

Investigation of Dynamical Properties of a Laser with Incorporated DBR Section Under the Influence of External Optical Feedback

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We report in this paper the results of theoretical investigations of the dynamical properties of a laser with incorporated Distributed Brag Reflector (DBR) section under the influence of external optical feedback. The adapted Lang-Kobayashi model was used to simulate and analyze the dynamics of the considered laser device. We have identified the nature of the bifurcations that occur in such a system. We plotted the Hopf bifurcation, responsible for instabilities, in the plane of different parameters. The conditions that are necessary for stable laser operation are identified. We also demonstrate the influence of the length of active region on the stability of devise emission, and show how this property is changed by variation of detuning of the mode of solitary laser.