

Required SNR for PPM in Downlink Gamma-Gamma Turbulence Channel

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Abstract : In this paper, in order to achieve sufficient bit error rate (BER) according to zenith angle of the satellite to ground station, SNR requirement is investigated utilizing pulse position modulation (PPM). To realize explicit results, all parameters such as link distance, Rytov variance, scintillation index, wavelength, aperture diameter of the receiver, Fried's parameter and zenith angle have been taken into account. Results indicate that after some parameters are determined since the constraints of the system, to achieve desired BER, required SNR values are in wide range while zenith angle changes from small to large values. Therefore, in order not to utilize high link margin, either SNR should adjust according to zenith angle or link should establish with predetermined intervals of the zenith angle.

Keywords : Free-space optical communication, optical downlink channel, atmospheric turbulence, wireless optical communication

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