

Abstract Submitted
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The ZPIC educational code suite RICARDO FONSECA, ISCTE - Lisbon University Institute, ANTON HELM, BERNARDO MALACA, MIGUEL PARDAL, JORGE VIEIRA, LUIS O. SILVA, Instituto Superior Tcnico, Lisboa, Portugal — Particle-in-Cell (PIC) codes are used in almost all areas of plasma physics, such as fusion energy research, plasma accelerators, space physics, ion propulsion, and plasma processing, and many other areas. In this work, we present the the ZPIC educational code suite, a new initiative to foster training in plasma physics using computer simulations. ZPIC includes a set 1D/2D fully relativistic electromagnetic PIC codes (with both finite difference and spectral field solvers), as well as 1D electrostatic. To improve performance, we wrote the core of the codes is in C (C99) and developed a complete interface for Python using Cython. In this paper we will discuss the implementation of this interface and focus on the use of the code in Python environments, including its use in Python / Jupyter notebooks. The distribution includes well-documented notebooks with example problems, that can be used to illustrate several textbook and advanced plasma mechanisms and including instructions for parameter space exploration. We also invite contributions to this repository of test problems that will be made freely available to the community provided the notebooks comply with the format defined by the ZPIC team. The code suite is freely available and hosted on **GitHub** at <https://github.com/ricardo.fonseca/zpic>

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