

From additive stochastic Zakharov system to multiplicative stochastic nonlinear Schrödinger equation

Anne DE BOUARD

Ecole Polytechnique

anne.debouard@polytechnique.edu

We study the convergence of a Zakharov system, which couples a Schrödinger equation for the electric field envelope with a wave equation for the variation in ion density. This system is a simplified model for Langmuir turbulence and the introduction of a noise describes the influence of external perturbations of the ion density. In the subsonic limit, the system formally converges to a stochastic nonlinear Schrödinger equation, but this limit becomes singular in the presence of noise. It will be shown that the system can nevertheless be rewritten in the approximation-diffusion regime and that this limit can thus be studied rigorously using predictor-corrector methods.

This work is in collaboration with Grégoire Barrau, Arnaud Debussche and Rita Nader (ENS Rennes).