

FWF SFB INFRARED OPTICAL NANOSTRUCTURES

IR-ON SEMINAR

Modeling of THz QCLs: Carrier transport and carrier-light coupling

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Seminarraum Institut für Photonik, Gußhausstrasse 27, 1040 Wien, Raum CBEG02

The aim of this presentation is to discuss self-consistent approaches for the simulation of quantum cascade lasers (QCLs), and derive strategies for their design optimization. The validity of the widely used semiclassical ensemble Monte Carlo method is tested against fully quantum mechanical carrier transport simulations. Furthermore, an approach for the coupled modeling of carrier transport and optical cavity field is presented. Simulation results for THz QCLs are extensively compared to experimental data, and design strategies for a further optimization, especially with respect to the temperature performance, are extracted.

Host: K. Unterrainer