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Recent results of invariant torus breakup in nontwist maps

ALEXANDER WURM, Dept. of Physical & Biological Sciences, Western New England College, KATHRIN FUCHSS, P.J. MORRISON, Dept. of Physics and Institute for Fusion Studies, The University of Texas at Austin — As simple models for degenerate Hamiltonian systems, nontwist maps have been used to describe, e.g., magnetic field lines in toroidal plasma devices with reversed magnetic shear profiles. Of particular interest in these maps are the so-called shearless invariant tori which correspond to transport barriers in the physical system. We investigate the breakup of shearless tori in several maps and with several different winding numbers, in order to understand the dependence of the details of the breakup on the winding number and on the symmetries of the map model. Here we report on recent results of this investigation.[1]

[1] K. Fuchss, A. Wurm, A. Apte, and P.J. Morrison, to appear in *Chaos* (2006); K. Fuchss, A. Wurm, and P.J. Morrison, preprint/submitted to *PRL* (2006).

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