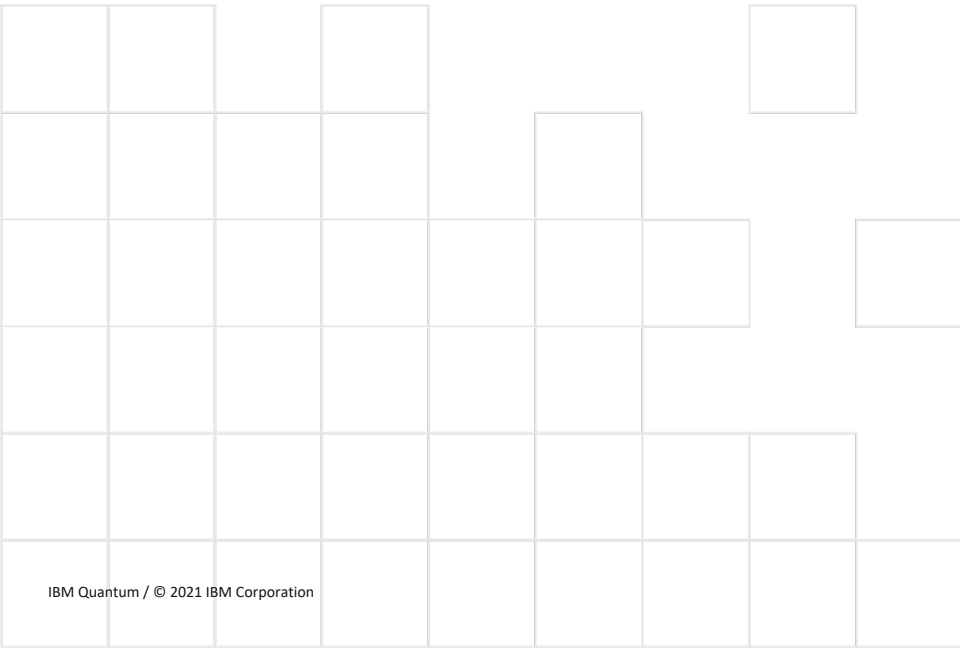


# #44 Update qiskit-experiment tutorials

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# Current Tutorials > Ultimate Goal

- Step-by-step progression
- Regroup and reformat
- Goal-oriented how-to guides

## Experiments Tutorials



*Calibrating single-qubit gates on  
ibmq\_armonk*



*Saving Experiment Data to the  
Cloud*



*Fine amplitude calibration*



*Quantum Volume*



*Randomized Benchmarking*



*Quantum State Tomography*



*T<sub>1</sub>*



*T<sub>2</sub> Ramsey Characterization*

# Steps

- Create a new guide plan
- Define the outline
- Set the vocabulary

## Calibrations Guide Outline

Let's say I want to write the calibrations how-to guide, showing users how to utilize calibrations . My considerations are:

- Target audience: This should be written as generally as possible, since the user may not know anything about the module if they're reading this guide (in fact, they are more likely to be beginners if they are reading this)
- Technical level: We want to give a big picture view of the module rather than overwhelm the reader with technical details. At the same time, we want to demonstrate what this module can do, so we should show some example code snippets that can be understood and executed easily

### Documentation system

Search docs  

[Docs](#) » The documentation system

- > Introduction
- > Tutorials
- > How-to guides
- > Reference guides
- > Explanation
- > About the structure
- > Who is using the system?

## The documentation system

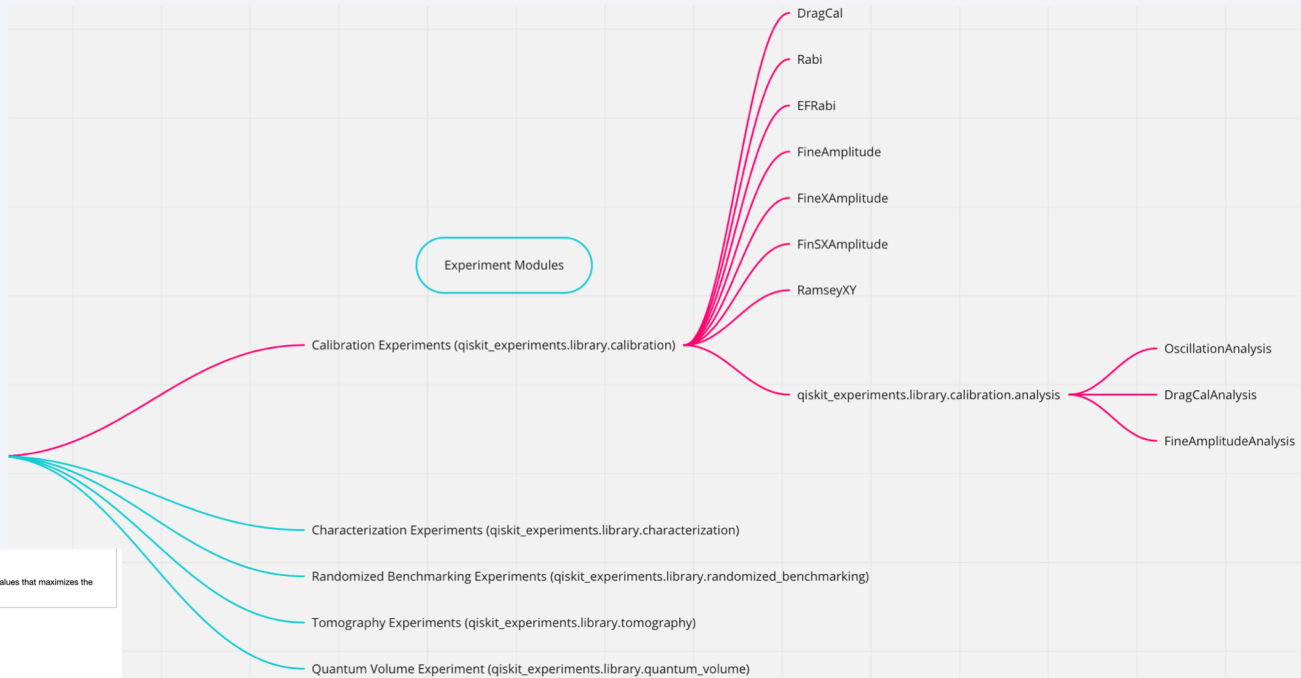
*The Grand Unified Theory of Documentation*

- David Laing

There is a secret that needs to be understood in order to write good software documentation: there isn't one thing called *documentation*, there are four.

# Progress

- Start from API reference
- Decide on prioritization
- Writing the guides



## Run a Single-Qubit Calibration Experiment

The calibration module in qiskit-experiments allows users to run calibration experiments to find the pulse shapes and parameter values that maximizes the fidelity of the resulting quantum operations.

### Calibration Experiment Types

- **DragCal** is used to scan the DRAG parameter to find the optimal value.
- **Rabi** is used to scan the amplitude of a pulse to calibrate rotations between 0 and 1.
- **EFRabi** is used to scan the amplitude of a pulse to calibrate rotations between 1 and 2.
- **FineAmplitude** is an error amplifying fine amplitude calibration experiment.
- **FineXAmplitude** is a fine amplitude experiment with all the options set for the pi-rotation.
- **FinSXAmplitude** is a fine amplitude experiment with all the options set for the pi/2-rotation.
- **RamseyXY** is used to measure the frequency of a qubit.

```
In [1]: import numpy as np
import qiskit.pulse as pulse
from qiskit.circuit import Parameter

from qiskit_experiments.calibration_management.backend_calibrations import BackendCalibrations
from qiskit_experiments.library.calibration import Rabi
from qiskit import IBMQ, schedule
```

For the backend, we use one of the publicly available and pulse-enabled backends.

```
In [2]: IBMQ.load_account()
provider = IBMQ.get_provider(hub='ibm-q', group='open', project='main')
backend = provider.get_backend('ibmq_armonk')
```

### 1. Calibrate the pulse amplitudes with Rabi experiment

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