HDF5 storage toolbox

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1 Why to use it?

We organize track data with two formats: a work format which is a MATLAB structure (easy to use but not optimal to save and difficult to read with other languages), and a storage format which is a HDF5 file (easy to save and read). Thus this MATLAB toolbox enables to save a MATLAB track structure in a normalized format in a HDF5 file, and vice versa, to generate the initial MATLAB track structure from the HDF5 file.

2 How to use it?

As an example, we use the file *tracks_sample.mat*: 1473 stitched tracks longer than 50 frames (6250 fps) of tracers (250 µm) from homogeneous isotropic turbulence in water (LEM experiments). They are saved in the work format: a structure with one line per track and different fields for different quantities (here *x,y,z* for the positions, *vx,vy,vz* for the velocities, and *t* for the frame number), and a field *L* for the length of each track. To save them in the storage format, the tracks are concatenated in one big array for each field, then each field is saved as a dataset in the .h5 file. To get back to the initial structure, the field *L* enables to rearrange per track by slicing the big array. The script *run_h5_storage* 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.

- *tracks_h52mat*: read the .h5 file generated by *tracks_mat2h5* and return the initial track structure

- *tracks_mat2h5*: save a track structure in .h5 format