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Quantitative spatial information from K-alpha and XUV imagers in FI-related experiments with cone targets V.M. OVCHINNIKOV, D.W. SCHUMACHER, L. VAN WOERKOM, R.R. FREEMAN, The Ohio State University — The Fast Ignition (FI) concept for Inertial Confinement Fusion (ICF) relies on energetic electrons produced by laser-plasma interaction to deliver their energy into a pre-compressed fuel core. Metallic cones are proposed as a way of protecting the incoming short pulse igniter laser from the compression. Currently cone structures are widely studied to understand their effects on laser coupling to electrons. Typically, K-alpha and XUV two dimensional imaging diagnostics are used to obtain spatially resolved information of fast electron transport and temperature within a target, respectively. Since these images only capture specific emission wavelengths, uncertainties arise as to the physical location of the emission within the target. We developed detailed optical models for these diagnostics to obtain computer-generated images of a cone target as it would appear in the image plane of each diagnostic. Superimposing these images with actual K-alpha and XUV experimental images allowed us to pinpoint the location of emission with respect to the target boundaries. Sufficient knowledge of the target geometry along with the dimensions made it possible to map intensities from a 2D image onto a 3D cone surface thus reconstructing a 3D emission picture.

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