Lagrangian statistics toolbox

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1 Why to use it?

For a given set of tracks, this MATLAB toolbox enables to compute basic Lagrangian statistics: autocorrelation functions and structure functions.

2 How to use it?

As an example, we use the file *tracks_sample.mat* available in the HDF5 storage toolbox (cf. *readme_hdf5_storage*). Once the statistics are computed, we can extract the integral time scale from the Lagrangian velocity autocorrelation function ($T \simeq 30\,\mathrm{ms}$) and the linear slope from the Lagrangian second order structure function ($C_0\varepsilon \simeq 1.7\,\mathrm{W/kg}$, according to $\varepsilon \simeq 0.9\,\mathrm{W/kg}$ found with the pair dispersion toolbox, we have $C_0 \simeq 2$). The script *run_lagrangian_statistics* gives a run example.

3 Functions

help function name gives some documentation, especially input and output arguments. These functions are commented and designed to be easily modified.

- *lagstats_onetrack*: compute Lagrangian statistics for one track
- *lagstats_tracks*: compute Lagrangian statistics for all tracks with *lagstats_onetrack* and compute the mean over the tracks with *meancell*
- *meancell*: compute the mean of array cells of different lengths