Performance Evaluation of BER for An Massive-MIMO with M-ary PSK Scheme over Three-Dimension Correlated Channel

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ABSTRACT
In this article the performance evaluation of bit error rate (BER) for an massive multi-input multi-output (M-MIMO) system with M-ary PSK (phase shift keying) scheme over three-dimension (3-D) correlated fading model is presented. The 5th generation (5G) M-MIMO radio system is deployed with beamforming techniques over 3-D environment that contains the correlation phenomenon between angle of arrival (AoA) and angle of departure (AoD). Moreover, the determination of moment generating function (MGF) and characteristic function (CF) approaches is applied to derive analytical expression of BER for 3-D M-MIMO in order to avoid some difficult steps. Besides, the channel capacity is presented by using of mutual information to confirm the accuracy of the theoretical derived formulas. Furthermore, the work of performance evaluation is with different numbers of transmitter and receiver antenna. The correlation parameter between AoA and AoD definitely generates impact on the performance of BER when consider an M-MIMO system over the simplified 3-D channel and beamforming transmission.

Keywords: AoA, AoD, Massive-MIMO Beamforming, moment generating function (MGF), M-ary PSK

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