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Towards a high quality three-dimensional superconducting electromechanical cavity ADAM REED, REED ANDREWS, BRAD MITCHELL, KONRAD LEHNERT, JILA NIST University of Colorado–Boulder — Macroscopic mechanical resonators coupled to microwave circuits enable quantum control of mechanical motion. These experiments are often limited by undesired loss in the electrical resonator. Current devices are typically fabricated on planar structures with materials that limit the electrical quality. Motivated by the high electrical quality obtainable in three-dimensional superconducting resonators, we explore such non-planar architectures. We present preliminary results of an electromechanical device that moves away from a planar geometry by combining a high quality mechanical resonator with a three-dimensional microwave resonator.

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