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Autor(en) des Beitrags: Jirauschek, C.
Titel des Beitrags: Modeling of quantum cascade laser sources with giant optical nonlinearities
Abstract: A characteristic feature of the quantum cascade laser (QCL) is that the optical properties of the active region can be custom-tailored by quantum engineering. Recently, the possibility to integrate giant artificial optical nonlinearities has enabled various novel applications, such as room temperature terahertz generation based on difference frequency mixing and the QCL-based generation of mid-infrared and terahertz frequency combs. We extend established modeling approaches, such as the ensemble Monte Carlo method, to the simulation of such nonlinear optical QCL sources. The obtained theoretical results are shown to be consistent with available experimental data.
Stichworte: Quantum cascade lasers, frequency conversion, laser mode locking, nonlinear optical devices, optical mixing
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