

Abstract Submitted
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Universal Long-time Relaxation Behavior of a Nuclear Spin Lattice ERIC SORTE, BRIAN SAAM, University of Utah — We report experimental results indicating that isolated macroscopic systems of interacting nuclear spins possess the fundamental property that spin decays, starting from different initial configurations, quickly evolve towards the same long time behavior. We show that the generic functional form of the long time behavior of the infinite temperature spin correlation function decays with either a simple exponential or exponential multiplied by a cosine, even though the characteristic timescale of the functional form of this decay is considered non-Markovian. The results corroborate predictions made by a theory based on a strong conjecture that, as a result of chaos generated by the correlated spin dynamics, a Brownian-like Markovian description can be applied to the long time properties of ensemble average quantities on a non-Markovian timescale.

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