

Experimental evaluation of the flow field generated by a counter-current hydraulic pump using PIV methods

Studienarbeit

The Institute of Jet Propulsion and Turbomachinery at TU Braunschweig has designed and developed counter-current hydraulic pumps for the purpose of athletic training in swimming pools. The Institute aims to develop an experimental technique to visualize the flow field and streamline patterns that the pump would generate when installed in a swimming pool. The advertised thesis work would involve the experimental design of such a setup in the institute's water laboratory. The proposed setup would use an open top water tank installed with the hydraulic pump. Balls that float on the water surface would be used to trace the flow direction. High speed cameras would be used to capture images of the flow. Subsequent image analysis would be performed using the Particle Image Velocimetry (PIV) approach to visualize the surface streamlines. During this work the following tasks are to be completed:

1. Studying and adapting the Open PIV code to the specific application
2. Complete design of the experimental setup
3. Parameter studies of tracer ball size and materials; camera settings for optimum flow field visualization

Start from : April/May, 2021

Thesis Language : German/English

Note : Student must be comfortable with being instructed in English

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