

Abstract Submitted  
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**Electronic instabilities at paraelectric and superconducting interface: A mean field approach**<sup>1</sup> J.T. HARALDSEN, A.V. BALATSKY, Theoretical Division, Los Alamos National Laboratory and Center for Integrated Nanotechnologies, Los Alamos, NM 87545 — We examine the modified electronic states at the interface between superconducting and ferro(para)-electric films. We find that the coupling of a classical fluctuating paraelectric  $P$  and superconducting  $\psi$  order parameters can significantly modify these orders at the interface. Using a Ginzburg-Landau formalism, we show that linear and quadratic terms of the electric polarization produce instabilities in  $\psi$  at the interface, where the linear interaction produces a modulation of the order parameters and create an interface-induced ferroelectric polarization within the paraelectric bulk state. We will discuss implications of this work for the experiments on the epitaxial oxide films.

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