

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Single crystalline and aggregate elasticity of hcp cobalt at high pressure DANIELE ANTONANGELI, MICHAEL KRISCH, European Synchrotron Radiation Facility, GUILLAUME FIQUET, Laboratoire de Mineralogie et Cristallographie, Universite Paris VI, DANIEL FARBER, JAMES BADRO, CHANTEL ARACNE, FLORENT OCCELLI — The determination of elasticity at high pressure is singularly important for geophysics. In particular a comparison of single-crystalline and polycrystalline results is essential, since the various elements or minerals in Earth are present as textured aggregates. We report the first experimental determination of the complete elastic tensor of hcp cobalt under hydrostatic compression to 39 GPa by Inelastic X-ray Scattering (IXS). These results are complemented by an IXS study on polycrystalline cobalt up to 99 GPa, over the whole stability range of the hcp phase. Moreover the orientational averaging schemes and the micro-mechanical models describing the stress and strain relations of the interacting grains, currently employed to link the single crystal elastic moduli with the aggregate sound velocities in textured polycrystalline samples, will be discussed.

Daniele Antonangeli

Date submitted: 08 Dec 2004

Electronic form version 1.4