**X-ray radiography of a titanium wire isochorically heated by laser-accelerated electrons**

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 We performed an experiment using the laser Phelix at GSI to isochorically heat a wire and study its following expansion using time resolved X-ray radiography.

A mm-long titanium wire (50 µm in diameter) was irradiated on its tip by the laser pulse with duration τ=0.5 ps, energy E=50 J and intensity I$\~$ $10^{18}W/cm^{2}$. Hot electrrosn were gereated innteh interaction and propagated along the wire isochorically heating the titanium material. X-ray emisison spectroscopy (FSSR) of the titanium K-a line was performed to retrieve the wire temperature along the wire, i.e. T=T(z) where z=0 corresponds to the wire tip [1, 2].

 After this initial quasi-instantaneous heating, the expansion of the wire was followed using time-resolved X-ray radiography. Backlighter target was 5um tungstenwire illuminated by a second laser beam with similar characteristics. Measurement of wire expansion was done at different time by changing the delay between the two laser beams. X-ray radiography was successfully used to measure plasma expansion and sound velocity cs = cs (z).

We observed how local plasma expansion velocity along the wire is consistent with the temperature extracted from FSSR data [2]

[1] A. Schönlein,G. Boutoux, S. Pikuz, L. Antonelli, D. Batani, A. Debayle, A. Franz, L.Giuffrida, J.J. Honrubia, J. Jacoby, D. Khaghani, P. Neumayer, O.N. Rosmej, T. Sakaki, J.J. Santos, A. Sauteray « Generation and characterization of Warm Dense Matter isochorically heated by laser-induced relativistic electrons in a wire target» Europhys. Lett, 114, 45002 (2016)

[2] A. S. Martynenko, S. A. Pikuz, L. Antonelli, F.Barbato, G. Boutoux, L. Giuffrida,J. J. Honrubia, E.Hume, J. Jacoby, D. Khaghani, K. Lancaster, P.Neumayer, O.N.Rosmej, J. J. Santos, O. Turianska, and D. Batani. Role of relativistic laser intensity on isochoric heating of metal wire targets” Optics Express 29 (2021)