Abstract Submitted
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Proton Beam Driven Isochoric Heating to Warm Dense Matter Conditions on Texas Petawatt[1] R. ROYCROFT, G.M. DYER, E. MCCARY, X. JIAO, B. BOWERS, A. BERNSTEIN, T. DITMIRE, M. MONTGOMERY, D. WINGET, B.M. HEGELICH, University of Texas Austin — Isochoric heating of solids and gases to warm dense matter conditions is relevant to the study of equation of state as well as laboratory astrophysics, specifically heating of hydrogen gas (~10^{17}-10^{19} cm^3) to 0.5-3eV for the study of white dwarf atmospheres. In a series of experiments on Texas Petawatt, we have built a platform using the petawatt laser focused softly to a large focal spot (60-70um) to generate large numbers of intermediate energy protons via TNSA, ideal for isochoric heating. We have previously used the proton beam to isochorically heat 10um aluminum foils to 20eV. This poster presents results of experiments in which low Z materials such as methane gas, carbon foams, and hydrogen are heated using this platform. We are measuring the surface brightness temperature and heating with a streaked optical pyrometer, and XUV emissions using an XUV spectrometer.

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