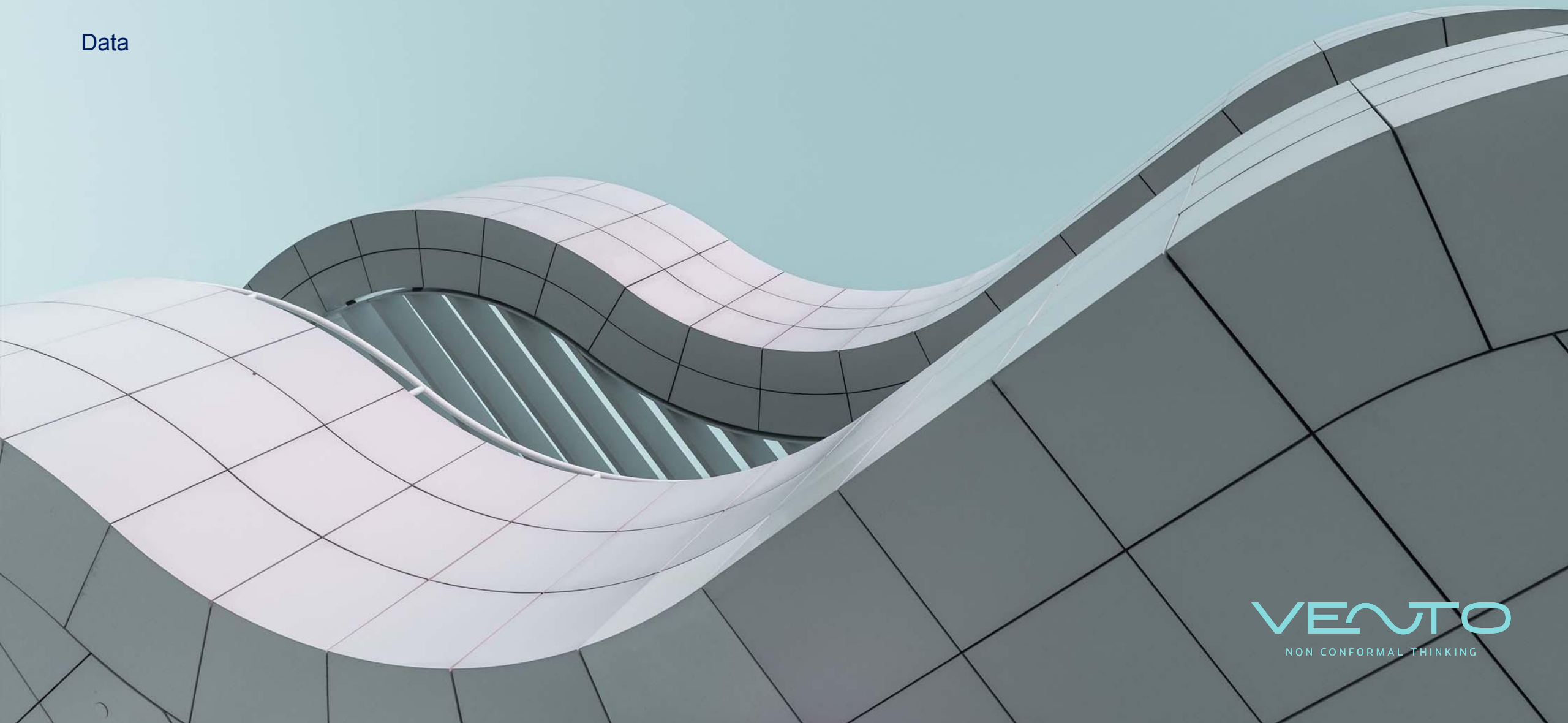
VENTO

NON CONFORMAL THINKING

Innovative CFD for the built environment

Validation | Aerodynamic forces on an airplane (benchmark NASA)

Data



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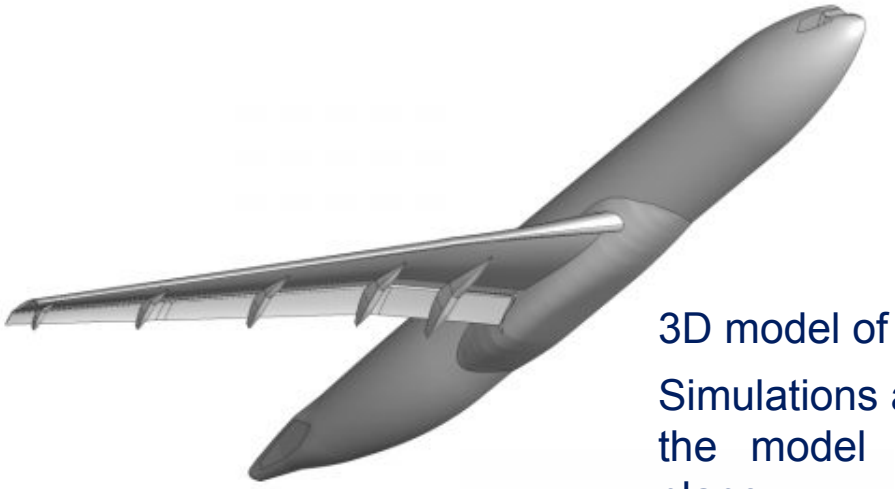
Reference: DLR F11

AIAA CFD high-lift prediction workshop [1]

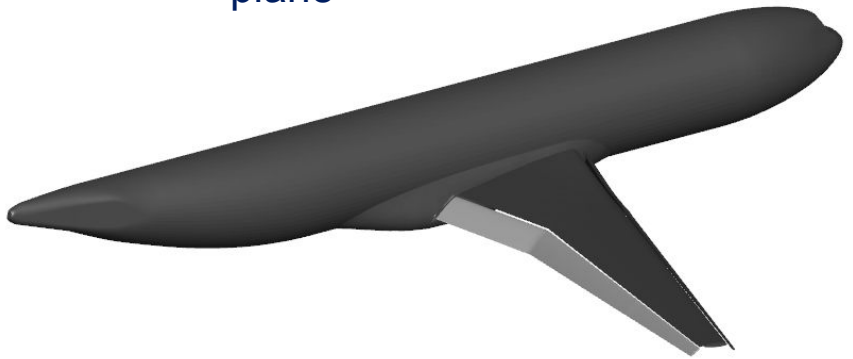
Conditions

no. of cells	4.7 M
Mach no.	0.175
Reynolds no.	1.35 M
AoA	7 deg
grid @ wall	1 mm



3D model of the DLR F11

Simulations are carried out on half of the model by using a symmetry plane



A very coarse mesh of less than 5 M cells was used.
Note. the workshop suggested to use mesh sizes larger than 50 Mcells!

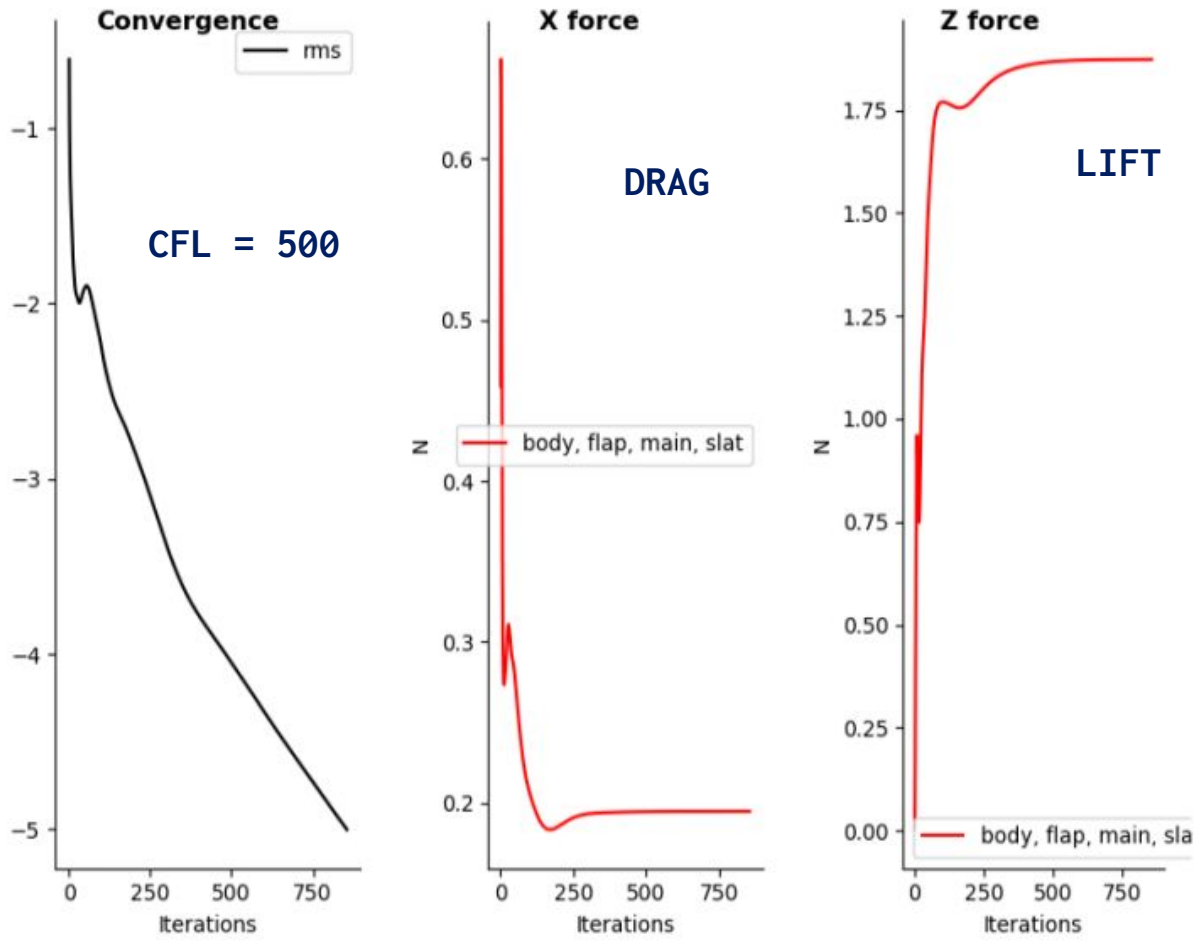
[1] http://hiliftpw.larc.nasa.gov/index-workshop2.html

VENTO results vs reference

~ 10 minutes setup (from CAD import to CFD-ready status) including grid generation

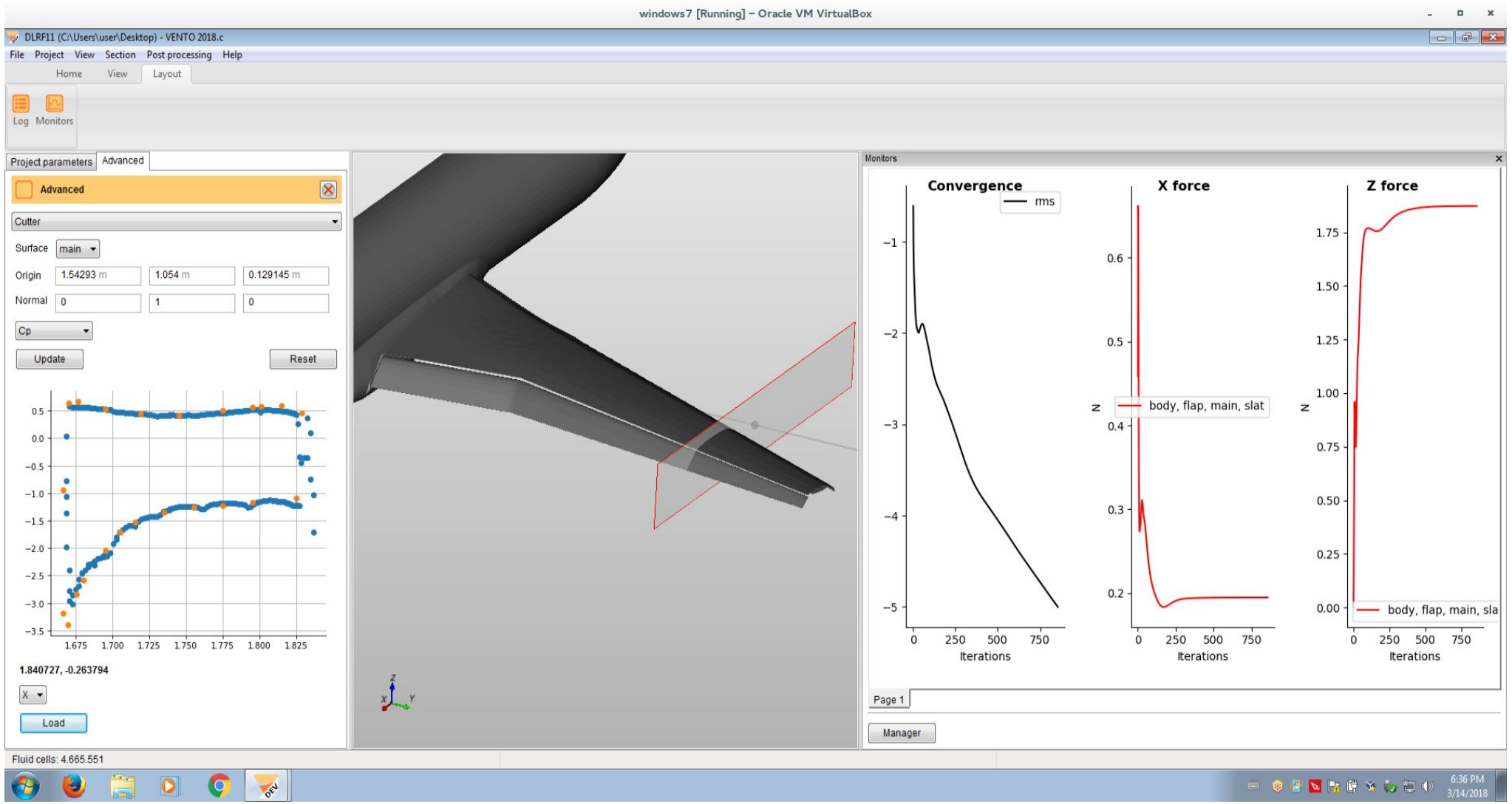
~ 3 hours of computing time to drop the residuals by 5 orders of magnitude (on six i7 cores)

	Cl	Cd
Wind tunnel	1.871	0.164
VENTO	**1.873**	**0.195**



VENTO results vs reference

VENTO's UI allows to import the experimental data on top of CP distribution on the two sides of the wing



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