Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Phonon Behavior in the Hidden Order state of the Heavy Fermion Superconductor URu_2Si_2 DILLON GARDNER, CRAIG BONNOIT, Massachuesetts Institute of Technology, TRAVIS WILLIAMS, GRAEME LUKE, McMaster University, YOUNG LEE, Massachuesetts Institute of Technology — The heavy fermion compound URu_2Si_2 has generated much interest after the initial discovery of coexisting superconductivity and magnetism. Subsequent measurements revealed a phase transition at T=17.5 K into what is referred to as the "hidden order" state. The order parameter of this state remains unknown. Anomalous behavior in both the lattice component of thermal conductivity and thermal expansion parameters suggest that the phonons may also exhibit anomalous behavior that can shed light on the nature of the Hidden Order. We present inelastic X ray scattering measurements of lattice dynamics in both the hidden order phase and high temperature phase.

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Date submitted: 11 Dec 2012 Electronic form version 1.4