Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Simulations of MA current transport in conductor and insulator laser irradiated targets PHILIPPE LEBLANC, YASUHIKO SENTOKU, University of Nevada, Reno — Prior research done by Stephens *et al.* [PRE2004] has demonstrated that k-alpha emission patterns from the back side of a laser irradiated target are different for plastic and aluminum targets. Aluminum shows a more focused k-alpha image while plastic emissions exhibit larger scale modulations and lower emissions which indicates more electrons are stopped anomalously inside the target. To better understand the problem, we have conducted detailed 2D particle-in-cell simulations using a non-equilibrium ionization model to study electron and energy transport inside simulated aluminum conductor and plastic insulator targets. Analysis of the transport patterns reveal strong transverse modulations in electron transport in both materials. For insulators, the strong electric field at the ionization front slows hot electrons down and tightens their Larmor radius translating in shorter scale modulations which retain their shape through the entire thickness of the target. Conductors lack such a field which leads the hot electrons being focused more by the strong resistive magnetic field. For aluminum, modulations merge to form large scale transport patterns 100μm deep into the target while cold bulk electrons collisions smooth out inhomogeneities between transport channels.

Philippe Leblanc
University of Nevada, Reno

Date submitted: 09 Jul 2012 Electronic form version 1.4