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Stopping power measurements of ions in a moderately coupled and degenerate plasma SOPHIA MALKO, CLPU, W. CAYZAC, CEA, DAM, DIF, V. OSPINA, CLPU, X. VAISSEAU, CEA, DAM, DIF, J. APINANIZ, CLPU, D. BATANI, CELIA, M. BARRIGA-CARRASCO, Universidad de Castilla La Mancha, R. FEDOSEJEVS, University of Alberta, M. HUAULT, CLPU, P. NEUMAYER, GSI, G. PRESTOPINO, C. VERONA, Universit degli studi di Roma, J.A. PEREZ-HERNANDEZ, CLPU, R. RAMIS, Universidad Politecnica de Madrid, L. VOLPE, CLPU — Ion stopping in dense plasmas plays a central role in ICF for the target self-heating by alpha-particles that triggers ignition. The existing experimental database is essentially limited to large projectile velocities (vp >>vth) and validates the perturbative stopping-power models in that range. The parameter region for vp ˜vth (Bragg peak), reached at low projectile velocities of few hundred keV/u is theoretically and experimentally more challenging. This work presents an experimental approach to study proton stopping at low velocity projectile in warm dense carbon at the CLPU 200 TW VEGA II, high repetition laser system. A TNSA proton beam is generated by focusing a 4 J, 30 fs laser pulse on a thin Al target with an intensity of 10^{19} W/cm^2. A magnet-based device selects a proton energy interval of 500 6 keV. These protons are used to probe a WDM sample created by irradiating a 1 m thick carbon target with 30 fs 10^{16} W/cm^2 laser pulse. A magnet spectrometer coupled with an imaging MCP detector is employed to measure downshifted proton spectra. We reach a target electron temperature of 20 - 30 eV, which corresponds to Γ ˜0.2 and θ ˜2 and velocity ratio of vp / vth ˜3.

Sophia Malko
CLPU

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