

Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Fast ion distribution in the presence of flow¹ SETH DAVIDOVITS, NATHANIEL FISCH, Princeton University — Experiments and simulations in multiple ICF related configurations have observed signs of bulk flow near stagnation. These configurations include both laser driven implosions such as at the NIF, as well as Z-Pinches. We investigate the possibilities for enhancement or depletion of fast ion tails in simplified flow models, with an eye towards applicability to ICF experiments. Small effects on the tail populations may substantially affect fusion output, as the fast ions in these tails have much larger fusion cross sections than thermal ions and make up the majority of fusion production for typical ICF temperatures. While in collisional plasma the bulk of the distribution function is driven toward Maxwellian in a few collision times, the high velocity tails can take much longer to form. Furthermore, the long mean free paths of the fast ions means they may sample differing regions of flow, while thermal particles only sample the local flow.

¹This work was supported by DOE through contracts DE-AC02-09CH1-1466 and 67350-9960 (Prime # DOE DE-NA0001836). Seth Davidovits would like to acknowledge support by the DOE-CSGF program under grant DE-FG02-97ER25308.

Seth Davidovits
Princeton University

Date submitted: 11 Jul 2014

Electronic form version 1.4