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Collapsing Schrodinger Cats in the Density Matrix Renormalization Group HONGCHEN JIANG, University of California, Berkeley, LEON BALENTS, University of California, Santa Barbara — In this paper, we propose a modified Density Matrix Renormalization Group (DMRG) algorithm to preferentially select minimum entropy states (minimally entangled states) in finite systems with asymptotic ground state degeneracy. The algorithm adds a “quench” process to the conventional DMRG method, which mimics the decoherence of physical systems, and collapses non-locally entangled states such as Schrodinger cats. We show that the method works for representative models with ground state degeneracy arising from either topological order or spontaneous discrete symmetry breaking. In the minimal entropy states thus obtained, properties associated with thermodynamic limit, such as topological entanglement entropy and magnetic order parameters, can be obtained directly and efficiently.

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