

Uphill diffusion in the 2d n.n. Ising model

In this talk I will consider the Kawasaki dynamics in the 2d Ising model with ferromagnetic n.n. interaction in the square of side L with periodic boundary conditions in the vertical direction. The temperature is below the critical one. We add independent spin flips on the left and right columns to simulate reservoirs at magnetization m_+ and $m_- < m_+$.

We have some theoretical indications supported by numerical simulations that the horizontal current changes sign when m_+ decreases past a critical value.

I will also discuss similar results observed in the $d=1$ case when the spin-spin interaction is given by a ferromagnetic Kac potential.