Temperature chaos is present in off-equilibrium spin-glass dynamics.

Javier Moreno-Gordo on behalf of the Janus Collaboration.

Spin glasses exhibit a fragile behavior in response to perturbations such as temperature changes. Specifically, arbitrary small changes in the temperature would lead to a complete reorganization of the equilibrium configurations of the spin glass. This phenomenon has been called Temperature Chaos [1, 2].

This equilibrium definition has focused the research effort on small system sizes that can be equilibrated. We have observed a phenomenon that closely mimics the Temperature Chaos in large non-equilibrium spin-glass and we provide a quantitative description [3]. By invoking the static-dynamic equivalence principle we find that the key quantity which is ruling the non-equilibrium Temperature Chaos phenomenon is the correlation length ξ . Also, a rare-event analysis is needed to deal with the strong spatial-heterogeneity of the non-equilibrium Temperature Chaos. We find a crossover between weak and strong chaos regime controlled by a crossover length ξ whose analysis reveals the close relation with its equilibrium counterpart: the chaotic-length [2].

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