An Eyring-Kramers formula for parabolic SPDEs with space-time white noise

Nils Berglund, Université d'Orléans

We consider the effect of weak space-time white noise on bistable parabolic PDEs such as the Allen-Cahn equation. The noise induces rare transitions between stationary states of the deterministic system. In 1982, Faris and Jona-Lasinio proved an Arrhenius law for the mean transition time, describing its exponential asymptotics in terms of an energy functional. We provide much sharper asymptotics, showing that the subexponential behaviour of mean transition times can be expressed in terms of spectral determinants of Sturm-Liouville problems associated with the stationary solutions. The proof uses a potential-theoretic approach to metastability due to Bovier et al and results on spectral Galerkin approximations for SPDEs by Blömker and Jentzen. This is joint work with Barbara Gentz (Bielefeld).