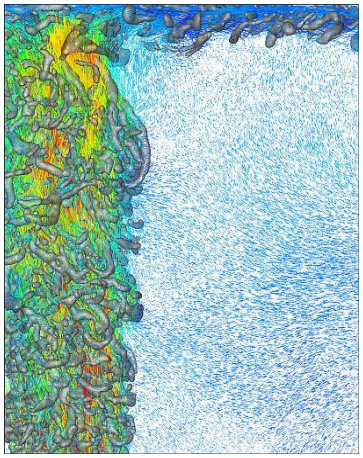
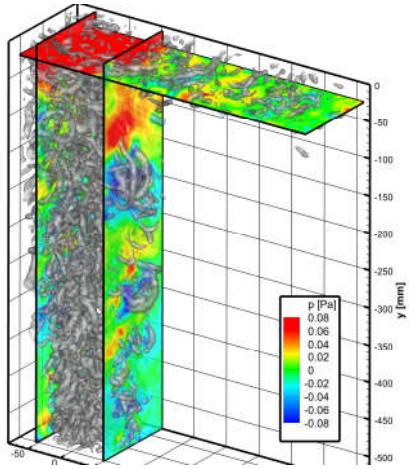
3rd Workshop and 1st Challenge on Data Assimilation & CFD Processing for PIV and Lagrangian Particle Tracking





Online workshop on Thursday-Friday, November 19-20, 2020

HOMER

General

We would like to draw your attention to this online workshop that is scheduled for November 19-20, 2020. Recently several data assimilation (DA) methods have been developed at the junction between experimental and numerical fluid mechanics and aerodynamics. DA allows increasing the spatial and temporal resolution of sparse measurement data and calculating and extracting physical meaningful content like pressure fields, coherent structures or periodic flow features for a better insight into the flow dynamics. We assume you might be interested in participating, sharing your views, experience and of course latest research results within a relatively small and focused community.

Scope

Many procedures are nowadays available that increase or enhance the information measured with Particle Image Velocimetry (PIV) or Lagrangian Particle Tracking (LPT) using techniques imported from the CFD and applied mathematics community. The advent of time-resolved and volumetric measurements have multiplied the possibilities with much excitement of PIV and LPT development researchers as well as from the applied fluid mechanics community. The methods range from regularization strategies using the (simplified) Navier-Stokes-equation or the use of the momentum equation to obtain pressure from velocity and acceleration measurements, machine learning, to variational data-assimilation frameworks using adjoint CFD.

Organization and topics of workshop

The workshop will take place as a virtual meeting on **Thursday and Friday, November 19-20, 2020**

Talks are planned on the following areas:

- ***Data assimilation techniques for flow measurements / PIV / LPT***
- ***Particle tracking in densely seeded flows***
- ***Pressure and loads from PIV / LPT***
- ***Variational techniques using adjoint Navier-Stokes for PIV / LPT***
- ***Machine learning and data driven (modal) analyses***

The presentations (~15-minutes) will focus on recent studies, but as well on a larger perspective and showing the relevant work of different research groups related to data-assimilation for PIV and LPT processing. Several presentations are already confirmed. A detailed agenda will follow in October 2020. Do not hesitate to contact us in case you have any questions or require further information.

Challenge on 3D LPT and Data Assimilation

Since Friday, March 9, 2020 a synthetic test case based on an incompressible turbulent boundary layer flow with an immersed cylinder wake is available via the download link below to the participants of two challenges: https://w3.onera.fr/first_lpt_and_da_challenge/

1) Time-series, four-pulse and two-pulse synthetic particle images at various ppp-values from four virtual camera views of tracer particles in the TBL flow have been provided together with the calibration data in order to challenge the latest LPT code developments.
2) A large number of randomly distributed 3D particle tracks over many time-steps and at various densities representing the same flow conditions have been provided as starting points of a respective data assimilation challenge.

Deadline for the upload of results of the LPT and DA challenge was already on Friday, July 17, 2020!
Both results will be compared with and assessed by physical measures (position, velocity, pressure, etc.) of the full LES input data. The presentation of the challenge results will cover half of the second day of the workshop.

Website

http://cfdforpiv.dlr.de/

Registration

Registration should be done on the workshop website only. All details are given there. The registration is **free of charge**. The workshop is financially supported by ERCOFTAC, LaVision GmbH and the H2020 EU project HOMER.

Dates and deadlines

Since Friday, March 9, 2020, Release of Test Data for 1st Challenge on LPT and DA https://w3.onera.fr/first_lpt_and_da_challenge/

Friday, July 17, 2020, Deadline for upload of LPT and Data Assimilation challenge results

Friday, September 18, 2020, Deadline for Two-page-abstract submission
Please send abstracts to catrin.rosenstock@dlr.de

Friday, October 2, 2020, Notification of Acceptance

Friday, October 16, Deadline for Registration (limitation to 80 participants)

Date for Online-Workshop: Thursday/Friday, November 19-20, 2020

Organizing committee

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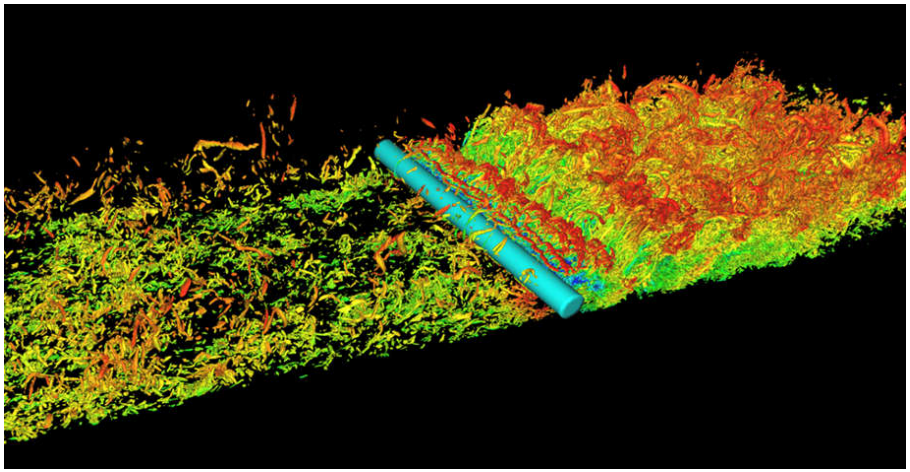

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Looking forward to welcome you soon!!!