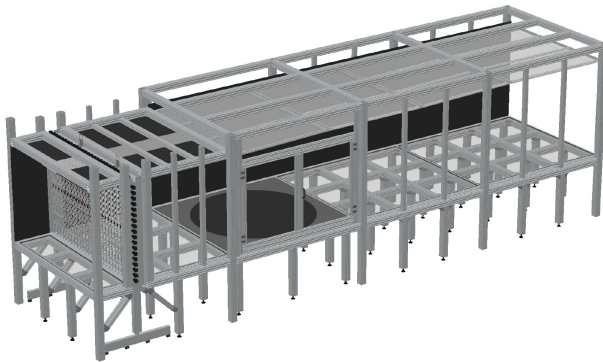


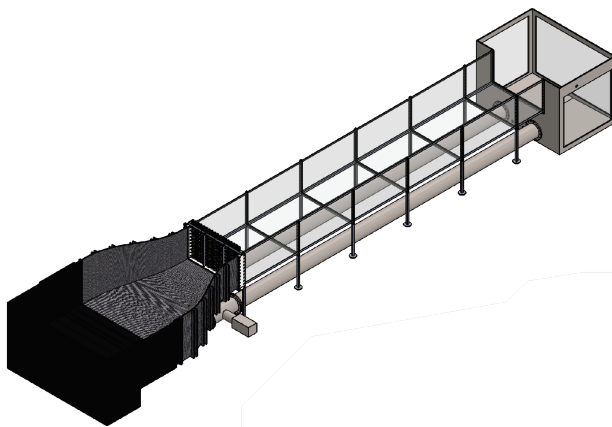
Large-scale wind tunnel and water channel at the Norwegian University of Science and Technology

Description of facilities

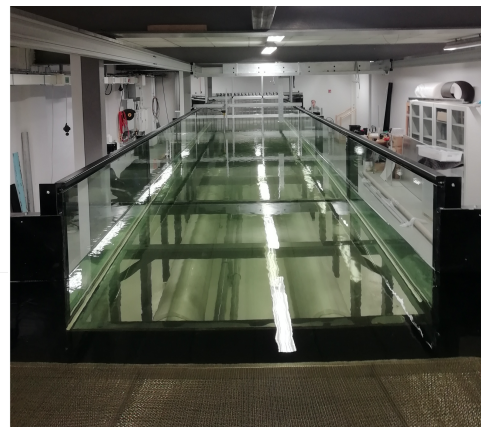
Pictures:



Large-scale wind tunnel with new test section and active grid



Water channel



General description large-scale wind tunnel:

Type: recirculating wind tunnel
Size of test section: 2.7 m x 1.8 m x 11 m (width x height x length)
Configuration: closed test section
Velocity range: up to 23 m/s
Background Ti: below 0.6%
Cooling: none
Additional features: adjustable roof to achieve zero pressure gradient, turntable (diameter 2.3 m), optical access from three sides

Additional wind tunnel equipment:

Passive grids: 2 multi-scale grids
Active grid: 2.7 m x 1.8 m active grid with 90 motors (from November 2020)
Force measurement: 6-component force balance on turntable
[forced vibration rig](#)
Traverse: 3-axis traverse system

General description water channel

Type: recirculating open surface water channel
Size of test section: 1.8 m x 1 m x 11 m (width x height x length)
Configuration: free surface flume, or closed test-section with an adjustable roof
Velocity range: up to 1 m/s
Background Ti: 2-3% (fixed passive grid)
Cooling: none
Additional features: full optical access

Additional water channel equipment:

Active grid: 1.8 m x 1 m active grid with 28 motors
Traverse: 3-axis traverse system

Measurement equipment:

Pressure: 4x Scanivalve MPS4264 Miniature Pressure Scanner (64 channels each)
Forces: 6-component force balance on wind tunnel turntable

forced vibration rig integrated in wind tunnel.
(simultaneous 3 degrees of freedom vibrations, 2 load cells
to measure fluid-structure interactions)

Velocity:

Particle Image Velocimetry (PIV) systems:

20 kHz, 1 MP stereo PIV system

10 kHz, 1 MP tomo PIV system

1 kHz, 4 MP stereo PIV system

15 Hz, 16 MP stereo PIV system

15 Hz, 25 MP stereo PIV system

15 Hz, 5 MP (16-bit) stereo PIV system

Laser-Induce Fluorescence (LIF) systems:

The above systems can also be used for LIF, which
we do in water using Rhodamine 6G.

Hot-wire anemometry (HWA) systems:

2x Dantec StreamLine Pro constant temperature
(CTA) systems (4 channels each)

Numerous single-wire and X-wire probes for use in
air.

Numerous single-wire and X-wire probes for use in
water.

2-component Dantec Laser-Doppler Anemometry (LDA)

2x 3D-Cobra probes for use in air.

Temperature:

thermocouples

WEA Models:

2 turbines with rotor diameter of 90 cm and various
actuator discs between 4.5 and 20 cm diameter

Website:

<https://www.ntnu.edu/ept/laboratories/aerodynamic>

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