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A Coherent Ising Machine Based On Degenerate Optical Parametric Oscillators[1] ZHE WANG, ALIREZA MARANDI, KAI WEN, ROBERT L. BYER, YOSHIHISA YAMAMOTO, Stanford Univ - Ginzton Lab — A degenerate optical parametric oscillator network is proposed to solve the NP-hard problem of finding a ground state of the Ising model. The underlying operating mechanism originates from the bistable output phase of each oscillator and the inherent preference of the network in selecting oscillation modes with the minimum photon decay rate. Computational experiments are performed on all instances reducible to the NP-hard MAX-CUT problems on cubic graphs of order up to 20. The numerical results reasonably suggest the effectiveness of the proposed network.

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