

Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Radial profile of large scale velocity and magnetic field fluctuations in the solar wind J.J. PODESTA, NASA Goddard Space Flight Center — Solar wind measurements obtained by several different spacecraft in the ecliptic plane are used to determine the radial profile of the variance of the velocity and magnetic field fluctuations between 0.3 and 30 astronomical units (AU). The radial decay law is a fundamental physical property of the turbulence and is important because of its suspected connection to the heating of the solar wind plasma. For each spacecraft, one hour averages of the velocity vector, density, and magnetic field vector are sorted into radial bins (subintervals) and the variance in each bin is computed. Most of the power in the fluctuations is contained in the largest scales, with periods in excess of one hour in the spacecraft frame, so that one hour average data is sufficient to estimate the total power (total variance) in the fluctuations. The measurement is difficult primarily because of the limited amount of data outside of 1 AU. The speed of the spacecraft limits the dwell time in each bin and, therefore, the number of data points available in each bin. The measurements are also significantly affected by solar wind transients and solar cycle variations. Theoretical models are also discussed.

J.J. Podesta
NASA Goddard Space Flight Center

Date submitted: 22 Jul 2005

Electronic form version 1.4