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**Quantum process verification methods and applications to superconducting qubits<sup>1</sup>**

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Determining how well a quantum gate is implemented on a quantum device is of fundamental importance. Such a characterization allows a direct comparison between different architectures for computation as well as an understanding of the performance of the building blocks of a quantum computer. In this talk I will show that the standard approach of process tomography is grossly inaccurate in the case where the states and measurement operators used to interrogate the system are generated by gates that have some systematic error, a situation all but unavoidable in any practical setting. I will then present some recent proposals with experimental implementations that are resilient to this type of noise.

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