

Abstract Submitted
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Proposal for a cavity based superconducting qubit ANDREI VRAJITOAREA, Princeton University, JENS KOCH, Northwestern University, ANDREW HOUCK, Princeton University — Various technological challenges need to be resolved in order to demonstrate a working cQED network of superconducting qubits. For single Josephson junction devices important factors include improving coherence times and reducing fluctuations in junction critical current that ultimately lead to dephasing and unwanted frequency collisions. Superconducting microwave resonators show great potential for storing and manipulating quantum states and are known for their accurate reproducibility. We propose the direct addressability of a two level cavity state by dispersively coupling a fluxonium qubit to a coplanar lumped element resonator. We report preliminary experimental results that point towards an induced cavity anharmonicity due to the large dispersive shifts of the fluxonium system.

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