

Room F (Sicily), 2F

Chair: Tatsuro Hiraki (NTT, inc.)

We1F

July 1 (Wed), 2026

III-V on Silicon Active Devices II & Electronic ICs

08:30-10:00

We1F-1 Invited 08:30-09:00

Ultra-Low Power SiGe ASIC for InP Mach Zehnder Modulator and CMOS Quenching-IC for SPAD for QKD Communication

Jung Han Choi

Fraunhofer Institute for Telecommunications, Heinrich Hertz Institute

This talk presents ultra-low power SiGe HBT driver for InP Mach-Zehnder modulator and CMOS active quenching IC for InP single-photon avalanche diode for quantum key distribution. The driver exploits co-design methodology, implementing non-50 Ω impedance-match between the modulator and the driver. 360 mW power consumption is achieved to generate 3 V_{pp,diff} for differential 50 Ω load. The active quenching circuit supports two modes, gated- and free-running modes. It consumes 60 mW. It supports up to 100 MHz gate pulse.

We1F-2 09:00-09:15

Demonstration of Microdisk Modulator Driven by InP/Si Hybrid SIS Capacitor

Kyunghwan Kim, Jae-Hoon Han

Korea Institute of Science and Technology

We demonstrate a microdisk modulator with InP/Al₂O₃/Si hybrid SIS capacitor by oxide wafer bonding. The fabricated microdisk modulator achieves 49.3 pm/V high tuning efficiency with 28.2 nm large FSR by carrier accumulation in SIS interface.

We1F-3 09:15-09:30

Heterogeneously Integrated III-V/Si Semiconductor Optical Amplifier Switch

Jaeseong Jeon, Il-Sug Chung

Ulsan National Institute of Science and Technology

An optical switch based on heterogeneously integrated III-V/Si semiconductor optical amplifier (SOA) has been designed, fabricated, and characterized. It demonstrates >11 dB gain as amplifier and a record-high extinction ratio (ER) of >81 dB as switch.

We1F-4 09:30-09:45

20 dB Gain Heterogeneous Integration Semiconductor Optical Amplifier on 220nm Silicon-on-Insulator Platform

Haibo Kuang, Guobiao Tang, Yu Zhang

Huazhong University of Science and Technology

We proposed and fabricated a III-V-on-220-nm silicon-on-insulator (SOI) semiconductor optical amplifier (SOA) via direct bonding. The device yields a small-signal gain of ~20 dB and a saturated output power of 8 dBm.

We1F-5 09:45-10:00

Heterogeneously Integrated Vernier Laser with 45-nm Tuning Range

Sangmin Oh, Il-Sug Chung

Ulsan National Institute of Science and Technology

We demonstrate a heterogeneously integrated III-V-on-SOI Vernier racetrack ring laser using a 10-nm BCB bonding. The device achieves 6.8-mW single-facet output power, 2.6-kHz linewidth, 45.09-K/W thermal impedance, and a 45-nm wavelength tuning range.