Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Using coupling strength to tell apart experimental quantum annealing and classical thermalization models MILAD MARVIAN, SERGIO BOIXO, TAMEEM ALBASH, DANIEL LIDAR, University of Southern California — Working with a two-qubit Ising Hamiltonian as the target Hamiltonian of quantum annealing implemented on a D-Wave One chip, we study how the qubit-qubit coupling strength affects the probability of finding the ground state. We solve the same problem analytically and numerically using classical thermalization models, and discuss conditions under which the classical prediction for the ground state probability, as a function of coupling strength, differs from the experimental results. For certain reasonable noise models this allows us to tell apart quantum annealing and classical thermalization.

Milad Marvian
University of Southern California

Date submitted: 09 Nov 2012 Electronic form version 1.4