

IPID4all Senior Research Exchange with CalTech and USC

Feedback report

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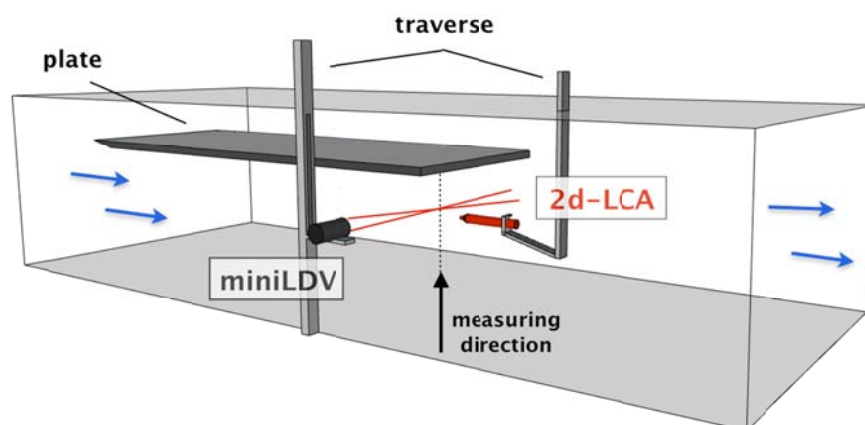
Measurements in a water channel with the 2d-LCA

Activities / Contacts

The main purpose of the visit to the lab facilities of USC was to test our in-house developed turbulence sensor (2d-LCA) in a water channel. Up to this time, the sensor has been applied for measurements in air only.

The water channel at USC is particularly suited for testing new sensors since it is well characterized and equipped with alternative measurement techniques for monitoring (provided by CalTech).

The first test involved velocity measurements in a boundary layer of a porous plate. For this purpose, the 2d-LCA and a commercial LDV-system have been placed in the water channel according to the sketch. Automatic traverses have been used in order to measure the velocities at given vertical distances from the plate. The results from both sensors showed an overall great agreement.

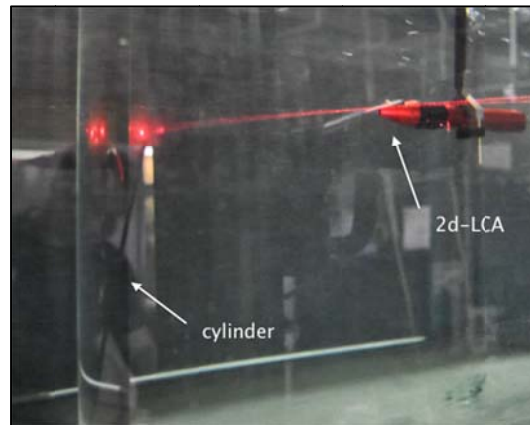


Experimental setup for measuring the boundary layer profile.

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The aim of the second important test was to evaluate the temporal performance of the 2d-LCA under water. To do so, the 2d-LCA has been placed in the wake flow generated by a cylinder (see photograph).

A stochastic analysis of the measured turbulent flow velocity signal has been performed in order to determine the sensor's real temporal resolution.



Measurements with the 2d-LCA in the wake of a cylinder.

Future collaboration / Outlook

All scientists agreed to expand this collaboration and deepen the research with focus on boundary layers with the aid of the 2d-LCA. Further research visits are planned, as well as joint publications.

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