

Nonlinear Schrödinger equations on compact surfaces

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This talk is devoted to the general study of the long-time dynamics of solutions to nonlinear Schrödinger equations (NLS) on compact surfaces. In this context, weak dispersion and nonlinear resonances can cause energy cascades from low to high frequency scales of oscillations. Meanwhile, one can use the Galerkin approximation and extend methods from the study of finite-dimensional Hamiltonian systems to show stability in certain regimes.

We present a dynamical approach based on Birkhoff normal forms to prove long-time stability on Diophantine tori, as well as a statistical approach in which we prove the invariance of the Gibbs measure for the cubic NLS on the sphere.

The results are based on joint work with Joackim Bernier, and ongoing joint works with Gigliola Staffilani, and Nicolas Burq, Chenmin Sun, Nikolay Tzvetkov.

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