SEMINARS IN STATISTICAL PHYSICS

22nd June 2016
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Iberê L. Caldas

Institute of Physics, University of São Paulo, SP, Brazil

Shearless Barriers in Chaotic Symplectic Maps

Initially, we introduce shearless transport barriers created in nonmonotonic dynamical systems described by symplectic maps [1]. These barriers reduce the transport in the shearless region. After that we show that secondary shearless bifurcations can also occur in monotonic systems [2]. To show the presence of these barriers in confined plasmas, we present examples of two kinds of symplectic maps: the first kind describing the chaotic magnetic field line transport in plasmas with external resonant perturbations [3]; the second kind concerning the chaotic particle drift motion caused by electrostatic waves [3].

References
[1] I. L. Caldas, R. L. Viana, J. D. Szezech, J. S. Portela, J. C. Fonseca. Communications in Nonlinear Science and Nonlinear Simulations 17, 2021 (2012).
[2] C. V. Abud and I. L. Caldas. Nuclear Fusion 54, 064010 (2014).
[3] I. L. Caldas et al., Plasma Physics and Controlled Fusion 54, 124035 (2012).