

Abstract Submitted
for the SES17 Meeting of
The American Physical Society

Shining X-Ray Light on the Volume Collapse Phenomenon of Cerium Metal BRANDON SCOGGINS, Department of Physics, University of North Georgia, BIJUAN CHEN, YANG DING, Center for High Pressure Science and Technology Advanced Research, CHENG-CHIEN CHEN, Department of Physics, University of Alabama at Birmingham — Elemental rare-earth metals exhibit intriguing properties arising from strong correlation effects due to partially filled f-electron shells. Of particular interest is the volume collapse phenomenon observed under high pressure conditions. In this study, we perform calculations including hybridization effects and atomic multiplet interactions to model recent high-pressure X-ray Raman measurements on Ce metals. We find that the X-ray measurement after the volume collapse is compatible with a Kondo screening scenario. However, direct 4f-4f hopping as in the Mott-Hubbard model also provides a small screening channel.

Brandon Scoggins
University of North Georgia

Date submitted: 30 Sep 2017

Electronic form version 1.4