Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Particle-in-Cell Simulations of Driven Solar Wind Turbulence JASON TENBARGE, JAMES JUNO, University of Maryland — Turbulence is a ubiquitous phenomenon in space and astrophysical plasmas and is responsible for mediating the transfer of large scale electromagnetic energy to small scales where the energy is eventually damped onto the particles. Solar wind observations suggest that the turbulence is dominated by low frequency Alfvénic fluctuations, which approximately follow the predictions of critical balance. We present results from the first driven, three-dimensional particle-in-cell simulations of Alfvénic turbulence spanning inertial to electron kinetic scales. The simulations are driven to a statistically steady state with an oscillating Langevin antenna intended to mimic turbulent energy cascaded from scales larger than the simulation domain. Since a primary focus of the turbulence community is energy dissipation and one of the dominant mechanisms is likely Landau damping, a parameter scan in wavelength, plasma beta, and particle number is presented to determine the computational requirements of particle-in-cell simulations to accurately capture the Landau damping of Alfvén waves.

Jason TenBarge
University of Maryland

Date submitted: 08 Jul 2014

Electronic form version 1.4