Industry Contact Point Digital Transformation

Industry Contact Point Industry 4.0

Industry Contact Point Medical Technologies and Health

PPTF Polish Technological Platform on Photonics

Ministry of Science and Higher Education Republic of Poland

Horizon4Photonics

Brokerage event

GRADIANT | RTO

Galicia, Spain | Advanced Communication Department | Micro-nanoelectronics and Photonics

Topics of special interest:

HORIZON-CL4-2026-04-DIGITAL-EMERGING-14	Networking and Future Photonics Strategy (CSA) (Photonics Partnership)
HORIZON-CL4-2027-05-DIGITAL-EMERGING-03	**Advanced integrated photonic devices for extended features and ultra-low power consumption (RIA) (Photonics Partnership)**
HORIZON-CL4-2026-05-MAT-PROD-25	New or enhanced Innovative Advanced Materials (IAM) enabled sensing functionality (RIA)

Technology with real impact

- Innovation provider, with more than 15 years of experience in technology incubation

+250 people

+400 clients

+800 developed projects

14M€ revenue

18 active EU projects

3 SpinOff companies

Advanced Communications Department

indra

Telefónica

AIRBUS DEFENCE & SPACE

BOEING

cellnex
driving telecom connectivity

Navantia

Redess

Televes

SERTEL

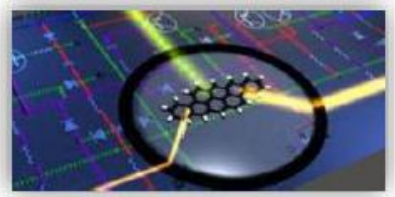
Egatel

Advanced Communications Department

Advanced Communications

- Communication systems

- Micro-Nanoelectronics and Photonics

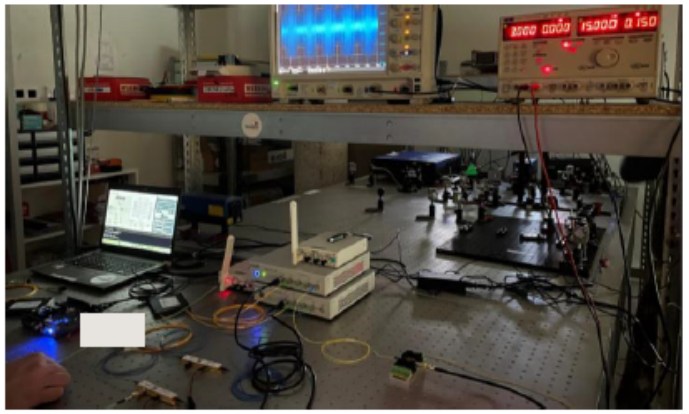


- Quantum Technologies

- Autonomous systems

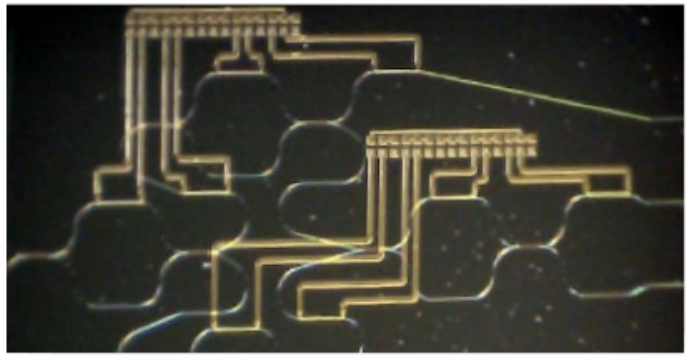
Micro-Nanoelectronics and Photonics

TWO INNOVATION LAYERS



Enabling

- Boost performance, reduce footprint and power consumption.
- Hybrid solutions based on RF photonics
- Broadband ultrafast analog processing



Transformative

- AI inference and Neuromorphic photonics
- Integrated energy harvesting for near-zero consumption
- Simultaneous communication and sensing
- Miniaturization of advanced photonic sensors

Photonic Technologies & Capabilities

RF PHOTONICS

⇒Self Interference cancellation
⇒Analog signal pre-processing
⇒Simultaneous communication and sensing

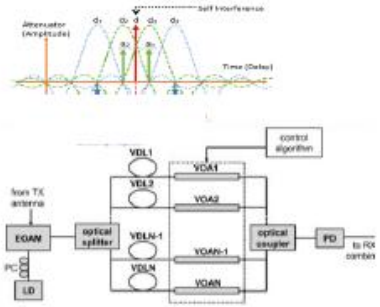
COMPUTATION

⇒Neuromorphic photonics
⇒PIC based AI inference
⇒Near zero consumption via integrated energy harvesting

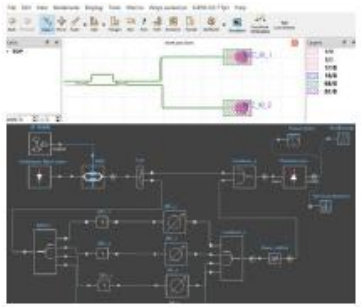
SENSING

⇒Photonic sensors
⇒Integrated quantum sensors
⇒Miniaturization and added functionality sensors

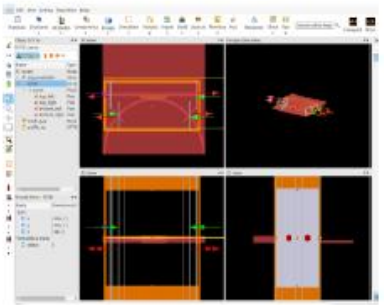
Processing



Desing



Modelling



Packaging

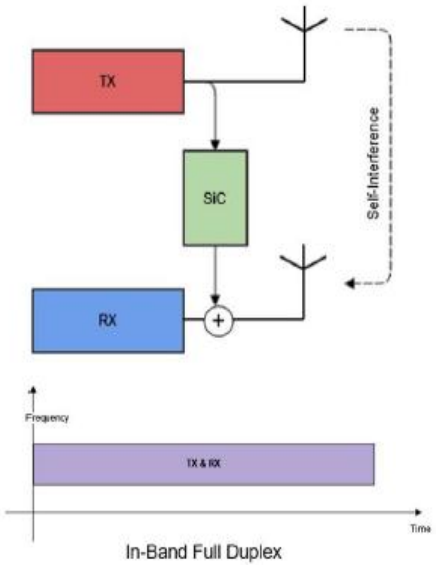
Assembly

Validation

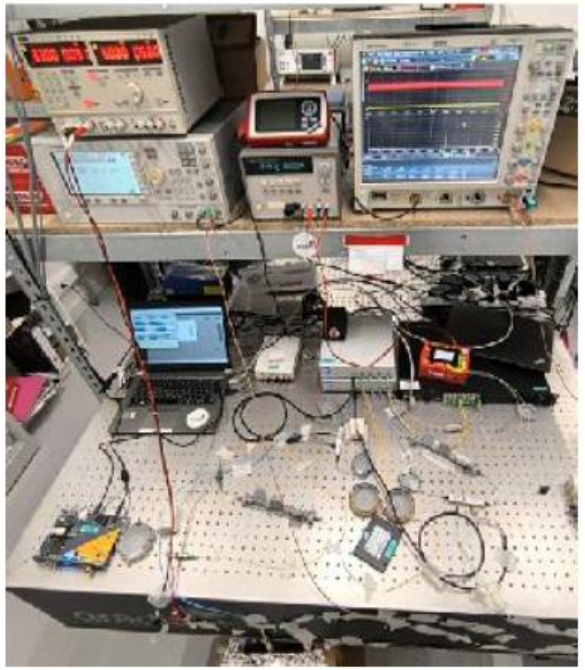
Photonic Self-Interference Cancellation

Theoretical and Experimental Results

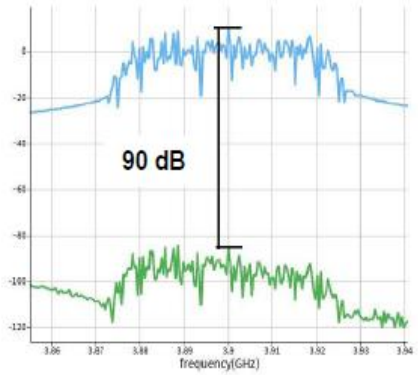
- Theoretical Simulations of real COTS components reach **BER of 0% for 16-QAM modulation at 3.9GHz with a cancellation of 90 dBm** of the auto-interference.
- Experimental demonstrator **reach 50dB cancellation**. Stabilization in progress.

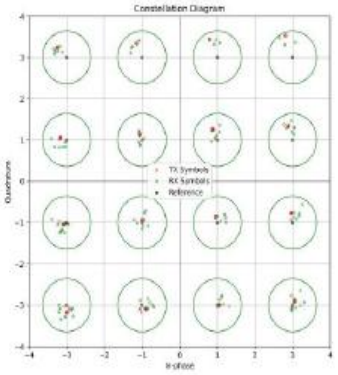


In-Band Full Duplex



SIC Simulations





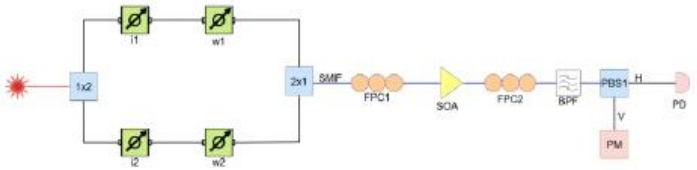
Experimental Validation

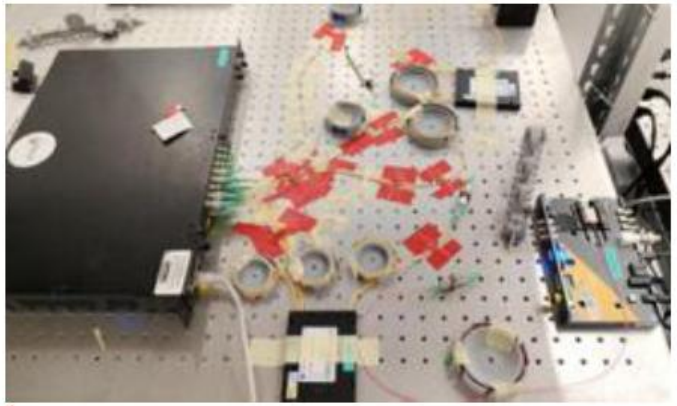
Photonic AI Inference

Theoretical and Experimental Development

- Theoretical Simulations of PIC implementation executing AI inference for input classification.
- Experimental demonstrator of a single photonic neuron.

Experimental Photonic neuron





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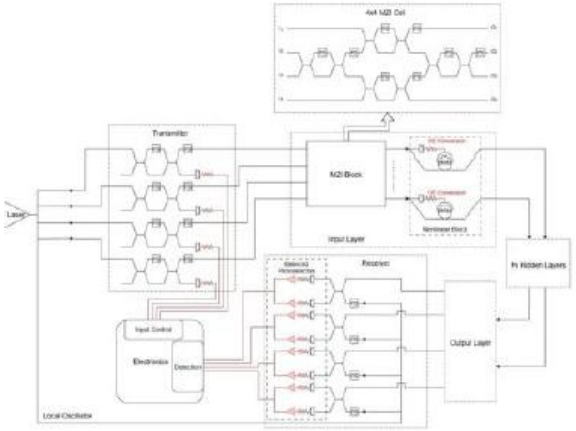
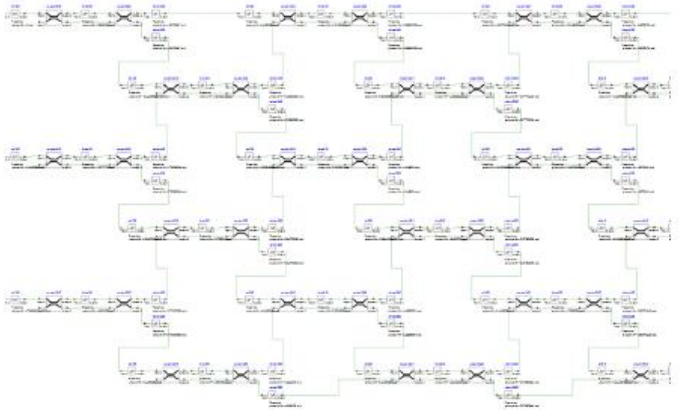
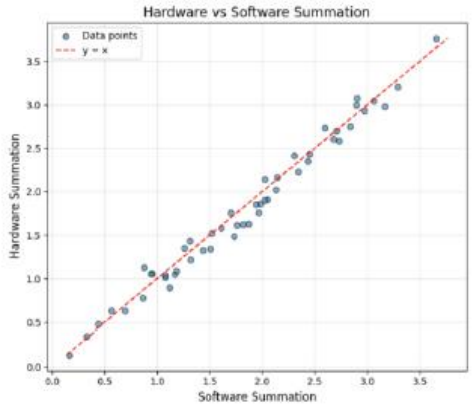
Block Diagram



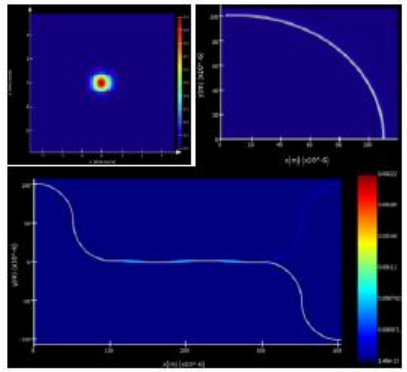
Circuit-Level Simulation



Experimental Photonic AI Inference



Component-Level Simulation



AGENDA 2030

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