Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Epitaxial In_2O_3 and Sn-doped In_2O_3 thin films with (100) and (111) orientation[1] ERIE MORALES, Tulane University, MATTHIAS BATZILL, University of South Florida, ULRIKE DIEBOLD, Tulane University — In_2O_3 and Sn-doped In_2O_3 (Indium-Tin Oxide, ITO) have optical transparency and low electrical resistivity. Relatively little is known about their atomic-scale surface properties because of challenges in preparing single crystal samples. We have grown epitaxial In_2O_3 and ITO films on Yttrium Stabilized Zirconia. The (100) surface has polar character and the (111) orientation is non-polar. Films were prepared using oxygen-plasma assisted e-beam epitaxy under UHV conditions and the growth was monitored by RHEED. *In-situ* characterization with XPS, ARXPS, LEED and synchrotron-based UPS was used. In_2O_3 (100) facets while ITO(100) stays with a 1x1 termination and Sn segregates to surface. In_2O_3 and ITO (111) exhibit a 1x1 termination. On both orientations valence band maximum is 2.7 eV below the Fermi level. For the ITO films resonant photoemission measurements indicate a Sn-derived band gap state.

[1]NSF # CHE 0715576, CHE 010908

Erie Morales
Tulane University

Date submitted: 03 Dec 2007 Electronic form version 1.4