

Statistical Channel Modeling for Multiple-Input-Multiple-Output Communication System

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Abstract : The performance of wireless communication systems is affected mainly by the environment of its associated channel, which is characterized by dynamic and unpredictable behavior. In this paper, different statistical earth-satellite channel models are studied with emphasize on two main models, first is the Rice-Log normal model, due to its representation for the environment including shadowing and multi-path components that affect the propagated signal along its path, and a three-state model that take into account different fading conditions (clear area, moderate shadow and heavy shadowing). The provided models are based on AWGN, Rician, Rayleigh, and log-normal distributions were their Probability Density Functions (PDFs) are presented. The transmission system Bit Error Rate (BER), Peak-Average-Power Ratio (PAPR), and the channel capacity vs. fading models are measured and analyzed. These simulations are implemented using MATLAB tool, and the results had shown the performance of transmission system over different channel models.

Keywords : fading channels, MIMO communication, RNS scheme, statistical modeling

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