

Abstract Submitted  
for the MAR17 Meeting of  
The American Physical Society

**Investigations of quantum heuristics for optimization** ELEANOR RIEFFEL, NASA Ames Research Center, STUART HADFIELD, Columbia University, ZHANG JIANG, SALVATORE MANDRA, DAVIDE VENTURELLI, ZHIHUI WANG, NASA Ames Research Center — We explore the design of quantum heuristics for optimization, focusing on the quantum approximate optimization algorithm, a metaheuristic developed by Farhi, Goldstone, and Gutmann. We develop specific instantiations of the of quantum approximate optimization algorithm for a variety of challenging combinatorial optimization problems. Through theoretical analyses and numeric investigations of select problems, we provide insight into parameter setting and Hamiltonian design for quantum approximate optimization algorithms and related quantum heuristics, and into their implementation on hardware realizable in the near term.

Eleanor Rieffel  
NASA Ames Research Center

Date submitted: 12 Nov 2016

Electronic form version 1.4