CMT P21 COMPLEX DYNAMICS OF QUANTUM DOTS LASERS UNDER THE INFLUENCE OF EXTERNAL MULTIPLE OPTICAL FEEDBACK

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We report in this paper the numerical results on the dynamical behavior of a semiconductor laser with quantum dots active medium under the influence of multiple external optical feedback. The dynamic behavior is studied based on the Bloch equation model. The locus of external cavity modes is found and the nature of bifurcations and the stability of steady state solutions are analyzed. A bifurcation analysis is carried out revealing the points of Hopf bifurcations. The effect of the different parameters on the stabilization and destabilization of laser emission is investigated. Finally, we find the optimal conditions for CW, periodic and chaotic operation. The synchronization of two unidirectional-coupled (master–slave) systems and the influence of parameters mismatch on the synchronization quality are also studied.