

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Electromagnons and Multiple Phase Transitions in BiFeO₃ Multiferroic System MARIOLA RAMIREZ, A. KUMAR, S. DENEV, J. IHLEFELD, D. SCHLOM, VENKATRAMAN GOPALAN, Penn State University, R. RAI, X. XIU, J. MUSFELDT, University of Michigan, S. LEE, S. CHEONG, Rutgers University, R. RAMESH, J. SEIDEL, E. CHIU, J. ORESTEIN, University of California, Berkley — Magnetoelectrics (ME) multiferroics has recently become an exciting research area due to its potential technological applications. Of special relevance is the case of Bismuth ferrite, BiFeO₃ (BFO) where multiferroicity coexist at room temperature. In this work, the Fe-Fe exchange interaction effects on the optical properties of BiFeO₃ are analyzed by using both, linear and non linear spectroscopy as a function of temperature. Two and three magnons Raman scattering as well as detectable *electromagnons* in the second harmonic generation (SHG) signal are reported. Temperature studies up to 750 K reveals a cascade of phase transitions associated to different dynamic reorientations in the magnetic subsystem. These transitions were detectable by several optical methods including linear absorption, Raman spectroscopy and SHG due to the strong electric dipole coupling found between electromagnetic radiation and spin waves in BFO.

Mariola Ramirez

Date submitted: 26 Nov 2007

Electronic form version 1.4