Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Above scaling short-pulse ion acceleration from flat foil and "Pizza-top Cone" targets at the Trident laser facility KIRK FLIPPO, B. MANUEL HEGELICH, D. CORT GAUTIER, J. RANDY JOHNSON, JOHN L. KLINE, TSUTOMU SHIMADA, JUAN C. FERNÁNDEZ, Los Alamos National Laboratory, SANDRINE GAILLARD, JENNIFER RASSUCHINE, NATHALIE LE GALLOUDEC, THOMAS E. COWAN, Nevada Terawatt Facility, University of Reno, Nevada, STEVE MALEKOS, GRANT KORGAN, University of Reno, Nevada
— Ion-driven Fast Ignition (IFI) has certain advantages over electron-driven FI due to a possible large reduction in the amount of energy required. Recent experiments at the Los Alamos National Laboratory's Trident facility have yielded ion energies and efficiencies many times in excess of recent published scaling laws, leading to even more potential advantages of IFI. Proton energies in excess of 35 MeV have been observed from targets produced by the University of Nevada, Reno - dubbed "Pizza-top Cone" targets - at intensities of only $1x10^{19}$ W/cm^2 with 20 joules in 600 fs. Energies in excess of 24 MeV were observed from simple flat foil targets as well. The observed energies, above any published scaling laws, are attributed to target production, preparation, and shot to shot monitoring of many laser parameters, especially the laser ASE prepulse level and laser pulse duration. The laser parameters are monitored in real-time to keep the laser in optimal condition throughout the run providing high quality, reproducible shots.

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Date submitted: 25 Jul 2006 Electronic form version 1.4