

DIMENSION – Directly Modulated Lasers on Silicon

European Commission H2020 – Grant agreement no: 688003, ACINO Project

Research and Innovation Action under 2015.ICT.27a Photonics call

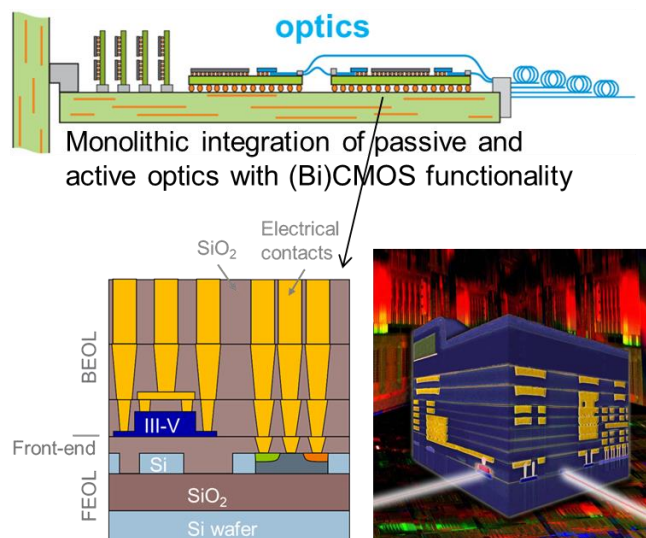
Start date: February 2016, Duration: 48 months

Total budget: 2.621.759 € AIT's budget: 270.625 €

Project Summary

DIMENSION project (<http://www.dimension-h2020.eu>) studies and develops a silicon platform that combines monolithically BiCMOS electronics with silicon photonics and III-V photonics. The process requirements are fully CMOS compatible and overcome limitations in state-of-the-art III-V on silicon integration approaches. This enables breakthrough advancements at device and system-level including:

- Extended design flexibility and scalability of electro-optical structures by integration of active III-V structures at any position on the wafer
- Improved overlap of the optical mode with the active III-V quantum well region providing lower threshold lasing
- Enhanced functionality and device control at chip-level enabling laser wavelength and power stabilization, direct laser modulation and many other innovations
- Simplified and ultra-dense electro-optical packaging solutions.
- Cost savings by up to one order of magnitude by mitigating the application of discrete lasers and overcoming a substantial fraction of the packaging and assembly cost.
- Power savings of more than 70% by enabling fast direct modulation of an on-chip silicon laser and overcoming laser to chip optical coupling losses.



The application field of the proposed technology is for data centre interconnects and targets 400Gb/s transceiver solutions for both intra-data centre links (with PAM4 25Gbaud) and inter-data centre links (with 16QAM at 25Gbaud), as well as innovative directly modulated silicon laser solutions at 25Gb/s.

AIT's Role

AIT provides its expertise on data centre interconnects and leads the related system definition and evaluation studies that provide the targeted design requirements for the modules. AIT is leading also the techno-economic evaluation studies and the technology migration study in future interconnects.

Project partners

Technische Universität Dresden, IBM, ADVA, IHP Microelectronics, Opticap, AIT

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