Observations of How Magnetofluid Turbulence Dissipates at Small Scales

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The solar wind is a turbulent magnetofluid that can be studied intensively at multiple scales. Investigations using single spacecraft have revealed much about the properties of the solar wind throughout the heliosphere (from 0.3 AU to 100 AU). More recently, data from multiple spacecraft have provided further details of both the statistical properties of the turbulence and its small-scale structure. In particular, high time resolution magnetic field measurements from the four Cluster spacecraft have led to the conclusion that at spatial scales of order the proton inertial length and smaller, the turbulence becomes strongly anisotropic and the power in fluctuations that are perpendicular to the (local) magnetic field is measured to be much larger than that in fluctuations that are parallel to the magnetic field. As the spatial scales approach the electron inertial length, the power is almost completely dissipated. Various analysis techniques and theoretical ideas have been put forward to account for the properties of those measurements. The talk will describe the current state of observations, theory and simulations.