# Abstracts

## High-frequency synchronized signal generation using semiconductor lasers

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Generation of high-speed optical pulses is an important technology for not only optical data transmission/processing, but also optical subcarrier transmission in wireless-access networks. Semiconductor lasers are the most promising optical pulse sources for these application fields. The typical methods of generating optical pulses with repetition frequencies of up to subterahertz from semiconductor lasers are reviewed in this paper. Synchronization of subterahertz optical pulses to an electrical clock and suppression of phase noise are essential for many applications. A few techniques that enable free-running subterahertz pulses to be synchronized to a given clock with lower frequency are also introduced. Our experimental results on the synchronization of 0.2-THz free-running pulses generated from a harmonic colliding pulse mode-locked laser using photonic down-conversion with phase-locked loop (PDC-PLL) are described. It is shown theoretically and experimentally that the clock-source-limited low-timing-jitter subterahertz pulses can be generated using PDC-PLL.

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