

Abstract Submitted  
for the DPP16 Meeting of  
The American Physical Society

**Measuring Landau damping in Particle-in-Cell simulations using particles of different charge-weights**<sup>1</sup> C. REN<sup>1,3</sup>, A. SARKAR<sup>2</sup>, Y.-X. CAO<sup>3</sup>, M. C. HUANG<sup>2</sup>, J. LI<sup>1</sup>, Depts. of <sup>1</sup>Mechanical Engineering, <sup>2</sup>ECE, and <sup>3</sup>Physics & Astronomy, University of Rochester — We study whether putting more particles in region of interest (ROI) in phase space can efficiently increase Particle-in-Cell (PIC) simulation accuracy. We use Landau damping of a plasma wave as a figure of merit and set the ROI near the phase velocity of the wave. Improvement in Landau damping rate measurement is observed in 1D PIC simulations when employing more particles in the ROI but the effect is not monotonic. This is partly due to energy transfer from particles of large charge weights to those of smaller weights through the electric fields. Possible strategies to mitigate the energy transfer will also be discussed.

<sup>1</sup>This work is supported by the National Science Foundation under Grant No. PHY-1314734 and by the Department of Energy under Grant No. DE-SC0012316.

C. Ren  
University of Rochester

Date submitted: 12 Jul 2016

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