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Accession number:20114014391351

Title:Ultrafast all-optical temporal differentiators based on CMOS-compatible integrated-waveguide Bragg gratings

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Source title:Optics Express

Abbreviated source title:Opt. Express

Volume:19

Issue:20

Issue date:September 26, 2011

Publication year:2011

Pages:19514-19522

Language:English

E-ISSN:10944087

Document type:Journal article (JA)

Publisher:Optical Society of America, 2010 Massachusetts Avenue NW, Washington, DC 20036-1023, United States

Abstract:We report the first realization of integrated, all-optical first- and higher-order photonic differentiators operating at terahertz (THz) processing speeds. This is accomplished in a Silicon-on-Insulator (SOI) CMOS-compatible platform using a simple integrated geometry based on (Π -)phase-shifted Bragg gratings. Moreover, we achieve on-chip generation of sub-picosecond Hermite-Gaussian pulse waveforms, which are noteworthy for applications in next-generation optical telecommunications.

Number of references:32