Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Measurements of charged-particle stopping around the Bragg peak in OMEGA ICF plasmas J. FRENJE, C.K. LI, F. SEGUIN, A. ZYLSTRA, R. PETRASSO, MIT, P. GRABOWSKI, UCI, R. MANCINI, UNR, S. REGAN, J. DELETTREZ, V. GLEBOV, T. SANGSTER, LLE — We report on measurements of charged-particle stopping around the Bragg peak in plasmas relevant to Inertial Confinement Fusion (ICF). The energy loss of DD-tritons, DD-protons, D3He-alphas and D3He-protons, which are ideal particles for validating approximations to the ion-electron collision operator, have been measured in D^3He gas-filled filled implosions. These experiments are relevant to alpha-particle transport and heating in hot-sport ignition experiments. As the DD and D3He fusion products span a large range of velocities, these measurements represent the first detailed experimental study of charged-particle stopping, ranging from linear low-velocity stopping, through the Bragg peak, to high-velocity stopping. The results are contrasted to commonly used theories, including the Brown–Preston–Singleton and Li–Petrasso formalisms. The data is also used to rule out theories that neglect quantum diffraction and dynamic screening. This work was supported in part by the US DOE, NLUF, LLE and GA.

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Date submitted: 10 Jul 2014 Electronic form version 1.4