

Abstract Submitted
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Microwave properties of epitaxial superconductor-semiconductor interfaces¹ JOSEPH YUAN, Department of Physics, City College of CUNY, KLEA DHIMITRI, Department of Physics, Hunter College, CUNY, AARON SOMOROFF, JESSE KANTER, JAVAD SHABANI, Department of Physics, City College of CUNY, SHABANI LAB TEAM — A key challenge in fabrication of hybrid semiconductor-superconductor devices is forming highly transparent contacts between the active electrons in the semiconductor and the superconducting metal. It has been shown that a near perfect interface and a highly transparent contact can be achieved using epitaxial growth of aluminum on InAs [1]. We have grown in-situ aluminum thin films on InAs (100), InAs (110), InAs (111), and Si (111) after oxide removal and regrowth. Guided by our numerical studies, we have isolated the optimal growth orientations to minimize the strain energy at the interface. The interfaces are studied using x-ray diffraction patterns and transmission electron microscope imaging. Field-effect Josephson junctions have been fabricated and studied in microwave regime. [1] Shabani et al. PRB 2016.

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