

Performance Analysis of MIMO-OFDM Using Convolution Codes with QAM Modulation

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Abstract : Performance of Orthogonal Frequency Division Multiplexing (OFDM) system can be improved by adding channel coding (error correction code) to detect and correct the errors that occur during data transmission. One can use the convolution code. This paper presents performance of OFDM using Space Time Block Codes (STBC) diversity technique use QAM modulation with code rate 1/2. The evaluation is done by analyzing the value of Bit Error Rate (BER) vs. Energy per Bit to Noise Power Spectral Density Ratio (Eb/No). This scheme is conducted 256 sub-carrier which transmits Rayleigh multipath channel in OFDM system. To achieve a BER of 10^{-3} is required 30 dB SNR in SISO-OFDM scheme. For 2x2 MIMO-OFDM scheme requires 10 dB to achieve a BER of 10^{-3} . For 4x4 MIMO-OFDM scheme requires 5 dB while adding convolution in a 4x4 MIMO-OFDM can improve performance up to 0 dB to achieve the same BER. This proves the existence of saving power by 3 dB of 4x4 MIMO-OFDM system without coding, power saving 7 dB of 2x2 MIMO-OFDM system without coding and significant power savings from SISO-OFDM system.

Keywords : convolution code, OFDM, MIMO, QAM, BER

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