Photonic Integrated Circuits on InP technology plAtform enaBling low cost metro netwOrks and next generation PONs

Fact Sheet

Project Information

**PICaboo**

Grant agreement ID: 101017114

**DOI**

10.3030/101017114

**Funded under**

INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)

**Total cost**

€ 4 907 666,25

**EU contribution**

€ 4 907 666,25

**Start date**

1 January 2021

**End date**

31 December 2023

**Coordinated by**

EREVNITIKO PANEPISTIMIAKO INSTITOUTO SYSTIMATON EPIKIONION KAI YPOLGISTON-EMP

**Greece**

Project description

**High-performance integrated photonic circuits based on indium phosphide**

Cloud, 5G and IoT applications are pushing modern networks to the edge to satisfy the stringent requirements for high capacity and low latency. Photonic integrated
technologies are promising to tackle the new challenges and bring new products and services to the market. The EU-funded PICaboo project plans to develop new building blocks on a photonic integrated circuit (PIC) platform made of indium phosphide. Compact models of the building blocks will be compiled in process design kit, PDK-compatible libraries, allowing designers to explore their use in a wide range of applications. PICaboo’s PIC demonstrators are expected to transform the optical metro and access networks in terms of speed, power consumption and cost.

**Objective**

Cloud applications, 5G and IoT are pushing modern networks over the edge to satisfy the stringent high capacity and low latency demands. Photonic integration is a key enabling technology to tackle the new challenges and to bring new products and services to the market. PICaboo will develop novel building blocks on the InP PIC platform of TUe and III-V Lab based on the generic foundry model aiming to enhance PIC performances and reduce development costs. It will develop compact models of the building blocks and will compile them in PDK-compatible libraries allowing designers to explore their use in a wide range of applications hence maximizing their exploitation potential. PICaboo PIC demonstrators will transform the optical metro and access networks in terms of speed, footprint, power consumption and cost. The high speed EAM-based transmitters will employ all-optical equalization functionality on-chip which will scale PON line rate to 50/100Gb/s reducing the electronic signal pre-processing required for meeting the 29dB power budget of the optical distribution network within the expected dispersion limit. Both single EAM-MZM and coherent EAM-IQM transmitter PICs will leverage power consumption benefits of 50 and 65% respectively compared to 50G EML solutions and overall cost reduction by almost 20%. The dual polarization coherent receiver PIC employs integrated reset-free phase and polarization control allowing for complex DSP functions to be performed directly at the optical domain. In this case, power consumption reduction of more than 30% with concurrent cost benefits 3.6x will be achieved compared to standard coherent transceivers stemming from the use of simplified direct detection DSPs and low-cost tunable lasers, making PICaboo an attractive technology within the 20-80km DCI range. Exploitation of the PIC demonstrators will be pursued by NOKIA and ADVA. VLC will exploit the developed PDK libraries for a fast uptake of PICaboo building blocks by end-users.

**Fields of science**

- engineering and technology
- electrical engineering
- electronic engineering
- information engineering
- information engineering
- telecommunications
- telecommunications networks
- mobile network
- 5G
- natural sciences
- computer and information sciences
- internet
- internet of things
- natural sciences
- physical sciences
- optics
- laser physics
Programme(s)

H2020-EU.2.1.1. - INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)

Topic(s)

ICT-37-2020 - Advancing photonics technologies and application driven photonics components and the innovation ecosystem

Call for proposal

H2020-ICT-2018-20

See other projects for this call

Sub call

H2020-ICT-2020-2

Funding Scheme

RIA - Research and Innovation action

Coordinator

EREVNITIKO PANEPISTIMIAKO INSTITOUTO SYSTIMATON EPIKOINONION KAI YPOLGISTON-EMP

Net EU contribution

€ 614 375,00

Address

Patisson 42
106 82 Athina
Greece

Region

Κεντρικός Τομέας Αθηνών > Αττική > Αττική

Activity type

Research Organisations
Participants (5)

TECHNISCHE UNIVERSITEIT EINDHOVEN
Netherlands
Net EU contribution
€ 1 143 867,50
Address
Groene Loper 3
5612 AE Eindhoven
Region
Noord-Brabant > Zuidoost-Noord-Brabant
Activity type
Higher or Secondary Education Establishments
Links
Contact the organisation Website Participation in EU R&I programmes HORIZON collaboration network
Other funding
€ 0,00

III-V LAB
France
Net EU contribution
€ 1 299 213,75
Address
1 Avenue Augustin Fresnel Campus Polytechnique
91767 Palaiseau Cedex

Other funding
€ 0,00
Region
Ile-de-France > Ile-de-France > Essonne

Activity type
Other

Links
Contact the organisation Website Participation in EU R&I programmes HORIZON collaboration network

Other funding
€ 0,00

VLC PHOTONICS SL
Spain
Net EU contribution
€ 343 585,00

Address
Camino De Vera Sn Edificio 9b D5 Universidad Politecnica De Valencia
46022 Valencia

SME Yes

Region
Este > Comunitat Valenciana > Valencia/València

Activity type
Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links
Contact the organisation Participation in EU R&I programmes HORIZON collaboration network

Other funding
€ 0,00

NOKIA SOLUTIONS AND NETWORKS GMBH &CO KG
Germany
Net EU contribution
€ 736 250,00
ADVA OPTICAL NETWORKING SE

Germany

Net EU contribution
€ 770 375,00

Address
Maerzenquelle 1-3
98617 Meiningen

Region
Thüringen > Thüringen > Schmalkalden-Meiningen

Activity type
Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links
Contact the organisation
Participation in EU R&I programmes
HORIZON collaboration network

Other funding
€ 0,00

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