

Contribution ID: 532 Contribution code: **contribution ID 532**Type: **Oral**

Qibo: towards a quantum computing open source OS

Tuesday 30 November 2021 17:40 (20 minutes)

We present Qibo, a new open-source framework for fast evaluation of quantum circuits and adiabatic evolution which takes full advantage of hardware accelerators, quantum hardware calibration and control, and large codebase of algorithms for applications in HEP and beyond. The growing interest in quantum computing and the recent developments of quantum hardware devices motivates the development of new advanced computational tools focused on performance and usage simplicity. In this work we introduce a new quantum simulation framework that enables developers to delegate all complicated aspects of hardware or platform implementation to the library so they can focus on the problem and quantum algorithms at hand. As example for HEP applications, we show how to use Qibo for the determination of parton distribution functions (PDFs) using DIS, fixed-target DY and LHC data, and the construction of generative models applied to Monte Carlo simulation. We conclude by providing an overview of the variational quantum circuit models included in Qibo.

Significance

References

Speaker time zone

Compatible with Europe

Author: CARRAZZA, Stefano (CERN)**Presenter:** CARRAZZA, Stefano (CERN)**Session Classification:** Track 3: Computations in Theoretical Physics: Techniques and Methods**Track Classification:** Track 3: Computations in Theoretical Physics: Techniques and Methods