Exponential transition law for the kinetic Ising model

A. Gaudillière[1], A. Bianchi[2], P. Milanesi[3], M. E. Vares[4]

[1] CNRS - Marseille

[2] Università di Padova

[3] Universitè d'Aix-Marseille

[4] Universidade Federal do Rio de Janeiro

We prove that a metastable two-dimensional Ising model evolving at subcritical temperature in a finite but diverging box exhibits a transition from metastability to equilibrium at an asymptotically exponential time in the limit of vanishing magnetic field. We establish this result by following a pathwise approach combined with the introduction of soft-measures. We use the basics of the Wulff construction to prove that local relaxation times are short with respect to typical exit times from the basins of attraction of metastable and stable equilibria. Getting such an upper bound on local relaxation times is the key point of the proof and is based on a random path estimate inspired from block dynamics to control spectral gaps.