ON THE GROWTH OF SOBOLEV NORMS OF A STOCHASTIC CGL EQUATION WITH ARBITRARY SPACE DIMENSION

ABSTRACT. In this talk, we consider a stochastic CGL equation in an n-cube $K \subset \mathbb{R}^n$, $n \in \mathbb{N}$, under Dirichlet boundary conditions

$$u_t - \nu\Delta u + i|u|^2 u = \sqrt{\nu}\eta(t,x), \quad x \in K, \quad u|_{\partial K} = 0,$$

where $\eta(t,x)$ is a random force that white in time and regular in space. We will show that for $\nu > 0$ small enough, for any initial data, with large probability, the Sobolev norms $\|u(t,\cdot)\|_m$ of the solutions with $m > \max\{\frac{n}{2}, 2\}$ become large at least to the order of $\nu^{-\kappa(n,m)}$ with $\kappa(n,m) > 0$. In particular, one can choose $\kappa(n,m) = \kappa_n m$ with $\kappa_n > 0$ depending only on the space dimension n if either $n = 1, 2$ or $n \geqslant 6$, and or $m \geqslant 3$. This is a project working in process.