

Modeling Turbulence in Space Plasmas

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Space plasmas are magnetized and in turbulent states. I will briefly introduce properties of turbulence in a strongly magnetized medium. Turbulence in space plasmas is involved with various length scales. In general, different descriptions should be used for different scales. On large scales, plasma turbulence can be described in the framework of magnetohydrodynamics (MHD). In the first part of the talk, I will focus on MHD turbulence in the presence of a strong mean field. I will discuss energy cascade and structure of turbulence in this regime. On the other hand, on small scales near the proton gyro-scale, we cannot use MHD. In the second part of the talk, I will discuss how we can treat magnetized turbulence on small scales. I will also discuss properties and scaling relations of waves and turbulence in this regime.

Keywords: turbulence, MHD, waves, magnetic field