Abstract Submitted
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Bayesian model calibration of ramp compression experiments on Z JUSTIN BROWN, LAUREN HUND, Sandia National Laboratories — Bayesian model calibration (BMC) is a statistical framework to estimate inputs for a computational model in the presence of multiple uncertainties, making it well suited to dynamic experiments which must be coupled with numerical simulations to interpret the results. Often, dynamic experiments are diagnosed using velocimetry and this output can be modeled using a hydrocode. Several calibration issues unique to this type of scenario including the functional nature of the output, uncertainty of nuisance parameters within the simulation, and model discrepancy identifiability are addressed, and a novel BMC process is proposed. As a proof of concept, we examine experiments conducted on Sandia National Laboratories' Z-machine which ramp compressed tantalum to peak stresses of 250 GPa. The proposed BMC framework is used to calibrate the cold curve of Ta (with uncertainty), and we conclude that the procedure results in simple, fast, and valid inferences. Sandia National Laboratories is a multi-mission laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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