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Instabilities and Chaos in Semiconductor Laser With Optical Injection and Feedback

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Abstract

A numerical has been under taken to study the effects of the optical injection and the optical feedback on the nonlinear dynamical behavior of the semiconductor laser using a simple model, based on the coupled electric field and population inversion rate equations. A number of distinct states are obtained. These include periodic limit – cycle operation , quasiperiodicity, and chaotic behaviors dependent on the type of the laser control parameter and the operating conditions.

***Keywords*: Instabilities, Chaos, Period – doubling, Semiconductor lasers.**