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Hugoniot measurements at near Gbar pressures at the NIF ANDREA KRITCHER, DAMIAN SWIFT, TILO DOEPPNER, GILBERT COLLINS, BENJAMIN BACHMANN, Lawrence Livermore National Laboratory, JOE NILSEN, Swift, Damian C. ; Collins, Rip ; Bachmann, Benjamin ; Doeppner, Tilo ; Nilsen, Joe ; Roger Falcone ; Glenzer, Siegfried H. ; Dominik Kraus; Dubois, J, DAVE CHAPMAN, AWE plc, Aldermaston, UK, ALFREDO CORREA, PHIL STERNE, LORIN BENEDICT, JIM GAFFNEY, Lawrence Livermore National Laboratory, DOMINIK KRAUS, ROGER FALCONE, University of California, Berkeley, SIEGFRIED GLENZER, SLAC, National Accelerator Laboratory, STEVE ROTHMAN, AWE plc, Aldermaston, UK — Laboratory measurements of the Equation of State (EOS) of matter at high pressure are of great importance in the understanding and accurate modeling of matter at extreme conditions. For example, at hundreds of Mbars - 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 measurements of the strong shock hugoniot, at pressures up to 720 Mbar for CH and 630 Mbar for High Density Carbon (HDC, or diamond) at the National Ignition Facility (NIF). Spherically convergent shocks are launched into solid CH or diamond samples, using a hohlraum radiation drive. X-ray radiography is applied to measure the shock speed and infer the mass density profile, enabling determining of the shock pressure and Hugoniot equation of state. *This work was performed under the auspices of the U.S. Department of Energy by University of California Lawrence Livermore National Laboratory under contract No. W-7405-Eng-48. Supported by LDRD 08-ERI-003.

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