Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Low-temperature Thermodynamic Properties of Eu-filled Skutterudites Y. LUAN, S. BHATTACHARYA, V. KEPPENS, Department of Materials Science and Engineering,The University of Tennessee, Knoxville, TN 37996, D. MANDRUS, B.C. SALES, Condensed Matter Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN 37831, THE UNIVERSITY OF TENNESSEE COLLABORATION, OAK RIDGE NATIONAL LABORATORY COLLABORATION — It is well known that the presence of a ?rattling? atom in filled skutterudite antimonides leads to glasslike thermal properties, complemented by an unusual thermodynamic behavior that indicates the presence of low-energy vibrational modes in addition to the normal acoustic phonons. The current work focuses on a study of $EuFe_4Sb_{12}$, which combines "rattling" with magnetic ordering below T_c= 90 K. The elastic moduli have been measured as a function of temperature and magnetic field, using resonant ultrasound spectroscopy (RUS). The temperature-dependence of the elastic response is dominated by two phase transitions: the well-known magnetic ordering at 90 K, as well as a second transition at 40 K. In addition, specific heat measurements have been carried out for the same compound. Together these measurements provide us with an extensive set of data, probing the complex thermodynamic behavior of this material.

Yanbing Luan
The University of Tennessee

Date submitted: 04 Dec 2005 Electronic form version 1.4