Workshop Speaker	
Full Name	Seok-Hwan Jeong
Affiliation	PETRA / Fujitsu Laboratories Limited
Presentation Title	Silicon photonics technologies for high-density optical interconnections

Biography

Seok-Hwan Jeong received the Ph.D. degrees in electrical and electronic engineering from the Tokyo Institute of Technology, Tokyo, Japan in 2003. He is currently a Research Manager at Fujitsu Laboratories Limited, Atsugi, Japan, and a Chief Researcher at Photonics Electronics Technology Research Association (PETRA) project, Tsukuba, Japan. Since November 2012, he has been involved with the PETRA, developing and managing for low-cost silicon photonics integrated circuits for optical transceiver applications. He joined Fujitsu Laboratories Ltd. in 2006 where he has been working on InP-based and Silicon-based photonic integrated devices such as optical switches, optical demodulators for coherent detection, hybrid external cavity lasers and optical demultiplexers for WDM optical links. From 2005 to 2006, he was a Postdoctoral Researcher at the National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan, where he was involved in the research on GaAs-based photonic crystal devices and nanofabrication technology. From 2003 to 2005, he was a Postdoctoral Researcher at NTT Photonics Laboratories, Atsugi, Japan, where he was involved in research on InP-based widely tunable filters and tunable diode lasers. He is the author for more than 120 international journal papers and conference proceedings and the patent holder of 35.

200 words abstract

The use of optics in interconnects is one of promising solutions for handling ever-increasing data demand along more than a few hundred-meter distances via single mode fiber (SMF) transmission. Optical transceivers based on silicon photonics can be one of best technologies for satisfying aforementioned requirements. In this talk, I will introduce recent R&D activities of PETRA/Fujitsu team on silicon photonics technologies for high-density optical interconnections. From the viewpoint of higher bandwidth with lower power consumption, we developed on-package type optical transceiver technologies based on parallel single mode (PSM), and multiplexing technologies based on wavelength division multiplexing (WDM) and 4-level pulse amplitude multiplexing (PAM4) modulation. First, I will show our recent progress of several functional devices such as optical sources based on III-V compound semiconductor on a SOI substrate, WDM filters for Mux/DeMux, grating couplers for coupling to SMF, and Ge photo detectors for a receiver. Also, optical transceiver technologies where electric circuit (EIC) is integrated with photonics circuits (PIC) via a glass ceramic interposer to mount on a package substrate will be discussed with 16ch-PSM 400-Gbpsoperation, 4 WDM 100Gbps operation and 56Gbps per single lane operation based on PAM-4 modulation technologies.