Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Anomalous magnetic transition in multiferroic $BiMnO_3$ under high pressure CHIH CHIEH CHOU, S. TARAN, J.L. HER, C.P. SUN, C.L. HUANG, Department of Physics, National Sun Yat-Sen University, Kaohsiung 804, Taiwan, H. SAKURAI, A.A. BELIK, E. TAKAYAMA-MUROMACHI, Advanced Nano Materials Laboratory (ANML), National Institute for Materials Science (NIMS), 1-1 Namiki, Tsukuba, Ibaraki 305-0044, Japan, H.D. YANG, Department of Physics, National Sun Yat-Sen University, Kaohsiung 804, Taiwan — The magnetic-field-dependent dc magnetization and the pressure-dependent ($p_{max} \sim$ 16 kbar) ac susceptibilities $\chi_p(T)$ on both powder and bulk multiferroic $BiMnO_3$ samples, synthesized in different batches under high pressure, are reported. The ferromagnetic (FM) transition ($T_C \sim 100$ K) increases with higher magnetic field. The magnetic hysteresis shows the behavior as a soft ferromagnet. Ac susceptibility data indicate the following phenomena. (I) The FM peak (peak I) and its temperature (T_C) decrease simultaneously with increasing pressure. (II) Above a certain pressure (9 -11 kbar), another peak (peak II) appears at ($T_p \sim$93 K). (III) Peak II also decreases with increasing pressure. (IV) Both these peaks persist over some intermediate pressure range (9–13 kbar). (V) Peak I disappears with further application of pressure; however, the second peak survives until present pressure limit ($p_{max} \sim$ 16 kbar). These features are considered to originate from the complex interplay of the magnetic and orbital structure of $BiMnO_3$ being affected by pressure.

Chih Chieh Chou
Dept of Physics, National Sun Yat-Sen University, Kaohsiung 804, Taiwan

Date submitted: 02 Dec 2008 Electronic form version 1.4