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Characterization of Aluminum Oxide Tunnel Barrier for use in a Non-Local Spin Detection Device JOSEPH ABEL, JOHN GARRAMONE, ILONA SITNITSKY, VINCENT LABELLA, University at Albany — Aluminum oxide can be utilized as an interface layer between ferromagnetic metals and silicon to achieve spin injection into silicon. The goal of our research is to inject and readout spins using a non-local measurement device that utilizes 1-2 nm aluminum oxide interface layers as tunnel barriers. An important step of fabricating a non-local measurement device out of silicon is the growth of an aluminum oxide tunnel barrier[1]. Aluminum Oxide thin films where grown using a Knudsen cell to deposit 1 nm, 2 nm, and 3 nm of aluminum. The films were then oxidized in O_2. X-ray photoelectron spectroscopy (XPS) was performed to characterize the film stoichiometry, and the band gap. We will also report on current voltage measurements of these films after they have been capped with metal and compare the resistance area product to those calculated for spin injection into silicon[2].

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Joseph Abel
University at Albany

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