

Contributed Talk

Nonlinear Dynamics of Quantum Dots Lasers with External Optical Feedback

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Theoretical results on investigations of the dynamical behavior of a semiconductor laser with quantum dots active medium under the influence of a feedback from double external cavity are presented. The setup of quantum dots lasers with optical feedback is treated in the framework of the rate equations model with Lang-Kobayashi type of feedback. The location of external cavity modes is found. A detailed bifurcation analysis is carried out revealing the position of saddle-node and Hopf bifurcations in the plane of different parameters. The stability of steady state solutions is analyzed. The synchronization properties of two identical quantum dots lasers coupled in unidirectional direction are studied numerically. Finally, a high bit rate message encoding process by different techniques using compact quantum dots lasers with feedback from external multi-cavities is reported.
