

MISALIGNMENT FADING EFFECTS ON PERFORMANCE OF AMPLIFY-AND-FORWARD RELAYING FSO SYSTEMS USING SC-QAM SIGNALS OVER LOG-NORMAL ATMOSPHERIC TURBULENCE CHANNELS

Author: *Duong Huu Ai, Do Trong Tuan, Ha Duyen Trung*

*Viet Nam Korea Friendship Information Technology College; aidh@viethanit.edu.vn
Ha Noi University of Science and Technology; trung.haduyen@hust.edu.vn*

Abstract:

This paper presents the theoretical analysis of misalignment fading effects on performance of free-space optical (FSO) communication system based on Amplify-and-Forward (AF) relaying technology. This system uses subcarrier quadrature amplitude modulation (SC-QAM) over weak atmospheric turbulence modelled by Log-Normal distribution. The misalignment fading effect is studied by taking into account the influence of beamwidth, aperture size and jitter variance on the average symbol error rate (ASER). The influence of the number of relay stations, link distance on the system's ASER are also discussed in this paper. The numerical results show that the misalignment fading affect the performance of systems and how we use proper values of aperture size and beamwidth to improve the performance of such systems. The simulation results on ASER versus average signal-to-noise ratio (SNR) show a close agreement with analytical results.

Key words: AF; Atmospheric turbulence; ASER; FSO; QAM; Misalignment fading.