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Quantum Simulation of Coherent Ising Machines with Positive-P Representation

Coherent Ising Machines (CIM) are novel computing schemes to solve combinatorial optimization problems with pulsed degenerate optical parametric oscillators(DOPO). In these machines, each DOPO is connected by approximate measurement and feedback. We propose a new quantum simulation method using positive-P representation in terms of off-diagonal coherent state expansion and analyze various quantum properties of the machines.