Document details

‹ Back to results | 1 of 1

Export Download Print E-mail Save to PDF Add to List More... ›

Full Text View at Publisher

Microwave and Optical Technology Letters
Volume 62, Issue 10, 1 October 2020, Pages 3363-3368

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

Ahmad, H.[a,b,c], Azmy, N.F.[a], Aidit, S.N.[a], Zulkifli, M.Z.[d]

[a]Photonics Research Center, University of Malaya, Kuala Lumpur, Malaysia
[b]Physics Department, University of Malaya, Kuala Lumpur, Malaysia
[c]Department of Physics, Faculty of Science and Technology, Airlangga University, Surabaya, Indonesia

View additional affiliations

Abstract

View references (28)

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.

SciVal Topic Prominence

Topic: Erbium-Doped Fiber | Ring Lasers | Thulium

Prominence percentile: 92.917

Author keywords

2-mode interferometer | multiwavelength fiber laser | semiconductor optical amplifier

Indexed keywords

Engineering controlled terms: Fiber lasers | Fibers | Four wave mixing | Interferometers | Optical switches | Semiconductor optical amplifiers

Engineering uncontrolled terms: Comb like spectrum | Extinction ratios | Multi-wavelength operation | Multiwavelength spectra | Operational stability | Output channels | Overall stabilities | Wavelength spacing

Engineering main heading: Fiber amplifiers

Funding details

Funding sponsor	Funding number	Acronym

Funding sponsor	Funding number	Acronym
Universiti Malaya	RU 011 - 2019	

Funding text

This work was supported by the University of Malaya (Grant Number HiCoE Phase II Funding and RU 011 - 2019).

ISSN: 08952477
CODEN: MOTLE
Source Type: Journal
Original language: English
DOI: 10.1002/mop.32454
Document Type: Article
Publisher: John Wiley and Sons Inc.

References (28)

View in search results format >

All | Export | Print | E-mail | Save to PDF | Create bibliography

1 Chen, L.R., Pagé, V.
Tunable photonic microwave filter using semiconductor fibre laser

(2005) *Electronics Letters*, 41 (21), pp. 1183-1184. Cited 29 times.
doi: 10.1049/el:20052952

View at Publisher

2 Pleros, N., Bintjas, C., Kalyvas, M., Theophilopoulos, G., Yiannopoulos, K., Sygletos, S., Avramopoulos, H.
Multiwavelength and power equalized SOA laser sources

(2002) *IEEE Photonics Technology Letters*, 14 (5), pp. 693-695. Cited 77 times.
doi: 10.1109/68.998728

View at Publisher

3 Perez-Herrera, R.A., Lopez-Amo, M.
Fiber optic sensor networks

(2013) *Optical Fiber Technology*, Part B 19 (6 PART B), pp. 689-699. Cited 27 times.
http://www.journals.elsevier.com/optical-fiber-technology/
doi: 10.1016/j.yofte.2013.07.014

View at Publisher

4 Chow, J., Town, G., Eggleton, B., Ibsen, M., Sugden, K., Bennion, I.
Multiwavelength generation in an erbium-doped fiber laser using in-fiber comb filters

(1996) *IEEE Photonics Technology Letters*, 8 (1), pp. 60-62. Cited 345 times.
doi: 10.1109/68.475778

View at Publisher

5 Reeve, M.H., Hunwicks, A.R., Zhao, W., Methley, S.G., Bickers, L., Hornung, S.
Led Spectral Slicing for Single-Mode Local Loop Applications

(1988) *Electronics Letters*, 24 (7), pp. 389-390. Cited 118 times.
doi: 10.1049/el:19880263

View at Publisher

6 Wagner, S.S., Chapuran, T.E.
Broadband High-Density WDM Transmission Using Superluminescent Diodes

(1990) *Electronics Letters*, 26 (11), pp. 696-697. Cited 69 times.
doi: 10.1049/el:19900454

View at Publisher

7 Morioka, T., Uchiyama, K., Kawanishi, S., Saruwatari, M., Suzuki, S.
Multiwavelength picosecond pulse source with low jitter and high optical frequency stabilitybased on 200 nm supercontinuum f

(1995) *Electronics Letters*, 31 (13), pp. 1064-1066. Cited 71 times.
doi: 10.1049/el:19950759

View at Publisher

8 Lee, J.S., Chung, Y.C., DiGiovanni, D.J.
Spectrum-Sliced Fiber Amplifier Light Source for Multichannel WDM Applications

(1993) *IEEE Photonics Technology Letters*, 5 (12), pp. 1458-1461. Cited 275 times.
doi: 10.1109/68.262573

View at Publisher

9 Park, N., Wysocki, P.F.
24-line multiwavelength operation of erbium-doped fiber-ring laser

(1996) *IEEE Photonics Technology Letters*, 8 (11), pp. 1459-1461. Cited 305 times.
doi: 10.1109/68.541549

View at Publisher

10 Zhang, Z., Wu, J., Xu, K., Hong, X., Lin, J.
Tunable multiwavelength SOA fiber laser with ultra-narrow wavelength spacing based on nonlinear polarization rotation

(2009) *Optics Express*, 17 (19), pp. 17200-17205. Cited 56 times.
http://www.opticsinfobase.org/DirectPDFAccess/BF36E33A-BDB9-137E-C80296B48586671E_185902.pdf?da=1&id=185902&seq=0
doi: 10.1364/OE.17.017200

View at Publisher

11 Luo, Z., Zhong, W.-D., Cai, Z., Ye, C., Wen, Y.J.
High-performance SOA-based multiwavelength fiber lasers incorporating a novel double-pass waveguide-based MZI

(2009) *Applied Physics B: Lasers and Optics*, 96 (1), pp. 29-38. Cited 14 times.
doi: 10.1007/s00340-009-3538-4

View at Publisher

12 Yao, J., Yao, J., Deng, Z., Liu, J.
Investigation of room-temperature multiwavelength fiber-ring laser that incorporates an SOA-based phase modulator in the las

(2005) *Journal of Lightwave Technology*, 23 (8), pp. 2484-2490. Cited 29 times.
doi: 10.1109/JLT.2005.850818

View at Publisher

13 Yu, B.-A., Hwan Kim, D., Lee, B.
Multiwavelength pulse generation in semiconductor-fiber ring laser using a sampled fiber grating

(2001) *Optics Communications*, 200 (1-6), pp. 343-347. Cited 18 times.
doi: 10.1016/S0030-4018(01)01625-X

View at Publisher

14 Bilenca, A., Eisenstein, G.
On the noise properties of linear and nonlinear quantum-dot semiconductor optical amplifiers: The impact of inhomogeneousl

(2004) *IEEE Journal of Quantum Electronics*, 40 (6), pp. 690-702. Cited 59 times.
doi: 10.1109/JQE.2004.828260

View at Publisher

15 Han, Y.-G., Kim, G., Lee, J.H., Kim, S.H., Lee, S.B.
Lasing wavelength and spacing switchable multiwavelength fiber laser from 1510 to 1620 nm

(2005) *IEEE Photonics Technology Letters*, 17 (5), pp. 989-991. Cited 89 times.
doi: 10.1109/LPT.2005.846748

View at Publisher

16 Sulaiman, A.H., Abu Bakar, M.H., Zamzuri, A.K., Hitam, S., Abas, A.F., Mahdi, M.A.
Investigation of multiwavelength performance utilizing an advanced mechanism of bidirectional lyot filter (Open Access)

(2013) *IEEE Photonics Journal*, 5 (6), art. no. 6648662. Cited 9 times.
doi: 10.1109/JPHOT.2013.2287564

View at Publisher

17 Liu, T., Jia, D., Yang, T., Wang, Z., Liu, Y.
Stable L-band multi-wavelength SOA fiber laser based on polarization rotation

(2017) *Applied Optics*, 56 (10), pp. 2787-2791. Cited 14 times.
https://www.osapublishing.org/view_article.cfm?gotourl=https%3A%2F%2Fwww%2Eosapublishing%2Eorg%2FDirectPDFAccess%2FA51D3D1C-B4D0-DB60-02787%2Epdf%3Fda%3D1%26id%3D361902%26seq%3D0%26mobile%3Dno&org=Elsevier%20Inc
doi: 10.1364/AO.56.002787

View at Publisher

18 Dong, H., Zhu, G., Wang, Q., Sun, H., Dutta, N.K., Jaques, J., Piccirilli, A.B.
Multiwavelength fiber ring laser source based on a delayed interferometer

(2005) *IEEE Photonics Technology Letters*, 17 (2), pp. 303-305. Cited 66 times.
doi: 10.1109/LPT.2004.840814

View at Publisher

19 Sulaiman, A.H., Kadir, M.Z.A., Yusoff, N.M., Cholan, N.A., Abdullah, F., Abas, A.F., Alresheedi, M.T., (...), Mahdi, M.A.
Broad bandwidth SOA-based multiwavelength laser incorporating a bidirectional Lyot filter

(2018) *Chinese Optics Letters*, 16 (9), art. no. 090603. Cited 10 times.
doi: 10.3788/COL201816.090603

View at Publisher

20 Sulaiman, A.H., Zamzuri, A.K., Hitam, S., Abas, A.F., Mahdi, M.A.
Flatness investigation of multiwavelength SOA fiber laser based on intensity-dependent transmission mechanism

(2013) *Optics Communications*, 291, pp. 264-268. Cited 21 times.
doi: 10.1016/j.optcom.2012.10.078

View at Publisher

21 Qi, Y., Kang, Z., Sun, J., Ma, L., Jin, W., Lian, Y., Jian, S.
Wavelength-switchable fiber laser based on few-mode fiber filter with core-offset structure

(2016) *Optics and Laser Technology*, 81, pp. 26-32. Cited 39 times.
doi: 10.1016/j.optlastec.2016.01.022

View at Publisher

22 Liu, Y., Wei, L.
Low-cost high-sensitivity strain and temperature sensing using graded-index multimode fibers

(2007) *Applied Optics*, 46 (13), pp. 2516-2519. Cited 173 times.
http://ao.osa.org/Issue.cfm
doi: 10.1364/AO.46.002516

View at Publisher

23 Toshimasa, U., Pham, D., Eiichi, H., Kenichi, K., Atsushi, K., Kouichi, A., Atsushi, M., (...), Tetsuya, K.
(2017) *100 Ghz Optical-To-Radio Converter Module and Its Application in Radio and Power over Fiber Transmission through Multi-Core Fiber*
W4B.2. 10.1364/OFC.2017.W4B.2

24 Dahlman, E., Mildh, G., Parkvall, S., Peisa, J., Sachs, J., Selén, Y., Sköld, J.
5G wireless access: Requirements and realization

(2014) *IEEE Communications Magazine*, 52 (12), art. no. 6979985, pp. 42-47. Cited 207 times.
doi: 10.1109/MCOM.2014.6979985

View at Publisher

25 Liu, X., Lu, C.
Self-stabilizing effect of four-wave mixing and its applications on multiwavelength erbium-doped fiber lasers

(2005) *IEEE Photonics Technology Letters*, 17 (12), pp. 2541-2543. Cited 95 times.
doi: 10.1109/LPT.2005.858075

View at Publisher

26 Bellemare, A., Karásek, M., Riviere, C., Babin, F., He, G., Roy, V., Schinn, G.W.
A broadly tunable erbium-doped fiber ring laser: Experimentation and modeling

(2001) *IEEE Journal on Selected Topics in Quantum Electronics*, 7 (1), pp. 22-29. Cited 124 times.
doi: 10.1109/2944.924005

View at Publisher

27 Lee, B., Yoon, I., Roh, S., Baek, S., Chung, S., Yong, W.L.
Multiwavelength switchable SOA-fiber lasers using comb filters

(2006) *COIN-NGNCON 2006 - The Joint International Conference on Optical Internet and Next Generation Network*, art. no. 4454651, pp. 343-345.
ISBN: 8995530146; 978-899553014-6
doi: 10.1109/COINNGNCON.2006.4454651

View at Publisher

28 Ummy, M.A., Madamopoulos, N., Joyo, A., Kouar, M., Dorsinville, R.
Tunable multi-wavelength SOA based linear cavity dual-output port fiber laser using Lyot-Sagnac loop mirror

(2011) *Optics Express*, 19 (4), pp. 3202-3211. Cited 36 times.
http://www.opticsinfobase.org/view_article.cfm?
gotourl=http%3A%2F%2Fwww%2Eopticsinfobase%2Eorg%2FDirectPDFAccess%2F8537A0C2%2DD37F%2DDDF6D%2D6EE1D7B054DF1ABE%5F209919%2Ep
doi: 10.1364/OE.19.003202

View at Publisher

Ahmad, H.; Photonics Research Center, University of Malaya, Kuala Lumpur, Malaysia; email:harith@um.edu.my
Ahmad, H.; Physics Department, University of Malaya, Kuala Lumpur, Malaysia; email:harith@um.edu.my
Ahmad, H.; Department of Physics, Faculty of Science and Technology, Airlangga University, Surabaya, Indonesia;
email:harith@um.edu.my