

# Qibo status report

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**Qibo**

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## API changes:

- Added fermionic swap operator.
- Added S and T gates.
- Possibility to switch platforms programmatically.

## Model changes:

- qGAN model [[arXiv:2110.06933](#)]
- AAVQE model [[arXiv:1806.02287](#)]

## Technical changes:

- Improved import time / loading.
- Added python 3.10 supported.
- Removed python 3.6 is not supported.
- Tests and coverage improved.

$$\text{fSwap} = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & i & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & -1 \end{pmatrix}$$

$$S = \begin{pmatrix} 1 & 0 \\ 0 & i \end{pmatrix}$$

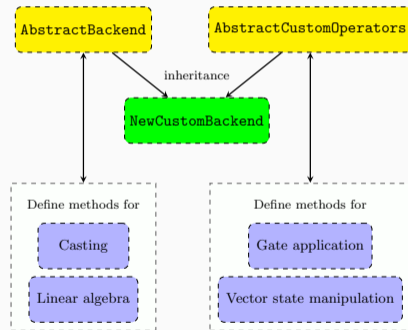
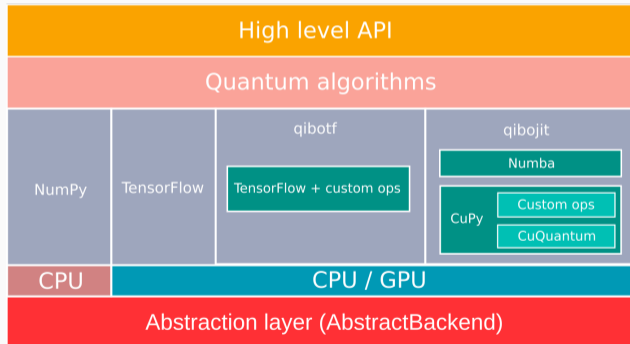
$$T = \begin{pmatrix} 1 & 0 \\ 0 & e^{i\pi/4} \end{pmatrix}$$

**Qibojit**

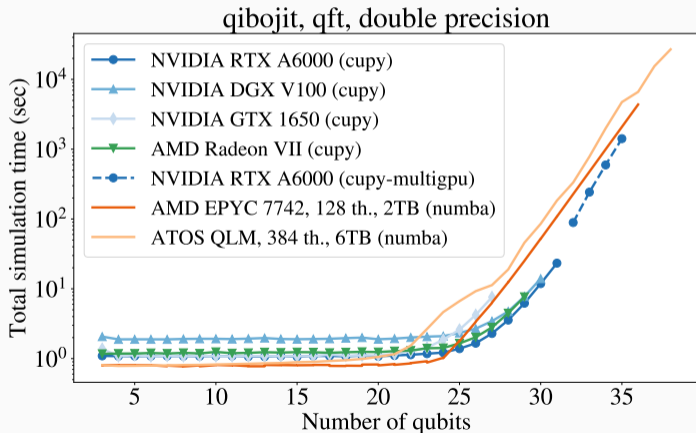
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**Qibojit:** New just-in-time quantum simulator [[arXiv:2203.08826](https://arxiv.org/abs/2203.08826)]

## Qibo stack

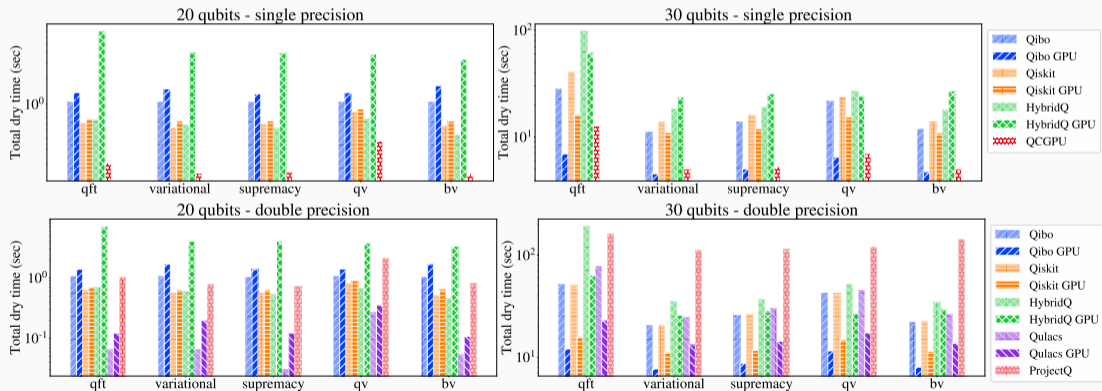


**Benchmark library:** <https://github.com/qiboteam/qibojit-benchmarks>  
[\[arXiv:2203.08826\]](https://arxiv.org/abs/2203.08826)



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[arXiv:2203.08826]



**Qibolab**

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## Major changes:

- New platform abstraction model.
- Diagnostics / characterization library
- New platform switcher (TIIq, QILI, IcarusQ).
- Refactoring and cleanup (removed unused interfaces)
- Add tests and coverage (including real quantum hardware)

## Instruments:

- Qblox QRM, QCM and QbloxCluster
- Rohde Schwarz: SGS100A
- Tektronics AWG5204
- AlazarTech ATS9371 ADC
- MiniCircuit RCDAT-8000-30 variable attenuator
- National Instrument QuicSyn Lite local oscillator

qibolab repository: <https://github.com/qiboteam/qibolab>