

Low Power Coherent Links to Enable New System Architectures

Clint Schow

University of California Santa Barbara

schow@ece.ucsb.edu

Abstract – Coherent detection of phase-modulated signals has been proven to maximize spectral efficiency and bandwidth in telecommunications networks. For short-reach interconnects in datacenters and HPC systems, coherent links offer significantly larger optical budgets compared to direct-detection. This not only represents a key advantage for point-to-point connections, but can also enable new network architectures that rely on all-optical routing and switching. However, to be viable in datacenters and HPC, a new class of coherent technology is required that aggressively minimizes power, density, and cost. An analog approach, based on optical phased locked loops (OPLLs), has the potential to dramatically lower the power consumption, cost, and latency of coherent signaling by eliminating the need for power-hungry DSP circuits.

Bio – Clint Schow received B.S., M.S. and Ph.D. degrees from the University of Texas at Austin. After positions at IBM and Agility Communications, Dr. Schow spent more than a decade at the IBM T.J. Watson Research Center in Yorktown Heights, NY, as a Research Staff Member and Manager of the Optical Link and System Design group. He has led international R&D programs spanning chip-to-chip optical links, VCSEL and Si photonic transceivers, nanophotonic switches, and new system architectures enabled by high-bandwidth, low-latency photonic networks. In 2015, Dr. Schow joined the faculty of the University of California at Santa Barbara.

Dr. Schow has served on numerous international conference committees and has been General Chair for the Optical Fiber Communications (OFC), Optical Interconnects (OI), and Photonics in Switching conferences. He is a Fellow of the OSA and the IEEE, has published more than 200 journal and conference articles, and has 33 issued patents.