Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Full scale explicit PIC simulation of fast ignition experiments YASUHIKO SENTOKU, ANDREAS KEMP, Department of Physics, University of Nevada, Reno — Recent experiments at ILE using the GEKKO laser coupled to the PW laser system have demonstrated the cone guiding FI concept [*Kodama, Nature, 2002*]. Compressed cores at densities of 50-100 g/cm^3 within 30-50 μm diameter are expected to be located 20-30mum from the cone tip. The PW laser is supposed to heat the core up to 1 keV based on the observed neutron yields. To understand this core heating process, we have performed one-dimensional particle in cell code (*PICLS1d*), which simulates the fast electron generation by ultra-short intense laser pulse, the fast electron transport through the coronal plasma, and the energy deposition in the core. In general, PIC simulations have the limitation to simulate extremely dense and low temperature plasmas due to the numerical heating. We are currently working to reduce computational cost of explicit PIC calculations, and have succeeded in extending the spatial cell size to the plasma skin length, which is much larger than the Debye length of the core plasma, and also suppressing the numerical heating. This enables us to simulate a core density plasma in a 100 m spatial scale over picoseconds. We have carried out the *PICLS1d* simulations with parameters similar to the ILE experiment. The results are disscussed in this talk. This work was supported by DOE/NNSA-UNR grant DE-FC52-01NV14050.

Yasuhiko Sentoku
Department of Physics, University of Nevada, Reno

Date submitted: 27 Jul 2005 Electronic form version 1.4