

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Raman spectroscopy of multiferroic TbMnO₃¹ J. R. SIMPSON, A. R. HIGHT WALKER, NIST, Gaithersburg, MD 20899, R. VALDÉS AGUILAR, A. B. SUSHKOV, H. D. DREW, University of Maryland, College Park, MD 20742, S. PARK, Y. J. CHOI, C. ZHANG, S.-W. CHEONG, Rutgers University, Piscataway, NJ 08854 — Coupling between the lattice and magnetic degrees of freedom in TbMnO₃ has been observed to produce magnetic excitations with electric dipole activity, or electromagnons. Recent reports of electromagnons in other multiferroic (113)-orthomanganites² and related (125)-manganites³ indicate a complementary Raman study may provide additional insight into the importance of spin-lattice coupling. We present Raman spectra of single-crystal and polycrystalline TbMnO₃ using a triple-grating spectrometer in a collinear backscattering configuration as a function of temperature (4 – 300 K) and polarization along various crystallographic axes. The absence of any observable low-frequency modes (intensity < 1000 times that of prominent Raman-active phonons) suggests a weak scattering cross-section for the electromagnon. Additionally, we discuss the temperature dependence of Raman-active phonons and compare with results from infrared measurements.

¹Work supported, in part, by the NIST-NRC postdoctoral fellowship.

²R. Valdés Aguilar *et al.*, Phys. Rev. B **76**, 060404 (2007).

³A. B. Sushkov *et al.*, Phys. Rev. Lett. **98**, 027202 (2007).

Jeff Simpson
National Institute of Standards and Technology

Date submitted: 27 Nov 2007

Electronic form version 1.4