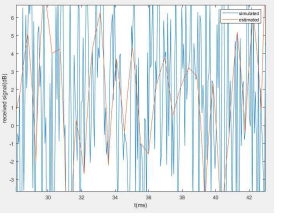
N = 13
Frequency = 28 GHz



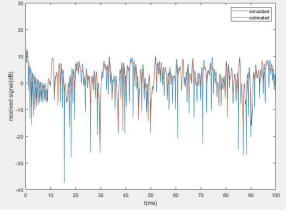
3 Km/h



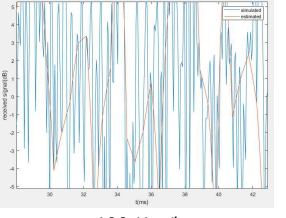
60 Km/h



300 Km/h



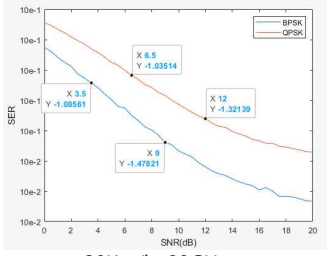
30 Km/h



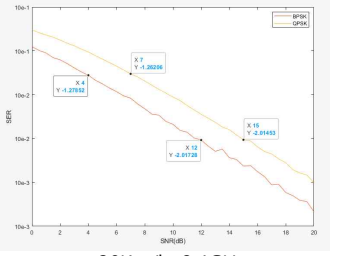
100 Km/h

SNR 대비 SER 그래프 in Jakes case

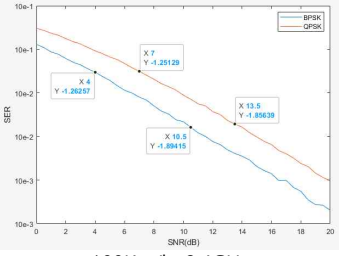
BPSK vs QPSK



30Km/h, 28GHz

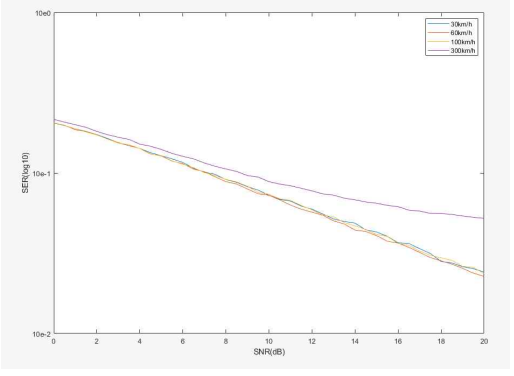


30Km/h, 2.4GHz



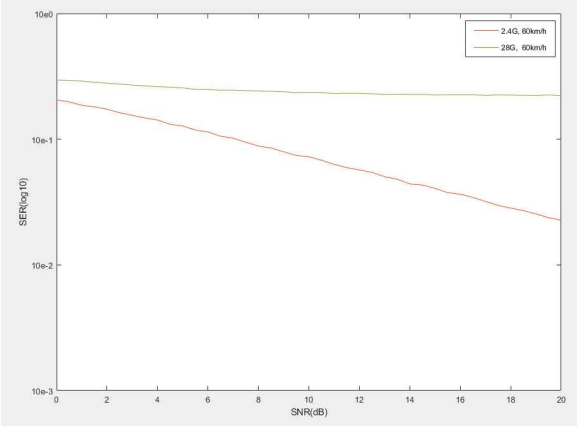
100Km/h, 2.4GHz

SNR 대비 SER 그래프 in Jakes case (속도)



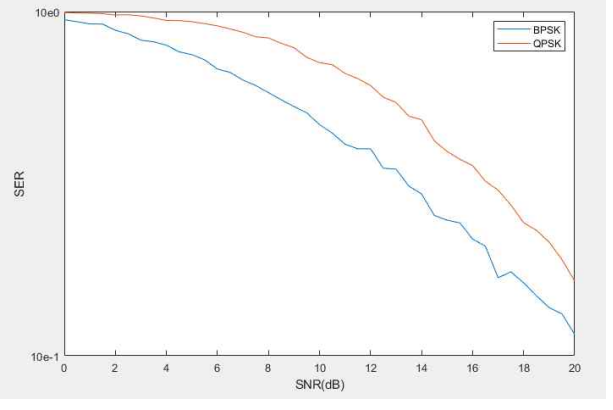
N = 13
Frequency = 2.4 GHz

SNR 대비 SER 그래프 in Jakes case (주파수)

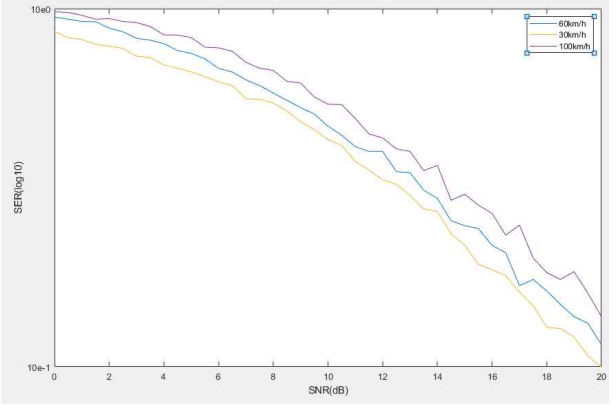


N = 13
Velocity = 60Km/h

SNR 대비 **FER** 그래프 in Jakes case

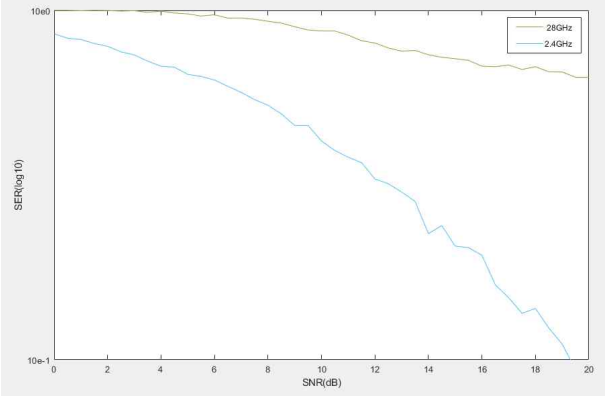


SNR 대비 **FER** 그래프 in Jakes case (속도)



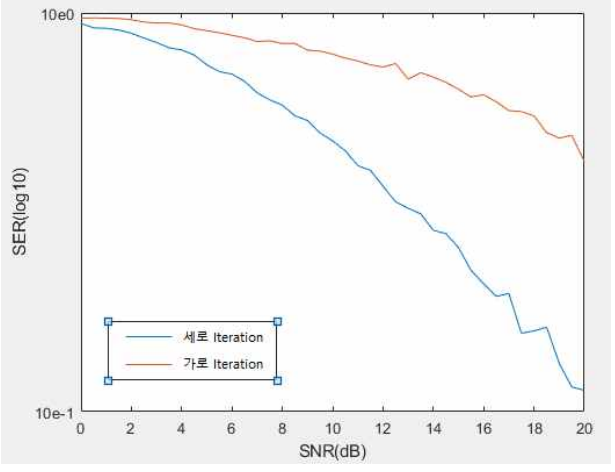
N = 13
Frequency = 2.4 GHz

SNR 대비 **FER** 그래프 in Jakes case (주파수)



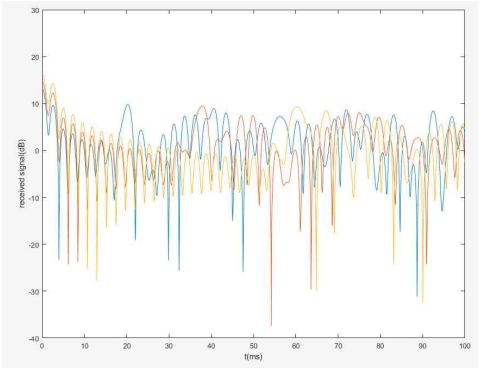
N = 13
Velocity = 60Km/h

SNR 대비 **FER** 그래프 in Jakes case 에러 분산

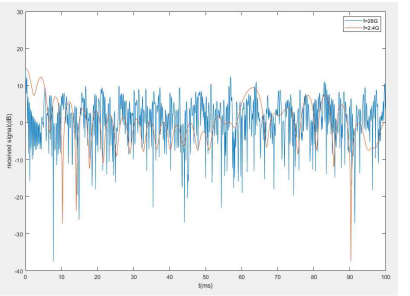


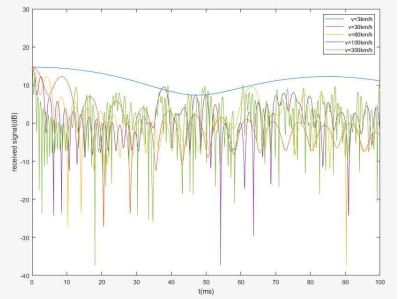
N = 13
Velocity = 60Km/h
Frequency = 2.4GHHz

나머지 비교 그래프



N, Velocity, Frequecy에 따른
주파수 비교





결론

- AWGN에서 SNR대비 SER 그래프는 QPSK가 두배 더 크다. (Error Rate)
  - QPSK에 크기를 곱해 3dB차이가 생김.

- Jakes fading 의 선형보간 그래프의 경우 2.4G에서는 300km/h 이상에서, 28G에서는 60km/h 이상에서 제대로 선형보간이 되지 않아 송신 파워가 올라감에도 error rate가 줄지 않는 것을 알 수 있다.

- FER 그래프의 경우 7*14의 벡터를 세로 순서로 fading을 적용하는 것이 아니라 벡터를 전치하여 가로 순서로 fading을 적용하면서 에러를 분산시켰고, 그로 인해 hamming code의 에러 복구 확률이 올라갔다.