

Abstract Submitted
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BARS: Bidirectional Adaptive Refinement Scheme for Advanced, Learned PIC Simulations of Nonlinear Kinetic Plasma Physics BEDROS AFEYAN, Polymath Research (United States), BRAD SHADWICK, University of Nebraska-Lincoln, SEAN YOUNG, Stanfords University — BARS, or the Bidirectional Adaptive Refinement Scheme promises to optimize PIC code performance in modeling plasma kinetic phenomena. It is a learning algorithm meant to facilitate the simulation of a large number of interrelated nearby problems by using optimum phase space tiling and grid choices learned from previous simulations. We show its power and functionality by simulating nonlinear kinetic electron plasma waves, NL-EPW, and kinetic electrostatic electron nonlinear or KEEN waves. Under-resolving or over-resolving the particle density in various partitions of phase space will be compared and contrasted.

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