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Symmetry Properties and Coexistence of the Mode-Locked States in Semiconductor Lasers

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We experimentally and numerically, explore the symmetry properties of mode-locked semiconductor lasers and demonstrate existence, multistability, and switching of translationally symmetrical mode-locked regimes which possess different repetition rates and temporal pulse profiles.

Superradiance as a Way to the Steady-State Multimode and Ultrasub-Pulsed Lasing in CW Quantum-Dot Heterolasers

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We design the pulsed quantum-dot heterolaser based on the superradiance under CW pumping and show that a few superradiant modes emit the sequences of ultrashort pulses and support many steady-state modes which are self locked.

Self-sustained pulse oscillations in a quantum dot laser monolithically grown on germanium

Y. Zhou, 1,2 I. Duan, 1,2 H. Huang, 1,2 C. Cao, 1,2 G. Gong, 1,2 F. Grillot, 1,2 and C. Wang 1,3, 1 ShanghaiTech University, Shanghai, China; 2 Telecom ParisTech, Paris, France; 3 Shanghai Institute of Microsystem and Information Technology, Shanghai, China; 4 University of New Mexico, New Mexico, USA

We show that a free-running InAs/InGaAs quantum dot laser monolithically grown on germanium exhibits self-sustained pulse oscillations with one, two, and three periods at different pump currents, without incorporating any saturable absorber.

Repetition rate locking of mutually injected monolithic passively mode-locked semiconductor quantum dot lasers

C. Weber 1, D. Auth 1, I. Simos 2, C. Simos 2, and S. Breuer 1, 1 Technische Universität Darmstadt, Institute of Applied Physics, 64289 Darmstadt, Germany; 2 University of West Attica, Department of Electrical and Electronic Engineering, 12243 Athens, Greece; 3 Technological Educational Institute of Sterea Ellada, Department of Electronic Engineering, 35100 Lamia, Greece

We demonstrate the small-signal chipping of transistor lasers and the reshaping of the optical Gaussian pulse in fibers. It shows that the pre-chirped pulse of TMs can be compressed in both normal and anomalous dispersion.

Tailoring localization features in passively mode-locked lasers with V-shaped cavity geometry

J. Hausen, S. Meinecke, and K. Lüdge, Institute of Theoretical Physics, TU Berlin, Berlin, Germany

We examine the influence of the distinct cavity features of a passively mode-locked laser with V-shaped external cavity geometry on localized structures, forming from a multi-stability of the off-solution and the periodic mode-locking solutions.

Optical Frequency Comb Generation Using Quantum Cascade Lasers Subject to Optical Injection

B.-B. Zhao and C.-W. Tang, ShanghaiTech University, Shanghai, China

We propose to produce optical frequency combs using pump-probe dynamics of quantum cascade lasers subject to optical injection. The comb frequency is continuously tunable via fine control of injection ratio and/or detuning frequency.

The contribution has been withdrawn.

Relative Intensity Noise of 3.4 µm Interband Cascade Laser

Y. Deng, Y.-T. Gu, B.-B. Zhao, and C.-W. Tang, ShanghaiTech University, Shanghai, China

We experimentally show that the relative intensity noise of a continuous-wave InAs/InGaSb interband cascade laser operated at room temperature reaches as low as -130 dB/Hz.

Modelling the spatio-temporal dynamics of quantum cascade laser frequency combs

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A theoretical model which describes the intra-cavity dynamics of the QCL phase-locking process through the inclusion of optical non-linearities and group velocity dispersion is presented. The model is found to agree with recent experimental results.