

294

Accession number:20114614512507

Title:Analytical investigation of all-optical wavelength conversion in a semiconductor-optical-amplifier integrated distributed feedback laser wavelength converter based on four-wave mixing

Authors:Kaatzian, Hassan (1); Moazzam, Mostafa Keshavarz (1)

Author affiliation:(1) AmirKabir University of Technology, Electrical Engineering Department, Photonics Research Laboratory, Tehran, Iran

Corresponding author:Kaatzian, H.(hsnkato@aut.ac.ir)

Source title:Optical Engineering

Abbreviated source title:Opt Eng

Volume:47

Issue:1

Issue date:2008

Publication year:2008

Article number:014202

Language:English

ISSN:00913286

E-ISSN:15602303

CODEN:OPEGAR

Document type:Journal article (JA)

Publisher:SPIE, P.O. Box 10, Bellingham, WA 98227-0010, United States

Abstract:We investigate nondegenerate four-wave mixing and the resulting high efficiency of wavelength conversion in a semiconductor-optical-amplifier integrated distributed feedback laser, which is one of the latest achievements of photonics technology. For analyzing the amplifier we use a finite-difference beam propagation method based on solution of a modified nonlinear Schrödinger equation, and for the laser we use a coupled-wave approach. We investigated wavelength conversion up to 4-THz pump-probe detuning with lossless conversion up to 400-GHz detuning and a conversion efficiency of -4.8dB at 1-THz pump-probe detuning. For calibration and verification of the software developed in this study, we have used experimental measurements reported from MIT electronics and Fujitsu research laboratories on a similar device. We have successfully estimated the conversion efficiency of the tested device.

Number of references:26