

Channel Sounding and PAPR Reduction in OFDM for WiMAX Using Software Defined Radio

Authors : B. Siva Kumar Reddy, B. Lakshmi

Abstract : WiMAX is a high speed broadband wireless access technology that adopted OFDM/OFDMA techniques to supply higher data rates with high spectral efficiency. However, OFDM suffers in view of high Peak to Average Power Ratio (PAPR) and high affect to synchronization errors. In this paper, the high PAPR problem is solved by using phase modulation to get Constant Envelop Orthogonal Frequency Division Multiplexing (CE-OFDM). The synchronization failures are brought down by employing a frequency lock loop, Poly phase clock synchronizer, Costas loop and blind equalizers such as Constant Modulus Algorithm (CMA) equalizer and Sign Kurtosis Maximization Adaptive Algorithm (SKMAA) equalizers. The WiMAX physical layer is executed on Software Defined Radio (SDR) prototype by utilizing USRP N210 as hardware and GNU Radio as software platforms. A SNR estimation is performed on the signal received through USRP N210. To empathize wireless propagation in specific environments, a sliding correlator wireless channel sounding system is designed by using SDR testbed.

Keywords : BER, CMA equalizer, Kurtosis equalizer, GNU Radio, OFDM/OFDMA, USRP N210

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