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【562】 Integrating cold atomic quantum simulators into Qiskit

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Quantum systems based on cold atoms trapped in tweezer arrays are powerful analog simulators of the Hamiltonians they implement. Their experimental control has advanced to a point where they can be programmed to simulate a wide variety of physical systems. We report on a circuit- and gate-based description of cold atomic quantum simulators and how they integrate into a modern quantum computing software stack such as Qiskit. This paves the way to using non-standard quantum hardware beyond qubits for quantum information processing. As an example, we investigate variational algorithms for cold-atom-based simulators.

Primary authors: FISCHER, Laurin (IBM Research Zürich);　Dr EGGER, Daniel J. (IBM Research Zürich)

Presenter: FISCHER, Laurin (IBM Research Zürich)

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