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| **Title:** | High Speed OTDM-DWDM Bit Compressed Network for Long-Haul Communication | | |
| **Author(s) Name:** | T. Islam, Mohammad Nasir Uddin | | |
| **Contact Email(s):** | drnasir@aiub.edu | | |
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| **Abstract:** |  |
| This paper represents an optical communication network design that incorporates both OTDM and DWDM techniques which provides up to 240 Gbit/s data transfer rate, long-haul communication distance of 2700 km with a maximum number of 384 channels in this designed architecture. Each channel has a bitrate of 625 Mbit/s that follows optical signal hierarchy OC-12, STS-12 (SONET ANSI), and STM-4 (SDH CCITT), and the design maintains standard parameters for commercially available channel grids at 100 GHz spacing. The communication is done by Single Mode Fiber (SMF) of 50 km and Dispersion Compensating Fiber (DCF) of 10 km followed by one optical amplifier gain in each span. Bit error rate (BER) remains significantly low while transmission distance for only OTDM is 18000 km at a BER < 10-12, and for the hybrid OTDM-DWDM it is 2700 km at a BER < 10-16. Both values are measured under 128 bits sequence length. Three compression stages are used for 8 channels each in order to minimize the gap between bits, and to utilize the space for more channels within a specific time window. | |