

Abstract Submitted
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Efficient Modelling of K-shell Emission for Short-Pulse Laser Experiments in SPECT3D¹ JAMES SEBALD, TIM WALTON, IGOR GOLOVKIN, JOSEPH MACFARLANE, Prism Computational Sciences (United States) — Cold K-alpha and K-beta emission provides a diagnostic for hot electron distributions produced in short pulse laser experiments. Spect3D is able to post-process results of PIC simulations and compute high-resolution spectra for plasmas containing arbitrary distributions of hot electrons. These calculations, however, require comprehensive sets of atomic data and can become prohibitively expensive for modest and large simulation grids. To significantly increase calculation speed, it is desirable to use pre-computed emissivity/opacity tables that include effects of hot electrons, rather than calculating the data for every spatial zone. However, to tabulate results for arbitrary hot electron energy distributions, a general method must be found to describe arbitrary energy distributions with an analytic function of just a few parameters. We will present a set of PrismSPECT and Spect3D results validating the replacement of hot electron distributions with a Gaussian function determined by each hot electron distribution. Tests are performed on LSP simulations for experiments on Omega EP.

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