



Magnetic Field Fluctuations in Saturn's Magnetosphere

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In the framework of turbulence, we analyze the statistical properties of magnetic field fluctuations measured by the Cassini spacecraft inside Saturn's plasma sheet. In the spacecraft-frame power spectra of the fluctuations we identify two power-law spectral ranges separated by a spectral break around ion gyro-frequencies of O^+ and H^+ . The spectral indices of the low frequency power-law are found to be between $5/3$ (for fully developed cascades) and 1 (during energy input on the corresponding scales). Above the spectral break there is a constant power-law with mean spectral index ~ 2.5 indicating a permanent turbulent cascade in the kinetic range. An increasing non-gaussian probability density with frequency indicates the build-up of intermittency. Correlations of plasma parameters with the spectral indices are examined and it is found that the power-law slope depends on background magnetic field strength and plasma beta.