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PHOTONIK SEMINAR

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Dynamic Modelling of Quantum Cascade Lasers for Frequency Comb and Mode-Locking Operation

Increasingly, quantum cascade lasers (QCLs) are used for the targeted generation of special temporal and spectral waveforms, in particular periodic trains of ultrashort pulses as well as broadband comb-like spectra. The systematic development of suitable QCL devices and related applications largely benefits from reliable and computationally efficient dynamic simulation models, which account for the rich interplay of coherent light-matter interaction, tunnelling, quantum dephasing and incoherent electron transport. In this talk, the focus will be given to the QCL modelling based on generalized Maxwell-Bloch-type equations, which can be coupled to carrier transport simulations to obtain a self-consistent multiscale approach. Simulation results for QCL comb sources will be presented, and the possibility of achieving passive mode-locking in QCLs will be discussed.

Friday, April 12th, 2019, 14:00

Seminarraum Institut für Photonik

Gußhausstraße 27-29, 1040 Wien, Raum CBEG02

Host: Juraj Darmo