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Qibo: a full-stack framework for simulation, control and calibration of self-hosted qubit devices

We present the latest developments of Qibo, a full-stack and open-source framework for quantum computing. Qibo was initially born as a quantum circuit simulation tool, but over time we have developed new packages, through which quantum control (qibolab) and quantum calibration (qibocal) can be performed.
Through its modular layout for backend abstraction it is possible to change efforlessy between different backends, including an high-performance simulator based on just-in-time compilation able to simulate quantum circuits with large number of qubits (greater than 35). Due to its modularity, Qibo can easily be adopted as a tool for controlling and calibrating self-hosted quantum devices.
With the extension of this NISQ era, we still want to start relying on quantum computers in tackling real problems. In this context, the Qibo ecosystem becomes the perfect candidate to deepen the development of noise resistant solutions with the eye of research.

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