Abstract Submitted for the DPP20 Meeting of The American Physical Society

The Bayesian Super Postshot: Inferring drive, shape and physics degradations from non-scalar inertial confinement fusion data JIM GAFFNEY, GEMMA ANDERSON, SCOTT BRANDON, KELLI HUMBIRD, MICHAEL KRUSE, BOGDAN KUSTOWSKI, RYAN NORA, LUC PETERSON, BRIAN SPEARS, Lawrence Livermore Natl Lab — Experiments in inertial confinement fusion (ICF) and high energy density physics (HEDP) rely heavily on nonscalar diagnostics like images and spectra. Traditionally, comparing these data with simulations requires they are first 'featurized' into scalar quantities so that a standard metric like chi-squared can be used. This process requires significant user input and has the potential to introduce bias and/or loss of information, reducing the utility of the diagnostics in constraining the parameters of interest. In this talk we will present the 'Bayesian Super Postshot', which uses state-of-the-art deep learning to extract important features from an entire experimental dataset. This new capability produces the best possible constraints on unknown drive and physics parameters in ICF experiments by directly matching simulated X-ray images, FNADs, line-of-site resolved data and multiple scalar quantities. We will present results for recent highperformance ICF implosions at the National Ignition Facility and give a discussion of the new constraints on simulations that come from our full treatment of diverse experimental data types. Prepared by LLNL under Contract DE-AC52-07NA27344. LLNL-ABS-812146

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Date submitted: 30 Jun 2020

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