Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Functional Interfaces of a Crystalline Oxide on Semiconductor FRED WALKER, Yale University, CRISP and Department of Applied Physics, New Haven, CT, CURT BILLMAN, AMI Semiconductor, Pocatello, ID, MARCO BUONGIORNO-NARDELLI, North Carolina State University, Department of Physics, Raleigh, NC, RODNEY MCKEE, Oak Ridge National Laboratory, Oak Ridge, TN — Interfaces play a pivotal role in the properties of complex oxides such as polarization of ferroelectrics, band offsets of gate dielectrics and the field effect in correlated electron materials. The concept of the interface phase has guided us in understanding these diverse roles of the interface. Moreover, this concept has been especially powerful in guiding the development of processes for the heteroepitaxial growth of oxides on semiconductors. Functional substitutions of elements at a crystalline-oxide and silicon interface have been accomplished using molecular beam epitaxy of alkaline earth oxides deposited on silicon. We present capacitance-voltage measurements to spectroscopically characterize the interface states induced by changing the composition of the interface from, for example, strontium to barium silicide. Research sponsored jointly by the Division of Materials Sciences and Engineering, Office of Basic Energy Sciences, U.S. Department of Energy at Oak Ridge National Laboratory under contract DE-AC05-00OR22725 with UT-Battelle, LLC and at the University of Tennessee under contract DE-FG02-01ER45937.

Fred Walker
Yale University

Date submitted: 20 Nov 2006 Electronic form version 1.4