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【266】 Flexible resources for Quantum Metrology

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Quantum Metrology allows one to perform measurements which are quadratically more precise than classically possible. However, the hurdle of implementing the necessary quantum probe states and measurements, whose complexity varies drastically for different metrological scenarios, is usually not taken into account. We show that for a wide range of tasks in metrology, the 2D cluster state can serve as a flexible resource that allows one to efficiently prepare any required state for sensing; the required (entangled) measurements can be performed using only single qubit operations on the cluster. Crucially, the overhead in the number of qubits is less than quadratic, thus preserving the quantum scaling advantage.

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