



Asymmetric multifractal model for space plasma turbulence

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In order to quantify the multifractality of space plasma turbulence, we consider a generalized weighted Cantor set with two different scales describing nonuniform compression of cascading eddies. We investigate the resulting multifractal spectrum of generalized dimensions depending on two scaling parameters and one probability measure parameter, especially for asymmetric scaling [1]. In particular, we show that intermittent pulses are stronger for the model with two different scaling parameters and a much better agreement with the solar wind data is obtained, especially for the negative index of the generalized dimensions, while the usual p-model can only reproduce the spectrum for positive index [2]. Therefore we argue that there is a need to use a two-scale cascade model [3]. Hence we propose this new more general model as a useful tool for analysis of intermittent turbulence in various space environments.

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