

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Fabrication of superconducting single crystal aluminum resonators on silicon and sapphire CHRISTOPHER RICHARDSON, JUSTIN HACKLEY, JENN ROBINSON, ZACH KEANE, BENJAMIN PALMER, Laboratory for Physical Sciences, LABORATORY FOR PHYSICAL SCIENCES COLLABORATION — Superconducting Al on sapphire are the mainstay materials used for the current development of superconducting qubit devices. We have grown single crystal Al films using MBE on both sapphire and silicon wafers with different surface preparations. Structural analysis indicates high quality films on both substrates with the twinned single crystal aluminum films abruptly relaxing misfit strain at the substrate interface. Different fabrication recipes for etching quarter-wave resonators and their impact on resonator performance will also be discussed. We have observed internal quality factors at low photon numbers above 600k for resonators on both substrates. Most resonators exhibit a lower than expected power dependence.

Christopher Richardson
Laboratory for Physical Sci

Date submitted: 14 Nov 2013

Electronic form version 1.4