ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

9. Ordinary Differential Equations and Dynamical Systems

1991 MS Classification: 58
Loskutov, Alexander, Dmitrii Udin, Sergei Rybalko, Moscow State University, Russia

Dynamics of one-dimensional nonhomogeneous coupled map lattices

Coupled map lattices (CMLs) are an approximation of some distributed systems. We study spatially nonhomogeneous 1D CMLs (i. e. chains) of n diffusively coupled piecewise-linear one-dimensional maps which describe a discrete analog of the one-component active medium. Spatial nonhomogeneities are realized as distinctions in the parameters of maps that form the chains. Such CMLs can be considered as a dynamical system $f : \mathbf{R}^n \to \mathbf{R}^n$ with characteristic polynomial which takes the form of determinants of tridiagonal matrices. Using recurrence relations for these matrices we found the Lyapunov exponents expressed via the Chebyshev polynomials. A class of the chains with periodic and unique nonhomogeneities is investigated. Generalizations for some non-autonomous 1D CMLs will be presented.