

Abstract Submitted
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A device-oriented optimizer for solving ground state problems on an approximate quantum computer, Part II: Experiments for interacting spin and molecular systems ABHINAV KANDALA, ANTONIO MEZZACAPO, KRISTAN TEMME, SERGEY BRAVYI, MAIKA TAKITA, JOSE CHAVEZ-GARCIA, ANTONIO CÓRCOLES, JOHN SMOLIN, JERRY CHOW, JAY GAMBETTA, IBM T.J Watson Research Center — Hybrid quantum-classical algorithms can be used to find variational solutions to generic quantum problems. Here, we present an experimental implementation of a device-oriented optimizer that uses superconducting quantum hardware. The experiment relies on feedback between the quantum device and classical optimization software which is robust to measurement noise. Our device-oriented approach uses naturally available interactions for the preparation of trial states. We demonstrate the application of this technique for solving interacting spin and molecular structure problems.

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