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Thomas Davidsmeier  
*Illinois Wesleyan University*

William Murphy  
*Illinois Wesleyan University*

Delara Godrej  
*Illinois Wesleyan University*

Gabriel Spalding, Faculty Advisor  
*Illinois Wesleyan University*

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Poster Presentation 23

ANISOTROPIC ETCHING OF SrTiO<sub>3</sub>

Thomas Davidsmeier, William Murphy, Delara Godrej, and Gabriel Spalding\*  
Department of Physics, Illinois Wesleyan University

The anisotropic etching properties of silicon seem to gain ever more technological importance as we enter the age of microelectromechanical devices, but the anisotropic etching of more highly polarizable materials such as SrTiO<sub>3</sub> has been relatively unstudied. We have reproducibly observed pyramidal pitting of single crystal SrTiO<sub>3</sub> surfaces, which is indicative of anisotropy in the etch rates. For a variety of etch conditions (concentration, time of etch, initial crystallographic orientation of the sample surface), we measure the depth from unetched areas down to the bottoms of etch pits on SrTiO<sub>3</sub> single crystals. By comparing these etch rates, along with the temporal evolution of the angles of the etch pit walls, we extract a measure of the anisotropy of etching. We present what we have learned of the kinetic bottlenecks in the etch process within a context supplied by our own theoretical calculations of lattice potentials for a variety of possible surface angles and surface terminations.