Abstract: "Stochastic nonlinear Schrödinger equations with linear multiplicative noise: the rescaling approach"

We present well-posedness results for stochastic nonlinear Schrödinger equations with linear multiplicative Wiener noise including the non-conservative case. Our approach is different from the standard literature on stochastic nonlinear Schrödinger equations. By a rescaling transformation we reduce the stochastic equation to a random nonlinear SchrÃűdinger equation with lower order terms and treat the resulting equation by a fixed point argument, based on generalizations of Strichartz estimates proved by J. Marzuola, J. Metcalfe and D. Tataru in 2008. This approach allows to improve earlier well-posedness results obtained in the conservative case by a direct approach to the stochastic Schrödinger equation. In contrast to the latter, we obtain well-posedness in the full range $(1, 1 + 4/d)$ of admissible exponents in the non-linear part (where d is the dimension of the underlying Euclidean space), i.e. in exactly the same range as in the deterministic case.

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