

Characterization, validation, and verification (4:00-5:15)

In this breakout session, we will discuss the characterization, verification, and validation needs of a quantum testbed as well as the role a testbed could potentially play in developing validation and verification capabilities. The session will begin with a few brief presentations that lead into a discussion of the following questions:

- What verification and validation protocols are available for use with a quantum testbed? To what extent are these able to predict the performance of quantum algorithms on a testbed system?
- What characterization capabilities will a quantum testbed need? How does this depend on the specific hardware instantiation?
- How might a testbed be used to advance research in validation and verification? What are the hardware requirements for a testbed capable of advancing this research?
- What are the quantum control capabilities needed for calibration, verification, and validation? Do these differ from control capabilities needed to implement algorithms?

Speakers:

1. Andrew Landahl, Sandia National Lab
Demonstrating Fault-Tolerant Quantum Error Correction with a Small Testbed
2. Michael Biercuk, University of Sydney
Quantum Control Engineering for Quantum Testbeds
3. Scott Pakin, Los Alamos National Lab
Physical Characterization of Quantum Testbeds

Session Chair: Robin Blume-Kohout