Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Turbulence analysis using multi-point, multi-scale spacecraft observations KRISTOPHER KLEIN, Univ of Arizona, OWEN ROBERTS, Austrian Academy of Sciences, JASON TENBARGE, LEV ARZAMASSKIY, MATT KUNZ, Princeton University, HARLAN SPENCE, University of New Hampshire, HELIOSWARM PROPOSAL TEAM TEAM — There are many fundamental open questions about the structure and dynamics of turbulence in weakly collisional plasmas. Answering these questions is complicated by the multi-scale nature of the turbulent transfer of mass, momentum, and energy, with characteristic temporal and spatial scales spanning many orders of magnitude. The solar wind is an ideal environment in which to measure turbulence, but multi-point observations with spacecraft separations spanning these scales are needed to simultaneously characterize structure and cross-scale turbulent transfer. This work uses synthetic multi-point spacecraft data recorded from numerical simulations to demonstrate the utility of multi-point, multi-scale measurements, in preparation for data from such future multi-spacecraft observatories. In particular, we use the baseline orbit design for the HelioSwarm mission concept to explore the effects of different inter-spacecraft separations and geometries on the accuracy of the measured turbulence properties.

Kristopher Klein
Univ of Arizona

Date submitted: 29 Jun 2020 Electronic form version 1.4