ABSTRACT

OFDM Numerology is one of the features that distinguishes between LTE technology and 5G NR technology. OFDM Numerology is a set of parameters used in 5G NR communication systems according to user data rate requirements and channel conditions. In addition, 5G NR technology uses Polar Codes as error correction and error detection. Testing is needed to determine the performance characteristics of the 5G NR communication system based on OFDM Numerology provisions by adding Polar Codes, so that the resulting performance is close to real and can be a reference for efficient power requirements in the implementation of 5G NR technology in the future.

This undergraduate thesis conducts a test to determine the performance characteristics of the 5G NR communication system based on OFDM Numerology provisions by adding Polar Codes. This undergraduate thesis simulation uses QPSK modulation and uses soft demapper techniques so that the resulting performance is more optimal. This undergraduate thesis reviews the bit error rate (BER) and frame error rate (FER) parameters. This undergraduate thesis also calculates outage probability with coding rates R = 1 and R = 1/2.

The results of This undergraduate thesis test show that numerology 3 has the same performance characteristics as numerology 4, both uncoded and Polar Codes. The performance of the 5G NR communication system using Polar Codes is better than uncoded.

Keywords—OFDM, Numerology, Polar Codes, BER, FER.