

## **PERFORMANCE IMPROVEMENT OF 2 X 2 MIMO-OFDM BASED WIRELESS COMMUNICATION SYSTEM USING CHANNEL ESTIMATION**

**S. B. POKLE & K. D. KULAT**

### **Abstract**

The multiple-input multiple-output (MIMO) wireless communication system stands for the use of multiple antennas at the transmitter and receiver. It is an emerging cost-effective technology that offers best possible solution in making very high-speed (1-Gb/s) wireless links a reality. Designing very high-speed wireless links that offer well quality-of-service and range capability in non-line-of-sight (NLOS) environments constitutes a significant research and engineering challenge. Orthogonal frequency division multiplexing (OFDM) is a popular method for high data rate wireless transmission. OFDM may be combined with antenna arrays at the transmitter and receiver to increase the diversity gain and/or to enhance the system capacity on time-variant and frequency-selective channels, resulting in a MIMO-OFDM system configuration. This paper deals with designing of a 2 x 2 MIMO-OFDM wireless communication system. A system design using MATLAB program is carried effectively with BPSK as well as QPSK modulation scheme. The spatial multiplexing as well as spatial diversity of the data transmitted is achieved in the design.

This paper emphasizes channel estimation methods for 2 x 2 MIMO-OFDM system to improve its overall performance. The minimum mean-square error (MMSE) and least-squares (LS) channel estimators are incorporated in the earlier systems. Simulation results show that the MIMO-OFDM system modified with proposed channel estimators outperform systems that were designed without channel estimators in terms of bit error rate at particular SNR values.

-----  
**Keywords :** Multiple-input multiple-output (MIMO), Orthogonal frequency division multiplexing (OFDM), Least Square (LS), Minimum mean-square error (MMSE).