

INVESTIGATION OF TRANSMISSION PERFORMANCE OF OC-768 DWDM LINK USING PHOTONICS CAD 1.6

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Abstract

We investigate the performance of optical carrier (OC)-768 (40 Gbps) transmissions using dense wavelength-division multiplexing (DWDM) technologies based on the 10 Gbps line rate. To find the optimum conditions, the transmission performance is evaluated for direct and external modulators with non return to zero (NRZ) and return to zero (RZ) data formats. Investigation is done for the three different transmission powers in single mode fiber (SMF). All the investigations are done considering the linear effects and nonlinear effects of self phase modulation (SPM), cross phase modulation (CPM) and four wave mixing (FWM). Optical signal to noise ratio (OSNR), bit error rates (BERs) and eye-diagrams have been measured to investigate the system performance. We achieved the optimum transmission distance of 2800 kms using LiNbO₃ Mach Zehnder Modulator (MZM) external modulator with RZ data format and 10 dBm single mode fiber input power.

Keywords: Dense Wavelength Division Multiplexing (DWDM), OC-768, Long haul communication, Erbium doped fiber amplifier (EDFA), SMF, Bit Error Rate (BER).