

Silicon photonics electro optical modulators for data/telecom applications

seminar

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Abstract

Ongoing growth of cloud computing and streaming is creating significant challenges for interconnect systems in data centers and high performance computing systems mainly in terms of data-rate, power consumption, size and cost. Maturing silicon photonics (SiP) technology allowing mass production of integrated photonic devices at a competitive cost due to the utilization of existing CMOS infrastructure, and enabling high integration of optical devices such as modulators at the wafer scale is expected to be particularly competitive to service an emerging need for extended reach high-speed data center interconnects. Tremendous efforts have been made in the past decade to maximize the bandwidth and reduce the power consumption of SiP modulators. In this talk, I will present my research in this field during my PhD in the Institute of Integrated Photonics (IPH) at RWTH Aachen University. The outline of the talk includes 1) devices manufactured by using the standard fabrication process available on multi-project wafers i.e. the SiP travelling wave Mach-Zehnder Modulators (MZMs), ring resonator modulators with their applications in wavelength division multiplexing (WDM) systems, and the resonantly enhanced MZMs, 2) SiP modulators with highly linear epitaxially grown phase shifters, and 3) hybrid silicon modulators including (Si)GeSn modulators based on Franz-Keldysh effect, strained silicon modulators with SiN cladding, and Graphene-silicon modulators using Pauli-blocked Burstein-Moss shift.

Speaker

Saeed Sharif Azadeh
Institute for Integrated Photonics
(IPH), RWTH Aachen