Abstract Submitted
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Role of Phonons in Heavy Fermion Volume Collapse within the Periodic Anderson Model[1] P. REIS, P. ZHANG, Louisiana State, M.A. MAJIDI, Yakarta University, F. ASSAAD, University of Wuerzburg, T. PRUSCHKE, University of Goettingen, J. MORENO, M. JARRELL, Louisiana State, A.K. MCMAHAN, Lawrence Livermore National Lab — Recent X-ray and neutron diffraction studies indicate the involvement of phonons in the volume collapse of Cerium. Whether phonons are driven the volume change, or the effect has an electronic origin and phonons play a secondary role, is unknown. We address this problem within the Periodic Anderson Model using Continuous Time Quantum Monte Carlo as the cluster solver within DMFA and DCA. We consider several possibilities of Holstein phonons coupled with the local 4f electronic density, the d electron density, or the hybridization term. We calculate the temperature and volume dependence of the Debye frequency for these different electron-phonon couplings and evaluate the change in entropy during the transition.

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