

Abstract Submitted
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Characterization of a two-transmon processor with individual single-shot qubit readout¹ DENIS VION, FLORIAN ONG, VIVIEN SCHMITT, ROMAIN LAURO, NICOLAS BOULANT, PATRICE BERTET, ANDREAS DEWES, DANIEL ESTEVE, CEA-Saclay, France — We report the characterization of a two-qubit processor implemented with two capacitively coupled tunable superconducting qubits of the transmon type, each qubit having its own non-destructive single-shot readout. The fixed capacitive coupling yields the \sqrt{iSWAP} two-qubit gate for a suitable interaction time. We reconstruct by state tomography the coherent dynamics of the two-bit register as a function of the interaction time, observe a violation of the Bell inequality by 22 standard deviations after correcting readout errors, and measure by quantum process tomography a gate fidelity of 90%.

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