

Degenerate lower-dimensional invariant tori for non-convex Hamiltonian systems

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We consider two classes of quasi-integrable Hamiltonian systems, obtained by adding to non-convex integrable Hamiltonian functions (“partially isochronous” or “saddle-type”), a perturbation depending only on the angle variables. We focus on a resonant maximal torus of the unperturbed system, foliated into a family of 1-codimensional tori invariant under the flow generated by the unperturbed Hamiltonian. We show that, at least one lower-dimensional invariant torus always exists, without further conditions on the perturbation besides smallness and analyticity.

These results are obtained in collaboration with Roberto Feola and Guido Gentile.

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