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**OSIRIS 2.0: an integrated framework for parallel PIC simulations** RICARDO FONSECA, MICHAEL MARTI, SAMUEL MARTINS, LUIS SILVA, Instituto Superior Técnico, FRANK TSUNG, JOHN TONGE, MICHAIL TZOUFRAS, WARREN MORI, University of California Los Angeles, SUZHI DENG, TOM KATSOULEAS, University of Southern California, CHUANG REN, University of Rochester, OSIRIS CONSORTIUM TEAM — We describe OSIRIS 2.0 framework, an integrated framework for particle-in-cell (PIC) simulations. This framework is based on a three-dimensional, fully relativistic, massively parallel, object oriented particle-in-cell code, that has successfully been applied to a number of problems, ranging from laser-plasma interaction and inertial fusion to plasma shell collisions in astrophysical scenarios. The OSIRIS 2.0 framework is the new version of the OSIRIS code. Developed in Fortran 95, the code runs on multiple platforms and can be easily ported to new ones. Details on the capabilities of the framework are given, focusing on the new capabilities introduced, such as bessel beams, binary collisions, tunnel (ADK) and impact ionization, and new diagnostics, and also dynamic load balancing and parallel I/O. This framework also includes a visualization and data-analysis infrastructure, tightly integrated into the framework, developed to post-process the scalar and vector results from our simulations.

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