Abstract Submitted
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Investigation of the melting of shock compressed Iron with XANES technique at LCLS A. RAVASIO, M. HARMAND, A. DENOEUD, A. BENUZZI-MOUNAIX, M. KOENIG, T. VINCI, LULI, France, S. MAZEVET, R. MUSELLA, LUTH, France, F. GUYOT, IMPMC, France., G. MORARD, IMPMC, France, F. DORCHIES, C. FOURMENT, J. GAUDIN, CELIA, France, Y. FENG, D. ZHU, H.J. LEE, B. NAGLER, E.C. GALTIER, LCLS, USA, N. OZAKI, K. MIYANISHI, Osaka University, Japan, S. TOLEIKIS, FLASH, Germany, J. BOUCHET, V. RECOULES, CEA, France, M. NAKATSUTSUMI, European XFEL, Germany, U. ZASTRAU, Univ. of Jena, Germany — X-ray Absorption Near Edge Spectroscopy is a powerful technique of both the electronic structure and the atomic short-range order in various media, from molecules to condensed matter. In a recent experiment performed at LCLS-MEC, we have applied this technique to study the melting of Iron under shock compression. An accurate knowledge of its properties at high pressures and temperatures is indeed crucial for geophysics and planetary science. In particular, detailed information on melting curves and solid phases are required to anchor the Earth's thermal profile and assess the solid or liquid nature of exoplanets' cores. Here we will present the obtained results and discuss how XANES data unambiguously evidenced the melting of iron on the high pressure Hugoniot.

Michel Koenig
LULI, Ecole Polytechnique, CNRS, CEA, UPMC, Palaiseau, France

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