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**Whispering-Gallery modes dynamics of GaAs-AlGaAs microdisk lasers** ALBERT HEBERLE, Sullivan Park R&D Center, Corning Incorporated and Department of Physics and Astronomy, University of Pittsburgh, USA, BOTAO ZHANG, Department of Physics and Astronomy, University of Pittsburgh, USA — Semiconductor microdisk lasers are of great interest because of their low threshold, high Q-factor and potential for quantum optical effects. A microdisk laser consists of a disk with typically 100 nm thickness and several microns diameter freely standing on a pedestal. Total reflection induces high-Q whispering-gallery modes inside the circular outer edge of the disk-shaped cavity. We investigated the picoseconds dynamics of GaAs/AlGaAs microdisk lasers after ultrafast optical excitation at a sample temperature of 10 Kelvin. Surface recombination was prevented by passivation. The emission was measured temporally and spectrally resolved with a streak camera connected to a confocal microscope. The spatial emission patterns of the lasers varied significantly with the position of the exciting laser spot and shifted blue shift with increasing excitation power. The devices emitted in one or two optical modes with an excitation-dependent turn-on delay of the order of 15 picoseconds and a 5 meV red shift with two time constants during the typically 50 picosecond emission time. These effects show the balance between carrier cooling, diffusion and recombination in connection with band gap renormalization and refractive index changes

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