

Abstract Submitted
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Quantum Annealing and Many-Body Localization¹ NOAH BRAY-ALI, Joint Quantum Institute, University of Maryland, College Park and National Insitute of Standards and Technology, Gaithersburg, MD 20899 — The quantum phase transition separating the Ising spin glass from the quantum paramagnet phase in one-dimension is many-body localized. We study quantum annealing across this transition using the recently developed, dynamical strong-disorder renormalization group approach. The probability of successful adiabatic quantum computation of the spin glass ground-state obeys a universal scaling function of system size, anneal rate, and strength of disorder, which we obtain. Measurement of this universal scaling behavior in a quantum annealing device, for example, would be the first direct test of the activated dynamics of a many-body localized quantum phase transition.

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