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Finite-temperature reservoir engineering and entanglement dynamics SERGUEï FEDORTCHENKO, Université Paris Diderot, ARNE KELLER, Université Paris-Sud 11, THOMAS COUDREAU, PEROLA MILMAN, Université Paris Diderot — We propose experimental methods to engineer reservoirs at arbitrary temperature which are feasible with current technology. Our results generalize to mixed states the possibility of quantum state engineering through controlled decoherence. Finite-temperature engineered reservoirs can lead to the experimental observation of thermal entanglement–the appearance and increase of entanglement with temperature–to the study of the dependence of finite-time disentanglement and revival with temperature, quantum thermodynamical effects, and others, enlarging the comprehension of temperature-dependent entanglement properties. Our proposal is discussed in detail in two model systems, consisting of different modes of a single photon and a trapped-ion system.

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