QAMeLeon

Sliceable Multi-QAM SDN-powered Transponders and ROADMs Enabling Elastic Optical Networks

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QAMeleon Partners & Facts

Total Costs

Overall Cost:
7.999.558,75 €

EU Contribution:
7.999.558,75 €

Duration:

48 months

Start date:
01/01/2018

NOKIA Bell Labs

FINISAR

III-V lab

optocap

imec

SMART PHOTONICS
Independent InP Foundry

Fraunhofer
Heinrich Hertz Institute

vario-optics ag

DTU Technical University of Denmark

TU/e

TIM

NEXTWORKS
ENGINEERING FORWARD

VPIphotonics
DESIGN AUTOMATION

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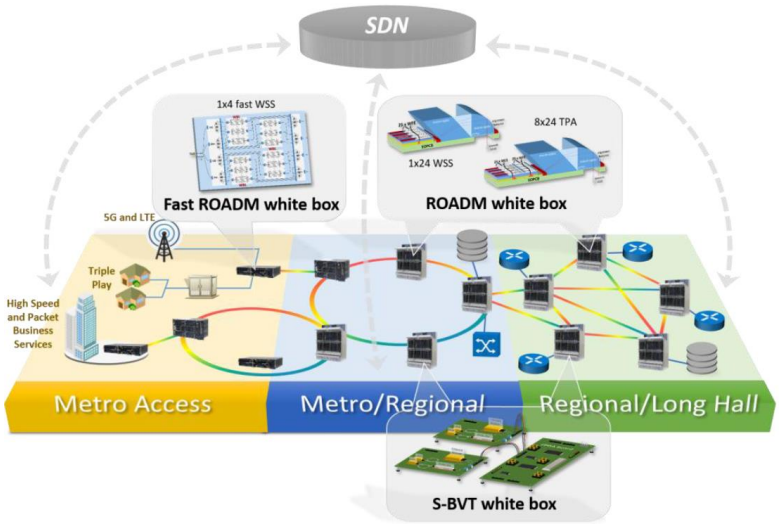
Objectives

“Deliver next generation photonic devices towards scaling core & metro networking to the next decade”

- **Electro-Optical Transceivers:** Develop a sliceable S-BVT “white-box” operating a 3Tb/s, generating/detecting ultra-high-speed optical pol. mux signals up to 128 Gbaud
- **Optical Switches & Wavelength Selective Switches (WSS):** Develop reconfigurable**,** flex-bandwidth, CDCG high port-count ROADM “white-boxes” for metro-access and metro/long haul networks
- **Modulation/ Transmission techniques:** Exploit multi-Tb/s bitrate traffic with maximum spectral efficiency per channel
- **SDN Framework:** Achieve flexible re-programmability of signals’ bandwidth, bitrate, wavelength, modulation, format, spectrum shape both at the transceiver and ROADM side

Do it faster, cheaper, smaller, greener and more efficiently



Expected outcomes

Capacity scaling

- ✓ 3 Tb/s S-BVT capacity
- ✓ 75 GHz InP IQ MZM technology
- ✓ 100GHz Monolithic coherent receivers
- ✓ Synergetic use of high speed InP-HBT electronics and high resolution SiGe ICs (128 GSa/s)
- ✓ Handling 7x more spectral slices per port of the 1x4 WSS wrt SOTA 1x4 WSSs
- ✓ Large port count TPAs with15x footprint reduction

Improve energy efficiency

- ✓ QAMeleon dual pol transceiver will offer 10.4x improvement in energy/bit compared to a commercial 32 Gbaud system
- ✓ An 8-degree node with 96 channels based on QAMeleon 1x24WSS and 8x24 TPAs yields improvement of 3.8 times in energy consumption

Enhance network agility

- ✓ SDN enabled transceivers resulting in better utilization of resources and 30% reduction to the number of transceivers used in the network
- ✓ Slotted operation for networks with high dynamicity and low latency such as 5G backhaul, metro/access and DCI

Introduce extensive cost savings

- ✓ 4.3x reduction in cost/Gb/s of QAMeleon transceivers wrt 32 Gbaud commercial ones
- ✓ 14% cost savings on large port count WSS technology
- ✓ 36% lower cost of the 1x4 WSS compared to multistage implementations

What will be key for European photonics market impact towards 2030?

- Strong contribution to standardization activities on > 100 Gbaud transmitters.
- Enabling mass manufacturing of PICs through the development of simpler/automated integration processes.
- Contribution to the “5G revolution” via the uptake of new network concepts in metro-access networks e.g. Slotted operation, elastic bandwidth allocation and routing down to the photonic layer.
- Exploit breakthroughs in machine learning and neuromorphic photonics.
- Quickly turn research breakthroughs in new products and services.

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THANK YOU

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