We present for the first time the full phase stabilization and independent control of the two comb degrees of freedom (offset and spacing) of a mode-locked multi-frequency THz QCL, finally proving its true comb nature.

Oral
PD-1.6 19:50 ROOM 13a ICM
Mid-Infrared Frequency Comb from a Ring Quantum Cascade Laser — Bo Meng, Mattias Beck, and Jérôme Faist — ETH, Zurich, Switzerland
Mid-infrared frequency comb quantum cascade laser has been demonstrated. Both intermode beating (less than 1 kHz linewidth) and multitherodiney spectra verify the frequency comb nature of the device.

Oral
PD-1.7 20:00 ROOM 13a ICM
Birefringent Surface Gratings for Ultrafast Spin-VCSELs — Tobias Pusch1, Pierluigi Debernardi1, Christophe Derycke2, Ryoichi Horisaki2,3, Rainer Michelzik1 — 1Department of Physics, The University of Tokyo, Tokyo, Japan; 2Graduate School of Information Science and Technology, Osaka University, Osaka, Japan; 3PRESTO, Japan Science and Technology Agency, Saitama, Japan — 1Functional Nanosystems, Ulm, Germany; 2Photonics and Terahertz Technology, Bochum, Germany
We present the first truly integrated approach for incorporating birefringence in a VCSEL cavity to enable spin-based ultrafast optical communications. Up to 98 GHz polarization mode splitting is achieved using a tailored surface grating.

Oral
PD-1.8 20:10 ROOM 13a ICM
Quantitative phase microscopy with molecular vibrational sensitivity — Miu Tamamitsu1, Keiichiro Toda1, Ryoichi Horisaki2,3, Takuro Ideguchi2,3,4 — 1Department of Physics, The University of Tokyo, Tokyo, Japan; 2Graduate School of Information Science and Technology, Osaka University, Osaka, Japan; 3PRESTO, Japan Science and Technology Agency, Saitama, Japan; 4Institute for Photon Science and Technology, The University of Tokyo, Tokyo, Japan
We propose and demonstrate quantitative phase imaging method that yields label-free molecular-vibrational spectroscopic contrasts in the molecular-fingerprint region, which works by measuring the optical-phase-delay change induced upon molecular-vibrational absorption of a mid-infrared optical pulse.

Oral
PD-1.9 20:20 ROOM 13a ICM
A silicon photonic design concept for a chip-to-fibre orbital angular momentum mode–division multiplexer — Jan Markus Baumann, Kasper Ingerslev, Yunhong Ding, Lars Hagedorn Frandsen, Leif Katsuo Ouenlowe, and Toshihisa Morikai — DTU Fotonik, Technical University of Denmark, Lyngby, Denmark
A chip is presented for multiplexing to orbital angular momentum modes in air hole fibres in the C-band. The coupling to modes with topological charges of L = 5, 6 and 7 is demonstrated.