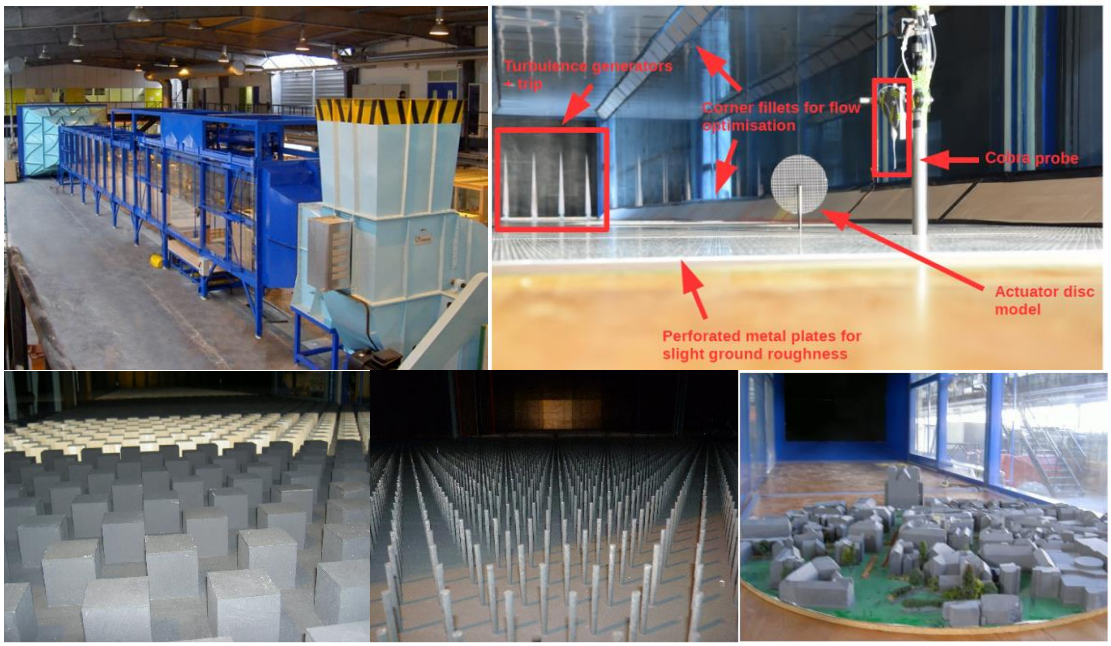
Atmopsheric Wind Tunnel at Ecole Centrale de Nantes / LHEEA, France

Description of facility

Pictures:



General description

Type:	Göttingen type wind tunnel
Size of test section:	2m x 2m x 20m (width x height x length)
Configuration:	Closed test section
Velocity range:	up to 10m/s
Background Ti:	1.2%
Cooling:	No
Additional features:	Adjustable ceiling

Measurement equipment:

Pressure:	3 Prandtl tubes plus Furness pressure sensors Unsteady wall-pressure transducers (8 channels) Mean pressure transducers (96 channels).
Forces:	6 component unsteady force balance Drag balance (< 0.5N),
Velocity:	1 Cobra probe (3 velocity components) Hot-wire anemometry (hot-wires, X-wires), 2 DISA and 3Dantec MiniCTA 2D Low-frequency Laser Doppler Anemometry (2D LDA),

Stereo Particle Image Velocimetry (2D-3C PIV)

Additional equipment:

ABL conditioning: Set of turbulence generators + perforated metal plates on the floor + roughness elements

Traverse: 1-axis traverse system ()

Discs:

	Disc A	Disc B
Solidity	57%	inhomogeneous
Disc thickness [mm]	2	3.2
Disc diameter [mm]	200 / 160	120
Mast diameter [mm]	10	8
Mast properties	smooth shaft	smooth shaft
Hub diameter [mm]	/	10.8
Material	Metallic mesh with a hole size of 2mm and wire diameter of 1mm	Plywood

Inflow conditions:

At the inlet plane (without modelled ABL) :

Mean velocity distribution (3-C)
Turbulence intensity distribution (3-C)
Turbulence spectrum within boundary layer (3-C)

At the Test section (with modelled ABL):

Mean velocity distribution (3-C)
Turbulence intensity distribution (3-C)
Turbulence spectrum within boundary layer (3-C)
Integral length scale

If available references to publications regarding single topics from above.

- Wind Tunnel Study of a "Floating" Wind Turbine's Wake in an Atmospheric Boundary Layer with Imposed Characteristic Surge Motion. B Schliffke et al (2020) J. Phys.: Conf. Ser. 1618 062015
- Perret, L. , Basley, J., Mathis, R., and Piquet, T. The Atmospheric Boundary Layer Over Urban-Like Terrain: Influence of the Plan Density on

Roughness Sublayer Dynamics. In:Boundary-Layer Meteorology (2018). doi : 10.1007/s10546-018-0396-9 .

Website: https://lheea.ec-nantes.fr/test-facilities/test-facilities-for-micrometeorology-and-wind-engineering/atmospheric-wind-tunnel

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