

## Fourier spectra: slopes and breaks

G. Belmont, L. Rezeau, N. Dorville

When aiming at comparing the data of fluctuations with turbulence theories, it is necessary to determine reliable spectra, from which slopes (spectral indexes) can be deduced when they exist, as well as the positions of the breaks between different slopes. Unfortunately, when using FFT on data in a finite interval, a large uncertainty exists in those results, due to the global trend in the interval and to the effects of the limiting window. One of the most striking effects of these phenomena is the presence of large amplitude hairs affecting the spectrum when it is not smoothed or averaged on successive intervals. Using different windows can slightly alleviate the problem but not really solve it. In these conditions, beyond the questions of accuracy, the very existence of slopes and breaks can be questioned and authors can even be suspected to be fooled by their frenzy to detect straight lines inside the hairy spectra. We present here a new method to suppress the artificial hairs of the spectra in an objective way. We also present results obtained by the method, for turbulence spectra and also for spectrograms and polarization studies.