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Optik  
Volume 126, Issue 2, 2015, Pages 179-183

## Single mode EDF fiber laser using an ultra-narrow bandwidth tunable optical filter (Article)

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### Abstract

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Single longitudinal mode (SLM) erbium-doped fiber (EDF) laser operation using a commercialized ultra-narrow bandwidth optical filter has been demonstrated. A 2-m long EDF with an absorption coefficient of 24 dB m<sup>-1</sup> at the pump wavelength is used as gain medium. The ultra-narrow tunable filter is used for selection of a single longitudinal mode from the available spectrum of multiple modes, which originally exist in the FBG's reflection spectrum. Our approach provides a relatively simple and direct method for realization of SLM operation. A high-resolution optical spectral analyser with a resolution of 0.16 pm is used to observe the output spectrum. To verify the SLM operation, the delayed self-heterodyne method is used, giving a measured laser linewidth of 61.5 kHz. © 2014 Elsevier GmbH. All rights reserved.

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Delayed self-heterodyne method Single longitudinal mode (SLM) Ultra-narrow tunable filter

### Indexed keywords

Engineering controlled terms: Bandwidth Fiber Bragg gratings Fiber lasers Heterodyning

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## Funding details

Funding sponsor	Funding number	Acronym
Universiti Malaya	UM.C/625/1/HIR/MOHE/SCI/29,PV031/2012A	

### Funding text

This work was supported by the University of Malaya under the HIR Grant UM.C/625/1/HIR/MOHE/SCI/29 (Graphene) as well as grant PV031/2012A (IPPP).

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Source Type: Journal

Original language: English

DOI: 10.1016/j.ijleo.2014.08.150

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