Switchable dual- and Single-Wavelength mode-locked bismuth-doped fiber lasers at O-band

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Source OPTICAL FIBER TECHNOLOGY

Volume: 88

DOI: 10.1016/j.yofte.2024.104009

Article Number 104009

Published DEC 2024

Early Access OCT 2024

Indexed 2024-11-02

Document Type Article

Abstract In this work, we have demonstrated the switchable and tunable operation of mode-locked pulses at O-band. A 40 m silica-based bismuth-doped fiber (BDF) was used to provide a high gain with low losses in the O-band regime. The carbon nanotube (CNT) was used as a mode-locker, whereas the dual- and single-wavelength mode-locked pulses were achieved by including a tunable Mach-Zehnder filter (TMZF) to the BDF laser cavity. The laser operation was switched between dual- and single-wavelength operation by tuni

the TMZF wavelength knob within the ring cavity. The operating wavelengths were at 1308.2 and 1328.5 nm for dual-wavelength modelocked pulses. At the same time, the single wavelength mode-locked laser was tuned at three different operating wavelengths of 1316.3, 1328.5, and 1321.4 nm, with the 3-dB bandwidths of 3.3, 3.1 and 4.6 nm, and pulse durations of 790, 810 and 570 fs, respectively. The mode-locked laser remained stable from pump powers of 607 to 715 mW.

Keywords

Author Keywords: Bismuth-doped fiber; Dual-wavelength mode-locked laser; O -band; Saturable absorber

Keywords Plus: SATURABLE ABSORBER; RING LASER; PULSE GENERATION; FEMTOSECOND; ABSORPTION; TECHNOLOGY; DISPERSION; AMPLIFIER; SYSTEM; REGION

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Categories/ Classification

Research Areas: Engineering; Optics; Telecommunications

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