

Abstract Submitted  
for the MAR12 Meeting of  
The American Physical Society

**Numerical Study of the Electron-Phonon coupling in the Cerium Volume Collapse** PENG ZHANG, PETE REIS, KAMING TAM, Department of Physics, Louisiana State University, LA, FAKHER ASSAAD, Department of Physics, University of Wuerzburg, Germany, JUANA MORENO, Department of Physics, Louisiana State University, LA, ANDY MCMAHAN, Lawrence Livermore National Laboratory, CA, MARK JARRELL, Department of Physics, Louisiana State University, LA — Rare earth elements, for example Cerium, will experience a volume collapse with increasing pressure. Researchers have struggled for six decades to discover the mechanism behind this unusual first order phase transition. Although different models have been proposed that provide some qualitatively correct results, there is no theory that completely captures the volume collapse. Notably, some recent experiments show that lattice oscillations play an important role, contrary to the previous consensus that this phase transition is mainly driven by the contributions from spins and electrons. In this talk, we will discuss our study which employs the DMFA method to explore the role of electron-phonon coupling in the Periodic Anderson Model.

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Date submitted: 10 Nov 2011

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