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Minimally entangled typical thermal states versus matrix product purifications for the simulation of equilibrium states and time evolution MORITZ BINDER, THOMAS BARTHEL, Duke Univ — We compare matrix product purifications and minimally entangled typical thermal states (METTS) for the simulation of equilibrium states and finite-temperature response functions of strongly correlated quantum many-body systems. For METTS, we highlight the interplay of statistical and DMRG truncation errors, discuss the use of self-averaging effects, and describe schemes for the computation of response functions. We assess the computation costs and accuracies of the two methods for critical and gapped spin chains and the Bose-Hubbard model. For the same computation cost, purifications yield more accurate results than METTS except for temperatures well below the systems energy gap. (Phys. Rev. B 92, 125119 (2015))

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