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High-frequency and intermittent Alfvénic turbulence in the solar wind

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Alfvénic turbulent cascade perpendicular and parallel to the background magnetic field is studied accounting for anisotropic dispersive effects and turbulent intermittency. The perpendicular dispersion and intermittency make the perpendicular-wavenumber magnetic spectra steeper and speed up production of high ion-cyclotron frequencies by the turbulent cascade. On the contrary, the parallel dispersion makes the spectra flatter and decelerate the frequency cascade above the ion-cyclotron frequency. Competition of these factors results in spectral indices distributed in the interval [-2,-3], where -2 is the index of high-frequency space-filling turbulence, and -3 is the index of low-frequency intermittent turbulence formed by tube-like fluctuations. Spectra of fully intermittent turbulence fill a narrower range of spectral indices [-7/3,-3], which almost coincides with the range of indexes measured in the solar wind. This suggests that the kinetic-scale turbulent spectra are mainly shaped by the dispersion and intermittency. A small mismatch with measured indexes of about 0.1 can be associated with damping effects not studied here.