

Enhanced multiwavelength generation in Brillouin fiber laser with pump noise suppression technique

ABSTRACT

A new multiwavelength Brillouin fiber laser (BFL) that provides a large number of Stokes lines with improved optical signal-to-noise ratio has been proposed and demonstrated. The BFL cavity is only formed by a nonlinear fiber loop mirror (NOLM) with 500 m long highly nonlinear fiber (HNLF). The BFL with improved performance is based on the suppression of the Brillouin pump noise floor utilizing a narrow tunable bandpass filter. The generation of Stokes lines covering up to a 33.67 nm wavelength range is achieved by setting the Brillouin pump signal within the HNLF's zero dispersion wavelength and with power of 250 mW. This is owing to the combination of the stimulated Brillouin scattering and four-wave mixing effect in the NOLM structure.

Keyword: Multiwavelength generation; Brillouin fiber laser; Pump noise suppression technique