Numerical Investigation of Semiconductor Ring Lasers With Two External Cavities

I. V. Ermakov, G. Van der Sande, L. Gelens, A. Scirè, P. Colet, C. R. Mirasso, V. Z. Tronciu, and J. Danckaert

aDept. of Applied Physics and Photonics, Vrije Universiteit Brussel, Belgium
bInstituto de Física Interdisciplinar y Sistemas Complejos, Palma de Mallorca, Spain
cWeierstrass Institute for Applied Analysis and Stochastics, Berlin, Germany
dDept. of Physics, Vrije Universiteit Brussel, Belgium
iermakov@tona.vub.ac.be

We report results on the numerical analysis of the behaviour of a semiconductor ring laser under the influence of feedback from two external cavities. Double feedback arises naturally in a semiconductor ring laser, e.g. at the end facets of an outcoupling waveguide. We find that, under certain conditions, the system displays quasi-periodic and chaotic behavior.

Key Words semiconductor ring lasers, delayed optical feedback