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| **Abstract:** |  |
| **This paper exemplifies dense wavelength division multiplexing combined with polarization division multiplexing with C-band frequency range-based single-mode fiber. In the proposed link, 32 independent channels with 16 individual wavelengths are multiplexed with two different angles of polarization. Each carrying 130 Gbps dual-polarization data with 200 GHz channel spacing claiming a net transmission rate of 4.16 Tbits/s with spectral efficiency of 69% with 20% side-mode-suppression-ratio (SMSR)and optical signal to noise ratio (OSNR)40.7. The performance of the proposed techniques has been analyzed using optimized system parameters securing a minimum bit error rate (BER) 10-9 at a transmission distance up to 50 km.** | |