

## Documents

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**Switchable dual- and Single-Wavelength mode-locked bismuth-doped fiber lasers at O-band**  
(2024) *Optical Fiber Technology*, 88, art. no. 104009, .

**DOI:** 10.1016/j.yofte.2024.104009

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### 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 tuning the TMZF wavelength knob within the ring cavity. The operating wavelengths were at 1308.2 and 1328.5 nm for dual-wavelength mode-locked 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. © 2024

### Author Keywords

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

### Index Keywords

Fiber lasers, Optical pumping, Ring lasers, Saturable absorbers, Single mode fibers; Bismuth-doped, Bismuth-doped fiber, Doped fiber, Dual-wavelength, Dual-wavelength mode-locked laser, Mode-locked pulse, Modelocked lasers, O-band, Single wavelength, Tunables; Mode-locked fiber lasers

### Funding details

Ministry of Higher Education, Malaysia MOHE  
Universiti Malaya UMBKS002-2023, IIRG001A-2023

The HICOE supported this work through grant PRC-2022 from the Ministry of Higher Education of Malaysia and Universiti Malaya for grants BKS002-2023 and IIRG001A-2023.

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**Publisher:** Academic Press Inc.

**ISSN:** 10685200

**CODEN:** OFTEF

**Language of Original Document:** English

**Abbreviated Source Title:** Opt. Fiber Technol.  
2-s2.0-85206622854

**Document Type:** Article

**Publication Stage:** Final

**Source:** Scopus

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