Abstract Submitted
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**Characterizing and reducing microfabrication-induced loss in superconducting devices, Part I: Resonators**[1] ANDREW DUNSWORTH, UC Santa Barbara, A. MEGRANT, Google, Santa Barbara, Z. CHEN, C. QUINTANA, UC Santa Barbara, B. BURKETT, J. KELLY, R. BARENDS, A. FOWLER, E. JEFFREY, T. WHITE, D. SANK, J. MUTUS, Google, Santa Barbara, B. CAMPBELL, UC Santa Barbara, Y. CHEN, Google, Santa Barbara, B. CHIARO, C. NEILL, P.J.J. O'MALLEY, UC Santa Barbara, P. ROUSHAN, Google, Santa Barbara, A. VAINSENCHER, J. WENNER, UC Santa Barbara, J.M. MARTINIS, University of California and Google, Santa Barbara — Planar and 3D superconducting qubits have previously been shown to be limited by microfabrication induced loss. Using finite element simulations, we have identified a major source of this decoherence in superconducting qubits. Furthermore, we experimentally verified this dominant loss channel using a novel resonator based approach, which we call 'Hydra' resonators. We fully characterized and then substantially reduced this loss channel using these Hydra resonators. I will report on these measurements and their implications on improving the coherence of superconducting qubits.

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