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Iron Equation of State Measurements on the Z-Machine SEAN GRANT, University of Texas System, TOMMY AO, Sandia National Laboratories, AARON BERNSTEIN, University of Texas System, JEAN-PAUL DAVIS, Sandia National Laboratories, TODD DITMIRE, JUNG-FU LIN, University of Texas System, ANDREW PORWITZKY, CHRISTOPHER SEAGLE, Sandia National Laboratories — We have measured the equation of state of iron along an elevated quasi-isentrope from 275 GPa to 400 GPa, reaching pressure and temperature conditions similar to the core of the Earth. This is enabled by the shock-ramp capability at Sandia National Laboratory's Z machine, a pulsed power facility which can probe off-Hugoniot P-T regions by shocking a material and subsequently driving a further shockless compression. The resulting unique parameter space is lower in temperature than a shock Hugoniot, but higher than the primary isentrope. We derive the EOS using an iterative backward integration – forward Lagrangian technique on particle velocity traces from symmetrically-loaded sample pairs of differing thicknesses. Sandia National Labs is managed and operated by National Technology & Engineering Solutions of Sandia, LLC, a subsidiary of Honeywell International, Inc., for the U.S Dept. of Energy's National Nuclear Security Administration under contract DE-NA0003525. SAND2019-1631 A

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