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Simulation of ion generation and dynamics for Fast Ignition* W.L. ATCHISON, R.J. MASON, R.J. FAEHL, R.C. KIRKPATRICK, RAC, F.N. BEG, UCSD, D.W. SCHUMACHER, OSU, M.J. SCHMITT, K.A. FLIPPO, D.T. OFFERMANN, LANL — The ePLAS[1] implicit/hybrid code is being used to model fast ion generation in a variety of studies involving picosecond time scales on the Titan, and Omega EP lasers. Applied to Cu foils 200 μm in radius and 20 μm thick, under 1 ps of 5 x 10^{19} W/cm^2 laser illumination in a 10 μm radius spot, ePLAS shows (in particle electron mode) the generation of 10^{17} cm^3 ion beams travelling 80 μm by 2.9 ps. The corresponding calculation for a hydrogen foil (with fluid hot electrons) shows a forward 10^{18} cm^3 beam crossing $\sim$250 μm. Such calculations complete in 24 min on a 2 GHz PC. The talk will detail the expansion of Titan-driven deuterium beams from a 25 μm foil. For EP we explore ion beams from hemispheres with 400 μm curvature radius, again with a $\sim$25 μm thickness under 1 kJ, 40 μm diameter, 10 ps illumination. We compare the ion flows calculated for fluid vs. particle ions, and discuss the energy spectrum calculated with PIC. 1. R. J. Mason, JCP **71,** 429 (1987), and R. J. Mason, PRL **96,** 035001 (2006).

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