

Computational Fluid Dynamics (CFD) Team supporting CERN

Francesco Dragoni

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Seminar Content

- Introduction (5')
- R. Shukla - Case study #1 – Flow field and heat transfer (20')
- I. Melero - Case study #2 – Temperature and CO₂ concentration (20')
- Q&A session (20')

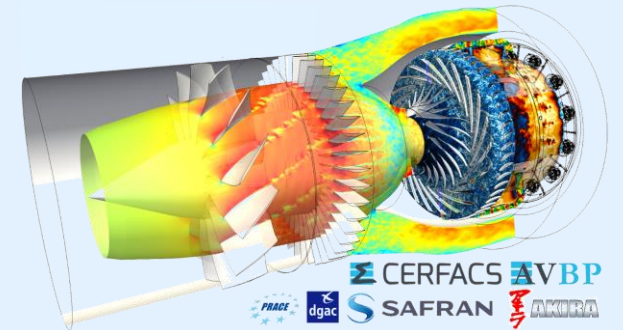
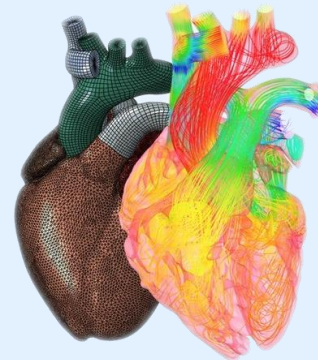
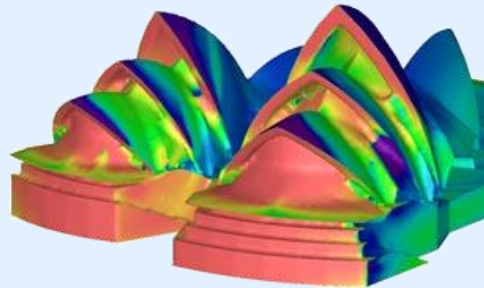
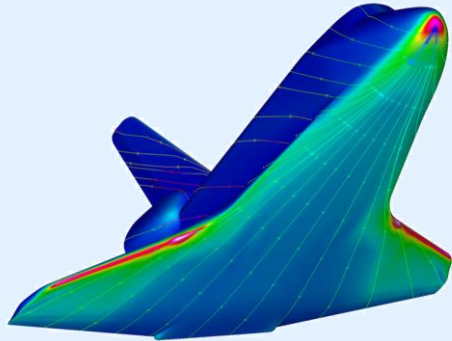
CFD – what is it?

Solution of fluid dynamics problems by means of numerical simulations

Pre-processing

Solving

Post-processing



CFD team at CERN

The Team

Created in 2003
in EN/CV

2-4 People – fellows and
PhD/technical students

4-8 projects/year

ANSYS[®]
FLUENT[®]

**CFD team**

HPC cluster
2 partitions

FLOWNEX[®]
SIMULATION ENVIRONMENT

cpu gpu
DualSPHysics

4 TechPCs

300+ nodes -
20 core/node

The Tools

The Hardware

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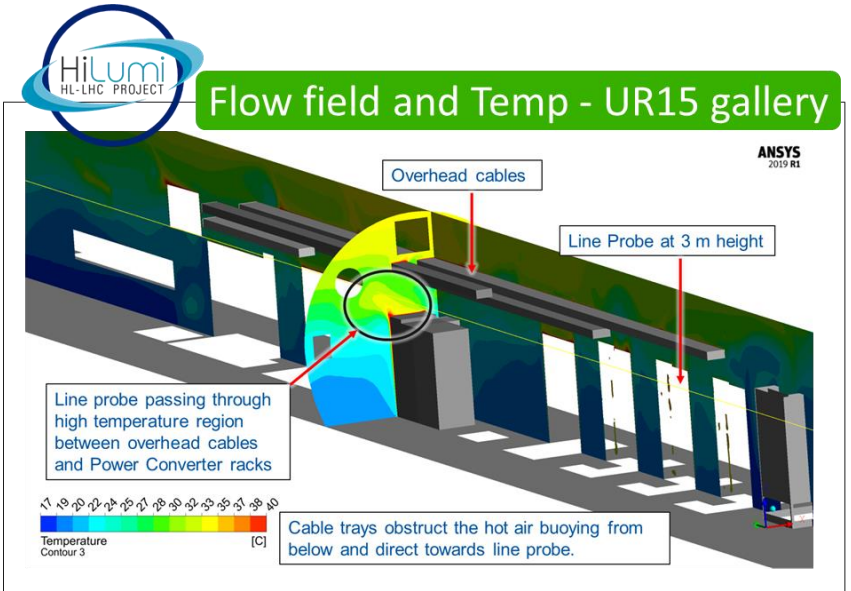
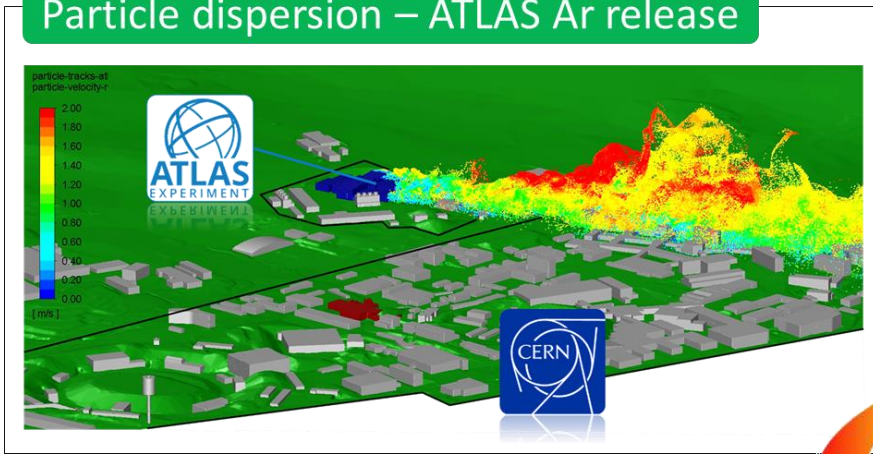
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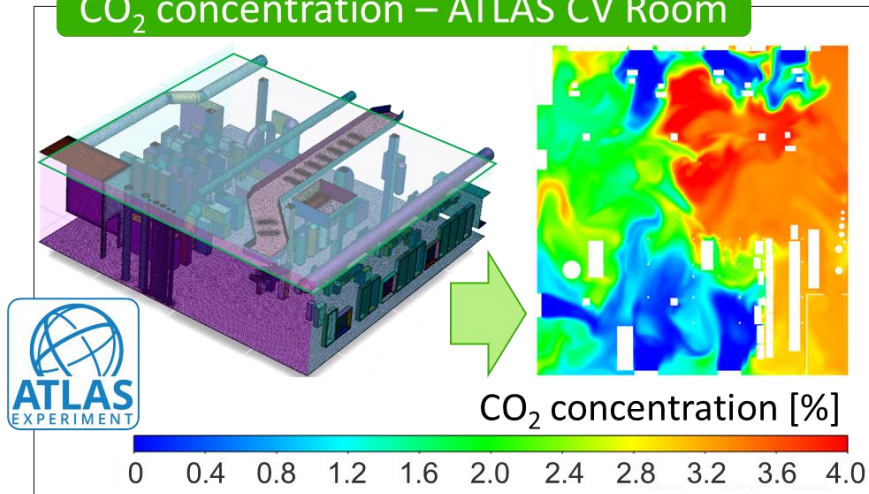
CFD team - Support to CERN

Particle dispersion – ATLAS Ar release

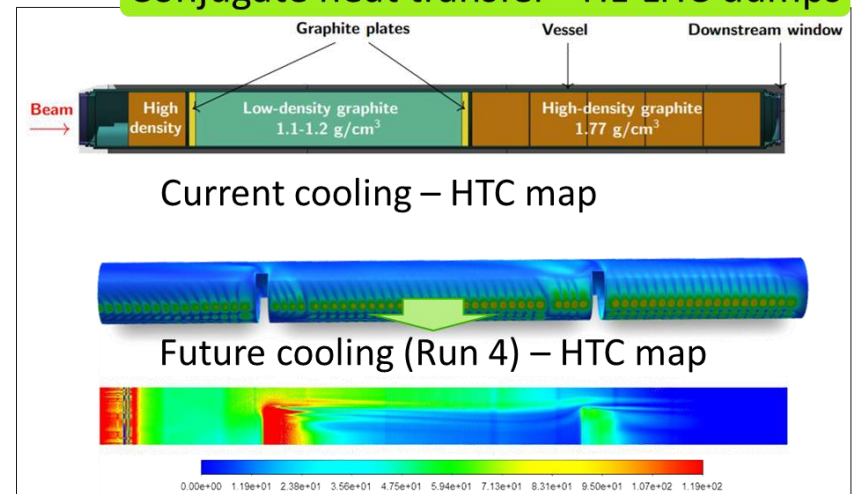


CFD team

CO₂ concentration – ATLAS CV Room



Conjugate heat transfer - HL-LHC dumps



CFD Team and You

Simplification, fast build of correct model and results interpretation

Weekly meeting to share progress and solve technical challenges

Experience and competence centre

Problem sharing



Support CERN

Knowledge sharing and training

Perform CFD studies for injector and LHC machines, experiments, detectors...

Archive case/mesh files and project reports of all past CFD simulations

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Thank you for your attention...
...Q&A at the end

Francesco Dragoni, PJ/CFD team, cfd-team@cern.ch - www.cern.ch/cfd



