On the stochastic Zakharov system

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Résumé

The Zakharov system is a model in plasma physics describing rapid oscillations of the electric field in a conducting plasma. It consists of a Schrödinger and a wave equation with quadratic coupling. In this talk we discuss the stochastic Zakharov system in the physical dimension $d = 3$ and the energy-critical dimension $d = 4$. We show local well-posedness in the energy space and prove that the solution exists globally as long as it does not cross the mass-energy threshold of the ground state. We further present the following regularization by noise phenomena: In $d = 3$ we show that finite time blowup before any given time can be prevented, while in $d = 4$ solutions even exist globally and scatter with high probability if the noise is non-conservative and sufficiently strong.

The talk is based on joint work with Sebastian Herr, Michael Röckner, and Deng Zhang.

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