

Abstract Submitted  
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**Investigation of electric field induction of superconductivity at complex oxide interfaces**<sup>1</sup> J.T. HARALDSEN, Los Alamos National Laboratory, P. WOLFLE, Karlsruhe Institute of Technology, A.V. BALATSKY, Los Alamos National Laboratory — We examine the modified electronic states and change in carrier density at the interfaces of complex oxide films produced by an external electric field. Using a Ginzburg-Landau formalism and ab-initio calculations, we show that linear coupling of an electric potential can influence the superconducting order parameter and induce a transition to a superconducting phase. Further, we examine the correlation between carrier density and the superconducting critical temperature  $T_c$  by investigating capacitance and density of states with changing electric potential. We will discuss implications of this work in the context of interfaces formed by LaAlO<sub>3</sub> and SrTiO<sub>3</sub> thin films. This approach points to an alternative path to superconducting devices with tunable transition temperature. Work was carried out under the help and support of the National Nuclear Security Administration of the U.S. Department of Energy at Los Alamos National Laboratory under Contract No. DE-AC52-06NA25396.

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Jason Haraldsen  
Los Alamos National Laboratory

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