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# Turbulence in the solar wind: what controls the slope of the energy spectrum?

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The spectrum of solar wind fluctuations is well described by a power law with an average spectral index -5/3 for periods between a few hours and a few minutes. However, the spectral index varies with stream speed and with the correlation of velocity and magnetic field fluctuations (Alfvénicity): the spectrum is softer in fast and Alfvénic streams.
Roughly, this variation can be understood in term of the turbulent age of fluctuations at a given scale: the faster is the wind or the stronger is the correlation than the younger is the turbulence. Since the coronal spectrum is supposed to be rather flat (at least in the fast solar wind), smaller spectral indices correspond to less evolved spectra. According to this interpretation, one would expect spectral slope to change with distance as the turbulence ages, while observations report fairly stable spectral slopes.
In order to quantify the effect of wind speed and Alfvénicity on the spectral slope, we ran a series of numerical simulations of MHD turbulence in the framework of the Expanding Box Model (EBM). In EBM we can vary the expansion rate and the initial correlation of fluctuations so as to investigate the existence of a threshold value for each parameter or for a combination of the two that could explain the observed variation and stability of the spectral index.
We present preliminary results that indicate that the expansion rate does control the spectral index of energy when the Alfvénicity is high.