# 3D Unsteady CFD model for Multi-Rotor Multi-Body Simulations with OpenFOAM including Body-Vortex Interaction


Rention Pasolari

Ph.D. Candidate

***Supervisors/Promotors***

Prof.dr.ir. CJ (Carlos) Simao Ferreira

Dr. Alexander van Zuijlen

Delft University of Technology

Faculty of Aerospace Engineering

Wind Energy Research Group

r.pasolari@tudelft.nl


## *Introduction*

Hybrid Eulerian-Lagrangian solvers are getting famous in the field of external aerodynamics, especially when strong body-vortex interactions take place.

*pHyFlow* is a hybrid solver that couples the open-source software OpenFOAM with a Lagrangian Vortex Particle Method (VPM). The solver can exploit the advantages of OpenFOAM on resolving boundary layers efficienlty, while the vortex particles evolve the wake dowstream preseving the vorticity structures.

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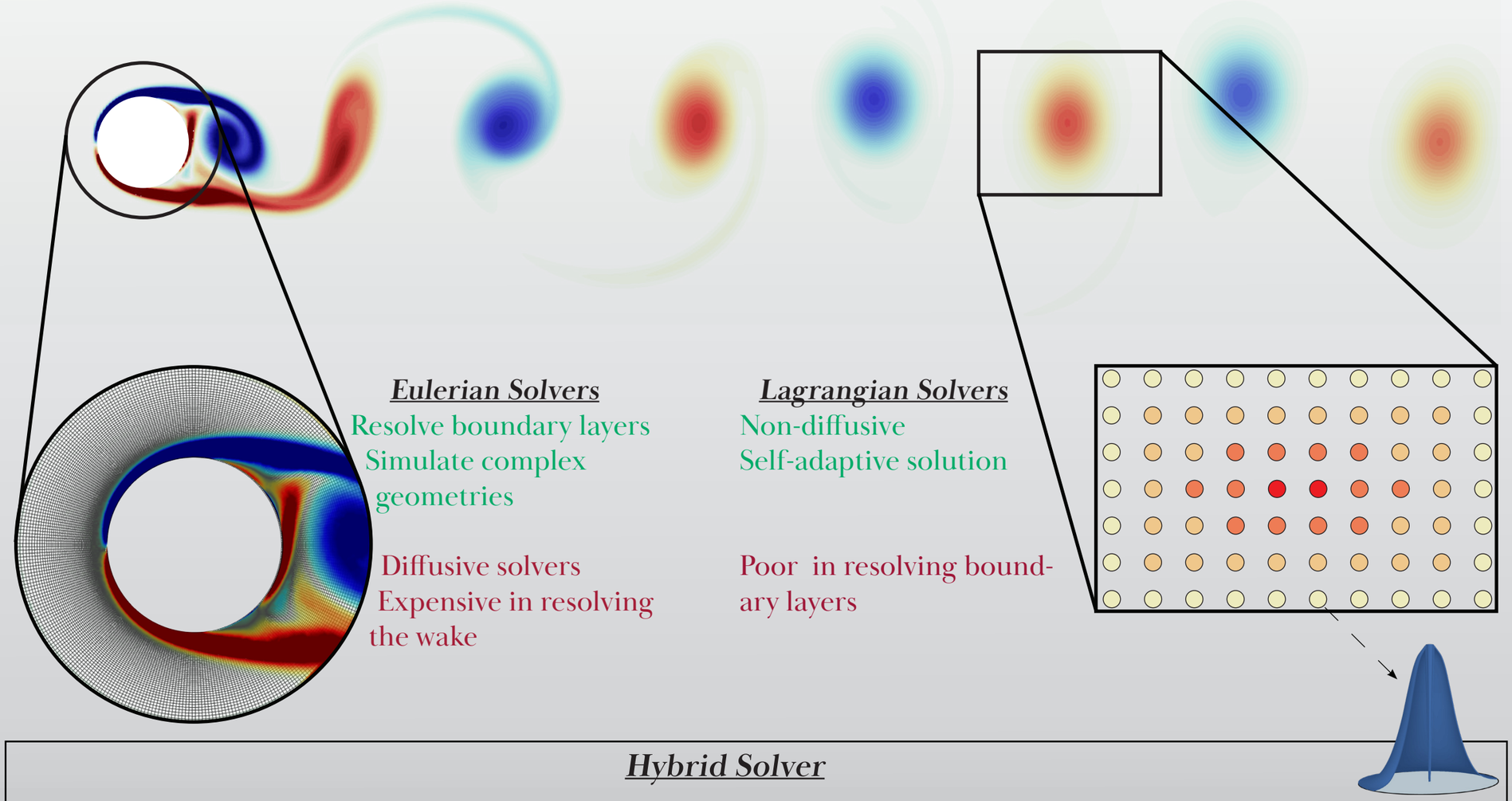

***Eulerian Solvers***

Resolve boundary layers

Simulate complex geometries

Diffusive solvers

Expensive in resolving the wake

***Lagrangian Solvers***

Non-diffusive

Self-adaptive solution

Poor in resolving boundary layers

## *Hybrid Solver*

- Resolve boundary layers
- Eliminate artificial diffusion in the far-field
- Reduce computational cost
- Accelarate calculations using parallelization techniques