Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Transport Simulations for Fast Ignition on NIF[1] D.J. STROZZI, M. TABAK, D.P. GROTE, R.P.J. TOWN, A.J. KEMP, Lawrence Livermore National Lab — Calculations of the transport and deposition of a relativistic electron beam into fast-ignition fuel configurations are presented. The hybrid PIC code LSP is used, run in implicit mode and with fluid background particles. The electron beam distribution is chosen based on explicit PIC simulations of the short-pulse LPI. These generally display two hot-electron temperatures, one close to the ponderomotive scaling and one that is much lower. Fast-electron collisions utilize the formulae of J. R. Davies [S. Atzeni et al., Plasma Phys. Controlled Fusion 51 (2009)], and are done with a conservative, relativistic grid-based method similar to Lemons et al., J. Comput. Phys. 228 (2009). We include energy loss off both bound and free electrons in partially-ionized media (such as a gold cone), and have started to use realistic ionization and non-ideal EOS models. We have found the fractional energy coupling into the dense fuel is higher for CD than DT targets, due to the enhanced resistivity and resulting magnetic fields. The coupling enhancement due to magnetic fields and beam characteristics (such as angular spectrum) will be quantified.

[1]Prepared by LLNL under Contract DE-AC52-07NA27344.

D. J. Strozzi

Date submitted: 15 Jul 2009 Electronic form version 1.4