

Abstract Submitted
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1/f noise and susceptibility-magnetization correlation in disordered ferromagnets¹ KOSTYANTYN KECHEDZHI, Rutgers, The State University of New Jersey — We consider a strongly disordered ferromagnet modeled by Ising spins placed at random in 2D with ferromagnetic interactions decaying exponentially with inter-site distance. Ferromagnetic phase in this model arises due to formation of infinite percolation cluster of strongly interacting spins. Fractal nature of the percolation cluster manifests itself in the dynamics of the system in the vicinity of the percolation transition. Simulating the dynamics with single spin flip Monte Carlo algorithm we observe 1/f power spectra of magnetization noise in a wide temperature range near the transition. Subjected to external AC magnetic field the system shows significant cross-correlation between susceptibility and magnetization in the ferromagnetic phase. This results suggest a possible explanation of the inductance-flux cross-correlation recently observed in SQUIDs [1].

[1] S. Sendelbach, D. Hover, M. Muck, and R. McDermott, Phys. Rev. Lett. 103, 117001 (2009)

¹This work is done in collaboration with Lara Faoro and Lev B. Ioffe

Kostyantyn Kechedzhi
Rutgers, The State University of New Jersey

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