

249

Accession number:20114814569742

Title:All-optical carry lookahead adder with the help of terahertz optical asymmetric demultiplexer

Authors:Gayen, Dilip Kumar (1); Roy, Jitendra Nath (2); Pal, Rajat Kumar (3)

Author affiliation:(1) Department of Computer Science, College of Engineering and Management, Kolaghat, KTPP Township, Midnapur (East) 721 171, W.B., India; (2) Department of Physics, NIT, Agartala, Tripura, India; (3) Department of Computer Science and Engineering, Calcutta University, Kolkata 700 009, India

Corresponding author:Gayen, D.K.(dilipgayen@yahoo.com)

Source title:Optik

Abbreviated source title:Optik

Volume:123

Issue:1

Issue date:January 2012

Publication year:2012

Pages:40-45

Language:English

ISSN:00304026

Document type:Journal article (JA)

Publisher:Urban und Fischer Verlag Jena, P.O. Box 100537, Jena, 07705, Germany

Abstract:An all-optical model of carry lookahead adder (CLA) implemented with a semiconductor optical amplifier (SOA)-assisted Sagnac interferometer (TOAD) is presented. The model accounts for the SOA small signal gain, linewidth enhancement factor, the switching pulses energy and width and the Sagnac loop asymmetry. Adder is a very basic component in a central processing unit. The CLA is the highest speed adder nowadays. Theoretical model is presented and verified through numerical simulation. The method promises both higher processing speed and accuracy. The model can be enhanced the functionality in which carry lookahead adder is the basic building block. © 2011 Elsevier GmbH. All rights reserved.

Number of references:20

Main heading:Adders

Controlled terms:Computer simulation - Demultiplexing - Light amplifiers - Optical switches - Program processors

Uncontrolled terms:All-optical - Basic building block - Carry look-ahead adder - Linewidth enhancement factor - Optical half adder - Processing speed - Sagnac interferometer - Sagnac loop - Small signal gain - Switching pulse - Terahertz optical asymmetric demultiplexers - Theoretical model

Classification code:741.3 Optical Devices and Systems - 723.5 Computer Applications - 723.1 Computer Programming - 722.4 Digital Computers and Systems - 718 Telephone Systems and Related Technologies; Line Communications - 717 Optical Communication - 716 Telecommunication; Radar, Radio and Television

DOI:10.1016/j.ijleo.2010.11.029

Database:Compendex

Compilation and indexing terms, Copyright 2012 Elsevier Inc.