

MHD Relaxation, Intermittency and Reconnection: Implications for Solar Wind Structure and Dissipation

Professor William. H. Matthaeus

Bartol Research Institute, University of Delaware

Studies of MHD turbulence show that small scale coherent structures appear as a by-product of an intermittent cascade, driven by what appear to be essentially ideal local relaxation processes. This view of generation of non-Gaussian features of turbulence is consistent with intermittency analysis. Furthermore the structures produced are shown to have statistical properties essentially identical to statistics of events frequently occurring in the solar wind that have usually been identified as classical ideal MHD discontinuities. These small scale structures lie at the interface between kinetic and fluid descriptions of low frequency plasma behavior. The implied concentrations of electric current density are potential sites for turbulent driven magnetic reconnection. Recent results show how the reconnection rates are related to the turbulence properties.

January 23, 2009
Center Green Laboratory 1, Room 2126
Lecture 2:00 pm