

Abstract Submitted
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Equation of State Measurements of Dense Plasmas Heated by Laser Accelerated MeV Protons GILLISS DYER, AARON BERNSTEIN, BYOUNG-ICK CHO, WILL GRIGSBY, ALLEN DALTON, The University of Texas at Austin, RONNIE SHEPHERD, YUAN PING, HUI CHEN, KLAUS WIDMANN, Lawrence Livermore National Laboratory, JENS OZTERHOZ, Heinrich-Heine-University, TODD DITMIRE, The University of Texas at Austin — Using a fast proton beam generated with an ultra intense laser we have generated and measured the equation of state of solid density plasma at temperatures near 20 eV, a regime in which there have been few previous experimental measurements. The laser accelerated a directional, short pulse of MeV protons, which isochorically heated a solid slab of aluminum. Using two simultaneous, temporally resolved measurements we observed the thermal emission and expansion of the heated foil with picosecond time resolution. With these data we were able to confirm, to within 10%, the SESAME equation-of-state table in this dense plasma region.

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