

## **Improvement of three-level code division multiplexing via dispersion mapping**

### **ABSTRACT**

A new dispersion map is designed for three-level code division multiplexing (3LCDM) of a 40 Gb/s (2 x 20 Gb/s) over 500 km (5 x 100km) standard single mode fiber. The results show that an 87.5 % dispersion compensation ratio was the optimum map for the 3LCDM system. The system performance is improved by 6 dB in optical signal-to-noise ratio, 6 dB in receiver sensitivity and 3 dB in self-phase modulation threshold. Based on these improvements, the 3LCDM performance is comparable to the available multiplexing and modulation techniques while offering simpler transmitter and receiver architecture.

**Keyword:** Dispersion map; Self phase modulation (SPM); Three level code division multiplexing (3LCDM); Wavelength-division multiplexing (WDM)