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A Universal Cooling Scheme for Quantum Simulations QI ZHOU, Joint Quantum Institute and Condensed Matter Theory Center, University of Maryland, College Park, MD, TIN-LUN HO, Department of Physics, The Ohio State University, Columbus, OH — The relevant energy scales in current Quantum Simulation experiments are so small that one has to reach the temperature and entropy regimes far below those achievable today. Here, we present a general scheme to extract entropy directly out from the region of interest. The later stage of this process is equivalent to a continuous "evaporation," and is able to combat intrinsic heating of the system. In principle, this scheme can reach arbitrarily low temperatures, provided the system is in thermal equilibrium during the process. For illustration, we show how to cool a weak coupling BCS superfluid to $10^{-11}K$ with this simple procedure.

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