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DK Seminar

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Nils Berglund

University of Orléans

Metastability of stochastic Allen-Cahn equations on the torus

Metastability is a common phenomenon observed in various stochastic processes in the weak-noise regime. In the case of reversible stochastic differential equations, the transition time between metastable states is governed by the so-called Eyring-Kramers formula, which can be proved using methods from potential theory. I will present extensions of this result to Allen-Cahn equations on the one- and two-dimensional torus. In dimension 1 (joint work with Barbara Gentz), the transition time depends on a Fredholm determinant defined by linearizations of the equation around two stationary states. In dimension 2 (joint work with Giacomo Di Gesù and Hendrik Weber), the Allen-Cahn equation needs to be renormalized in order to be well-defined. As a result, the Fredholm determinant is replaced by a Carleman-Fredholm determinant.