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Capacitively Shunted Flux Qubits for Multi-qubit Architectures JASEUNG KU, MATTHEW HUTCHINGS, YEBIN LIU, B.L.T. PLOURDE, Syracuse University, JARED HERTZBERG, MARTIN SANDBERG, MARKUS BRINK, EASWAR MAGESAN, FIRAT SOLGUN, JERRY CHOW, IBM T.J. Watson Research Center — Capacitively shunted flux qubits (CSFQs) are capable of achieving comparable coherence times to transmon qubits in cQED systems. In addition, the relatively large and positive anharmonicity of the CSFQ can be advantageous for high-fidelity single- and two-qubit gate operations and to address the issue of frequency crowding in multi-qubit systems. We present the design and measurement of various configurations of CSFQ aimed at multi-qubit architectures.

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