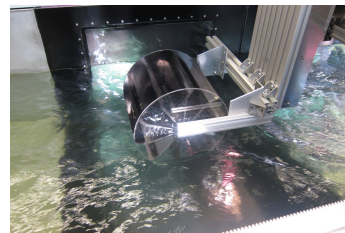




Characterization of a free-surface water channel

Master's thesis at the *Lehrstuhl für Strömungsmechanik und Strömungstechnik*

Work is currently underway at the institute aiming to evaluate the performance of low-impact hydraulic devices operating near the surface of river and tidal flows, as part of the *Fluss-Strom* project. One key aspect of this work is experimental investigations on models operating in the new water channel of the university, an installation capable of delivering 600 L s^{-1} of water over a 10-m long stretch with a free surface.



The water channel in the laboratory of the chair for fluid dynamics

The water channel is a complex tool. While it is already proving extremely useful for the experimental validation of numerical studies, the characteristics of the flow it can deliver have not yet been fully and systematically explored. This Master's thesis aims to investigate methods to increase the quality of the flow, in particular turbulence level, free surface smoothness and velocity distribution uniformity, at high volume flow rates, in particular:

- by mapping the volume flow, power and head drop which can produce any given water depth, and evaluating the procedures and limitations (splashes, free-surface wave travel) involved in high-power operation;
- by mapping the water velocity and turbulence intensity distribution with the help of Laser-Doppler (LDA) measurements for the most relevant flow cases;
- by characterizing the velocity and free surface altitude oscillations taking place in the channel, among others with the help of Particle Image Velocimetry (PIV) measurements.

Overall, this project should help establish broad guidelines about the design and operation of free-surface water channels.

For this work, we are looking for an autonomous, articulate Masters student able to use sensitive equipment in order to characterize complex phenomena. To apply, send a short application to:

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