Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Field-induced Spin Fluctuations in Intermetallic CeX_2Ge$_2$(X= Cu, Ag, Au) DEEPAK SINGH, National Institute of Standard and Technology, A. THAMIZHAVEL, Tata Institute of Fundamental Research, SUNG CHANG, JEFFREY LYNN, National Institute of Standard and Technology — Intermetallic rare-earth compounds containing a lattice of 4 f or 5 f- electrons are prototypical systems to study the magnetic quantum phase transition which mainly results from the fluctuation of the antiferromagnetic moment at T= 0 K. Therefore, understanding the mechanism behind spin fluctuations is important towards a meaningful universal formulation of the QPT phenomena. We have performed magnetic, thermodynamic and neutron scattering measurements on CeX_2Ge2 (X = Cu, Ag, Au) compounds in single crystal form to further understand the mechanism behind spin fluctuations. CeX_2Ge$_2$ crystallize in a ThCr$_2$Si$_2$-type tetragonal crystal structure and undergo antiferromagnetic transitions at T$_N$ = 4.2 K (Cu), 4.6 K (Ag) and 13.5 K (Au). Detail measurements of Q-vectors associated with the long-range order and the numerical modeling of the data revealed the propagation of amplitude modulated spin density wave in CeCu$_2$Ge$_2$ and CeAg$_2$Ge$_2$ with the propagation vectors of (0.29,0.29,0.52) and (0,0.705,0.11) respectively. Dynamic measurements of CeX_2Ge$_2$ compounds in applied magnetic field, exhibiting the varying nature of spin fluctuations as X changes, will be discussed and compared with other Ce-based intermetallic compounds.

Deepak Singh
National Institute of Standard and Technology

Date submitted: 10 Dec 2010 Electronic form version 1.4