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| **Title:** | An Empirical Analysis of 5.76 Tbit/s SDM-PDM-Nyquist superchannel WDM hybrid multiplexing technique for channel capacity enhancement | | |
| **Author(s) Name:** | R. M. Arnob, S. Nahar, Mohammad Nasir Uddin | | |
| **Contact Email(s):** | drnasir@aiub.edu | | |
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| **Abstract:** |  |
| This article presents the feasibility study of 5.76 Tbits/s SDM-PDM-Nyquist superchannel WDM hybrid multiplexing technique for enhancing the channel capacity over a transmission distance up to 10 km using C-band frequencies in the multimodal domain. This system uses 48 independent channels carrying 48 bits streams of data using 8 C-band frequencies, 2 polarization states, and 3 LP modes. At a transmission distance of 10 km, satisfactory BER (log BER -9.35, faithful Q-factor 6.09, and extinction ratios 7.78 were observed with the minimum OSNR (46.5 dB) of the system, not going below the minimum OSNR (27.8) considering FEC limit. Each channel receives a satisfactory amount of power after 2 stage amplification process leading to a spectral efficiency of 137%. | |