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**Electromagnon H-T phase diagram of multiferroic TbMn<sub>2</sub>O<sub>5</sub><sup>1</sup>**

DENNIS DREW, ANDREI SUSHKOV, ROLANDO VALDES AGUILAR, Department of Physics, University of Maryland, College Park MD, SOONGYONG PARK, SANG-WOOK CHEONG, Rutgers University, Piscataway, NJ — We report the results of infrared (5–250 cm<sup>-1</sup>) transmission study of multiferroic TbMn<sub>2</sub>O<sub>5</sub> as a function of temperature (3–300 K) and H||a for magnetic fields up to 8 T. Our major observation is that the main electromagnon feature softens without splitting with increasing field at T=5 K. This observation is in contrast with the gradual suppression of electromagnons without shifting by magnetic field in RMnO<sub>3</sub> compounds. Also, it is in agreement with the theoretical prediction of Fang and Hu <sup>2</sup> for this system. In this talk, we will also discuss other features of the magnetic field dependence of the low energy electromagnon excitations in multiferroic TbMn<sub>2</sub>O<sub>5</sub>.

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<sup>2</sup>C. Fang and J. Hu, condmat/0703487

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