Abstract Submitted
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Self-consistent microphysics models for materials at high energy density[1] ADAM FRASER, AIDAN CRILLY, Imperial College London, NICOLAS NIASSE, JAMES PECOVER, DAVID CHAPMAN[2], First Light Fusion Ltd., JEREMY CHITTENDEN[3], Imperial College London — The ability of radiation magneto-hydrodynamics codes to accurately predict the behaviour of high energy density physics experiments depends on the provision of accurate data for the constituent properties of the materials involved. The predicted properties vary depending on the microphysical model used to represent them. Furthermore, the interplay between the hydrodynamics and radiation transport leads to a source of error when using inconsistent models for material properties. This work presents the development of the DCA atomic code SpK [1] to enable the calculation of the equation of state, based on the solution to the Saha equation and following the work of Faussurier et al. [2]. SpK was initially developed to produce opacity data from the excited state level populations and distribution of charge states calculated. The extension of SpK to provide a description of the EoS enables tabulated data valid for dense plasmas to be produced at low computational cost compared to first-principles methods. References [1] J. P. Chittenden, et al., Physics of Plasmas 23, 052708 (2016) [2] G. Faussurier, et al., HEDP 4, 114 (2008)

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