

Abstract Submitted  
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**Ultrasonic Investigation of Cerium under High Pressure** MAGNUS LIPP, ZSOLT JENEI, HYUNCHAE CYNN, CHANTEL ARACNE-RUDDLE, WILLIAM EVANS, Lawrence Livermore National Laboratory, YOSHIO KONO, CURTIS KENNEY-BENSON, CHANGYONG PARK, HPCAT, Advanced Photon Source, Carnegie Institute of Washington — The contribution of the lattice to the famous volume collapse transition in cerium is re-evaluated using a unique combination of several techniques available at sector 16 BMB / HPCAT. These eliminate any indirect /iterative procedures employed previously: Energy dispersive X-ray scattering provides the pressure of the sample (as well as quality control about the state of the sample), X-ray radiography delivers a shadow image allowing a precise length measurement and the ultrasound pulse overlap method gives the transit time of the longitudinal and transverse pulses. Our preliminary analysis indicates a larger contribution by the lattice as previously thought. This work was performed under the auspices of the US DOE by LLNL under Contract DE-AC52-07NA27344. The X-ray studies were performed at HPCAT (Sector 16), APS/ANL. HPCAT is supported by CIW, CDAC, UNLV and LLNL through funding from DOE-NNSA, DOE-BES and NSF. APS is supported by DOE-BES, under Contract No. DE-AC02-06CH11357.

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