

Abstract Submitted
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New developments in the OSIRIS 4.0 framework RICARDO FONSECA, ISCTE - Lisbon University Institute, THAMINE DALICHAOUCH, UCLA, FBIO CRUZ, FABRIZIO DEL GAUDIO, ANTON HELM, Instituto Superior Tecnico, Lisboa, Portugal, ROMAN LEE, FEI LI, KYLE MILLER, UCLA, KEVIN SCHOEFFLER, Instituto Superior Tecnico, Lisboa, Portugal, ADAM TABLEMAN, HAN WEN, XINLU XU, FRANK TSUNG, UCLA, JORGE VIEIRA, MARIJA VRANIC, THOMAS GRISMAYER, MIGUEL PARDAL, Instituto Superior Tecnico, Lisboa, Portugal, VIKTOR DECYK, WARREN MORI, UCLA, LUIS O. SILVA, Instituto Superior Tecnico, Lisboa, Portugal — The OSIRIS [1] Electromagnetic particle-in-cell (EM-PIC) code is widely used in the numerical modeling of many kinetic plasma laboratory and astrophysical scenarios. In this work, we report on the new developments recently introduced into the framework. In particular, we will update on the progress of our dynamic load balancing algorithm and our customized solver for high fidelity laser particle interaction and removal of unphysical fields as well as our progress on the Quasi-3D algorithm, including its integration with many other modules. We will focus on our ability to study ionization injection of spin polarized electron beams and the use of an improved the absorber region to prevent reflux in laser solid interactions. We will also address the new features on our Compton scattering module and our advanced diagnostics for radiation shorter than the grid wavelength. Finally, we will discuss our new analytic particle pushers using 9D phase space for high fields (Lorentz force, Lorentz plus RR, Spin plus RR). [1] R. A. Fonseca et al., Lecture Notes in Computer Science **2331**, 342-351 (2002)

Ricardo Fonseca
ISCTE - Lisbon University Institute

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