MAR14-2013-008929

Abstract for an Invited Paper
for the MAR14 Meeting of
the American Physical Society

Error Corrected Quantum Annealing with Hundreds of Qubits

KRISTEN PUDENZ, University of Southern California

Physical realizations of quantum computing are always threatened by decoherence, especially as the scale of the device increases. This makes the implementation of error correction crucial. We have developed error correction techniques tailored to quantum annealing using superconducting adiabatic quantum optimization processors. I will show experimental results for computations using up to 448 physical qubits on the D-Wave Two device. Scaling of code performance on both antiferromagnetic chains and random 2D Ising problems will be addressed, along with insights into device error mechanisms and choices of decoding strategy. The error correction substantially enhances the observed success probabilities.