Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Doping influence of spin dynamics and magnetoelectric effect in hexagonal $Y_{0.7}Lu_{0.3}MnO_3$ WEI TIAN, Oak Ridge National Laboratory, GUOTAI TAN, University of Tennessee and Beijing Normal University, LIU LIU, JINXING ZHANG, Beijing Normal University, BARRY WINN, TAO HONG, JAIME FERNANDEZ-BACA, Oak Ridge National Laboratory, CHENGLIN ZHANG, PENGCHENG DAI, University of Tennessee and Rice University — Inelastic neutron scattering experiments were performed to study spin waves and their correlation with the magnetoelectric effect in $Y_{0.7}Lu_{0.3}MnO_3$. The Mn trimerization distortion has been suggested to play a key role in determining the magnetic structure and the magnetoelectric effect in $YMnO_3$ and $LuMnO_3$. In $Y_{0.7}Lu_{0.3}MnO_3$, our INS study reveals a much smaller in-plane (hexagonal *ab*-plane) anisotropy gap that coincides with a weaker in-plane dielectric anomaly at T_N. Since both the smaller in-plane anisotropy gap and the weaker in-plane dielectric anomaly are coupled to a weaker Mn trimerization distortion in $Y_{0.7}Lu_{0.3}MnO_3$ comparing to $YMnO_3$ and $LuMnO_3$, we conclude that the Mn trimerization is responsible for the magnetoelectric effect and multiferroic phenomenon in $Y_{1-x}LuxMnO_3$.

Wei Tian
Oak Ridge National Laboratory

Date submitted: 14 Nov 2013 Electronic form version 1.4