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Feasibility of an experiment to measure stopping powers in solid-density deuterium plasmas at OMEGA B. LAHMANN, H.G. RINDERKNECHT, A.B. ZYLSTRA, J.A. FRENJE, C.K. LI, F.H. SEGUIN, R.D. PETRASSO, MIT, S. REGAN, C. SANGSTER, LLE, F. GRAZIANI, G.W. COLLINS, J.R. RYGG, LLNL, P. GRABOWSKI, UC Irvine, S. GLENZER, Stanford University, P. KEITER, U Mich — An experimental design to measure the stopping powers of charged-particles through solid-density, fully-ionized deuterium plasmas at temperatures around 10 eV is investigated. Stopping power in this regime is crucial to the understanding of alpha-heating and burn in Internal Confinement Fusion. Recent work by A.B. Zylstra *et al.* on the OMEGA laser facility has demonstrated such measurements of stopping power in partially ionized Be plasmas, by measuring the downshift of D^3He-protons in an isochorically heated sample. As noted in their work, the effects of partial ionization are not well understood; however such effects are not applicable to hydrogenic fuels, for which the plasmas are expected to be fully ionized. This study will consider the viability of isochorically or shock heating a target to Warm Dense Matter conditions using a platform similar to the planar cryogenic system described by S.P. Regan *et al.*[1] Plasma properties will be determined by x-ray Thomson scattering while stopping powers will be inferred through measuring downshift of either DD-protons, D^3He-protons or D^3He-alphas, the latter of which is directly applicable to the stopping of DT-alphas in ignition experiments. This work was supported in part by the U.S. DOE, NLUF, LLE, and LLNL.

[1]S.P. Regan *et al.*, Phys. Rev. Lett. **109**, 265003 (2012).

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