

ABSTRACT

Direct Sequence Code Division Multiple Access (DS-CDMA) is CDMA technique based on Direct Sequence Spread Spectrum (DS-SS) technique. In DS-CDMA, number of user can use the same frequency bandwidth in the same time where channel each user deviated by particular code(spreading code).There are some kind of spreading codes, such as Walsh-Hadamard, m-sequence, Gold, Golay. Gold code has non-orthogonal characteristic but it has cross-correlation value better than m-sequence in multiuser condition. Golay code has orthogonal characteristic with the lowest cross-correlation value compared with other codes for asynchronous transmission scheme.

One of the most important problem which cause the limited CDMA system capacity is the presence of multiple access interference (MAI). MAI caused by non-orthogonal cross-correlation value of each spreading code. Multiuser Detection (MUD) is one of the detection techniques which can increase receiver performance in the cellular network by reducing MAI in the system. Parallel Interference Cancellation (PIC) is kind of the simplest sub optimum nonlinear MUD. Because of its nonlinear characteristic, PIC has better detection rather than other MUD when increasing user number.

On this final project conducted analysis and simulation the BER performance of Gold and Golay spreading code in Multiuser-DS-CDMA system that use PIC detection technique. The simulation results show that Golay code can give better performance than Gold code. On the achievement of 10^{-3} BER and 6 active users condition, applying Golay code can result 8.5 dB SNR. Meanwhile, applying Gold code can result 11 dB SNR on the same condition.

Keyword: MAI, MUD, DS-CDMA, Gold, Golay, PIC