Abstract Submitted
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A voltage-controlled superconducting quantum bus[1] LUCAS CASPARIS, NATALIE PEARSON, ANDERS KRINGHJ, THORVALD LARSEN, FERDINAND KUEMMETH, PETER KROGSTRUP, JESPER NYGARD, KARL PETERSSON, CHARLES MARCUS, Center for Quantum Devices and Station Q Copenhagen, Niels Bohr Institute, University of Copenhagen, Copenhagen, Denmark — Superconducting qubits couple strongly to microwave photons and can therefore be coupled over long distances through a superconducting cavity acting as a quantum bus. To avoid frequency-crowding it is desirable to turn qubit coupling off while rearranging qubit frequencies. Here, we present experiments with two gatemon qubits coupled through a cavity, which can be tuned by a voltage-controlled superconducting switch. We characterize the bus tunability and demonstrate switchable qubit coupling with an on/off ratio up to 8. We find that pulsing the bus switch on nanosecond timescales results in the apparent loss of qubit coherence. Further work is needed to understand how dynamic control of the tuneable bus affects qubit operation.

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