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Hugoniot measurements at pressures of 20-720 Mbar at the NIF¹ ANDREA KRITCHER, TILO DOEPPNER, BENJAMIN BACHMANN, Lawrence Livermore National Laboratory, DOMINIK KRAUS, ROGER FALCONE, University of California Berkeley, GILBERT COLLINS, OTTO LANDEN, Lawrence Livermore National Laboratory, DAVE CHAPMAN, Atomic Weapons Establishment, JIM HAWRELIAK, Lawrence Livermore National Laboratory, SIEGFRIED GLEN-ZER, SLAC Accelerator National Laboratory, JOE NILSEN, DAMIAN SWIFT, Lawrence Livermore National Laboratory — Laboratory measurements of the Equation of State (EOS) of matter at high pressure, exceeding several hundred Mbar, are of great importance in the understanding and accurate modeling giant planetary formation and benchmarking dense matter models is relevant for fusion energy experiments. For example, at Gbar pressures atomic shell effects may come into play, which can change the predicted compressibility at given pressure due to pressure and temperature ionization. In this work we present the first laboratory measurements of the strong shock hugoniot at pressures up to 720 Mbar for CH and 630 Mbar for High Density Carbon (HDC). X-ray radiography has been applied to measure the shock speed and infer the mass density profile, enabling determining of the material pressure and absolute shock Hugoniot. We will also present a comparison to postshot HYDRA simulations.

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