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Title:	Experimental demonstration of optimized quantum process tomography on the IBM quantum experience
Authors:	Gaikwad, Akshay (/jspui/browse?type=author&value=Gaikwad%2C+Akshay) Shende, Krishna (/jspui/browse?type=author&value=Shende%2C+Krishna) Dorai, Kavita (/jspui/browse?type=author&value=Dorai%2C+Kavita)
Keywords:	Experimental demonstration optimized quantum
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Citation:	International Journal of Quantum Information, 19(7).
Abstract:	We experimentally performed complete and optimized quantum process tomography of quantum gates implemented on superconducting qubit-based IBM QX2 quantum processor via two constrained convex optimization (CCO) techniques: least squares optimization and compressed sensing optimization. We studied the performance of these methods by comparing the experimental complexity involved and the experimental fidelities obtained. We experimentally characterized several two-qubit quantum gates: identity gate, a controlled-NOT gate, and a SWAP gate. The general quantum circuit is efficient in the sense that the data needed to perform CCO-based process tomography can be directly acquired by measuring only a single qubit. The quantum circuit can be extended to higher dimensions and is also valid for other experimental platforms.
Description:	Only IISERM authors are available in the record.
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