

Absolute polar duty cycle division multiplexing over wavelength division multiplexing system

ABSTRACT

The performance of absolute polar duty cycle division multiplexing (AP-DCDM) over wavelength division multiplexing (WDM) system is presented based on the simulation results. The AP-DCDM signal has narrower bandwidth than conventional time division multiplexing (TDM) signal, which makes its implementation in WDM system advantageous. In this paper, characteristics of AP-DCDM and TDM signals in WDM system are compared at the speed of 40 Gbit/s per channel, for the minimum allowed channel spacing and the chromatic dispersion tolerance. The results clearly show that AP-DCDM performs significantly better than TDM. By using AP-DCDM, 1.28 Tbit/s (32×40 Gbit/s) was successfully transmitted over 320 km standard single mode fiber. Spectral efficiency of 0.64 b/s/Hz was achieved by using 10 Gbit/s transmitters and receivers without polarization multiplexing.

Keyword: Optical fiber communication; Absolute polar duty cycle division multiplexing; Wavelength division multiplexing; Dispersion