All Optical Inverter, Logic and Memory Circuits based on Vertical Cavity Semiconductor Optical Amplifier-like Devices

Tech ID: 21157 / UC Case 2006-305-0

TECHNOLOGY DESCRIPTION

Researchers in the School of Engineering at The University of California, San Diego, have developed, and experimentally demonstrated, a VCSOA-like device that exhibits gain, bistability, and polarization selectivity to achieve Boolean inversion in the optical domain. Similar set-ups and methods can be used to achieve other optical logic, switching, as well as memory devices and systems.

Logic devices based optical cross-gain modulation (XGM) in SOAs to achieve optical inversion suffer from the need to operate at high power (near saturation), have low bandwidth, and high coupling losses due to their quantum-well structure. The present invention avoids these limitations and has the potential to achieve Boolean inversion at high speeds, low power, workable noise margins for cascadability because of input output isolation.

STATE OF DEVELOPMENT

This technology is in early stage development, but is presently available for licensing. Patents pending.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,036,253	05/19/2015	2006-305

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- STI-bounded Single-photon Detector in a Deep-submicron CMOS Process
- Frequency Up-conversion via Hot Carrier Luminescence

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OTHER INFORMATION

CATEGORIZED AS

- **Optics and Photonics**
  - All Optics and Photonics

RELATED CASES

2006-305-0