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Using experimental uncertainties to build uncertainty aware material models for extreme conditions RICHARD KRAUS, Lawrence Livermore Natl Lab, SUZANNE ALI, Lawrence Livermorre National Laboratory — Using sophisticated hydrodynamic codes, we can model events from giant impacts during planetary formation to inertial confinement fusion implosions. The degree to which these simulations predict reality, however, is dependent on how well we understand the materials and physics involved. We need material models that both accurately represent the experimental data and that also communicate the uncertainty in the experimental measurements. We have constructed a framework for using both experimental measurements and the associated experimental uncertainties to construct equation of state models that communicate not only current best measurements, but also the accuracy of those measurements. This method had been used to construct an ensemble of wide-ranging equation of state models for copper that reflect the experimental uncertainties in the data used to construct the table. 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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