

2004 Fall Meeting  
Search Results

Cite abstracts as **Author(s) (2004), Title, *Eos Trans. AGU*, 85(47), Fall Meet. Suppl., Abstract xxxxx-xx**

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HR: 0800h

AN: **SH51C-0284**

TI: [Anisotropic MHD/EMHD Turbulence in the Solar Wind and the Interstellar Medium](#)

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AB: The solar wind and the interstellar medium is permeated by large-scale magnetic fields that render magnetohydrodynamic (MHD) turbulence anisotropic. In the weak-turbulence limit in which three-wave interactions dominate, analytical and high-resolution numerical results based on random scattering of shear-Alfvén waves propagating parallel to a large-scale magnetic field demonstrate rigorously an anisotropic energy spectrum that scales as  $k_{\perp}^{-2}$ , instead of the famous Iroshnikov-Kraichnan spectrum of  $k^{-3/2}$  for the isotropic case. Even in the absence of a background magnetic field, when the energy spectrum is globally isotropic, anisotropy is found to develop with respect to the local magnetic field. Collisionless turbulence is studied in electron magnetohydrodynamics (EMHD), where whistler waves mediate the anisotropic energy cascade. Comparisons are made with MHD turbulence, especially with respect to global and local anisotropy in both inertial and dissipation ranges. The anisotropy of the energy cascade necessarily implies anisotropy of turbulent heating. Scalings of collisional and collisionless energy spectrum and dissipation rate will be discussed.

DE: 7863 Turbulence

DE: 2149 MHD waves and turbulence

DE: 2164 Solar wind plasma

SC: SPA-Solar and Heliospheric Physics [SH]

MN: 2004 AGU Fall Meeting

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