

Abstract

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Performance Evaluation of FSO Link Under NRZ-RZ Line Codes, Different Weather Conditions and Receiver Types in the Presence of Pointing Errors

Performance evaluation for a free space optical (FSO) link with latest wireless optical communications (WOC) vendor's networks specifications is presented. Analysis is performed for non return to zero (NRZ)-return to zero (RZ) line codes with various operating wavelengths using APD and PIN photodiodes receivers. The study includes the effect of atmospheric attenuation due to scattering effects for different weather conditions in the presence of pointing error. Maximum pointing error, received signal's power and bit error rate (BER) levels are indicators for performance evaluation. NRZ line code with 1550 nm operating wavelength and an APD receiver shows the best performance for the proposed FSO link. In the presence of moderate fog weather condition, 11.85 rad is the maximum pointing error and -41.09 dBm is achieved for NRZ-APD at 1550 nm in order to maintain BER $< 10^{-9}$.