

Abstract Submitted
for the SHOCK19 Meeting of
The American Physical Society

The equation of state of Invar alloy and systematic uncertainties in modeling the re-shock Hugoniot in quartz CHAD MCCOY, Sandia National Laboratories — The high-pressure equation of state provides constraint on the material response at extreme conditions relevant to planetary interiors. Invar, a Fe_{0.64}Ni_{0.36} alloy, helps constrain the properties of the cores of Earth and other terrestrial planets when combined with the EOS of pure Fe and Ni. Furthermore, it is a common alloy frequently used in high-precision optics and electronics due to its low thermal expansion. Measurements of the principal Hugoniot between ~200 and ~1000 GPa using impactors launched via 2-stage light gas gun, magnetically-accelerated flyer plates, and laser-driven shocks are presented. Results demonstrate a systematic difference between direct-impact and laser-driven experiments which can be attributed to use of the quartz release model to calculate the re-shock Hugoniot. Sandia National Laboratories is a multitechnology laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525.

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Date submitted: 14 Feb 2019

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