

Duty Cycle Division Multiplexing (DCDM): a new electrical multiplexing technique for high speed optical communication systems

ABSTRACT

A new multiplexing technique based on duty cycle division is proposed, thus the name duty cycle division multiplexing (DCDM). DCDM can be applied in both electrical and optical domains, for wired and wireless systems. The new technique allows for more efficient use of time slots as well as the spectrum, taking advantage of both the conventional TDM and FDM. In this paper, three channels operating at the same speed of 10 Gbps per channel are multiplexed in the electrical domain. The performance comparison is made against 3times10 Gbps TDM, and the experimental simulation results show that the DCDM system can support higher bit rate than TDM and also, it is less sensitive to the chromatic dispersion effect.

Keyword: Duty cycle; Multiplexing; Optical communication