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Non-Markovian qubit dynamics in a thermal field bath: Relaxation, decoherence and entanglement SANJIV SHRESTA, NIST, Gaithersburg, MD, CHARIS ANASTOPOULOS, ADRIAN DRAGULESCU, BEI-LOK HU, Physics Department, University of Maryland, College Park, MD — We have studied the non-Markovian dynamics of a qubit interacting with an electromagnetic field bath initially at finite temperature in the Jaynes-Cummings model. Unlike studies in which the bath is assumed to be fixed, we have included the dynamics of the bath, thus allowing for the coherent evolution of the combined qubit-bath system. In this way we can see the development of quantum correlations and entanglement between the system and its environment. The non-Markovian effects are illustrated in various quantities including the decoherence, relaxation, fidelity and von Neumann entropy, which are compared to the Markovian results.

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