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Alexander Elgart. *On efficiency of Hamiltonian-based quantum computation for low-rank matrices.*

We present an extension of Adiabatic Quantum Computing (AQC) algorithm for the unstructured search to the case when the number of marked items is unknown. The algorithm maintains the optimal Grover speedup and includes a small Hamiltonian based counting subroutine.

We also demonstrate that quantum speedup for the unstructured search using AQC type algorithms may only be achieved under very rigid control precision requirements. Namely, $O(\frac{1}{\sqrt{N}})$ control precision is necessary. (Received September 22, 2011)