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Does X matter? Assessing competing hypotheses in NIF implosions J. LUC PETERSON, JIM GAFFNEY, KELLI HUMBIRD, MICHAEL KRUSE, RYAN NORA, JAY SALMONSON, BRIAN SPEARS, Lawrence Livermore National Laboratory — A key element in the analysis of inertial confinement fusion experiments is comparison with simulated models of realized experiments. These models, which can vary in complexity, have a multitude of parameters, such as experimental boundary conditions, physical and numerical settings, and hypothetical degradation mechanisms. The inference of which parameter settings are most likely to be consistent with experimental observations can help guide conclusions about the behavior of current and future designs. In this talk, we will review a Bayesian approach to this problem, which leverages deep learning surrogate modeling of large simulation ensembles, and apply it to a variety of shots performed at the National Ignition Facility, in an attempt to systematically evaluate and assess competing explanations for observed shot behavior. Prepared by LLNL under Contract DE-AC52-07NA27344. LLNL-ABS-779523.

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