

## **Performance Analysis of M-Ary Pulse Position Modulation in Multihop Multiple Input Multiple Output-Free Space Optical System over Uncorrelated Gamma-Gamma Atmospheric Turbulence Channels**

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**Abstract :** The performance of Decode and Forward (DF) multihop Free Space Optical ( FSO) scheme deploying Multiple Input Multiple Output (MIMO) configuration under Gamma-Gamma (GG) statistical distribution, that adopts M-ary Pulse Position Modulation (MPPM) coding, is investigated. We have extracted exact and estimated values of Symbol-Error Rates (SERs) respectively. A closed form formula related to the Probability Density Function (PDF) is expressed for our designed system. Thanks to the use of DF multihop MIMO FSO configuration and MPPM signaling, atmospheric turbulence is combatted; hence the transmitted signal quality is improved.

**Keywords :** free space optical, multiple input multiple output, M-ary pulse position modulation, multihop, decode and forward, symbol error rate, gamma-gamma channel

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