



Uenohara Lab.

Research on Optical Signal Processing Techniques for Photonic Networks and Related Photonic Integration Device

Photonics Integration System Research Core, FIRST

<http://vcSEL-www.pi.titech.ac.jp>

- Photonic integrated devices for high-speed, high-efficient optical signal processing
- Linear, nonlinear compensation for optical transmission signals
- Optical switching, edge/cloud computing platform

In recent optical fiber communication systems, high-spectral efficient multi-level, multi-carrier modulation format, and linear and nonlinear compensation, seamless connection of wired with wireless signals with edge-convergence have been required to achieve large capacity and flexible networks with 400Gbps/ch and > 10Pbps/fiber.

To meet these requirements, optical signal compensation with neural network have been investigated. In addition, optical OFDM subcarrier add/drop function, optical filtering for suppression crosstalk for non-orthogonal WDM signals, and optical switching for low latency edge/cloud computing platform are pursued. Processing for optical computing is also investigated.

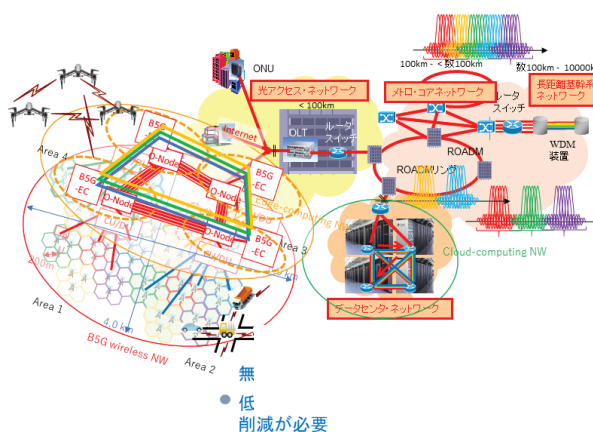
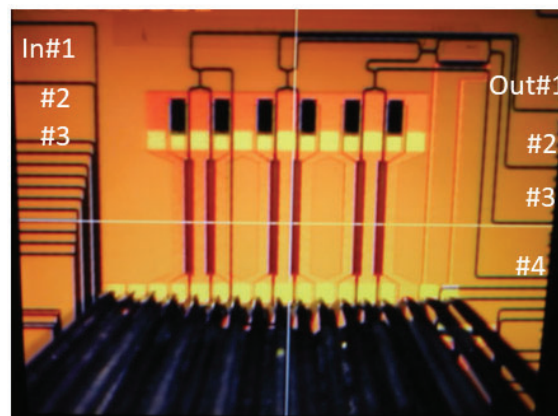
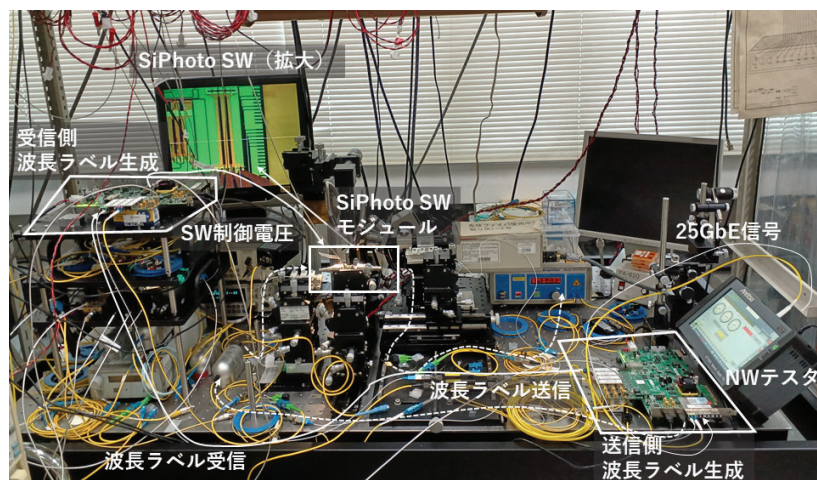


Image of optical network development



Si photonics optical switching circuit with WDM-DEMU/MUX filters for edge/cloud computing platform

- High-integration with silicon photonics technology
- High functionality by integration of optical switches with optical filters



Optical switching system with low latency operation using wavelength labels

- < 100ns switch control signal generation with wavelength labels
- Error free operation of switched optical packets