

New Materials for Active Devices in Silicon Photonics

D. Van Thourhout

¹ Photonics Research Group, INTEC, Ghent University – imec, Ghent, Belgium

dries.vanthourhout@ugent.be

Abstract

In this presentation we will report on our recent work on new materials that can be monolithically integrated on high-index contrast silicon or silicon nitride photonic ICs to enhance their functionality. This includes III-V materials for lasers and amplifiers, graphene and other 2D-materials for realizing compact electro-absorption modulators and non-linear devices, ferroelectric materials for realizing phase modulators and adiabatic couplers for realizing bistable switches.

Biography

Dries Van Thourhout received the Ph.D. degree from Ghent University, Ghent, Belgium in 1995 and 2000 respectively. From Oct. 2000 to Sep. 2002 he was with Lucent Technologies, Bell Laboratories, New Jersey, USA, working on the design, processing and characterization of InP/InGaAsP monolithically integrated devices. In Oct. 2002 he joined Ghent University, Belgium, where he has a position as full time professor. He is chair of the joint UGent-VUB Master in Photonics program and is coordinating the cleanroom activities of the research group and coordinating the NAMIFAB centre of expertise. His research focuses on the design, fabrication and characterization of integrated photonic devices. Main topics involve Silicon nanophotonic devices and the integration of novel materials (III-V, graphene, ferro-electrics, quantum dots, ...) on these waveguides to expand their functionality. He is working on applications for telecom, diatom, optical interconnect and sensing. He has submitted 14 patents, has authored and coauthored over 220 journal papers (see below) and has presented invited papers at all major conferences in the domain. He has coordinated several European Projects (FP6 PICMOS, FP7 WADIMOS, FP7 SMARTFIBER), contributed in many more and received an ERC Grant (ULPPIC).