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Stable multiwavelength semiconductor optical amplifier-based fiber laser using a 2-mode interferometer (Article)

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Abstract

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A multiwavelength semiconductor optical amplifier (SOA) fiber laser based on all-fiber two-mode interferometer (TMI) structure is demonstrated. The TMI generates in a comb-like spectrum with a 1-nm wavelength spacing and extinction ratio of 5.7 dB. By incorporating a TMI in the laser cavity, stable multiwavelength operation is obtained with 30 output channels from 1570.8 to 1600.8 nm with peak powers of at least 10 dB from the highest peak. The output comb spectrum and the overall stability of the multiwavelength are also enhanced with by inducing the four-wave-mixing effect in the cavity. The multiwavelength SOA fiber laser shows high operational stability with peak power fluctuations exceeding 1 dB observed only at the 1st, 23rd, 26th, and 30th peaks, which are at the ends of the multiwavelength spectrum. © 2020 Wiley Periodicals, Inc.

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Comb like spectrum Extinction ratios Multi-wavelength operation Multiwavelength spectra
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