On the focusing stochastic NLS equation: critical and inter-critical nonlinearities

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We study random perturbations of the focusing Non Linear Schr\"odinger equation in the case of L^2-critical, H^1-critical and inter-critical nonlinearities. Under proper assumptions on the initial condition, we give quantitative results about the maximal existence time.
We prove that, under appropriate conditions on the initial condition u_0 in H^1 with positive energy, blow-up occurs with positive probability.

We also give numerical results about the effect the roughness of the noise on the probability of blow-up before some given time T in the L^2-critical and inter-critical cases, and study numerically the blow-up profile.

This is joint work with Svetlana Roudenko, and Kai Yang for the numerical aspects.