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Gigabar shock experiments at the National Ignition Facility DAMIAN SWIFT, JAMES HAWRELIAK, Lawrence Livermore National Laboratory, STEVEN ROTHMAN, AWE Aldermaston, DAVID BRAUN, DAMIEN HICKS, Lawrence Livermore National Laboratory, PAULA ROSEN, AWE Aldermaston, GILBERT COLLINS, Lawrence Livermore National Laboratory — The unprecedented laser capabilities of the National Ignition Facility (NIF) make it possible for the first time to countenance laboratory-scale experiments in which gigabar pressures can be applied to a reasonable volume of material, and sustained long enough for ∼percent level equation of state measurements to be made. We describe the design for planned experiments at the NIF, using a hohlraum drive to induce a spherically-converging shock in samples of different materials. Convergence effects increase the shock pressure to several gigabars over a radius of over 100 microns. The shock speed and compression will be measured radiographically over a range of pressures using an x-ray streak camera. In some cases, we will use doped layers to allow a radiographic measurement of particle velocity. This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

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