

Delavnica: CFD on HPC – OpenFOAM primer



Monday, 26 June 2023 - Wednesday, 28 June 2023

Zoom

Program

DAY 01, 26th June, 2023

9:00–10:30: Introduction to supercomputers, supercomputing world, benefits for the research and industrial needs.

- What is a shared memory computer? The concept architecture and real hardware.
- Introducing the participants to modern hardware, HPCs, EuroHPC project
- Using HPC-FS and NoMachine client in desktop environment
- Linux background

Convener: Pavel TOMŠIČ

10:30–12:00: Introduction to Computational fluid dynamics (CFD)

- About CFD
- Theoretical background
- Different methods
- Pros and cons of the method
- Introduction to FVM

Convener: Aleksander GRM

12:00–13:00: Setting up environment for OpenFOAM, description of the basic program environment and running of basic programs.

Outline:

- Overview of OpenFOAM
- Workflow and background
- How to use OpenFOAM
- Main Components
- Parallel construct on HPC

Convener: Aleksander GRM

DAY 02, 27th June, 2023

9:00–10:30: Basic usage of OpenFOAM I

- Geometry and meshing
- Mesh manipulations
- Physical modelling and numerical simulations
- Initial and boundary conditions

Convener: Aleksander GRM

10:30–13:00 Hands-on with OpenFOAM I

- Running simple cases sequentially
 - o How to prepare the OF case
 - o Running the OF case
 - o Results preview – ParaVIEW introduction

Convener: Aleksander GRM

DAY 03, 28th June, 2023

9:00–10:30: Basic usage of OpenFOAM II

- HPC / Cloud – OF parallel run
- OF post-processing tools
- OF complex simulations – basic steps
- OF format conversions

Convener: Aleksander GRM

10:30–13:00: Hands-on with OpenFOAM II

- Advanced cases of OF usage
 - o Configuration for parallel case run
 - o Running parallel OF cases
 - o Advanced usage of OF – foil case

Convener: Aleksander GRM