

Abstract Submitted
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Adiabatic Quantum Computation with Neutral Cesium AARON HANKIN, Sandia National Labs, University of New Mexico, L. PAUL PARAZOLI, CHIN-WEN CHOU, YUAN-YU JAU, GEORGE BURNS, AMBER YOUNG, SHANALYN KEMME, Sandia National Laboratories, ANDREW FERDINAND, GRANT BIEDERMANN, ANDREW LANDAHL, Sandia National Labs, University of New Mexico, IVAN H. DEUTSCH COLLABORATION¹, MARK SAFFMAN COLLABORATION² — We are implementing a new platform for adiabatic quantum computation (AQC) [1] based on trapped neutral atoms whose coupling is mediated by the dipole-dipole interactions of Rydberg states. Ground state cesium atoms are dressed by laser fields in a manner conditional on the Rydberg blockade mechanism [2,3], thereby providing the requisite entangling interactions. As a benchmark we study a Quadratic Unconstrained Binary Optimization (QUBO) problem whose solution is found in the ground state spin configuration of an Ising-like model.

[1] E. Farhi, et al. *Science* 292, 472 (2000)

[2] S. Rolston, et al. *Phys. Rev. A*, 82, 033412 (2010)

[3] T. Keating, et al. *arXiv:1209.4112* (2012)

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