Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Sorting Category: 4.6.0 (C)

Core Heating Simulations for Cone-Guiding Fast Ignition TOMOYUKI JOHZAKI, ILE, Osaka Univ., YASUHIKO SENTOKU, Univ. of Nevada, Reno, HITOSHI SAKAGAMI, NIFS, HIDEO NAGATOMO, ATSUSHI SUNAHARA, KUNIOKI MIMA, ILE, Osaka Univ. — In the cone-guiding fast ignition, an imploded core is heated by fast electrons generated at the cone inner surface. In FIREX-I, our goal is the demonstration of efficient core heating (Ti $\sim$ 5keV) using a newly developed 10kJ LFEX laser. When irradiating such an intense laser, the bulk electron temperature in the cone tip becomes very high and Au atoms are highly ionized. We evaluated those effects by 1D the PIC and Fokker-Planck simulations. It was found that in the Au cone case, the rapid density steepening of the interaction surface and the strong scattering by highly ionized Au ions occur, which reduce the conversion efficiency of heating laser to fast electrons. In addition, the fast electron beam quality deteriorates due to the collisional and resistive drags and scattering by the Au ions. We proposed a CH as an alternative of cone tip material to reduce the collisional defects. We found a twice higher rise in temperature of a compressed core with the CH cone tip. We will also discuss multi-dimensional effects.

[X] Prefer Oral Session
[ ] Prefer Poster Session

Tomoyuki Johzaki
tjohzaki@ile.osaka-u.ac.jp
ILE, Osaka Univ.

Date submitted: 18 Jul 2008

Electronic form version 1.4