LaVision

FOCUS ON IMAGING

Tomo-PIV & STB Seminar

21. - 22.11.2024

Program Tomo-PIV & STB seminar 21. - 22.11.2024

<table>
<tr><td rowspan="7">Thursday,
21.11.</td><td rowspan="3">9:00 –
12:30</td><td>Welcome
Principles of Tomographic PIV and STB I
▸ Why 3D and how can you do it?
▸ Camera setup
▸ Volume illumination
▸ Scheimpflug adapters and prisms
▸ 3D Calibration
Image pre-processing</td></tr>
<tr><td>Break</td></tr>
<tr><td>Volume Self-calibration
▸ Theory
▸ Disparity maps
▸ Disparity vectors
▸ Optical transfer function
▸ Correction field
▸ Multi-camera vibration correction

Principles of Tomographic PIV and STB II
▸ Tomographic PIV: Basic principle
▸ STB: Principle of 4D-PTV</td></tr>
<tr><td>12:30 -
13:15</td><td>Lunch break</td></tr>
<tr><td rowspan="3">13:15 -
17:30</td><td>Lab session 1 (4 groups)
▸ Group 1: Tomographic PIV experiment
▸ Group 2: Shake-the-Box experiment
▸ Groups 3&4: DaVis evaluation session Tomographic PIV</td></tr>
<tr><td>Break</td></tr>
<tr><td>Lab session 2
▸ Group 3: Tomographic PIV experiment
▸ Group 4: Shake-the-Box experiment
▸ Groups 1&2: DaVis evaluation session Tomographic PIV</td></tr>
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Program Tomo-PIV & STB seminar 21. - 22.10.2024

Friday, 22.11.	9:00 – 12:30	**Principles of Tomographic PIV and STB III** **Volume reconstruction** ▸ Reconstruction methods (MART, SMART, MTE, SMTE) ▸ Ghost particles ▸ 3D-3C Volume correlation – vector calculation ▸ Tomo-Sizing **4D-PTV "Shake-the-Box"** ▸ Optical transfer function ▸ Iterative particle reconstruction ▸ Multi-pulse ▸ Object-aware STB ▸ Binning & Fine Scale Reconstruction
		Break
		Vector / Shake-the-Box post processing ▸ DaVis post processing (filter, extract volume, POD, …) ▸ Display (2D / 3D, backgrounds / colors: u, v, w, ω_x, ω_y, ω_z, λ_2, ...) ▸ Export **Pressure from PIV** ▸ Theory: governing equation, Poisson solver, boundary conditions ▸ Results: Reynolds averaged pressure, instantaneous pressure, 4D-solver
	12:30 - 13:15	***Lunch break***
	13:15 - 17:30	**Lab session 3** ▸ Group 4: Tomographic PIV experiment ▸ Group 3: Shake-the-Box experiment ▸ Groups 1&2: DaVis evaluation session Shake-the-Box & Pressure from PIV
		Break
		Lab session 4 ▸ Group 2: Tomographic PIV experiment ▸ Group 1: Shake-the-Box experiment ▸ Group 3&4: DaVis evaluation session Shake-the-Box & Pressure from PIV