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(54) **ISING MODEL QUANTUM COMPUTATION DEVICE AND ISING MODEL QUANTUM COMPUTATION METHOD**

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CPC ..... **G01R 33/1284** (2013.01); **B82Y 10/00** (2013.01); **G01R 33/0023** (2013.01); **G06N 99/002** (2013.01)

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See application file for complete search history.

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(57) **ABSTRACT**  
This computation device and method exponentially shortens a computation time of an NP-complete problem or the like mapped into an Ising model by exponentially shortening a computation time of the Ising mode. For each pair of a plurality of slave lasers, by controlling the intensity, the polarization, and the phase of light exchanged between two slave lasers using an attenuator and a wave plate, the magnitude and the sign of pseudo Ising interaction between two slave lasers are implemented. Then, after the plurality of slave lasers arrive at a steady state, by measuring the polarization of light generated by each slave laser with left-handed circular polarization and right-handed circular polarization used as bases, a pseudo spin of each slave laser is measured.

**27 Claims, 39 Drawing Sheets**

