ePLAS CODE ENHANCEMENTS FOR SHORT-PULSE LASER-MATTER INTERACTION STUDIES

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We detail improvements to ePLAS, a 2D PIC/hybrid simulation model in use for Fast Ignition[1]. The code can explore millimeter size target interactions over 0.5 – 11 ps durations. Its Implicit Moment[2] structure smoothly treats transport through targets with densities ranging from highly compressed solids to near-vacuum - with cell sizes largely exceeding a Debye length and time steps well beyond the plasma period. The full complement of *E*- and *B*-fields is now available in both Cartesian and cylindrical geometry via a new explicit treatment of *B*. The atomic Z can vary locally, as designated by either analytic Thomas-Fermi, or SESAME EOSs. Simulated K-alpha imaging is facilitated. A new joint-fluid and particle ion treatment enables superior fast ion interaction studies. The code runs efficiently on PCs. New versions exist for both the Linux and Mac OSX systems. Graphical output is now visible through the IDL Virtual Machine and free GDL. ePLAS is available for beta testing, generally w/o an export license.

1. T. Ma, M. Key, R. J. Mason et al. Phys. of Plasmas **16**, 112702 (2009).
2. R. J. Mason, J. Comp. Phys. **71**, 429 (1987).

* Supported by DOE SBIR Grant DE-FG02-07ER84723, Francis Thio, Project Manager.