Geophysical Research Abstracts
Vol. 13, EGU2011-13226, 2011
EGU General Assembly 2011

Basic Properties of MHD Turbulence

Andrey Beresnyak
Los Alamos National Laboratory, Los Alamos, NM, United States (andrey.at.astro@wisc.edu)

MHD Turbulence is common in many space physics and astrophysics environments. Recently there has been a debate on the spectral slope of MHD turbulence and the nature of so-called dynamic alignment. We address this question by means of high-resolution numerical simulations that are specifically designed to study the asymptotic regime of turbulence. We were able to confirm the -5/3 slope prediction for strong MHD turbulence and, for the first time, measured Kolmogorov constant for MHD. We also measured the anisotropy of MHD turbulence, which is an essential key to cascading. In the solar wind, MHD turbulence is often imbalanced or cross-helical. The standard Goldreich-Sridhar model does not apply in this case and a new model has to be adopted. The keys to understand energy cascades in the imbalanced case are the anisotropies of the Elsasser fields which are notably different, in particular the anisotropy of the weak wave is stronger, which is consistent with the predictions of our model.