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Simulations of Gd opacity experiments at the Omega laser[1]
STEPHAN MACLAREN, MARK ADAMS, ROBERT HEETER, LLNL — We have performed experiments at the Omega laser to validate opacity codes and associated opacity tables. These experiments used dual-axis imaging spectroscopy of tamped Gd:Al co-mixed samples. The samples were heated inside large (4mm dia.) shielded 3-chamber hohlraums to 35-45eV. The sample expansion was measured radiographically and the sample transmission was measured spectroscopically in several spectral bands. We modeled the laser drive, radiation transport, and hydrodynamics of the expanding sample inside the hohlraum using LASNEX. To generate synthetic spectra that correspond to the experimental spectroscopic detector orientation we post-process LASNEX simulations using CRETIN, a non-local thermodynamic equilibrium and radiation transport code, with varying levels of detail in the atomic data. Comparisons between simulated drive conditions, simulated spectra, and experimental data are conducted.

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