Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

**Energy deposition of quasi-two temperature relativistic electrons in fast-shock ignition scenario** SEYED ABOLFAZL GHASEMI, AMIR HOSSEIN FARAHBOD, Plasma Research School, NSTRI, Tehran-Iran — Previous calculations from Solodov et al. (2008) indicate that classical stopping and scattering dominate electrons energy deposition and transport when the electrons reach the dense plasma in FSI inertial confinement fusion concept [1]. Our calculations show that, by using quasi- two temperature electrons energy distribution function [2] in comparison with exponential [3] or monoenergetic distribution function and also increasing fast electrons energy to about 7 MeV, the ratio of beam blooming to straggling definitely decreases. Our analytical analysis shows that for fuel mass more than 1 mg and for fast ignitor wavelength$\lambda_{if} > 0.53\mu m$, straggling and beam blooming increases. Meanwhile, by reducing fast ignitor wavelength from 0.53 to 0.35 micron, and for fuel mass about 2 mg, electron penetration into the dense fuel slightly increases. Therefore, reduction of scattering (blooming and straggling) of electrons and enhancement of electron penetration into the dense fuel, can be obtained in relativistic regime with high energy fast electrons of the order of 5 Mev and more. Such derivations can be used in theoretical studies of the ignition conditions and PIC simulations of the electron transport in fast ignition scenario.

Seyed Abolfazl ghasemi
Plasma Research School, NSTRI, Tehran-Iran

Date submitted: 21 May 2016 Electronic form version 1.4