

K-edge shift and XANES investigation of laser shocked Aluminum

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The physical properties of warm dense matter, specially their structural properties, are still poorly known.

In this work, K-edge shift and X-ray Absorption Near Edge Spectroscopy (XANES) of shocked Aluminum have been investigated with the aim of bringing information on the evolution of its electronic structure [1-3].

The experiment was performed at LULI where we used one long pulse (500 ps) to create the shock and a second picosecond beam to generate an ultra-short broadband X-ray source near the Al K-edge. The spectra were registered by using conical KAP Bragg crystals.

By changing the delay between the two beams, we have been able to observe the modification of absorption spectra for different Aluminum conditions. The hydrodynamical Al conditions were measured by using VISARs interferometers and self-emission diagnostic.

[1] S. Mazevet and Zerah, Phys. Rev. Lett. PRL 101, 155001 (2008)

[2] O. Peyrusse, J. Phys.: Condens. Matter **20** (2008) 195211

[3] T. Hall et al. Eur. Phys. Lett. **41** (1998) 495