514. Title:Integrated Fourier-Domain Mode-Locked Lasers: Analysis of a Novel Coherent Comb Laser

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Abstract:Fourier-domain (FD) mode locking of integrated laser diode structures is studied theoretically and their application for wavelength division multiplexing (WDM) comb generation for future terabits per second interconnects is discussed. Twenty-five-gigahertz FD mode-locked structures with ring and Mach--Zehnder-based bandpass filters show comb widths of 1.0--1.8 THz, i.e., 40--72 comb lines, but the mode comb is not flat, which increases the mode relative intensity noise (RIN). It is shown that by combining AM and FD mode-locking wide and flat combs (down to 7 dB) can be achieved, with mode RIN values of less than 0.3%, suitable for error-free transmission. These novel structures have been simulated using experimentally verified parameters and technologically feasible configurations.