10-GHz return-to-zero pulse source tunable in wavelength with a single- or multiwavelength output based on four-wave mixing in a newly developed highly nonlinear fiber

In this letter, a novel scheme for a wavelength-tunable pulse source (WTTPS) is proposed and characterized. It is based on four-wave mixing (FWM) in a newly developed highly nonlinear fiber between a return-to-zero (RZ) pulsed signal at a fixed wavelength and a continuous wave probe tunable in wavelength. The corresponding FWM product acts as the WTTPS, and is implemented in a 10-Gb/s, 160-km transmission experiment and in a 40-Gb/s multiplexing/demultiplexing experiment. The scheme can be expanded to a multiwavelength WTTPS, which is demonstrated for two wavelengths. The introduced penalty using the WTTPS compared to the original RZ pulses is negligible.