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On the SOA-based MZI all-optical logic gates for all-optical networks

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In this paper, an all-optical logic scheme which exploits the cross-phase modulation (XPM) effect in semiconductor-optical-amplifier-assisted Mach-Zehnder Interferometer (SOA-MZI), is proposed, performance analyzed and parameters optimized. The proposal is validated and the system performance under various parameters is examined through numerical simulations. With only moderate parameters, high-speed all-optical AND gate based on SOA-MZI is realized with fairly high performance. The results are helpful for designing of SOA-based all-optical logic devices.

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