

Day 2 (Poster C)

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Title: Effect of additional operations for constrained quantum annealing

Abstract:

In this study, we propose an additional operation to improve the performance of constrained quantum annealing (CQA). In solving combinatorial optimization problems using quantum annealing, the objective function and constraints of the problem are represented by the Hamiltonian H_c of the Ising model, and a quantum-driver Hamiltonian H_q , which is noncommutative with H_c , is introduced, and the coefficients of H_q are gradually reduced. I. Hen et al. proposed a method of introducing a quantum-driver Hamiltonian, CQA, to represent quantum transitions only in the state space satisfying the constraints [I. Hen, F. M. Spedalieri, Phys. Rev. Applied 5, 034007 (2016)]. We consider introducing additional operations to the CQA. In our presentation, we will report the physical meaning of our proposed additional operations and evaluate their performance against existing methods.

The work was done in collaboration with Tatsuhiko Shirai (Waseda University), and Shu Tanaka (Keio University).