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Simulations of spatially resolved K-alpha emission as a tool to measure the divergence of fast electrons relevant to Fast Ignition[1] V.M. OVCHINNIKOV, D.W. SCHUMACHER, G.E. KEMP, A. LINK, R.R. FREEMAN, L.D. VAN WOERKOM, The Ohio State University — The Fast Ignition (FI) concept of Inertial Confinement Fusion relies on fast electrons created from the laser-matter interaction to deposit their energy into the compressed target core and start the fusion burn. Divergence of those electrons is one of the most crucial parameters in FI. Spatially resolved, time-integrated K-alpha x-ray imagers have been used in the past as a way to measure the divergence of fast electrons. Since any electron with energy above some threshold could produce a K-alpha photon, the K-alpha emission distribution can be quite different from that of the fast electrons. We present the results of 2D simulations using the hybrid PIC code LSP on the study of spatially resolved K-alpha emission as a tool to measure fast electron divergence. Among our results, we find that the K-alpha images evolve with time due to refluxing electrons, well after the laser pulse has stopped, giving rise to K-alpha images that suggest a larger electron beam size than is actually present for the FI relevant electrons.

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