Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Pressure Induced Valence Changes in $YbAl_3$ Studied by Resonant Inelastic X-Ray Emission ANDREW CORNELIUS, RAVHI KUMAR, MALCOLM NICOL, High Pressure Science and Engineering Center, University of Nevada, Las Vegas, MICHAEL HU, Advanced Photon Source, Argonne National Laboratory, ERIC BAUER, JOHN SARRAO, Los Alamos National Laboratory — We have performed high resolution x-ray absorption (XAS) and resonant inelastic x-ray scattering (RIXS) experiments to probe the pressure dependence of Yb valence in $YbAl_3$ up to 38 GPa. XAS spectra were collected in the partial fluorescence yield (PFY) mode with a Si (333) analyzer at the Yb L_3 edge. The RIXS spectra were recorded by fixing the incident energy and collecting the transferred energy as a function of pressure in 2 eV steps. The results showed a continuous valence change from intermediate (between 2+ to 3+) towards trivalent due to enhancement of 4f hybridization similar to other mixed valent Yb heavy fermion compounds under pressure [1, 2]. The 2+ to 3+ conversion of the valence state of Yb is almost complete above 29 GPa. The results, along with x-ray diffraction measurements, will be presented in detail. 1. C. Dallera, M. Grioni, A. Shukla, G. Vanko, J. L. Sarrao, J. P. Rueff and D. L. Cox Phys. Rev. Lett., 88, 196403 (2002) 2. C. Dallera, E. Annese, J. P. Rueff, A. Palenzona, G. Vanko, L. Braicovich, A. Shukla and M. Grioni, Phys. Rev. B., 68, 245114 (2003)

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Date submitted: 01 Dec 2004 Electronic form version 1.4