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Coupling two superconducting qubits via a cavity JOHANNES MAJER, STEVEN GIRVIN, ROBERT SCHOELKOPF, Yale University, YALE CIRCUIT QED TEAM TEAM — In a recent experiment [1] we have demonstrated that a superconducting qubit can be coupled strongly to a transmission line cavity. The qubit is able to swap its state with the cavity. Presently we place two qubits in the cavity which both can exchange their state with the cavity. This exchange establishes a coupling between qubits placed at the opposite end of the cavity. We discuss possible realizations of two-qubit gates and provide preliminary experimental results. [1] A. Wallraff et al., Nature (London) 431, 162 (2004)

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