

Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Ion-Kinetic Calculations of the Collisional Kelvin-Helmholtz Instability¹ ARI LE, ADAM STANIER, BILL DAUGHTON, Los Alamos National Laboratory — Using a recently implemented hybrid (kinetic ion/fluid electron) algorithm in the LANL particle-in-cell code VPIC [1], we study Kelvin-Helmholtz (KH) unstable sheared flow layers including full ion kinetics. The ion-ion collisions are treated with the Takizuka-Abe [2] particle-pairing algorithm, which includes the velocity dependence of the screened Coulomb collisions. In agreement with fluid predictions [3], the KH instability is suppressed by ion viscosity for Reynolds numbers below 100, corresponding to Knudsen numbers greater than 0.01 for subsonic flows. In addition to resolving the physical collisional viscosity, the particle treatment allows us to track plasma particle mixing over time. [1] K. J. Bowers, et al., *Physics of Plasmas*, 15, 055703 (2008). [2] T. Takizuka H. Abe, *Journal of computational physics* 25, 205-219 (1977). [3] E. Roediger et al., *Monthly Notices of the Royal Astronomical Society*, 436, 1721-1740 (2013).

¹Work supported by the US Department of Energy through the Los Alamos National Laboratorys ASC TBI program.

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Date submitted: 02 Jul 2019

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