Abstract Submitted
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Modeling of Plasma Conditions and Spectral Properties of Radiation-Heated Matter IGOR GOLOVKIN, JOSEPH MACFARLANE, VIKTORIYA GOLOVKINA, Prism Computational Sciences, TAISUKE NAGAYAMA, JAMES BAILEY, GREGORY ROCHAU, Sandia National Laboratories — Opacity experiments at the Z facility provide important data for benchmarking opacity models and atomic data. The ability to accurately interpret the data obtained in these experiments increases the confidence in opacity calculations for a variety of astrophysical and laboratory problems. In the experiments, the Z dynamic hohlraum radiation source is used to both heat and backlight material samples. We will present the latest improvements to the simulation codes developed at Prism and how they affect the analysis of the experimental data. In particular, we will discuss angle-dependent radiation boundary condition recently implemented in the radiation-hydrodynamics code HELIOS. This improved modeling capability can potentially be important for studying behavior of plasmas driven by radiation sources that cannot be adequately described as neither directional nor Lambertian. We will also discuss atomic kinetics in radiatively heated samples and the possibility of its deviation from LTE. The effect of such deviation on both hydrodynamic evolution and radiative properties of these plasmas will be addressed.

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