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Effect of Transmission Distance on the Performance of Hybrid Configuration Using Non Return to Zero (NRZ) Pulse Format

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Abstract : The effect of transmission distance on the performance of hybrid configuration H 10-40 Gb/s with Non-Return to Zero (NRZ) pulse format, 100 GHz channel spacing, and Multiplexer/De-Multiplexer Band width (MUX/DEMUX BW) of 60 GHz has been investigated in this study. The laser Continuous Wave (CW) power launched into the modulator is set to 4 dBm. Eight neighboring DWDM channels are selected around 1550.12 nm carrying different data rates in hybrid optical communication systems travel through the same optical fiber and use the same passive and active optical modules. The simulation has been done using Optiwave Inc Optisys software. Usually, increasing distance will lead to decrease in performance; however this is not always the case, as the simulation conducted in this work, shows different system performance for each channel. This is due to differences in interaction between dispersion and non-linearity, and the differences in residual dispersion for each channel.

Keywords : dispersion and non-linearity interaction, optical hybrid configuration, multiplexer/de multiplexer bandwidth, non-return to zero, optical transmission distance, optisys
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