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An Extended X-Ray Absorption Fine Structure Spectroscopy Study of Iron and Iron Oxide DAVID ALEXANDER CHIN, PHILIP NILSON, JOHN RUBY, GILBERT COLLINS, Laboratory for Laser Energetics, TOM BOEHLY, Retired, RYAN RYGG, Laboratory for Laser Energetics, DUSTIN TRAIL, University of Rochester, YUAN PING, FEDERICA COPPARI, Lawrence Livermore National Laboratory, MARION HARMAND, Sorbonne Universit — To increase our understanding of the formation and evolution of the Earth and iron-rich exoplanets, extended x-ray absorption fine structure (EXAFS) spectroscopy was used to characterize Fe and FeO ramp compressed to core Earth conditions. On the OMEGA laser,[1] Fe and FeO were laser compressed to 500 GPa and probed with a broadband x-ray source. A velocity interferometer system for any reflector (VISAR) characterized the pressure in the compressed material. A newly constructed von Hamos geometry spectrometer, with a highly annealed pyrolytic graphite (HAPG) crystal, obtained the absorption spectrum from the Fe and FeO. The EXAFS data was analyzed using FEFF and GNXAS to determine the local structure, density, and temperature of the compressed material. Preliminary data will be discussed herein. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0003856, the University of Rochester, and the New York State Energy Research and Development Authority.

[1]T. R. Boehly *et al.*, Opt. Commun. **133**, 495 (1997).

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