INVITED

# RECENT DEVELOPMENTS OF TRANSMITTER AND RECEIVER INTEGRATED CIRCUITS FOR OPTICAL FRONT-ENDS

PROFESSOR JOHAN BAUWELINCK,
GHENT UNIVERSITY, BELGIUM

Custom integrated circuit (IC) design enables the realization of new innovative transmitter and receiver sub-systems for low cost and energy efficient optical communication systems and optical interconnections. This talk will present our most recent developments for 10Gb/s passive optical access networks (PON), 100Gb/s metropolitan area networks and datacenter interconnections, funded by the European Commission through FP7 ICT framework, GreenTouch consortia and industrial collaborations.

Besides the ever increasing data rates, important drivers for this research are the need to drastically reduce the system power consumption and cost through miniaturization and close integration and co-optimization of the electronics, photonics and their interconnections. Strong collaboration with leading industrial partners on the system level, device level and photonic integration technology is the key for the success of this work. The examples highlighted in this talk are a 10Gb/s linear APD-based burst mode receiver, 10Gb/s bit-interleaving clock-and-data recovery chip, 10ax11Gb/s electro-absorption modulator (EAM) driver array, 2x28Gb/s EAM driver array for optical duobinary modulation and 4x28Gb/s receiver electronics. To finalize, three recently started FP7 projects will be briefly introduced as directions for future research.

Prof. Johan Bauwelinck was born in Sint-Niklaas, Belgium, in 1977. He received the Engineering degree in applied electronics and the Ph.D. degree in applied sciences, electronics from Ghent University, Ghent, Belgium, in 2000 and 2005, respectively. He became a part-time professor in the department of information technology (INTEC, associated lab of IMEC) at the same university in October 2009 and since February 2010 he has been a full-time tenure track professor there. 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 optical access networks, burst-mode ONUs and OLTs for next generation PONs, low-power driver electronics for 10x11Gb/s and 4x28Gb/s applications and RF transceivers for wireless systems and instrumentation. He was and is active in the EU-funded projects GIANT, POWERNET, PIEMAN, Euro-FOS, C3-PO, DISCUS, Phoxtrot and MIRAGE. He co-authored more than 100 publications and 5 patents in the field of high-speed electronics and fiber optics and he is a member of the ECOC technical program committee.