Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Finding Correlations in Inertial Confinement Fusion Experimental Data Using Machine Learning[1] ANDREW MARIS, SHAHAB KHAN, Lawrence Livermore National Laboratory — Here, we present results from a Machine Learning analysis of experimental data derived from Inertial Confinement Fusion (ICF) experiments performed at the National Ignition Facility (NIF). Neutron yield is the primary performance indicator of implosions, however, there is a suite of x-ray data such as images, broadband signals and spectroscopic data that provides additional information about the implosion. A machine learning model was developed where the program used the x-ray diagnostic results as the input parameters and the neutron yield and ion temperature as the output. The results of correlations inferred from the model will be presented. In addition, this model will help the ICF community determine which metrics are most important for achieving the highest energy gain.

[1]This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344. LLNL-ABS-XXXX

Andrew Maris
Lawrence Livermore National Laboratory

Date submitted: 01 Jul 2019 Electronic form version 1.4