

KAM theory for non linear partial differential equations on the circle

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In this course we shall mainly focus on the study of nonlinear Schrodinger type equations on the circle, with the purpose of proving existence and stability of invariant tori which carry a linear flow.

The persistence of finite dimensional invariant tori (quasi-periodic solutions) for semi-linear PDEs on the circle has been successfully studied in the last thirty years and recently there have been some important developments in the fully non-linear case. However there are still interesting open questions, for instance what happens for PDE's on more general compact domains, or —even in the simplest setting— whether infinite dimensional invariant tori persist. We shall give an overview of the classical KAM scheme in a framework which is flexible and suitable for the study of the aforementioned problems, which we shall then discuss.