

Abstract Submitted  
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**High Temperature XPS Studies of a Single Crystal of Magneto-electric TbMnO<sub>3</sub>** MARK WILLIAMSEN, SHISHIR RAY, YING ZOU, University of Wisconsin-Milwaukee, MARSHALL ONELLION, University of Wisconsin-Madison, PRASENJIT GUPTASARMA<sup>1</sup>, University of Wisconsin-Milwaukee — Recent interest in magnetoelectric and unconventional magnetic phenomena in materials such as the RMnO<sub>3</sub> series (R=Rare Earth) reveals competing electronic ground states, together with electronic and crystal structure phase transitions both above and below room temperature[1]. A complete elucidation of these phenomena calls for detailed studies of electronic properties at varying temperatures. Using a new high temperature insert with a resistive heater stage fitted to a Cylindrical Mirror Analyzer at the Synchrotron Radiation Center in Stoughton, WI, we have performed x-ray photoemission studies at variable temperatures (200-1000K) in a large single crystal of magnetoelectric orthorhombic TbMnO<sub>3</sub> (0.5 x 0.5 x 1cm) grown by us from a floating zone. We observe peak splitting in the Mn 3p and Tb 4d peaks near a structural distortion observed by us. Together with resistivity and detailed Rietveld analysis of powder x-ray diffraction, we ascribe this to possibly an orbital order-disorder transition around 900K. [1]J.S.Zhou,Phys.Rev.Let. 96,247202(2006)

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