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A statistical portrait of the entanglement decay of two-qubit memories[1] KAREN FONSECA-ROMERO, JULIAN MARTINEZ-RINCON[2], Universidad Nacional de Colombia — We present a novel approach to the study of entanglement decay, which focuses on collective properties. As an example, we investigate the entanglement decay of a two-qubit memory, produced by local identical reservoirs acting on the qubits, for three experimentally and theoretically relevant cases: depolarizing, dephasing and amplitude-damping channels. We study the probability distributions of disentanglement times, a quantity independent of the measure used to quantify entanglement, and the time-dependent probability distribution of concurrence. Uniformly distributed pure states are assumed for the two-qubit system. The calculation of these probability distributions gives a clearer insight on how different decoherence channels affect the entanglement initially contained in the set of two-qubit pure states. The entanglement evolution of mixed states, under the Hilbert-Schmidt metric, is also considered.

[1]Fundación para la Promoción de la Investigación y la Tecnología (Colombia)
[2]Now at University of Rochester

Karen Fonseca-Romero
Universidad Nacional de Colombia

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