Opacplot2: Enabling tabulated EoS and opacity compatibility for HEDLP simulations with the FLASH code JORDAN LAUNE, PETROS TZEFERACOS, SCOTT FEISTER, MILAD FATENEJAD, University of Chicago, ROMAN YURCHAK, Laboratoire pour l'Utilisation des Lasers Intenses, NORBERT FLOCKE, KLAUS WEIDE, DONALD LAMB, University of Chicago — Thermodynamic and opacity properties of materials are necessary to accurately simulate laser-driven laboratory experiments. Such data are compiled in tabular format since the thermodynamic range that needs to be covered cannot be described with one single theoretical model. Moreover, tabulated data can be made available prior to runtime, reducing both compute cost and code complexity. This approach is employed by the FLASH code. Equation of state (EoS) and opacity data comes in various formats, matrix-layouts, and file-structures. We discuss recent developments on opacplot2, an open-source Python module that manipulates tabulated EoS and opacity data. We present software that builds upon opacplot2 and enables easy-to-use conversion of different table formats into the IONMIX format, the native tabular input used by FLASH. Our work enables FLASH users to take advantage of a wider range of accurate EoS and opacity tables in simulating HELP experiments at the National Laser User Facilities.

Jordan Laune
Univ of Chicago