

# Monolithically Integrated Semiconductor Laser Amplifier Based Interferometers for Optical Signal Processing PDF - herunterladen, lesen sie



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**Beschreibung**

1 Jan 2007 . To investigate high-speed SOA-based all-optical signal processing systems, in this thesis we develop a . In this thesis we investigate a novel mode-locked laser based on nonlinear polarization rotation in ... possibility of monolithic integration of the optical switch

fabric, keeping the high-speed data in the.

All-optical signal processing has brought a great impact on developing the next generation of high-capacity optical-fiber related products and networks, drawing lots ... widely-tunable 10Gbit/s photocurrent-driven wavelength converter incorporating a monolithically integrated laser transmitter and optical receiver," Electron.

format reconversion from the red-chirped NRZ signal, generated by the RZ-to-NRZ converter, using a semiconductor optical amplifier in a fiber loop mirror (so-called an SOA-loop-mirror). The primary merit of the proposed NRZ-to-RZ reconversion is that no additional optical clock is required in the process, unlike other.

A micromachined accelerometer device structure with diffraction-based optical detection and integrated electrostatic actuation is introduced. . An integrated semiconductor laser such as a vertical cavity surface emitting laser (VCSEL) on a separate substrate illuminates the structure, with a portion of the incident light.

was little changed from that of a semiconductor laser, which resulted in a very divergent output mode and .. This can also be achieved by the monolithic integration of passive waveguides either by postgrowth . In SOA-based optical signal processing, two (or more) signals are launched into the SOA where they interact in.

PIC—photonic integrated circuit. QW—quantum well. RZ—return to zero. SAG—selective-area growth. SCH—separate confinement heterostructure. SOA—semiconductor optical amplifier. SSC—spot-size converted. TEC—thermoelectric cooler. VCSEL—vertical-cavity surface-emitting laser. WDM—wavelength division.

posed for modeling and optimisation at an integrated magneto-optics! il'riU} waveguide isolator: The trans-verse MU Kerr effect. in ferromagnetic . 'Tb ensure stable emission of a semiconductor laser, an optical isolator is needed to prevent . optical signal processing, underlines the need for an integrated optical isolator.

Monolithically integrated 1.55- $\mu\text{m}$  dual-wavelength distributed feedback laser and semiconductor optical amplifier array for terahertz mode-beating signal generation. Abstract: A 1.55- $\mu\text{m}$  . DFB lasers, SOAs, MMI coupler and spot-size converters (SSCs) have been integrated on the same InP based substrate. By electrically.

This thesis presents first of its kind a novel chip interferometer sensor based on hybrid integration technology for online surface and dimensional metrology applications. The complete metrology sensor system is structured into two parts; hybrid photonic chip and optical probe. The hybrid photonic chip interferometer is based.

22 Sep 2017 . SOA: semiconductor optical amplifier. EOPM: electro-optic phase modulator. tion in active media [5,6]. Using MMIs and curved waveguides, mode-locked lasers in ring geometry are feasible [7,8]. MIRs allow the on-chip Fabry-Pérot cavity [9], signal acquisition and post-stage processing [10]. In [11-13] it was.

Klee, Anthony, "Broad Bandwidth Optical Frequency Combs from Low Noise, High Repetition Rate Semiconductor Mode-Locked Lasers" . monolithic integration on-chip, feature high wall-plug efficiency due to direct electrical pumping, and can be .. Coupled Cavity Laser with Slab-Coupled Optical Waveguide Amplifier .

Index Terms— Modulation format conversion, nonlinear dynamics, optical communications, optical injection, optical signal processing, semiconductor lasers. I. INTRODUCTION. WHILE solitary single-mode semiconductor lasers normally emit continuous-wave radiation, their rich nonlinear dynamics, such as stable locking,.

"Spectral characterisation of monolithic modelocked lasers for mm-wave generation and signal processing", P Acedo, H Lamela, S Garidel, C Roda, J P Vilcot, . "Monolithic semiconductor amplifier based switch fabrics for interconnects and storage area networking",

K A Williams, M Glick, T Lin, G F Roberts, R V Penty and.

Long wavelength optical semiconductor integration technology and devices for gas sensing applications (GTIP-STW LWAVE-TECH). Startdatum: . The laser features an intracavity tuning mechanism based on nested asymmetric Mach–Zehnder interferometers with voltage controlled electro-refractive modulators. The laser.

Wavelength Conversion based on SOAs . signal processing, clock recovery, ultra fast optical time multiplexing/demultiplexing, pulse shaping, optical . SOAs amplify incident light through stimulated emission; the same mechanism used by semiconductor lasers. An optical amplifier is essentially a laser without feedback.

Introduction. As bandwidth demands for telecommunication networks increase, optical signal processing techniques may be required to provide the necessary network capacity. The semiconductor optical amplifier Mach-Zehnder interferometer (SOA-MZI) is an integrated all-optical switch which can operate at ultrafast.

By controlling the amount of feedback, we achieve chaotic dynamics in the long-cavity regime and show that the resulting dynamics is sufficiently complex in order to generate random bits based on the chaotic intensity fluctuation at a rate of 500 Mbits/s. Semiconductor lasers with optical feedback are interesting for several.

Azaña, J., Chen, L.R.: Multiwavelength optical signal processing using multi-stage ring resonators. IEEE Photon . beating between monolithically integrated semiconductor ring lasers. Appl. Phys. Lett. 86, 041101 (2005) .. analysis of directional couplers and multimode Interferometers based on ridge waveguides. IEEE J.

block is the semiconductor ring laser (SRL) that exhibits bistability between the counter-propagating cavity modes. .. 1.2 Schematic illustration of all-optical logic gates that are based on a. SRL monostable. .. and monolithic integrated elements counting as many as 200-300 per chip can be achieved today [1,2]. However.

Abstract. In this paper, we review the recent progress in the optical signal processing based on the nonlinearity of semiconductor optical amplifiers (SOAs). The four important optical signal processing functional blocks in optical switching are presented, i.e., optical wavelength conversion, optical regeneration, optical logic,.

15, 2013. Multi-wavelength laser based on an Arrayed Waveguide Grating and Sagnac loop reflectors monolithically integrated on InP. P Muñoz, R García-Olcina, . UWB doublet generation employing cross-phase modulation in a semiconductor optical amplifier mach–zehnder interferometer. V Moreno, M Rius, J Mora, MA.

500 ps). Efforts were soon underway to form a new class of switching devices based upon the efficient resonant nonlinearity in SOAs to induce a differential phase change between the two signal pulses counter-propagating in the fiber loop. The first device developed was known as a semiconductor laser amplifier in a loop.

NanoPhotonic Integrated Circuit: A Platform for “Optical Processor”. Nanophotonic Integrated ... “optical processor” are: guiding, amplifying, modulating, signal processing, attenuating, sensing, on-chip light source and detector, and . sketch of a PBG based interferometer proposed by ARP. Here PBG waveguides are used.

Our glossary of photonics terms is based on the definitions in the encyclopedia articles. . external-cavity diode lasers: non-monolithic diode lasers where the laser cavity (resonator) is completed with external optical elements .. integrated optics: the technology dealing with the construction of photonic integrated circuits.

Semiconductor optical amplifier (SOA)based, interferometric optical gates have appeared as the main-stream photonic signal processing units [51, 52, 53, 54], exploiting their fast response for high-speed operation and taking advantage of the remarkable advance of hybrid and

monolithic integration techniques for offering.

power semiconductor lasers or photonic integrated circuits. Starting . modulators and two monolithically integrated optical sensor ... interference signals. As shown by the position graph, direction changes occurred at 1.2 and 3.2 m. C. Position Sensor Based on DMI. These interferometer chips were tested in bar form and.

19 May 2017 . mode-locked lasers; near-infrared spectroscopy; optical frequency comb; semiconductor lasers; silicon photonics ... Gordón C, Leijtens XJM, Carpintero G. Optical frequency comb generator based on a monolithically integrated passive mode-locked ring laser with a Mach-Zehnder interferometer. Opt Lett.

SPIE 9516, Integrated Optics: Physics and Simulations II, 951608, 2015; I. Sackey, T. Richter, M. Nölle, M. Jazayerifar, K. Petermann, J.K. Fischer and C.Schubert, ... Parametric optical signal processing in silicon waveguides with reverse-biased p-i-n junctions, IEEE Photonics Society 2014 Summer Topical Meeting Series.

Robust Integrated Photonic Signal Processing by. Scott B. Kuntze ... Chapter 1 The promise of integrated photonics. 4. Figure 1.1: Microscopic views of a ridge waveguide diode laser or semiconductor optical amplifier [18]. . SOAs are small and may be fully integrated into monolithic waveguide-based photonic circuits.

Monolithically integrated asymmetric Mach-Zehnder interferometer as a 20 Gbit/s all-optical add/drop multiplexer for OTDM systems .. Ehrke, "Optical Signal Processing using Monolithically Integrated Semiconductor Laser Amplifier Structures," in Optical Amplifiers and Their Applications, R. Jopson, K. Stubkjaer, and M.

19 May 2008 . Optical Displacement Measurement with. GaAs/AlGaAs-Based Monolithically. Integrated Michelson. Interferometers. Daniel Hofstetter, Hans P. Zappe, .. Cleaving of the bars to the desired length and evaporation of suitable facet coatings completed the processing. On the left laser facet, we used a high-

The authors report on all-optical switching devices based on semiconductor laser amplifiers (SLA) in applications for optical time division multiplexing. .. Ehrke: Optical signal processing using monolithically integrated semiconductor laser amplifier structures, Optical Amplifiers and Their Applications, Monterey, California,.

1 Sep 2011 . The team proposes five optoelectronic chips on various semiconductor platforms (silicon, indium phosphide) and hybrid material platforms based on their functions in optical networking signal processing—namely (1) integrated chips for optical switching and buffering, (2) integrated chips for optical clock.

6 Feb 2013 . We demonstrate the monolithic integration of a mid-infrared laser and detector utilizing a bi-functional quantum cascade active region. When biased, this . A QCL is a unipolar semiconductor laser based on intersubband transitions in a periodically repeated quantum well structure. Their demonstrated.

Then, semiconductor optical amplifiers used in the external cavity lasers are highlighted more in detail as well as diffraction gratings and other types of wavelength-selective reflectors .. [23] O.K. Kwon, K.H. Kim, E.D. Sim, J.H. Kim, and K.R. Oh, "Monolithically integrated multiwavelength grating cavity laser", IEEE Photonic.

Downloaded from orbit.dtu.dk on: Nov 17, 2017. Semiconductor optical amplifier-based all-optical gates for high-speed optical processing. Stubkjær, Kristian ... signal processing. From the early 1990s, the SOA-based structures have been developed into monolithically integrated interferometric optical gates that offer many.

Chapter 6 Light Sources. 103. The semiconductor laser designer is challenged to integrate key optical elements (cavity, filter, excitation region, reflectors, etc.) in a device that is very small, monolithic, efficient, almost monochromatic, and stable. Wavelength and signal amplitude

stability of semiconductor lasers are im-

Integrated passively mode-locked semiconductor lasers are robust and compact sources for generating coherent optical frequency combs which are of great interests in ... "Optical frequency comb generator based on a monolithically integrated passive mode-locked ring laser with a Mach-Zehnder interferometer," Opt. Lett.

Optical channelizing filters with narrow linewidth are of interest for optical processing of microwave signals. Fabrication tolerances . present a tunable ring resonator filter with an integrated semiconductor optical amplifier (SOA) fabricated on an InP- based photonic integrated circuit (PIC) platform. The ring resonance is.

Results 1 - 17 of 17 . InP-Based Device Technologies for Signal Processing Using Ultrafast Frequency Combs . Integrated Semiconductor Laser Optical Phase Lock Loops . A low-power, high-performance integrated  $4 \times 4$  hybrid Mach-Zehnder interferometer (MZI) semiconductor optical amplifier (SOA) optical switch is.

2 Jun 2014 . The energy transfer process from an ultrashort optical pulse to the dielectric material lattice incorporates a series of complex, dynamical processes [1]. . Through the combination of these applications ULI is also rapidly being established as a technology capable of monolithic integration of photonic and.

Introduction: Optical signal processing using monolithically integrated semiconductor laser amplifier . Principle of operation: The different NSI and MZI interferometer structures shown in Fig. 1 are based on essentially the same principle of operation with some minor differences. Optical pulses at two different wavelengths.

gation, optical saturation, optical signal processing, semiconductor . tial amplifier. The TWC in ULSOAs has a high-speed potential because the FWM behind is based to a large extent on fast in- traband effects such as spectral hole burning or carrier heating. [2], [10], [11]. .. on monolithically integrated interferometers.

Photonic integrated circuits for ultrafast signal processing. Significant . "About the possibility of bistable dynamics in lasers with single-mode cavities," V. Shuvayev, V. M. Menon, A. Lisyansky, and L. .. "Monolithic integration of a semiconductor optical amplifier and a high bandwidth p-i-n photodiode using asymmetric.

Such nonlinear devices based on semiconductor optical amplifiers and their effects on propagating optical signals are also reviewed. Cited by (26):. Zaineb Al-Qazwini . (2009) Mode-Locked InP-Based Laser Diode With a Monolithic Integrated UTC Absorber for Subpicosecond Pulse Generation. IEEE Journal of Quantum.

15. Apr. 2017 . Download ebooks free Monolithically Integrated Semiconductor Laser Amplifier Based Interferometers for Optical Signal Processing ISBN 9783895887444 kostenlose PDF Bücher. Elke Jahn . No Description 97 Seiten, Maße: 14,9 x 21,2 cm, Kartoniert (TB), Deutsch, Verlag: Cuvillier Verlag, ISBN-10:.

Monolithically integrated nonlinear Sagnac interferometer and its application as a 20 Gbit/s all-optical demultiplexer. Abstract: A Sagnac interferometer consisting of a semiconductor laser amplifier and a 3 dB coupler monolithically integrated within a waveguide loop mirror is fabricated and its application as a 20 Gbit/s.

30 Nov 2017 . Abstract: We describe recent progress in integrated microwave photonics in wideband signal . of monolithic integration, and cascaded photonic signal processing for analog radio frequency (RF) .. of Mach Zehnder Interferometer (MZI) or microring resonator-based optical switches, thus generating.

32, 3 (1996) Jahn, E.: Monolithically integrated semiconductor laser amplifier based interferometers for optical signal processing. Ph. D. Thesis, Technical University of Berlin (1996) Japan, O.: Evolution of transmission data rates. Optoelectronics Industry and

Technology Development Association (2006) Kibler, T., Rode, M.,

To develop compact semiconductor laser transmitters for long haul, very high bit-rate optical fibre transmission links in . To obtain improvement in reliability using monolithic photonic-integrated-circuit concepts using existing (proven) . SOAs were studied for application in optical signal processing and as in-line amplifiers.

'The Input Power Dynamic Range of a Semiconductor Optical Amplifier and Its Relevance for Access Network Applications'; Bonk ... 'Polarization Independent Optical Phase Conjugation with Pump-Signal Filtering in a Monolithically integrated Mach-Zehnder Interferometer Semiconductor Optical Amplifier Configuration';

With improvements in complementary metal-oxide-semiconductor (CMOS) electronics, digital signal processing (DSP) became available circa 2002 to handle . 100-Gb/s coherent optics evolution, going from LiNbO<sub>3</sub> modulators and planar lightwave circuit (PLC)-based receivers to InP-based modulators and receivers to.

Narrow linewidth, hybrid integrated extended cavity diode lasers for quantum optics precision experiments in space, International Conference on Atomic Physics (ICAP), Palaiseau, France, July 23-27, 2012. Towards packaged micro-integrated semiconductor laser modules for the deployment of cold atom based quantum.

Simultaneous all-optical add and drop multiplexing of 40-Gbit/s OTDM signals using monolithically integrated Mach-Zehnder interferometer. Jepsen, Kim Stokholm; Mikkelsen, Benny; Vaa, Michael; Poulsen, Henrik Nørskov; Clausen, Anders;. Stubkjær, Kristian; Hess, R.; Duell, M; Vogt, W; Gamper, E.; Gini, E; Besse, P.A.;

Conversion Using a Single Semiconductor. Optical Amplifier. Y. Liu, Member, IEEE, E. Tangdiongga, Z. Li, Member, IEEE, Huug de Waardt, Member, IEEE, . A number of SOA-based wavelength converters have been demonstrated [5]–[16]. Monolithically integrated devices that contain a 40-Gb/s optical wavelength.

tical wavelength converter technology is reviewed with emphasis on all-optical wavelength converter types based on semiconductor optical amplifiers. ... integrated. An impressive activity on opto-electronic integration of interferometric converters has taken place resulting in rapid progress towards compact and ef-

demultiplex and demodulate optical signals, will be the key to the realization of economical and reliable wide band (-THz) optoelectronic systems for optical signal processing and computing applications. To date, efforts have focused on the development of hybrid and monolithically integrated devices and systems in the.

Semiconductor Optical amplifier based devices have been proposed as suitable alternatives . monolithic integration with other optical components like passive waveguides and couplers to perform more complex . Practical implementation of All-Optical signal processing unit requires integrated All-Optical devices for ease.

Harmonically mode-locked semiconductor-based lasers as high repetition rate ultralow noise pulse train and optical frequency comb sources . Lee W, Ozharar S, Quinlan F and Yimaz T 2006 Optical frequency combs from semiconductor lasers and applications in ultrawideband signal processing and communications.

RF/mm-wave signal generation with optoelectronic techniques + Mode-Locked semiconductor lasers [2002 - present]. Semiconductor laser interferometry and sensing based on self-mixing configuration - Effects of backreflections into semiconductor laser cavity [1995 - present]. Optical amplifier noise and noise in optical.

Monolithic passively mode-locked colliding pulse semiconductor lasers generating pico- to sub-picosecond . and signal processing where a much narrower frequency line set is needed. In this dissertation, a novel ... Figure 6: Photomask parameters of the semiconductor optical

amplifier (SOA) device. 15. Figure 7: Bars of.

integrated components while keeping the temperature below 250 o. C during the entire fabrication process. Two strong absorption peaks that appear at 1.5  $\mu\text{m}$  . such as semiconductor lasers and detectors, or polymer-based structures on the common .. grating Fabry-Perot interferometers", 10th Optical Fiber Sensors.

the semiconductor optical amplifier Mach-Zehnder Interferometer (SOA-MZI) as a key element, using the . Two schemes for all-optical packet header recognition are proposed based on the XOR logic gate. The first .. monolithically integrating arrays of interferometric switches, towards photonic very large scale integration.

2 Jul 2010 . wavelength is imposed, for each colorless component, by an external optical signal. Our studies include two types of colorless components: The Injection-Locked Fabry-Perot laser (IL-FP) and the. Reflective Electro-Absorption Modulator integrated with a Semiconductor Optical Amplifier (REAM-. SOA).

31 Oct 2017 . The photonic and electronic devices are integrated on a standard 180 nm complementary metal-oxide semiconductor silicon-on-insulator process. . integrated PDH frequency stabilization system based on an architecture where an electronically reconfigurable Mach-Zehnder interferometer (MZI) is used.

11 Mar 2014 . ing signal allowing the angular rate estimation. The Resonant. Micro-Optic Gyro (RMOG) overcomes these effects by using a passive resonant cavity with high Q-factor. RMOGs based on either a silica-on-silicon ring resonator with very low loss or an InP resonator that allows the monolithical integration.

This news page provides you picked up news about laser diodes from the most famous sites. . Microscale semiconductor lasers are an indispensable part of integrated photonic circuits. In this ... Application: Others . Study of gain-coupled distributed feedback laser based on high order surface gain-coupled gratings.

11-13, 1996, Monterey, Calif., "Optical Signal Processing Using Monolithically Integrated Semiconductor Laser Amplifier Structures", Agrawal et al. A semiconductor optical amplifier is used as a phase shifter in one arm of a two arm interferometer. The data stream to be switched is fed to both arms of the interferometer.

A laser is a device that emits light through a process of optical amplification based on the stimulated emission of electromagnetic radiation. The term "laser" originated as an acronym for "light amplification by stimulated emission of radiation". The first laser was built in 1960 by Theodore H. Maiman at Hughes Research.

Photonic integration and all-optical signal processing are promising solutions to the increasing demand for . V semiconductor materials, specially AlGaAs, have shown potentials for photonic integration and efficient ... of the microring resonators based on aluminium gallium arsenide (AlGaAs) III-V semiconductors as it.

Digital Optical Signal Processing with larization-. Bistable Semiconductor Lasers. JAI-MING LIU, MEMBER, IEEE, AND YING-CHIN CHEN, MEMBER, IEEE. Abstract-The operations of a complete set of optical AND, NAND,. OR, and SOR gates and clocked optical S-R, D, J-K, and T flip-flops are demonstrated, based on.

All-optical signal processing is one promising technique for providing the necessary capacity and offers payload transparency, power consumption which scales efficiently with increasing bit . thesis, we focus on using semiconductor optical amplifier-based logic gates to address . requires low-loss monolithic integration.

The design is based on a two mode interference waveguide. . integrated with the existing laser process and provides a monotonic varying output signal .. Amplifier. Grating Bursts. Curved Passive. Output Guide. Figure 8. SGDBR laser with integrated semiconductor optical



amplifier. The key to successful integration of the.

1993, to speed up signal processing based on XPM in SOA. They are SLALOM(semiconductor laser amplifier in a loop mirror)[32],. TOAD(terahertz optical asymmetric demultiplexer)[33], and SMZ(symmetric Mach-Zehnder interferometer) all-optical switch[34]. Later devices like. UNI(ultrafast nonlinear interferometers)[35].

9 Feb 2014 . The nonlinearity may be generated in numerous ways such as using nonlinear loop mirror, nonlinear fiber, photonic crystal, filter, waveguide, thyristor, acoustic waves, or semiconductor optical amplifier. Therefore, there are many researches going on to realize all-optical signal processing systems which.

All-Optical Control- And Data-Signal Separation Schemes. 230. 4. Static and Dynamic Characterizations. 236. 5. Conclusions. 248. 6.2 Polarization Independent Optical Phase Conjugation with Pump-Signal Filtering in a Monolithically Integrated Mach-Zehnder Interferometer. Semiconductor Optical Amplifier.

switches with recent technologies for ultrahigh-speed optical signal processing in future optical networks is . semiconductor optical amplifier based monolithically integrated nonlinear interferometer structures using the .. fiber (~10 km), the nonlinearity of a semiconductor laser amplifier (SOA) is used in a FWM based.

Optical switch using a nonlinear interferometer makes it possible for one optical signal to control and switch another . In this case the medium is optical fiber and semiconductor optical amplifier (InGaAsP) which is placed asymmetrically in.

11-13, 1996, Monterey, Calif., “Optical Signal Processing Using Monolithically Integrated Semiconductor Laser Amplifier Structures”, Agrawal et al. A semiconductor optical amplifier is used as a phase shifter in one arm of a two arm interferometer. The data stream to be switched is fed to both arms of the interferometer.

17 May 2017 . optical frequency comb generation by monolithically integrated linear mode-locked laser. Lo, Mu Chieh. The International Society For Optical (SPIE). Proceedings SPIE . A passively mode-locked laser is usually a two-section structure, composed of a semiconductor optical amplifier (SOA) as gain section.

Semiconductor lasers, quantum cascade; (250.0250) Optoelectronics. References and . ring based optical frequency comb generator,” International Topical Meeting on Microwave Photonics (MWP). 2007, 46–49 . D. C. J. Reid, A. C. Carter, and M. J. Wale, “Widely tunable DS-DBR laser with monolithically integrated SOA:.

capable of launching, receiving, and processing optical signals at the extremely high . optoelectronic devices on a single semiconductor crystal [1] . [2] offers the . lasers that have been studied for integration purposes are sometimes fabricated on semi-insulating (SI) substrates such as Fe doped InP or Cr doped GaAs.

Downloaded from orbit.dtu.dk on: Sep 13, 2017. Semiconductor optical amplifier-based all-optical gates for high-speed optical processing. Stubkjær, Kristian ... signal processing. From the early 1990s, the SOA-based structures have been developed into monolithically integrated interferometric optical gates that offer many.

M. Shtaif and G. Eisenstein, “Analytical solution of wave mixing between short optical pulses in a semiconductor optical amplifier. . W. Pieper, H.G. Weber, and C. M. Weinert, “40 Gbit/s all-optical demultiplexing using a monolithically integrated MachZehnder interferometer with semiconductor laser amplifiers,” Electron.

Abstract—Due to the flexible functions and monolithic integration, semiconductor ring laser (SRL) has become a hot topic in the field of . proposed and employed in optical signal processing, such as semiconductor optical amplifier-based Mach-Zehnder interferometer (SOI-MZI)[1], nonlinear optical loop mirror. (NOLM)[2].

All-optical data processing has been the subject of most research interest during last few decades. The area of optical computing provides a challenge to the . Liquid crystal (LC) switch. 1.6.4. Semiconductor optical amplifier (SOA). 1.6.5. Interferometric switch. 1.6.6. Terahertz optical asymmetric demultiplexer (TOAD). 1.6.7.

[1] Li, Z.; Li, G. Ultrahigh-Speed Reconfigurable Logic Gates Based on Four-Wave Mixing in a Semiconductor Optical Amplifier. . [8] Li, B.; Lu, D.; Memon, M. I.; Mezosi, G.; Wang, Z.; Sorel, M.; Yu, S. All-optical digital logic AND and XOR gates using four-wave-mixing in monolithically integrated semiconductor ring lasers.

As bandwidth demand rises, the construction of optical packet-switching nodes targeting optical routers would benefit from fast optical switches. Semiconductor-optical-amplifier (SOA) technology provides this high-speed switching capability as well as gain, high extinction ratio, and high integration potential. Moreover, it is a

15 Oct 2004 . Abstract—We propose a compact and simple all-optical sub-carrier-multiplexed (SCM) label-swapping system employing an integrated electroabsorption modulation laser and a semiconductor optical amplifier based Mach-Zehnder interferometer wavelength converter. The experiments demonstrated.

Semiconductor optical amplifier Mach-Zehnder interferometer (SOA-MZI) wavelength converters represent an important class of integrated wavelength converters that work for both RZ and NRZ data formats while also acting as 2R signal regenerators due to their nonlinear transfer functions. Integration of SOA-MZIs in InP.

monolithically integrated Mach-Zehnder interferometer,” *Electron Lett.* 34, 579-80 (1998). 4. .

All-optical techniques for processing lightwave-communication signals have advanced considerably in recent years. . flop operation based on polarization bistability in semiconductor lasers is expected to be ultrafast ( $\sim 100$  Gb/s).

The device combines a semiconductor optical amplifier-based wavelength converter and a fast-tunable multifrequency laser. Sub-nanosecond switching among the eight channels of the integrated laser is shown, and error-free operation of the wavelength conversion process at 40 Gb/s for each wavelength is demonstrated.

[63] R. J. Manning, A. D. Ellis, A. J. Poustie, and K. J. Blow, 'Semiconductor laser amplifiers for ultrafast all-optical signal processing,' *J. Opt. Soc.* . Ellis, D. Nasset, D. G. Moodie, and R. Kashyap, '80Gbit/s all-optical regenerative wavelength conversion using semiconductor optical amplifier based interferometer,' *Electron.*

Jun Qin, Yuefeng Ji, Hongxiang Wang, Danshi Wang, Min Zhang, and Guo-Wei Lu, "Multichannel Wavelength Multicasting for Two QPSK Signals based on Four-wave Mixing in Semiconductor Optical Amplifier," *Chinese Optics Letters*, vol.13, no.1, 2015.

systems, but have also found uses in optical signal processing applications and other optical systems as well. An interesting . development of semiconductor laser structures will not be pursued in detail, but integrated ... and InP based optoelectronic integrated circuits (OEICs) have been the focus of much research and.

J. Prat, C. Arellano, V. Polo, and C. Block, "Optical Network Unit Based on a Bidirectional Reflective. Semiconductor . Semiconductor Optical Amplifier at 1.3  $\mu$ m Wavelengths for Customer Connection in Optical Access . K. Hoppe, M. Løbel, and J. Hanberg, 'Optical signal processing using electro-absorption modulators',.

well lasers, semiconductor laser, semiconductor optical amplifier. I. INTRODUCTION . with a set frequency spacing for applications including: optical signal processing [4], . THEORY AND DESIGN OF THz INTRACAVITY GAIN-FLATTENED FILTERS FOR MONOLITHICALLY INTEGRATED MLLs. 115. Fig. 1. Fabricated.

Semiconductor optical amplifier (SOA)-based, interferometric optical gates have appeared as

the main-stream photonic signal processing units [8], exploiting their fast response for high-speed operation and taking advantage of the remarkable advance of hybrid and monolithic integration techniques for offering compact.

14 Feb 2011 . However, the required combination of high power lasers, high current SOAs and tight tolerance filters is a very difficult one to integrate and scale. Hybrid electronic and photonic switching approaches (Chiaroni et al., 2010) are increasingly studied to perform broadband signal processing functions in the.

15, 2013. Multi-wavelength laser based on an Arrayed Waveguide Grating and Sagnac loop reflectors monolithically integrated on InP. P Muñoz, R García-Olcina, . UWB doublet generation employing cross-phase modulation in a semiconductor optical amplifier mach-zehnder interferometer. V Moreno, M Rius, J Mora, MA.

