



SEMINARIO

venerdì 1 marzo 2013 ore 11:00 – Aula 44

Area della Ricerca CNR di Pisa – Edificio A, primo piano

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Measurements of Continuum Lowering in Isochorically Heated Hot-Dense Aluminum

Abstract.

We generated samples of hot-dense Al at solid density and temperatures up to 180 eV, by isochoric heating of thin foils irradiated by the X-ray pulse of the Linac Coherent Light Source (LCLS). The absorption process, dominated by single K-shell photoionization, was monitored by observing the subsequent K-alpha emission, resolving the lines emitted by ions with a different number of L-shell holes. Even if the charge states distribution is completely dominated by the thermal ionization of the L-shell [1], the emission is strongly dependent on the photon energy of the pump beam, that must be higher than the relevant K-edge in order to observe a given line. Thus by tuning the X-ray laser's wavelength and observing the corresponding variation in the number of satellite lines, we have performed charge resolved K-edge measurements in a hot-dense system [2]. The results are found to disagree with the predictions of the extensively used Stewart-Pyatt model, but are consistent with the earlier model of Ecker and Kröll, which predicts significantly greater depression of the ionization potential.

[1] S.M. Vinko et al., Nature (London) 482, 59 (2012).

[2] O.Ciricosta et al., Phys. Rev. Lett. 109, 065002 (2012)