

Abstract

Moustafa Hussein Aly

Pedestal Free Pulse Source for Ultrahigh Data Rate Optical Time Division Multiplexing Systems Self-Phase Modulation Based

In this paper, an ultra-short (0.95 ps) pedestal free pulse source is optimized for ultrahigh data rate optical time-division-multiplexing (OTDM) systems. This source is based on a dispersion-compensation stage using a single-mode fiber (SMF) followed by a simple fiber-based pulse compression stage (using comblike dispersion profiled fiber (CDPF) and a self-phase modulation (SPM) based reshaping stage. A stable operation, with a high extinction ratio of 81 dB and a remarkable timing jitter of 72 fs are successfully achieved. Source tunability is available over the wavelength range 1546–1561 nm with a high quality pulse shape of 0.475 time bandwidth product. A noteworthy behavior of multiplexing from 10 to 320 Gb/s is observed. A comparison between this work and related literature is carried out showing an appreciable improvement.