PERFORMANCE AND CAPACITY ANALYSIS OF MIMO COMMUNICATION SYSTEM AT 60 GHz IN INDOOR ENVIRONMENT

Name : Hikmah Miladiyah
Advisor : 1. Dr. Ir. Suwadi, M.T.

ABSTRACT

In an indoor environment there are various barriers that may affect the performance of an antenna because it can cause harmful multipath. Blockage by walls, roof, and furniture limits the range indoor. This problem can be resolved by the use of Multiple Input Multiple Output (MIMO) that utilizes the presence of multipath in an indoor environment. The frequency of 60 GHz in millimeter wave could be considered for MIMO in indoor environment. The width of bandwidth available and O₂ absorption present at 60 GHz make the MMW useful for high data rates and spatial reuse. The Triple Saleh Valenzuela model (desktop environment) is chosen as the most suitable channel for Millimeter Wave.

System performance based on the simulation results using Matlab analyzed by bit error rate (BER) value for MIMO 2x2-STBC Alamouti and MIMO 4x4-STBC Tarokh with transceiver distance of 3 meters. BPSK and QPSK are used for modulation schemes. The result of BPSK modulation shows lower BER value than that of QPSK modulation. Based on the number of antennas, MIMO 4x4 has better performance and bigger capacity than MIMO 2x2. At Eb/No 0 dB, the channel capacity is found to be 0.03508 bps/Hz for MIMO 2x2 and 0.12318 bps/Hz for MIMO 4x4.

Key Words: Alamouti, MMW, MIMO, Tarokh, TSV
Halaman ini sengaja dikosongkan