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**Developing Multi-timescale in PIC CODE OSIRIS** XIAODONG WANG, TOM KATSOULEAS, University of Southern California — An idea of advancing beam and plasma with different time scales is proposed in this paper. Because beam particles usually response much slower than plasma particles, large time steps can be used to update beam particles to save computation time. In this paper, we will describe how to apply this multi-timescales method in particle-in-cell (PIC) code OSIRIS. Simulation results for SLAC E164 experiment parameters are given and show high degree of accuracy while gain 4-5 times saving in computing time. The limitation of this method is also studied. The maximum time saving is decided by driver beam energy and size of simulation box.

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