

Invariant measures for a stochastic nonlinear and damped 2D Schrödinger equation

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We consider a two-dimensional stochastic nonlinear defocusing Schrödinger equation with zero-order linear damping, where the stochastic forcing term is given by a combination of a linear multiplicative noise in Stratonovich form and a nonlinear noise in Itô form. We work at the same time on compact Riemannian manifolds without boundary and on compact smooth domains with either Dirichlet or Neumann boundary conditions. We construct a martingale solution using a modified Faedo-Galerkin's method, then by means of suitable Strichartz estimates we show the pathwise uniqueness of solutions. Finally, we prove the existence of invariant measures by means of a version of the Krylov-Bogoliubov method, which involves the weak topology, as proposed by Maslowski and Seidler . Some remarks on the uniqueness in a particular case are provided as well. The talk is based on a joint work with B. Ferrario and Z. Brzeźniak.