ABSTRACT

Telecommunications technology is experiencing rapid development due to a large number of user requests to obtain high data transfer rates. Therefore, now comes the fifth generation cellular technology or commonly known as (5G) New Radio (NR) which has a data transfer rate of up to 20 Gbps using a high frequency, namely 6 Ghz – 100 Ghz which is included in the high-frequency category so it is sensitive to influences. nature and surroundings. Sensitivity to the environment and high frequency can cause loss of signal and data sent, this can be minimized by channel coding which is expected to meet the need for good, stable, and comprehensive data services for New Radio 5G technology users. This study analyzes Bit Error Rate performance using convolutional codes and polar codes on 5G systems with Statistical Spatial Channel Model (SSCM) channels using a frequency of 26 GHz with a bandwidth of 198 Mhz and using Binary Phase Shift Keying (BPSK) modulation with the Orthogonal Frequency multiplexing concept. Division Multiplexing (OFDM). SSCM channel characteristics are presented in the power delay profile (PDP) representative obtained by 15 paths to represent the power received by the user obtained from the simulation results. The value of the PDP functions in calculating the outage probability. This research will evaluate the performance comparison of bit error rate (BER) using channel coding convolutional codes with channel coding polar codes. The results show that the performance of BER polar codes is better than convolutional codes because it can minimize errors better. At an average BER of 10^{-3}*, the performance of BER convolutional codes requires an SNR of 20 dB while the performance of BER polar codes requires an SNR of 9 dB with a gap between the two of them of 11 dB. At an average BER of* 10^{-4}*, the performance of BER convolutional codes requires an SNR of 25.6 dB while the performance of BER polar codes requires an SNR of 11.5 dB with a gap between the two of them of 14.1 dB. At an average BER of* 10^{-5}*, the performance of BER convolutional codes requires an SNR of 31.5 dB while the performance of BER polar codes requires an SNR of 13.8 dB with a gap between the two of them of 17.7 dB. These results prove that channel coding polar codes at a frequency of 26 GHz can minimize better so that it can improve system performance.*

Keywords:

Bit Error Rate, Convolutional Codes, Polar Codes, Frekuency 26 GHz, 5G.