Document details

‹ Back to results | ‹ Previous 6 of 19 Next ›

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

Full Text View at Publisher

Quantum Electronics
Volume 43, Issue 10, 2013, Pages 923-926

S - C - L triple wavelength superluminescent source based on an ultra-wideband SOA and FBGs (Article)

Ahmad, H., Zulkifli, M.Z. , Hassan, N.A., Muhammad, F.D., Harun, S.W.

Photonics Research Centre, University of Malaya, 50603 Kuala Lumpur, Malaysia

Abstract

View references (17)

We propose and demonstrate a wide-band semiconductor optical amplifier (SOA) based triple-wavelength superluminescent source with the output in the S-, C- and L-band regions. The proposed systems uses an ultra-wideband SOA with an amplification range from 1440 to 1620 nm as the linear gain medium. Three fibre Bragg gratings (FBGs) with centre wavelengths of 1500, 1540 and 1580 nm are used to generate the lasing wavelengths in the S-, C- and L-bands respectively, while a variable optical attenuator is used to finely balance the optical powers of the lasing wavelengths. The ultra-wideband SOA generates an amplified spontaneous emission (ASE) spectrum with a peak power of -33 dBm at the highest SOA drive current, and also demonstrates a down-shift in the centre wavelength of the generated spectrum due to the spatial distribution of the carrier densities. The S-band wavelength is the dominant wavelength at high drive currents, with an output power of -6 dBm as compared to the C- and L-bands, which only have powers of -11 and -10 dBm, respectively. All wavelengths have a high average signal-to-noise ratio more than 60 dB at the highest drive current of 390 mA, and the system also shows a high degree of stability, with power fluctuations of less than 3 dB within 70 min. The proposed system can find many applications where a wide-band and stable laser source is crucial, such as in communications and sensing. © 2013 Kvantovaya Elektronika and Turpion Ltd.

SciVal Topic Prominence

Topic: Erbium-Doped Fiber | Ring Lasers | Thulium

Prominence percentile: 92.917

Author keywords

S-, C-, L-band superluminescent source | Ultra-wideband semiconductor optical amplifier

Indexed keywords

Engineering uncontrolled terms: Amplified spontaneous emission spectrum | Degree of stability | Dominant wavelength | High drive current | Power fluctuations | S-, C-, L-band superluminescent source | Triple wavelengths | Variable optical attenuators

Engineering controlled terms: Broadband amplifiers | Semiconductor optical amplifiers | Ultra-wideband (UWB)

Engineering main heading: Wavelength

ISSN: 10637818
DOI: 10.1070/QE2013v043n10ABEH015028
Source Type: Journal
Document Type: Article
Original language: English

References (17)

View in search results format >

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

1 Lee, S.-L., Jang, I.-F., Wang, C.-Y., Pien, C.-T., Shih, T.-T.
Monolithically integrated multiwavelength sampled grating DBR lasers for dense WDM applications

(2000) *IEEE Journal on Selected Topics in Quantum Electronics*, 6 (1), pp. 197-206. Cited 40 times.
doi: 10.1109/2944.826889

View at Publisher

2 Zhang, A., Liu, H., Demokan, M.S., Tam, H.Y.
Stable and broad bandwidth multiwavelength fiber ring laser incorporating a highly nonlinear photonic crystal fiber

(2005) *IEEE Photonics Technology Letters*, 17 (12), pp. 2535-2537. Cited 95 times.
doi: 10.1109/LPT.2005.859542

View at Publisher

3 Ahmad, H., Thambiratnam, K., Sulaiman, A.H., Tamchek, N., Harun, S.W.
SOA-based quad-wavelength ring laser

(2008) *Laser Physics Letters*, 5 (10), pp. 726-729. Cited 47 times.
doi: 10.1002/lapl.200810057

View at Publisher

4 Achaerandio, E., Jarabo, S., Abad, S., López-Amo, M.
New WDM amplified network for optical sensor multiplexing

(1999) *IEEE Photonics Technology Letters*, 11 (12), pp. 1644-1646. Cited 35 times.
doi: 10.1109/68.806874

View at Publisher

5 Chaudhari, A.L., Shaligram, A.D.
Multi-wavelength optical fiber liquid refractometry based on intensity modulation

(2002) *Sensors and Actuators, A: Physical*, 100 (2-3), pp. 160-164. Cited 51 times.
doi: 10.1016/S0924-4247(02)00040-7

View at Publisher

6 Ye, W., Liu, W., Chen, T., Yang, D.Z., Shen, Y.H.
Erbium-ytterbium co-doped multi-wavelength double-clad fiber laser around 1612 nm

(2010) *Laser Physics*, 20 (7), pp. 1636-1640. Cited 11 times.
doi: 10.1134/S1054660X10130189

View at Publisher

7 Fu, J., Chen, D., Sun, B., Gao, S.
A novel-configuration multi-wavelength Brillouin erbium fiber laser and its application in switchable high-frequency microwave generation

(2010) *Laser Physics*, 20 (10), pp. 1907-1912. Cited 15 times.
doi: 10.1134/S1054660X10190047

View at Publisher

8 Harun, S.W., Rahman, F.A., Dimyati, K., Ahmad, H.
An efficient multiwavelength light source based on ASE slicing

(2006) *Laser Physics Letters*, 3 (10), pp. 495-497. Cited 22 times.
doi: 10.1002/lapl.200610037

View at Publisher

9 Hwang, S., Song, K.-W., Song, K.-U., Park, S.-H., Nilsson, J., Cho, K.
Comparative high power conversion efficiency of C- plus L-band EDFA

(2001) *Electronics Letters*, 37 (25), pp. 1539-1541. Cited 16 times.
doi: 10.1049/el:20011014

View at Publisher

10 Zhou, Y.-W.
L-band polarization-controlled multiple dissipative solitons generation in a normal dispersion fiber ring laser

(2012) *Laser Physics*, 22 (4), pp. 753-756.
doi: 10.1134/S1054660X12040330

View at Publisher

11 Liu, X., Zhao, W., Liu, H., Zou, K., Zhang, T., Lu, K., Sun, C., (...), Hou, X.
A C- and L-band dual-wavelength erbium-doped fibre laser for assisting four-wave mixing self-stability

(2006) *Journal of Optics A: Pure and Applied Optics*, 8 (6), art. no. 016, pp. 601-605. Cited 9 times.
doi: 10.1088/1464-4258/8/6/016

View at Publisher

12 Shahabuddin, N.S., Harun, S.W., Zulkifli, M.Z., Thambiratnam, K., Ahmad, H.
Bismuth-based Brillouin/erbium fiber laser

(2008) *Journal of Modern Optics*, 55 (8), pp. 1345-1351. Cited 14 times.
doi: 10.1080/09500340701652303

View at Publisher

13 Im, J.E., Kim, B.K., Chung, Y.
Tunable single- and dual-wavelength erbium-doped fiber laser based on Sagnac filter with a high-birefringence photonic crystal fiber

(2011) *Laser Physics*, 21 (3), pp. 540-547. Cited 20 times.
doi: 10.1134/S1054660X11050100

View at Publisher

14 Chen, D., Qin, S.
Actively mode-locked fiber laser based on hybrid Raman and erbium-doped fiber gains

(2007) *Microwave and Optical Technology Letters*, 49 (10), pp. 2339-2341.
doi: 10.1002/mop.22735

View at Publisher

15 Zulkifli, M.Z., Jemangin, M.H., Harun, S.W., Ahmad, H.
Gain-flattened S-band depressed cladding erbium doped fiber amplifier with a flat bandwidth of 12 nm using a Tunable Mach-Zehnder Filter

(2011) *Laser Physics*, 21 (9), pp. 1633-1637. Cited 11 times.
doi: 10.1134/S1054660X11170348

View at Publisher

16 Ahmad, H., Saat, N.K., Harun, S.W.
S-band erbium-doped fiber ring laser using a fiber Bragg grating

(2005) *Laser Physics Letters*, 2 (7), pp. 369-371. Cited 42 times.
doi: 10.1002/lapl.200510009

View at Publisher

17 Connelly, M.J.
Wideband semiconductor optical amplifier steady-state numerical model

(2001) *IEEE Journal of Quantum Electronics*, 37 (3), pp. 439-447. Cited 320 times.
doi: 10.1109/3.910455

View at Publisher

Harun, S.W.; Photonics Research Centre, University of Malaya, Malaysia; email:harith@um.edu.my