

Activity 1 - 2d turbulence

Introduction

During this activity, we will use the **fluid2d** code to run two dimensional turbulence.

Get and run the script

Download and unzip Fluid2d from: <https://github.com/pvthinker/Fluid2d>

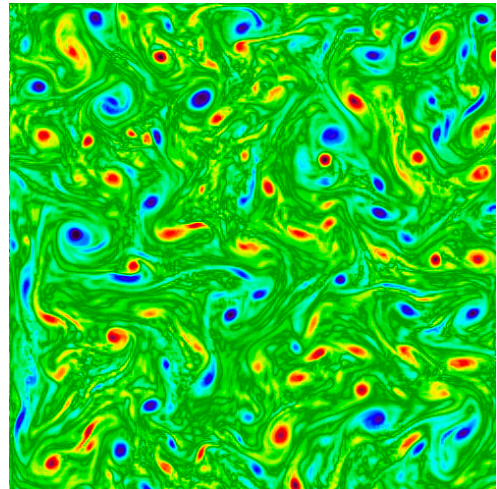
Download experiments energy_cascade.py and enstrophy_cascade.py from here: jgula.fr/Turb

Install:

- Fluid2d-master.zip
- cd Fluid2d-master
- make
- (in bash) source activate.sh
- (in csh) source activate.csh

Run the experiment:

- cd experiments/TwoDimTurb
- python energy_cascade.py



2d Turbulence

1. Run a first experiment without forcing (free decay)

- a) Look at the evolution of vorticity and tracer
- b) Plot the evolution of kinetic energy and enstrophy in the system
- c) Plot energy density spectra at different times

2. Run a second experiment with forcing (forced 2d turbulence)

- use the white noise forcing by setting *param.forcing = True*

- a) Plot the evolution of kinetic energy and enstrophy in the system

- b) Plot energy density spectra at different times
- c) Plot tracer variance spectra at different times