100 Gbaud Transceiver Circuits for Optical Interconnects

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Abstract

New circuit architectures and technologies for high-speed electronic and photonic integrated circuits are essential to realize optical interconnects with higher symbol rate. As a consequence of the increasing speeds, close integration and co-design of photonic and electronic chips have become a necessity to realize high-performance transceivers with novel packaging approaches. Extensive co-design also enables the design of new electro-optic architectures to create and process optical signals more efficiently.

This presentation will illustrate a number of recent developments of application-specific high-speed electro-optic transceiver circuits including e.g. broadband driver amplifiers, transimpedance amplifiers, analog equalizers and multiplexer circuits for signal generation and reception at 100 Gbaud and beyond. The basic concepts and architectures, technological aspects, design challenges and trade-offs will be discussed.

Speaker Bio:

Prof. Johan Bauwelinck was born in Sint-Niklaas, Belgium, in 1977. He obtained the MSc degree and the PhD degree in Electrical Engineering from Ghent University, Belgium, in 2000 and 2005, respectively. Since Oct. 2009 he is a professor in the IDLab research group of the department of Information Technology (INTEC) at the same university and imec where he is leading the Design lab since 2014 (currently 30 people strong). His research focuses on high-speed, high-frequency (opto-) electronic circuits and systems, and their applications on chip and board level, including transmitter and receiver analog front-ends for fiber-optic communication or instrumentation systems. He was and is very active in EU-funded projects in FP6, FP7 and Horizon 2020 such as Optima, Streams, HandheldOCT, POETICS and ESA protobix conducting research on advanced electronic integrated circuits for next generation optical networks, photonic satellite payloads and integrated optical sensing.

He has promoted 27 PhDs and co-authored more than 350 publications and 10 patents in the field of high-speed electronics and fiber-optic communication. In 2020, he co-chaired the Technical Program Committee of the European Conference on Optical Communications (ECOC) and in 2022, he became Associate Editor of the IEEE Transactions on Circuits and Systems II: Express Briefs.