

Abstract Submitted
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Proton energy loss measurements in high density, low temperature plasma¹ RONNIE SHEPHERD, HUI CHEN, SOPHIA CHEN, LLNL, JULIEN FUCHS, MAXENCE GAUTHIER, Ecole Polytechnique, France, ANDY HAZI, MICHAEL SURH, LLNL, MICHAEL MURILLO, LANL, SAM FELDMAN, GILLISS DYER, University of Texas, Austin, TODD DITTMIRE, RICHARD LONDON, LLNL, MICHAEL PURVIS, Colorado State University, CIMARRON TEAM — There is a great need for experimental verification of energy loss physics in plasma modeling codes. This is particularly true in the moderately-strongly coupled regime. Under this condition, the charged projectile experiences collisions with multiple particles simultaneously (many-body collisions). In inertial confinement fusion and stellar interiors, fusion reactions predominately occur in the moderately-strongly coupled. Understanding the charged particle stopping in this regime is critical to successfully designing and modeling burning plasma in these systems. We have embarked on an ambitious campaign to experimentally test stopping power models. The technique utilizes two short-pulse laser generated proton beams. One beam is used for isochoric heating of solid density matter while the second is used to probe the heated matter. The experiment will be compared to current stopping power models and the molecular dynamics code ddcMD. The measurement and comparison will serve as a bench mark and help further the understanding of energy exchange in ICF and astrophysics models.

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