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Nanophotonic integrated chip fabricated by CMOS technology

Shankar Kumar Selvaraja

Supervisor(s): Dries Van Thourhout and Roel Baets

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Optical communication is growing exponentially for the past decade. High bandwidth and data rate make fiber optical communication attractive from conventional copper based communication network. Despite its advantages, optical communication links lags all optical function often signal has to be converted to electrical domain for routing and processing. This conversion limits the performance of such network. An optical integrated chip with routing and processing functionality will remove this bottleneck. Using CMOS manufacturing facility, which

is a well-established industry for many years we can make such photonic integrated chips. Even though made to make nanometer scale circuits with high throughput the photonic circuit specifications are different from its electronic counterpart. Therefore studying various processes and its compatibility to make cheap and high performance photonic IC's is essential. We have fabricated high quality photonic integrated circuits with CMOS process which demonstrates the mass production and high performance.

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Efficient Polarization Independent Optical Link in Bonded InP-membrane

Frederik Van Laere, Tiziana Stomeo, Dries Van Thourhout and Thomas F. Krauss

Supervisor(s): Roel Baets

Using high refractive index contrast is the route towards very dense integrated optical circuits. On-chip components can be made very compact and put together on a small chip area. This paves the way for fast optical communication at an acceptable price. An optical chip typically requires both passive (e.g. guiding of light, wavelength selectivity) and active functionality (e.g. light generation, light detection). An important problem is the efficient coupling of these very small

on-chip components with the outside world (optical fiber). An attractive solution is the use of grating couplers for (near) vertical coupling to fiber. In this paper, we have integrated a (passive) grating coupler structure in high-index contrast InP-membrane with (active) photodetectors. This way, we demonstrate an efficient optical link from fiber to detector. Additionally, the link is made polarization independent by using so-called polarization diversity.

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