Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Characterization of Phase Space Energy Transfer in 2-D Collisionless Magnetic Reconnection using Field-Particle Correlations[1] ANDREW MCCUBBIN, GREGORY HOWES, Univ of Iowa — Magnetic reconnection plays an important role in the energization of particles in collisionless plasmas. We apply an established field-particle correlation technique to explore the energization of ions and electrons in collisionless magnetic reconnection simulations. The goal is to determine the characteristic velocity-space signatures of energy transfer in a collisionless plasma due to magnetic reconnection using single-point measurements of the electromagnetic fields and particle velocity distributions. We compare kinetic wave-particle energization to energy in bulk flows at specific spatial locations. The comparisons and characterization of energy outflows due to magnetic reconnection will help in understanding the impact of this phenomena on collisionless plasma energization. This work utilizes a diagnostic suite developed to analyze field-particle correlations from the gyrokinetic simulation code AstroGK. Understanding the entire phase-space energy budget in single point measurements may provide novel insight into kinetic plasma energy transfer. Developments of novel spacecraft measurement techniques to identify particle energization due to magnetic reconnection may gain insight from understanding these energy transfer signatures.

[1]Support for this work provided by NSF AGS-1842561

Andrew McCubbin
Univ of Iowa

Date submitted: 29 Jun 2020 Electronic form version 1.4