PRESS RELEASE

III-V Quantum dots & dashes on Silicon: a breakthrough towards efficient 16 x 25 Gb/s WDM photonic integrated circuits

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Significant advances in silicon photonic integrated circuits (PICs) have been achieved in the European FP7 project SEQUOIA (energy efficient Silicon Emitter using heterogeneous integration of III-V QUantum dOt and quantum dash materIAls).

The project carries two major innovations: the use of novel III-V materials, namely quantum dot (Qdot) and quantum dash (Qdash) based materials, and the exploitation of novel photonic device concepts through hybrid III-V/silicon integration.

The Sequoia project started on October 1st 2013. During the first period the quality of Qdot/Qdash materials has been significantly improved and the University of Kassel has recently demonstrated Qdot lasers with a record 34 Gb/s bit rate in direct modulation. In parallel, Qdot wafers have been successfully bonded onto silicon wafers. The two types of PIC final demonstrators have been designed: chirp-managed lasers (CMLs) directly modulated at 25 Gb/s and comb laser integrated with cascaded ring resonator modulators. These PICs, providing a total capacity of 400 Gb/s through the use of 16 WDM channels, will offer better performance at reduced cost and enhanced functionality through the use of new materials and novel integration processes.

The consortium is led by III-V Lab, one of the world leading research labs in InP-based photonics and hybrid integration of III-V on silicon. Two German partners, Dortmund based company Innolume and the University of Kassel, have an outstanding track record in Qdot materials and on III-V optoelectronics. CEA-LETI is one of world leading laboratories in the field of silicon photonics, and has competence in both design and fabrication of silicon PICs. DTU Fotonik in Denmark is a well known research institute in photonics with outstanding track records in optical communication systems demonstrations. Foton Laboratory at University of Rennes 1 in France has remarkable competence in high capacity optical transmission systems. Both DTU and University of Rennes 1 teams involved in this project demonstrated world-record CML performance.

For more information: http://www.uni-kassel.de/projekte/sequoia/project-infos.html

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