

Institut de Mécanique des Fluides

Amphithéâtre Nougaro (Entrée A) - 2 Allée du Pr Camille Soula, Toulouse

Mercredi 6 Février - 10h30

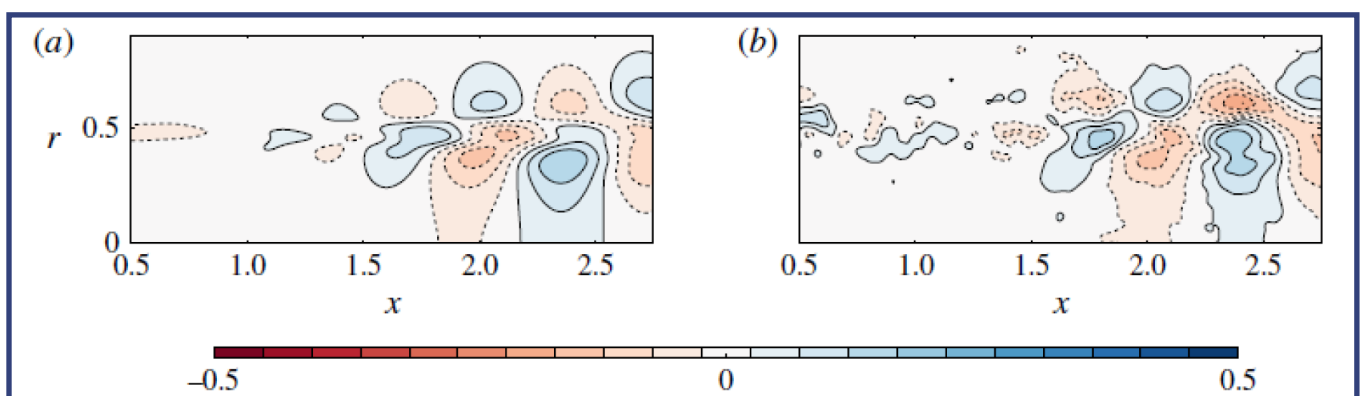
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Reconstruction of time-averaged and unsteady data in open-flows using non-linear optimization techniques and hydrodynamic stability

The accurate reconstruction of time-averaged and unsteady data in wind-tunnels from few measurements has become an important topic in the aerospace industry. We will show here how the use of time-averaged (Reynolds-Averaged Navier-Stokes) and fully unsteady (Navier-Stokes) models may help reconstruct a whole flow field from scarce measurements using non-linear optimization techniques. This will be

illustrated on experimental and numerical configurations exhibiting separation, such as bluff-bodies, backward facing step flows or jet flows. Finally, we will show how the knowledge of the time-averaged flow and its hydrodynamic stability properties may provide an alternative efficient way of reconstructing large-scale and low-frequency unsteady features in turbulent flows.



Transitional axisymmetric jet flow ($Re=3300$).
(a) Reconstructed streamwise velocity perturbation
(from stability)
(b) TR-PIV snapshot to be reconstructed.

Service communication IMFT

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