Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Multi-dimensional particle-in-cell simulation and analysis of ion acceleration from laser driven targets[1] L. YIN, B.J. ALBRIGHT, B.M. HEGELICH, K.J. BOWERS[2], T.J.T. KWAN, J.C. FERNÁNDEZ, Los Alamos National Laboratory — Ion acceleration from laser-driven targets is of interest to fast ignition (FI) inertial confinement fusion applications. One of the critical questions which must be addressed, however, is whether the ion beams generated from ultra-intense lasers can be made efficient enough and bright enough to ignite a target plasma with realistic facilities. Recently, the authors have employed the state-of-the-art simulation code VPIC in the study of laser-ion acceleration physics. VPIC is a fully relativistic, charge-conserving, three-dimensional explicit particle-in-cell code with unprecedented efficiency and speed. The VPIC simulation platform allows high-fidelity multi-dimensional exploration of the underlying physical processes to be performed and for various concepts for improving beam conversion efficiency to be examined. This presentation will report on recent work on modeling beams and understanding how the ion beams may be improved for FI applications. Implications for the feasibility of ion-driven fast ignition will be discussed.

[1]Work performed under the auspices of the U.S. DOE by the University of California Los Alamos National Laboratory under contract No. W-7504-ENG-36.
[2]Guest scientist; presently at D. E. Shaw Research and Development LLC

Brian Albright
Los Alamos National Laboratory

Date submitted: 24 Aug 2005 Electronic form version 1.4