

Abstract Submitted  
for the DPP14 Meeting of  
The American Physical Society

**Magnetic pumping of the solar wind**<sup>1</sup> JAN EGEDAL, EMILY LICHKO, UW-Madison, WILLIAM DAUGHTON, LANL — The transport of matter and radiation in the solar wind and terrestrial magnetosphere is a complicated problem involving competing processes of charged particles interacting with electric and magnetic fields. Given the rapid expansion of the solarwind, it would be expected that superthermal electrons originating in the corona would cool rapidly as a function of distance to the Sun. However, this is not observed, and various models have been proposed as plausible candidates for heating the solar wind as it super-sonically streams away from the sun. In the compressional pumping mechanism explored by Fisk & Gloeckler particles are accelerated by random compressions by the interplanetary wave turbulence. This theory explores diffusion due to spatial non-uniformities and provides a mechanism for redistributing particle. For investigation of a related but different heating mechanism, magnetic pumping, in our work we include diffusion of anisotropic features that develops in velocity space. The mechanism allows energy to be transferred to the particles directly from the turbulence. The efficiency of the process is explored using kinetic simulations.

<sup>1</sup>Moved to poster by APS

Jan Egedal  
UW-Madison

Date submitted: 10 Jul 2014

Electronic form version 1.4