Abstract Submitted
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Characterization of warm dense matter produced by laser-accelerated high-energy protons[1] M. NAKATSUTSUMI, J. FUCHS, A. MANCIC, J. ROBICHE, LULI, France, P. RENAUDIN, DPTA, CEA, France, P. COMBIS, DPTA,CEA, France, F. DORCHIES, M. HARMAND, CELIA, France, G. MAYNARD, J. VASSAUX, LPGP, France, P. MORA, CPhT, France, P. ANTICI, INFM, Italy, S. FOURMAUX, INRS-EMT, Canada, P. AUDEBERT, LULI, France — Producing warm dense plasmas (WDM: solid density, few eV $\sim$ few 10s eV) is of interest for fundamental plasma physics or ICF. Laser-produced proton heating is of interest since they are short (<1ps) and deposit their energy volumetrically. Experiments were performed using the LULI 100 TW facility to create and characterize WDM. We used, (i) 2D time-resolved optical self-emission of the heated target, (ii) surface expansion velocity measurement through phase measurements of a reflecting probe beam, and (iii) x-ray absorption spectroscopy. We showed that we could produce quasi-uniform heating of solids, as suited for e.g. EoS measurements. Time-resolved solid-liquid-plasma transition has been measured, as well as energy-loss of MeV protons in warm dense plasmas.

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