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Entanglement Dynamics in Heisenberg spin systems coupled to a dissipative environment GEHAD SADIEK, Department of Applied Physics, University of Sharjah, Sharjah 27272, UAE, SAMAHER ALMALKI, Department of Physics, King Saud University, Riyadh 11451, Saudi Arabia — Heisenberg Spin chains and lattices have been intensively used to represent many of the physical systems that are considered as promising candidates for quantum computing and quantum information processing. The main obstacle toward realizing the ultimate goals in these fields is decoherence caused by the surrounding dissipative and thermal environments. We are studying spin relaxation and entanglement dynamics in one and two-dimensional XYZ Heisenberg spin systems under coupling with a dissipative Lindblad environment at finite temperature. We investigate the effect of the anisotropy of the coupling between the spins on the asymptotic steady state of the system and the spin relaxation rates at different temperatures of the environment. We demonstrate the role played by the initial system setup on the entanglement and spin dynamics and steady state properties. Also we examine the effect of the long range interaction between the spins on the asymptotic behavior of the system.

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