

Abstract

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Performance evaluation of 6.4 Tbps dual polarization quadrature phase shift keying Nyquist-WDM superchannel FSO transmission link: Impact of weather conditions

This work reports the development of an ultra-high capacity Nyquist-wavelength division multiplexing (WDM) superchannel based free space optics (FSO) transmission link. In the proposed link, 32 independent wavelength channels are multiplexed, each carrying 200 Gbps dual polarization-quadrature phase shift keying (DP-QPSK) data with 60 GHz channel spacing yield net transmission rate of 6.4 Tbps with spectral efficiency of 3.33 bits/s/Hz. The performance of the proposed FSO link has been numerically investigated under the influence of dynamic weather conditions such as clear, haze, rain, and fog conditions. Also, we investigate the BER performance of the proposed link under the influence of beam divergence angle. Further, we compare the proposed FSO link performance with previous works reported in the literature showing the superiority of our proposed link. The simulative investigation of the proposed link was carried out using Optisystem version 14 which is a powerful tool for the development and investigation of optical networks.