

Abstract Submitted
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Lyapunov modes in coupled map lattices¹ GUENTER RADONS, HONGLIU YANG, Institute of Physics, Chemnitz University of Technology — Hydrodynamic Lyapunov modes, which have recently been observed in many extended systems with translational symmetry, such as hard sphere systems, dynamic XY-models, or Lennard-Jones fluids, are nowadays regarded as fundamental objects connecting Nonlinear Dynamics and Statistical Physics. A solution to one of the puzzles, the appearance of good and of “vague” modes, is presented here for the model system of coupled map lattices: The structural properties of these modes are related to the phase space geometry, especially the angles between Oseledec subspaces, and to fluctuations of local Lyapunov exponents. The numerical calculation of these quantities is achieved with the new algorithm proposed in [1]. In this context we report also on the possible appearance of branches in the Lyapunov spectra of inhomogeneous systems [2], similar to acoustic and optical branches for phonons.

[1] F. Ginelli et al., PRL 99, 130601 (2007)

[2] H. Yang and G. Radons, PRL 99, 164101 (2007)

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