



Anisotropic turbulent spectra in the terrestrial magnetosheath: Cluster observations

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Here we report the first three-dimensional (3-D) spatial spectrum of the low frequency magnetic turbulence obtained from the four Cluster spacecraft in the terrestrial magnetosheath close to the magnetopause. We show that: the turbulence is strongly compressible, and dominated by "mirror" structures; its energy is injected at a large scale $k^* \rho$ of the order of 0.3 ($l = 2000$ km) via a mirror instability well predicted by linear theory, and cascades non linearly and unexpectedly up to $k^* \rho = 3.5$ ($l = 150$ km), revealing a new power law in the "inertial" range not predicted by any turbulence theory; its anisotropy is controlled by the static magnetic field and the magnetopause normal