

Abstract Submitted  
for the DPP13 Meeting of  
The American Physical Society

**Spectroscopic and x-ray scattering models in SPECT3D I.**  
GOLOVKIN, J. MACFARLANE, P. WOODRUFF, I. HALL, S. KULKARNI, Prism  
Computational Sciences, Inc., G. GREGORI, University of Oxford, J. BAILEY, E.  
HARDING, T. AO, Sandia National Laboratories, S. GLENZER, SLAC National  
Accelerator Laboratory — Spectrally resolved x-ray scattering has become a very  
effective method for diagnosing electron temperatures, densities, and average ioniza-  
tion in warm dense matter. We present a newly implemented capability to simulate  
scattering signatures from realistic experimental configurations, which include the  
influence of plasma non-uniformities and collecting scattered x-rays from a range of  
angles. The method is based on a formalism developed by G. Gregori. The x-ray  
scattering modeling has been added to the multi-dimensional collisional-radiative  
spectral and imaging package SPECT3D. The ability to simulate the emissivity and  
attenuation of scattered photons within a multi-dimensional multi-volume-element  
plasma with non-uniform temperature and density distributions adds a major new  
capability to existing model. We will discuss details of the modeling and show results  
relevant to ongoing experimental investigations at Sandia National Laboratories.

Igor Golovkin  
Prism Computational Sciences, Inc.

Date submitted: 11 Jul 2013

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