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| **Title:** | Design and performance analysis of centrally seeded, long reach, cost optimized hybrid DWDM TDMA PON | | |
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| **Abstract:** |  |
| In this paper, simulation of 8192 way split effect in a 166.1 km long reach hybrid DWDM-TDMA PON employing centrally seeded technique, EAM modulator to provide downstream customer data channels operating at 10Gbit/s, was carried out in Optisystem 10. The upstream channels of capacity 320 Gb/s were simulated in burst-mode and featured low cost Distributed Feedback (DFB) lasers, Single Mode Fiber (SMF), Dispersion Compensating Fiber (DCF), Erbium Doped Fiber Amplifier (EDFA), and Electro absorption modulator (EAM). The DWDM wavelength grid comprises 32, 50 GHz spaced, wavelengths operating in the downstream direction (OLT to ONU) and another 32, 50 GHz spaced, wavelengths carrying data in the upstream direction (ONU to OLT). A central optical carrier distribution scheme is proposed and used to produce all the 32 upstream carriers at the local exchange and distribute them toward the optical network units (ONUs), where each channel serves 256 ONUs. Bidirectional transmission has been reported at 10Gb/s per channel over a 166.1 km-reach hybrid DWDM-TDMA PON using EAM to modulate the optical carrier. The full network supports up to 8192 customers with downstream data rate of 10 Gb/s and variable upstream data rate changes according to the availability of free time slot. Proposed hybrid DWDM-TDMA PON allows integration of metro and optical access networks into a single all-optical system and due to central seed carrier generation this network shows improved transmission distance and acceptable bit error rate. | |