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Stability results for resonant Schrödinger equations on Diophantine tori

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This presentation is devoted to a stability result for cubic Schrödinger equations (NLS) on Diophantine tori. We prove that the majority of small solutions in high regularity Sobolev spaces do not exchange energy from low to high frequencies over very long time scales. We first provide context on the Birkhoff normal form approach in the study of the long-time dynamics of the solutions to Hamiltonian partial differential equations. Then, we present the induction on scales normal form which is at the heart of the proof. Throughout the iteration, we ensure appropriate non-resonance properties while modulating the frequencies (of the linearized system) with the amplitude of the Fourier coefficients of the initial data. Our main challenge is then to addressing very small divisor problems, and describing the set of admissible initial data. The results are based on a joint work with Joackim Bernier, and an ongoing joint work with Gigliola Staffilani.

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