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Characterization of Fabrication Defects in Superconducting Epitaxial Aluminum Resonators NATHAN SIWAK, LEI HE, JUSTIN HACKLEY[1], CHRISTOPHER RICHARDSON, Laboratory for Physical Sciences — A continuing challenge in superconducting quantum computing is the creation of low-loss superconducting aluminum resonators. Significant processing difficulties lie in the removal of residues resulting from conventional Cl-based plasma etching without damaging the aluminum patterns. Correlations of resist residues and corrosion pit defect densities with cleaning process variations are completed using charge contrast-enhanced imaging in a scanning electron microscope. These quantified defects provide insight into the effectiveness of specific device processing steps in reducing these artifacts which can introduce additional loss mechanisms and limit potentially high performance devices.

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