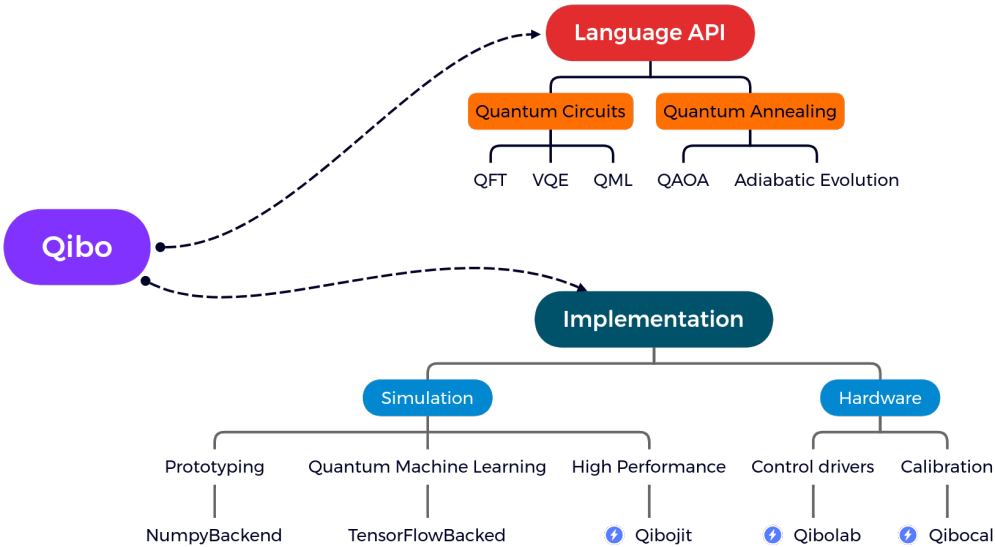
What is Qibo?

Qibo is an **open-source** full stack API for quantum simulation and quantum hardware control and calibration.



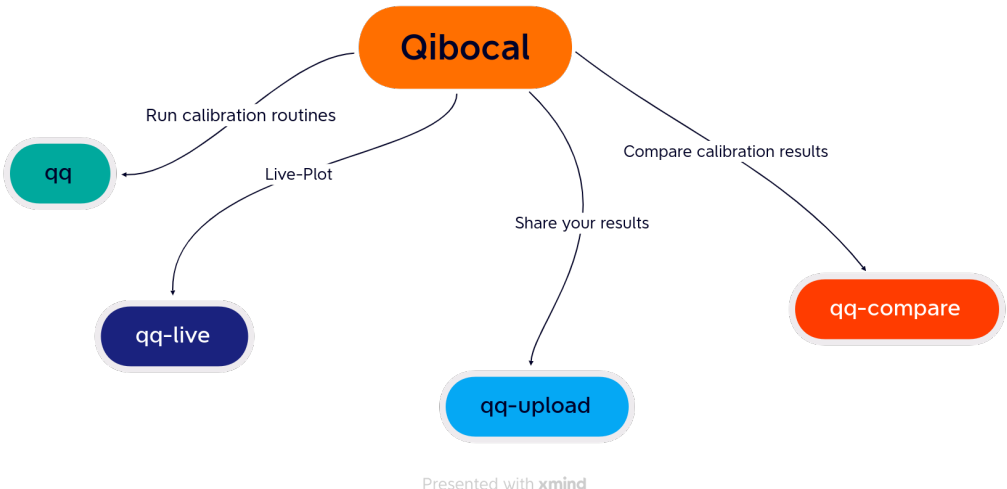
Motivation

We are developing a new tool called **Qibocal** to perform qubits calibration in Qibo using Qibolab as the main driver.

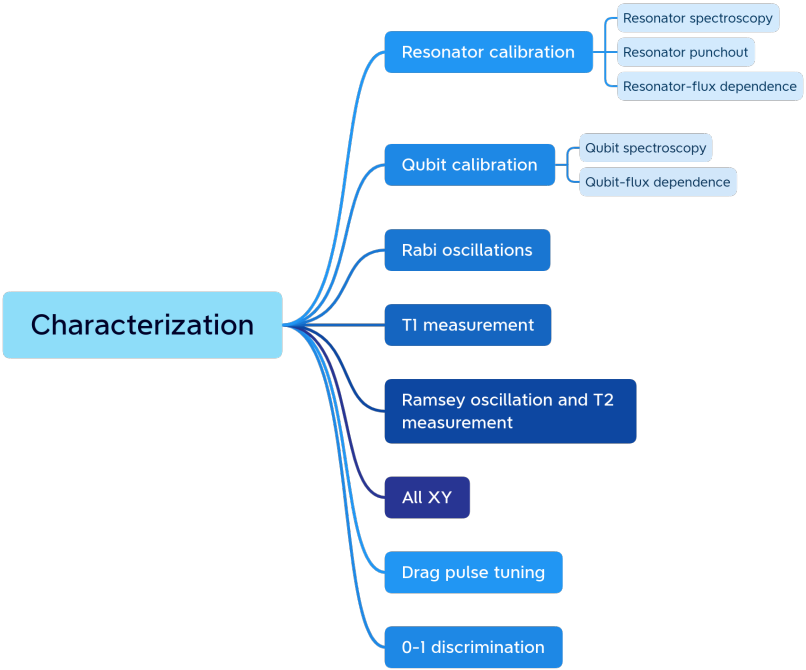
The main features that we are implemented are the following:

- Platform agnostic approach
- Launch calibration routines easily
- Live-plotting tools
- Live-fitting tools
- Save and share your data
- Autocalibration

Qibocal: implementation

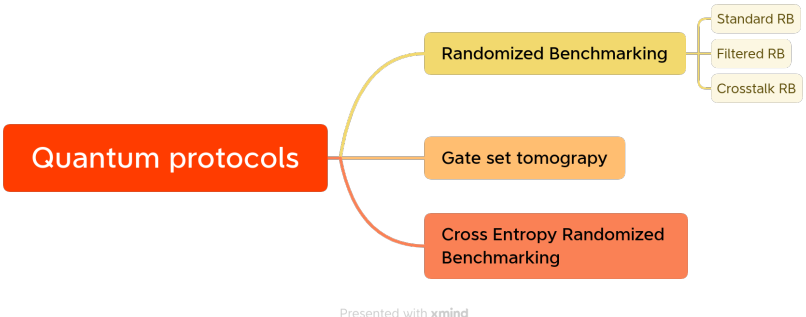


Single Qubit characterization



Extract fidellity using quantum protocols

We are also looking to include various quantum protocols to extract the fidelity



How to use qq

To run a specific set of calibration it is sufficient to write a runcard:

```yaml
platform: tii5q

qubits: [2]

format: csv

actions:
  resonator_spectroscopy:
    lowres_width: 5_000_000
    lowres_step: 2_000_000
    highres_width: 1_500_000
    highres_step: 200_000
    precision_width: 1_500_000
    precision_step: 100_000
    software_averages: 1
    points: 1

  qubit_spectroscopy:
    fast_start: -50_000_000
    fast_end: 50_000_000
    fast_step: 500_000
    precision_start: -500_000
    precision_end: 500_000
    precision_step: 100_000
    software_averages: 1
    points: 1
```

You can execute the following runcard by typing:

```
qq <runcard.yaml>
```

qq will take care of:

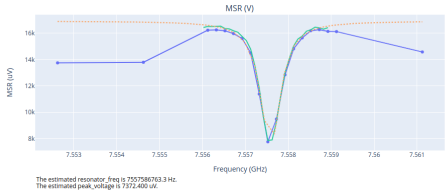
- connecting to the platform
- executing the routines listed under actions
- generating an update runcard for the platform
- generating a web report containing the results

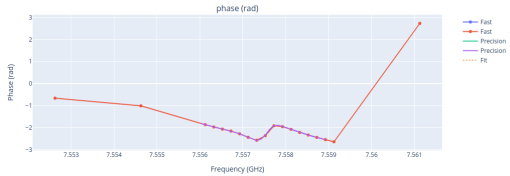
How to use `qq-live`

Using `qq-live` it is possible to visualize the results during (after) the execution

Resonator Spectroscopy

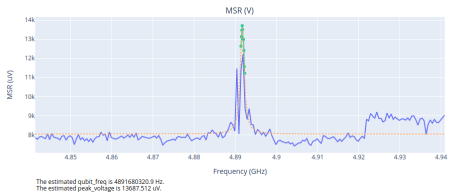
MSR and Phase vs Frequency - Qubit 2

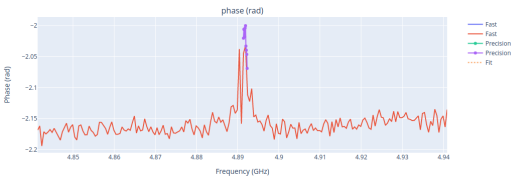




Qubit Spectroscopy

MSR and Phase vs Frequency - Qubit 2





How to use `qq-upload`

You can share your results by uploading the report generated by `qq` using `qq-upload`