Delavnica: CFD on HPC – OpenFOAM primer

Monday, June 26, 2023 - Wednesday, June 28, 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