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Etch Effects on Surface loss in High Quality Aluminum on Silicon Superconducting Coplanar Resonators[1] ANDREW DUNSWORTH, ANTHONY MEGRANT, RAMI BARENDS, YU CHEN, IOCHUN HOI, EVAN JEFFREY, JOSH MUTUS, PEDRAM ROUSHAN, BROOKS CAMPBELL, ZIJUN CHEN, BEN CHIARO, JULIAN KELLY, CHARLES NEILL, PETER O'MALLEY, CHRIS QUINTANA, DANIEL SANK, AMIT VAINSENCHER, JIM WENNER, TED WHITE, ANDREW CLELAND, JOHN MARTINIS, Univ of California - Santa Barbara, MARTINIS GROUP TEAM — Superconducting coplanar resonators are a powerful tool for studying capacitive loss from two level states (TLS's) in superconducting qubits. We have found evidence that standard processing of aluminum on sapphire superconducting devices leaves behind $\approx$2 nm organic residues which can contribute to loss at the Q$> 10^6$ level that we are presently working with. Removing these residues is possible on a silicon substrate as it allows various sidewall etchings and profilings via chemical and physical etches. I will present recent Q factor measurements of aluminum on silicon resonators that were defined through a variety of etching conditions.

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