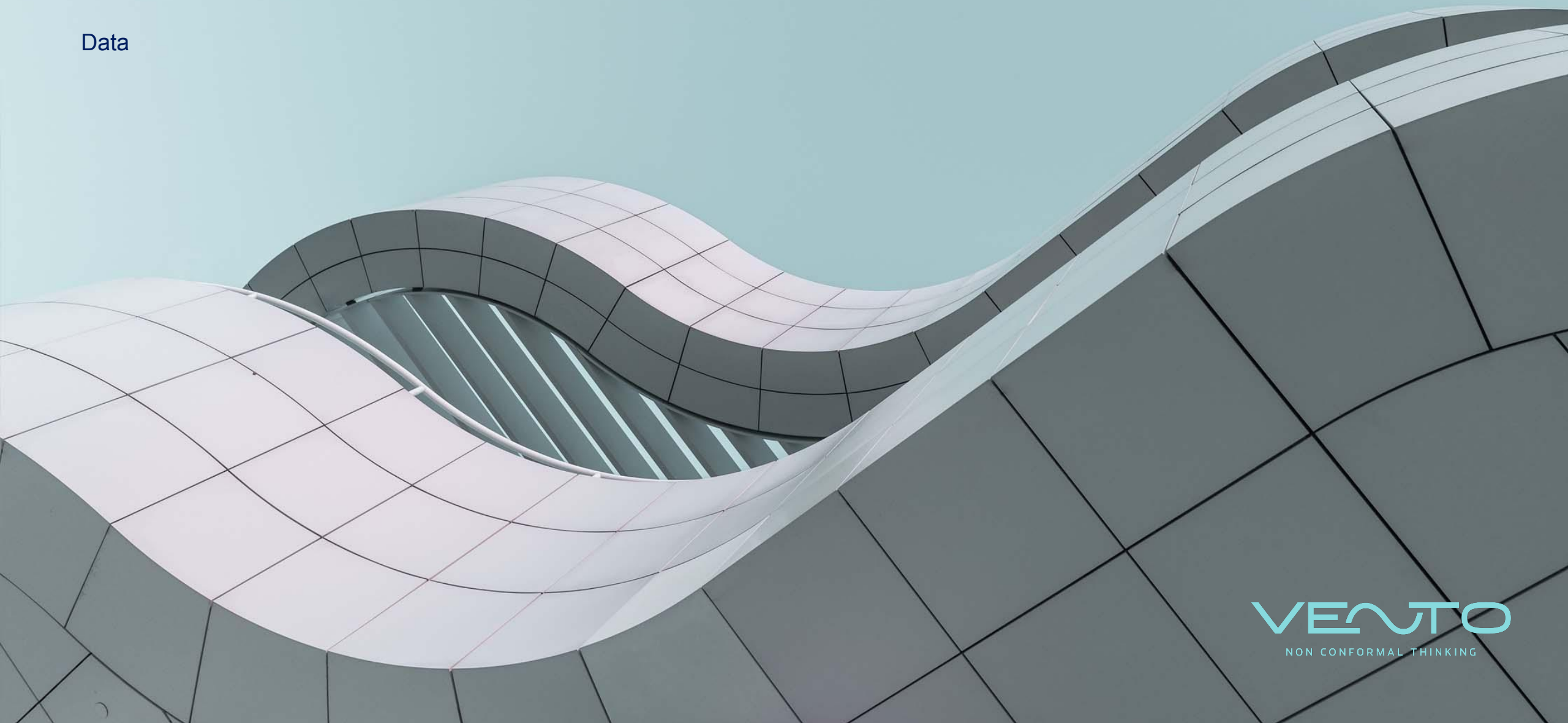
VENTO

NON CONFORMAL THINKING

Innovative CFD for the built environment

Validation | Building with balconies

Data



Reference

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Check for updates

CFD simulations of wind flow and mean surface pressure for buildings with balconies: Comparison of RANS and LES

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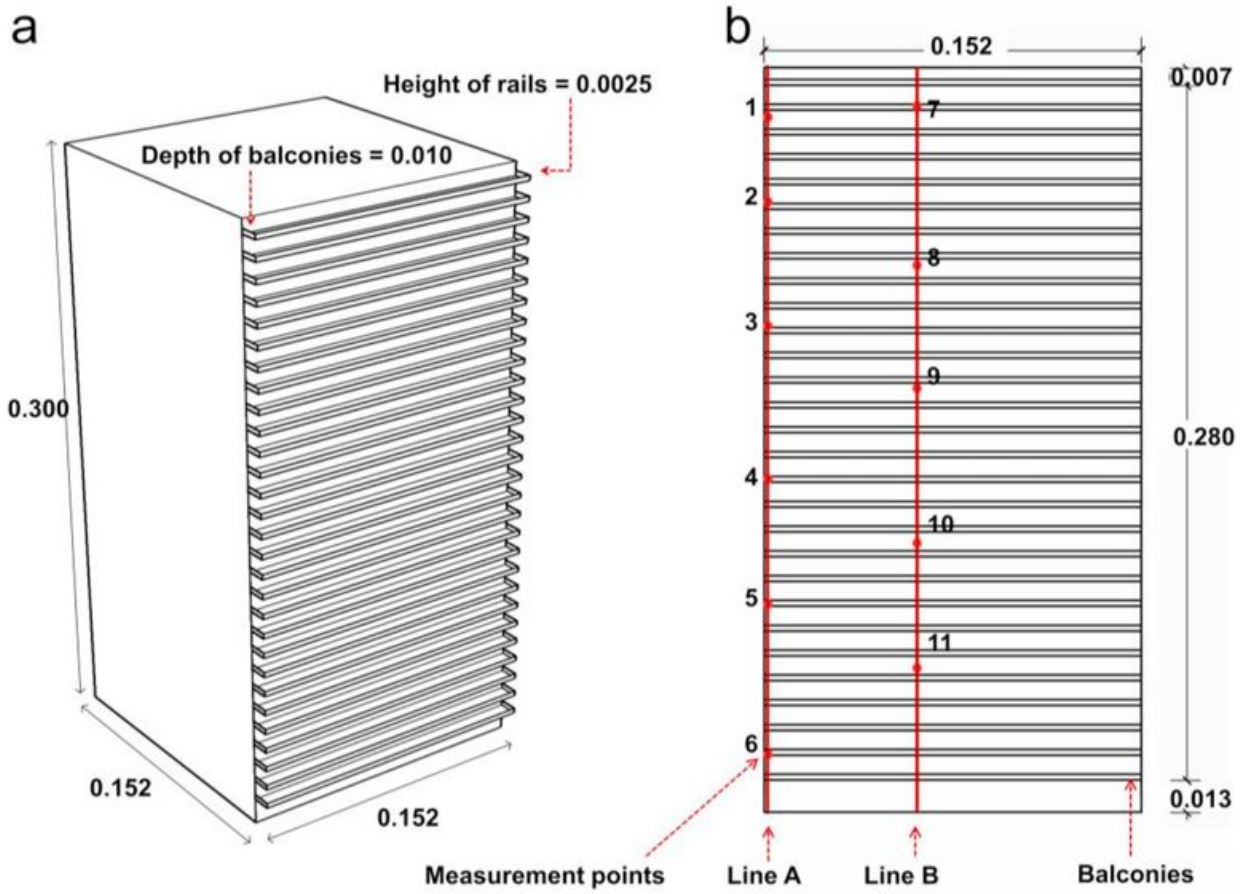
Conditions

CP data measured in the wind tunnel are available in **11 locations along two vertical lines** through the balconies (line A and line B).

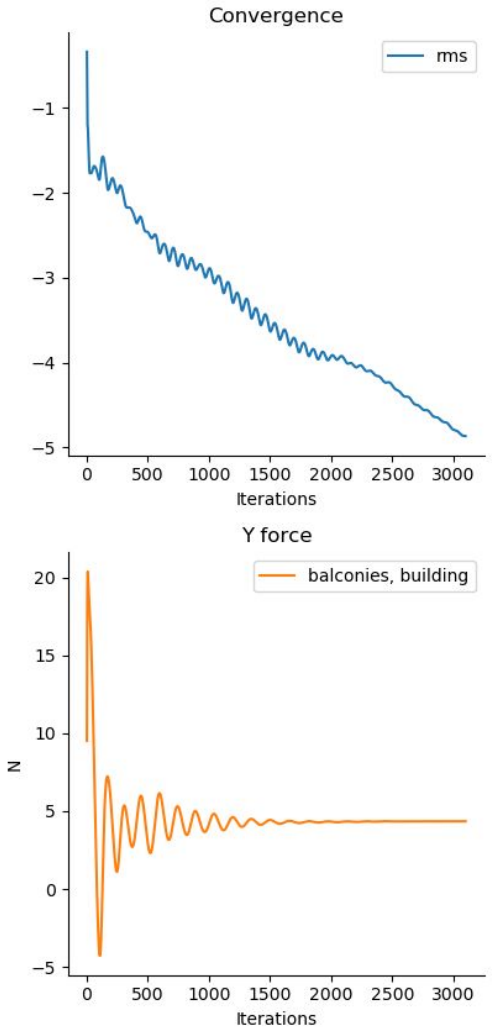
The wind blows at **14 m/s** over the building perpendicularly to the building façade.

Two simulations are presented with the balconies **on the windward and on the leeward side.**

The reference paper presents results obtained with **ANSYS** software, by using the k-esp model (**RANS**) and **LES** (Large Eddy Simulation)



VENTO CFD simulation



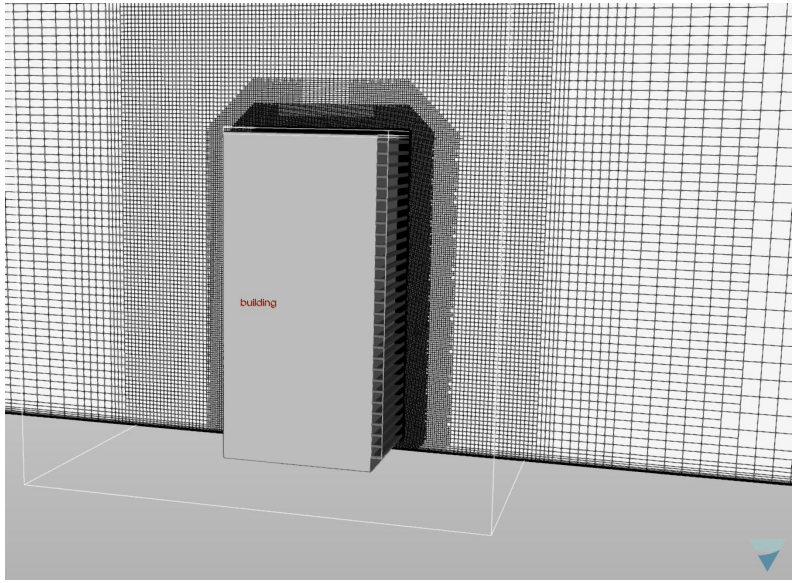
VENTO AEC: 15.2 M cells, Spalart & Allmaras turbulence model.

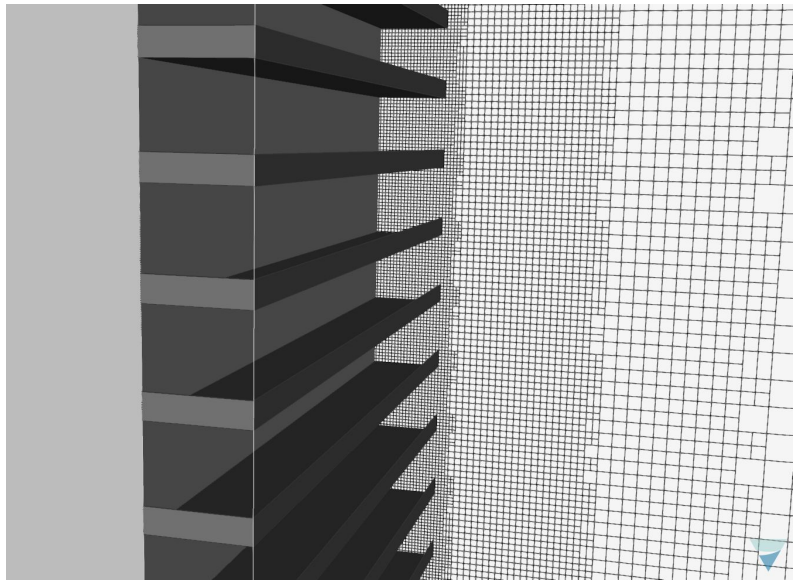
The convergence level -5 was reached in about 30h on a 6-core desktop with CFL=20. Forces were stable after 20h.

ANSYS RANS: 5.2 M cells, k-eps turbulence model

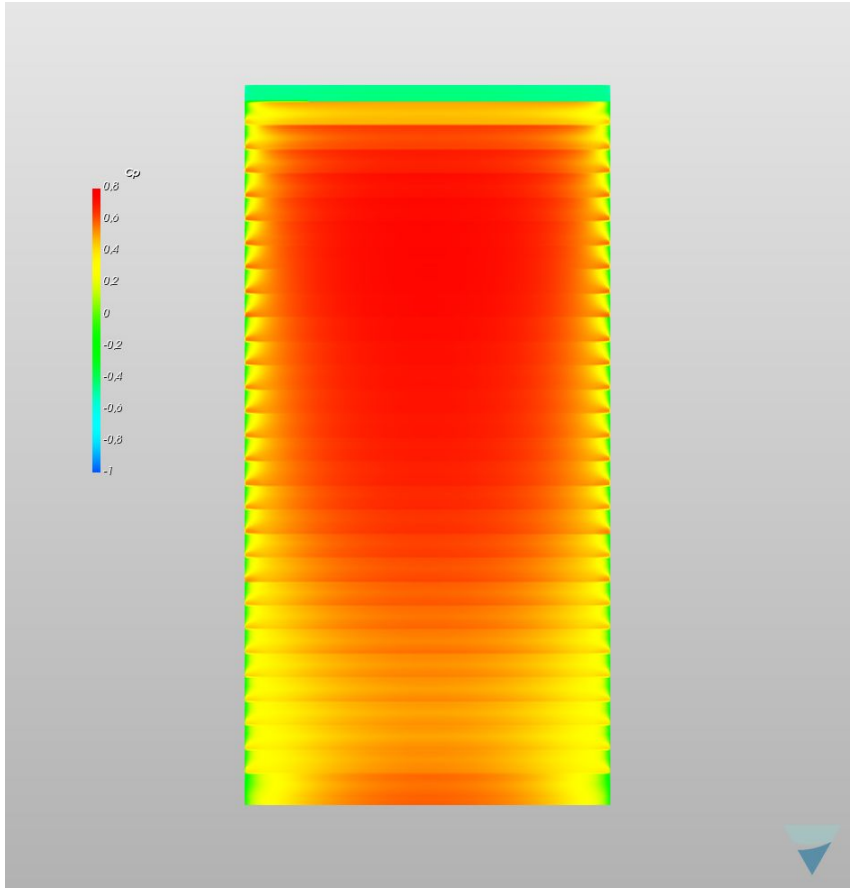
ANSYS LES: 19.3 M cells.

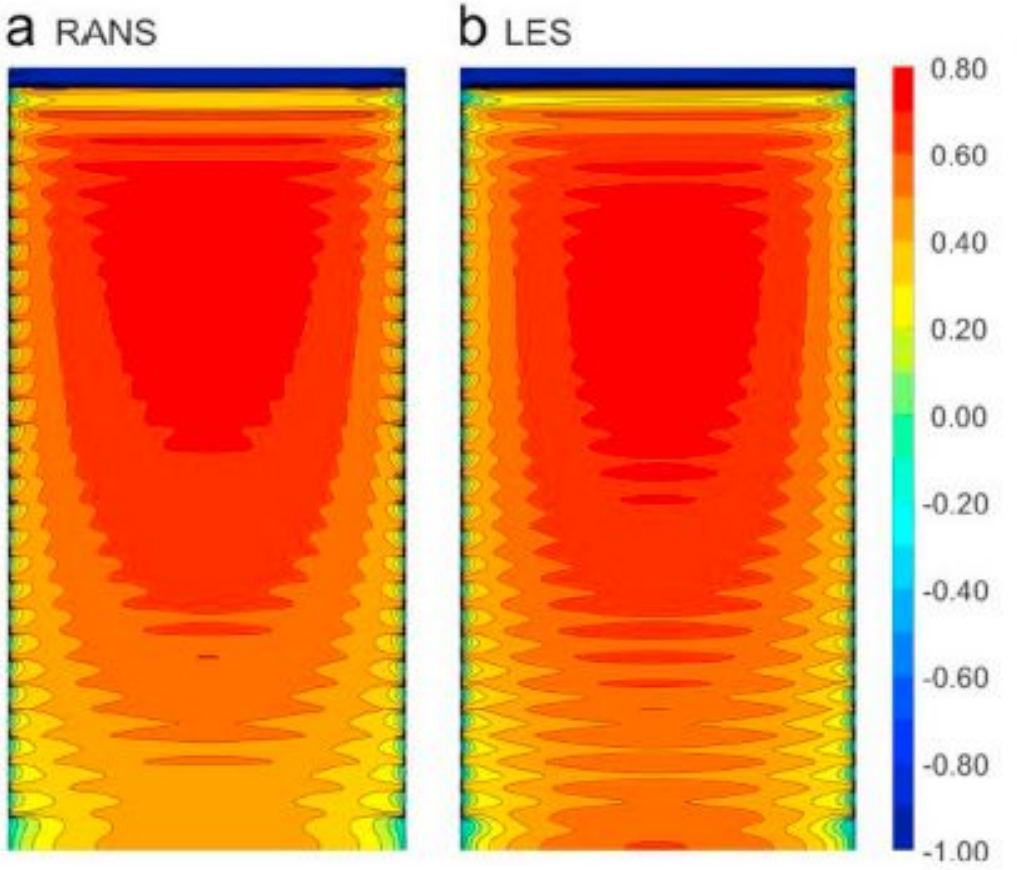
No information was found about the convergence and the CPU time.





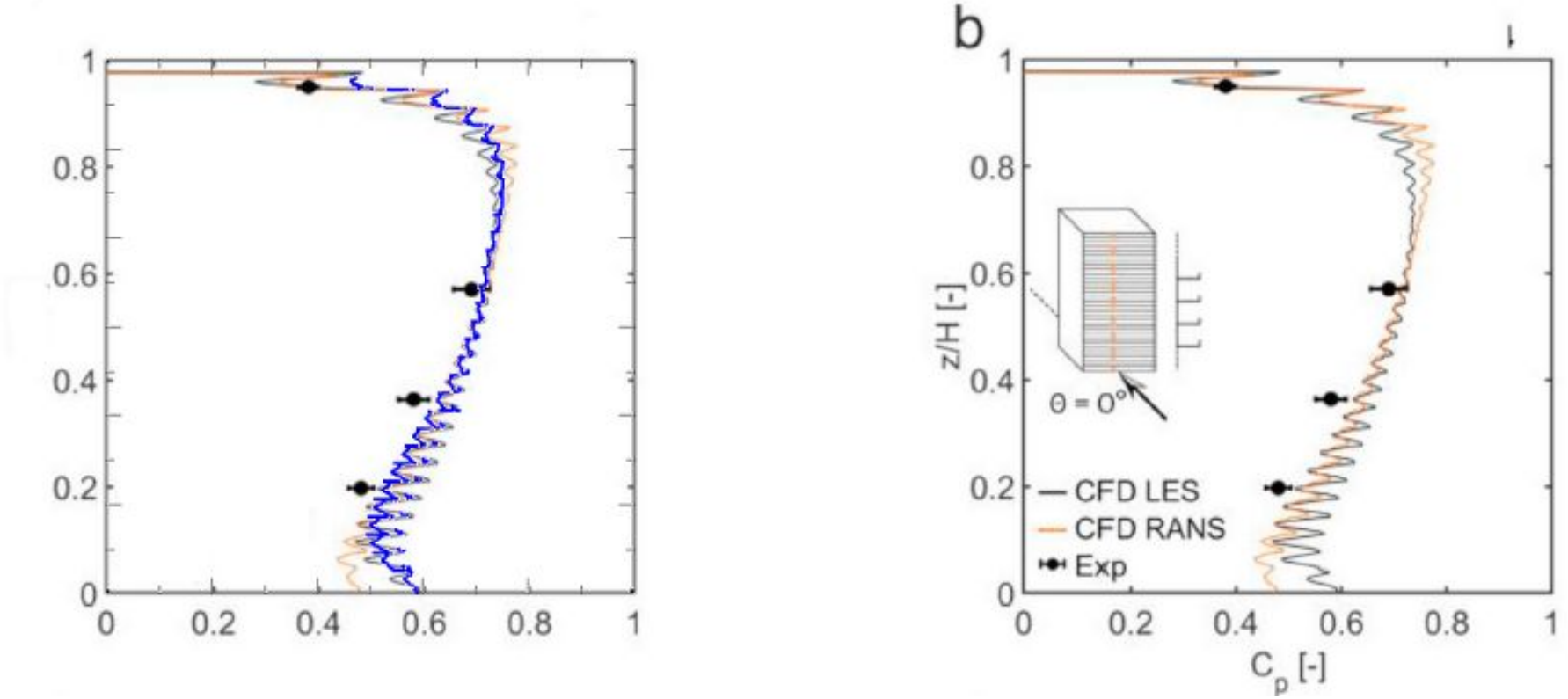
VENTO results vs reference





Map of CP distribution on the building facade: VENTO AEC (left) and ANSYS (right)

VENTO results vs reference



CP distribution on the vertical line B (building façade): VENTO AEC (blue line on the left) and ANSYS (on the left and on the right)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