

ABSTRACT

The evolution of wireless cellular network toward fourth generation (4G) technology allows the enhancement of several features compared with the already existed network. One of those is the improvement of the system performance over wide range of frequency in mobile radio channel. The multicarrier code division multiple access (MC-CDMA) based multiple access scheme has drawn a lot of attention to fulfill those feature.

MC-CDMA scheme enable spreading mechanism which so-called frequency domain spreading. The principle of MC-CDMA spreading is to send one chip per subcarrier. The spreading mechanism can also be done by applying different spreading codes. The selection of the spreading codes with good orthogonal property ensures the improvement of system performance, especially for downlink transmission. The good performance in CDMA based multiple access technique provide more system capacity with possible BER achievement.

We discuss and compare the BER performance of Walsh-Hadamard, Gold and Golay spreading codes in MC-CDMA downlink system. The simulation results show that Walsh and Golay codes provide similar BER performance. This is indicated by the achievement of 10^{-4} BER at ± 9 dB SNR each. On the other hand, applying Gold code result less BER performance, indicated by the achievement of $> 10^{-3}$ BER at 0 until 20 dB range SNR.