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PERFORMANCE EVALUATION OF DIRECT SEQUENCE SPREAD SPECTRUM CDMA TRANSCEIVER HARDWARE USING PSEUDO CODE AND CODE MODULATION TECHNIQUES

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Abstract

Recently**,** Code Division Multiple Access (CDMA) has become a most promising technology for the future cellular networks due to its various advantages. CDMA is a modulation and multiple access schemes based on Direct Sequence Spread Spectrum (DS-SS) communication technique. It spreads the message signal to a relatively wide bandwidth by using a unique code that reduces interference, enhances system processing, and differentiates users. CDMA does not require frequency or time division for multiple access, thus, it improves the capacity of the communication system. In this scheme, multiple users share the same frequency band at the same time, by spreading the spectrum of their transmitted signals, so that each user's signal is pseudo-orthogonal to the signals of the other users. In a DS-SS CDMA system, each signal consists of a different pseudorandom binary sequence (called spreading code) that modulates a carrier using Quadrature Phase Shift Keying (QPSK) or Offset Quadrature Phase Keying Modulation (OQPSK) techniques, spreading the spectrum of the waveform. This paper aims to evaluate the DS-SS CDMA Transceiver Hardware applying pseudo code and code modulation technique for transmission of data and retrieval of same data at the receiver. The paper includes performance evaluation of direct sequence spread spectrum of CDMA transceiver hardware using QPSK/OQPSK modulation, and multiplication with a Maximum Length Sequence (MLS) pseudo random code to generate spread spectrum, transmitting it over a common frequency band and despreading the signal using the same pseudo-random code at the receiver. Performance is successful.

Keywords: Wireless Communication, Code Division Multiple Access (CDMA), Direct Sequence Spread Spectrum (DS-SS), Pseudo Noise (PN), Maximum Length Sequence (MLS), Radio Frequency (RF), QPSK (Quadrature Phase Shift Keying), OQPSK (Offset Quadrature Phase Shift Keying), LFSR (Linear Feedback Shift Register, NRZ (Non Return to Zero)