Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Observations of magnetic pumping in the solar wind using MMS data[1] EMILY LICHKO, JAN EGEDAL, University of Wisconsin - Madison, WILLIAM DAUGHTON, Los Alamos National Laboratory, JUSTIN KASPER, University of Michigan — The turbulent cascade is believed to play an important role in the energization of the solar wind plasma. However, there are characteristics of the solar wind that are not readily explained by the the cascade, such as the power-law distribution of the solar wind speed. Starting from the drift kinetic equation, we have derived a magnetic pumping model, similar to the magnetic pumping well-known in fusion research, that provides an explanation for these features. In this model, particles are heated by the largest scale turbulent fluctuations, providing a complementary heating mechanism to the turbulent cascade. We will present observations of this mechanism in the bow shock region using data from the Magnetospheric MultiScale mission.

[1]This research was conducted with support from National Defense Science and Engineering Graduate (NDSEG) Fellowship, 32 CFR 168, as well as from NSF Award 1404166 and NASA award NNX15AJ73G

Emily Lichko
University of Wisconsin - Madison

Date submitted: 14 Jul 2017 Electronic form version 1.4