

In-situ X-ray structural analysis on laser-shock compressed iron

Yoshihiko Kondo^{1*}, OZAKI, Norimasa¹, URANISHI, Hiroyuki¹, RAVASIO, Alessandra², BENNUZZI-MOUNAIX, Alessandra², DENOUND, Adrien², BRAMBRINK, Erik², KOENIG, Michel², RILEY David³, KODAMA, Ryosuke¹

¹Graduate school of Engineering, Osaka University, ²Laboratory LULI, Ecole Polytechnique, ³Queen's University Belfast

The knowledge of high pressures ($P > 1$ Mbar) behavior of materials as iron is crucial for modeling the planetary interiors. Despite important progress obtained in the last decade on macroscopic characterization including equation of state (EOS), microscopic studies are necessary to investigate finely the structure changes.

Here we present recent studies to obtain information on solid-solid phase transformation of iron under laser-driven shock compression

using picosecond time-resolved x-ray diffraction technique.

BCC-HCP phase transformation was observed at dynamic high pressure of ~ 180 GPa.

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