



Theory and Simulation of Solar Wind Turbulence

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In many respects, the solar wind appears to be an excellent example of a turbulent magnetofluid. Fundamental questions exist as to how this turbulence evolves and how it affects macroscopic properties of the solar wind. For example, in fully-developed three-dimensional magnetohydrodynamic turbulence, energy cascades from large, energy-containing scales, down through an inertial range to small scales where it dissipates. In the solar wind, that cascade spans some seven orders of magnitude in spatial scales. This talk will discuss recent work that incorporates the effects of turbulence into large-scale three-dimensional numerical models of the solar wind and will review the most detailed measurements we have to date, made by the four Cluster spacecraft, as to the kinetic processes that ultimately transform the magnetic fluctuations that comprise the turbulence into heat.