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Sound Velocity in Shocked Iron, Copper, and Beryllium to 1500 GPa MARGARET HUFF, LINDA CRANDALL, RYAN RYGG, BRIAN HENDERSON, MOHAMED ZAGHOO, Laboratory for Laser Energetics, GILBERT COLLINS, None, CHAD MCCOY, Sandia National Laboratories, DAYNE FRATANDUONO, PETER CELLIERS, JOHN EGGERT, Lawrence Livermore National Laboratories — Measurements of the sound speed in a shock-compressed material have long been sought because they provide important information about the thermodynamic derivative in the equation of state of that material at high pressure. Specifically, constraining the sound speed in iron at high pressures can be useful to planetary science and geophysics to understand core formation and dynamo physics. We present measurements of shockcompressed iron sound speed to pressures of ˜400 to 1500 GPa, as well as sound speeds in high-pressure beryllium and copper. A novel, nonsteady wave-analysis technique[1] allows us to infer sound speed from the relative arrival times of pressure perturbations that transited the shocked sample material and an adjacent reference material. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0003856, the University of Rochester, and the New York State Energy Research and Development Authority.

[1]D. E. Fratanduono *et al.*, J. Appl. Phys. **116**, 033517 (2014).

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