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Coupled Quantum Fluctuations and Quantum Annealing LAYLA HORMOZI, Massachusetts Institute of Technology, JAMIE KERMAN, MIT Lincoln Laboratory — We study the relative effectiveness of coupled quantum fluctuations, compared to single spin fluctuations, in the performance of quantum annealing. We focus on problem Hamiltonians resembling the the Sherrington-Kirkpatrick model of Ising spin glass and compare the effectiveness of different types of fluctuations by numerically calculating the relative success probabilities and residual energies in fully-connected spin systems. We find that for a small class of instances coupled fluctuations can provide improvement over single spin fluctuations and analyze the properties of the corresponding class. Disclaimer: This research was funded by ODNI, IARPA via MIT Lincoln Laboratory under Air Force Contract No. FA8721-05-C-0002. The views and conclusions contained herein are those of the authors and should not be interpreted as necessarily representing the official policies or endorsements, either expressed or implied, of ODNI, IARPA, or the US Government.

Layla Hormozi
Massachusetts Institute of Technology

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