

Performance Analysis of Hybrid Optical Amplifiers for Super Dense Wavelength Division Multiplexing System in the Scenario of Reduced Channel Spacing

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Abstract: In this paper, we have evaluated 200 channels super dense wavelength division multiplexing system (SDWDM) with varying channel spacing from 100 to 900 GHz. Effect of proposed RAMAN-EDFA-RAMAN, RAMANEDFA, EDFA-SOA and SOA-SOA hybrid optical amplifier (HOA) have been traced out in term of the quality factor, bit error rate, gain, eye closure and output power respectively. It has also analyzed that RAMAN-EDFA-RAMAN HOA delivers the best rating outcome with the channel spacing of 3.125 GHz for long haul communication system. Further, dispersion compensation technique has also used to enhance the data rate up to 50 Gbps with the support of RAMANEDFA-RAMAN HOA. Maximum transmission distance of 400 km has covered by the same HOA with acceptable parameters in term of least bit error rate, good rating quality factor, and best-reported output power from the proposed system.

Keywords: Hybrid optical amplifier; Super dense wavelength division multiplexing system; Bit error rate; Channel spacing; RAMAN; EDFA; SOA; Dispersion compensation