



Scaling properties of high frequency biogeochemical data from a ferry box

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We consider here biogeochemical time series from automatic continuous records at high frequency inside a ferry box from Roscoff to Plymouth. This system is equipped with physico-chemical measuring devices from water pumped from the cooling system of the ferry, with time resolution of 1 minute.

The parameters analyzed are: temperature, salinity, dissolved oxygen, percentage of oxygen saturation, fluorescence. All these parameters time series reveal large fluctuations showing intermittency in their dynamics with many fluctuations at all scales. We characterized the dynamics at different temporal scales by considering the power spectra of each parameter and also by multifractal properties, using the structure functions approach.

The spectra from ferrybox data showed a very nice scaling regime with a breaking scale at 5 hours, corresponding to the duration of the cruise. The scaling behaviour reveals a spectral slope of 2 for all spectra. The theoretical interpretation of this value is still under consideration; it could be linked to the spectral slope obtained in the framework of passive scalar Lagrangian turbulence.