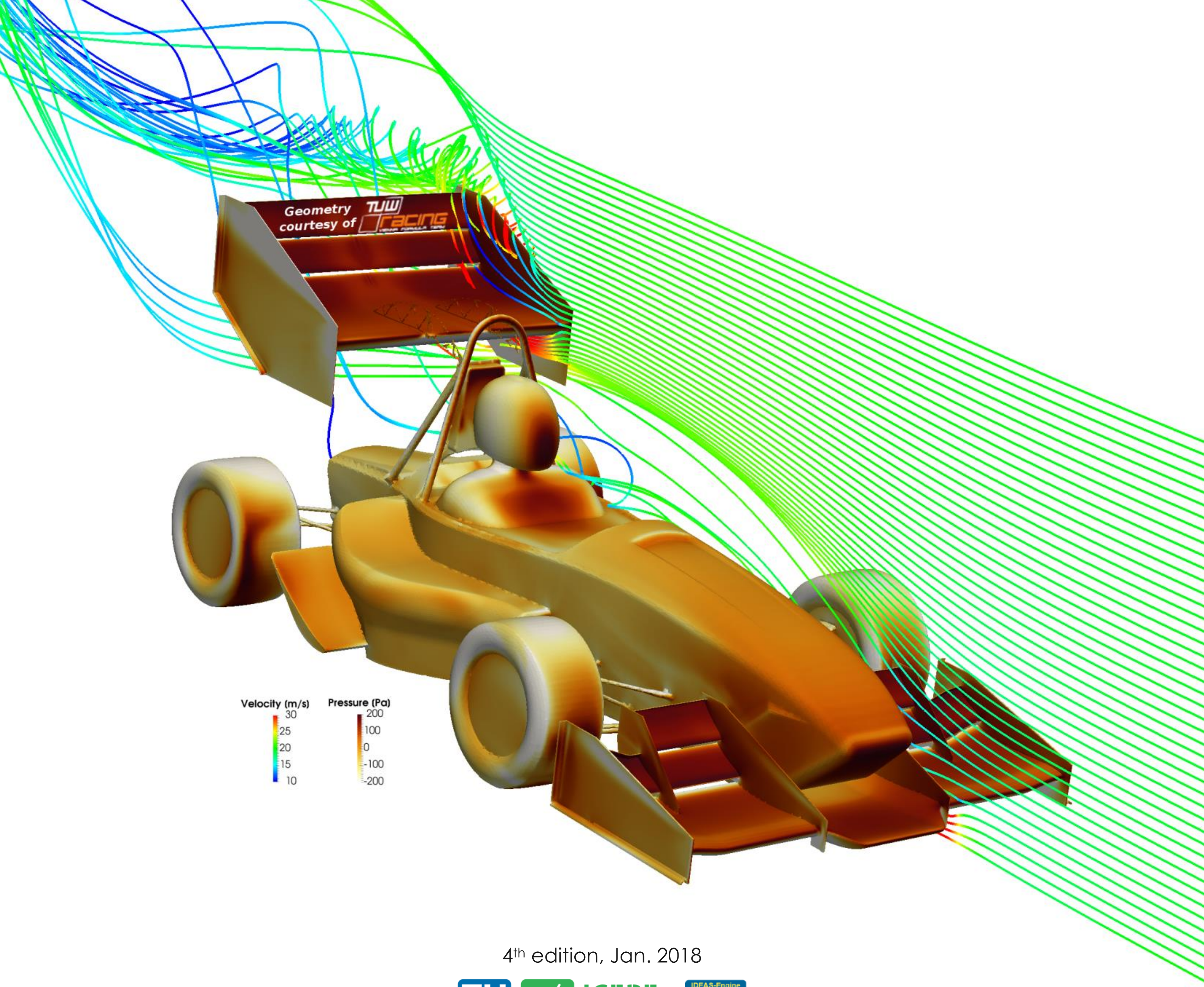
OpenFOAM® Basic Training



4th edition, Jan. 2018

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Compatibility:

- OpenFOAM® 5.0
- OpenFOAM® v1712

Cover picture from:

- Bahram Haddadi. Special thanks to Philipp Schretter and TUW-Racing.

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This book has been used as a basis for preparing a series of video lectures
on youtube by Jozsef Nagy (JKU Linz):
www.youtube.com/channel/UCjdgpuxuAxH9BqheyE82Vvw
(Search for: Jozsef Nagy OpenFOAM at youtube.com)

In this OpenFOAM® tutorial series, we have prepared fourteen case examples that are designed to help users to learn the key utilities and features within OpenFOAM®, including mesh generation, multiphase modeling, turbulence modeling, parallel processing and reaction modeling. The base tutorial examples can be imported directly from the OpenFOAM® installation directory.

The tutorials should be primarily used for OpenFOAM® versions 5.0 and v1712, with differences in the running procedure between v1712 and 5.0 highlighted in blue boxes. So, simply ignore the blue boxes if you are running in version 5.0! The structure of each case example follow the below general structure:

- **Background**: an introduction about the key topics explored in the tutorial and the relevant CFD theory

1. **Pre-processing**: instructions on how to set up the correct case structure for a given problem using base case tutorials, with explanations on relevant dictionaries
2. **Running simulation**: instructions on running the solver and its associated commands
3. **Post-processing**: examining the results in OpenFOAM®'s post-processing application, ParaView V5.4.0

Tutorial One: **Basic Case Setup**

Solver: icoFoam
Geometry: 2-dimensional
Tutorial: elbow

Tutorial Two: **Built in Mesh**

Solver: sonicFoam
Geometry: 2-dimensional
Tutorial: forwardStep

Tutorial Three: **Patching Fields**

Solver: sonicFoam
Geometry: 1-dimensional
Tutorial: shockTube

Tutorial Four: **Discretization – Part 1**

Solver: scalarTransportFoam
Geometry: 1-dimensional
Tutorial: shockTube

Tutorial Five: **Discretization – Part 2**

Solver: scalarTransportFoam
Geometry: 2-dimensional
Tutorial: circle

Tutorial Six: **Turbulence, Steady state**

Solver: simpleFoam
Geometry: 2-dimensional
Tutorial: pitzDaily

Tutorial Seven: **Turbulence, Transient**

Solver: pisoFoam
Geometry: 2-dimensional
Tutorial: pitzDaily

Tutorial Eight: **Multiphase**

Solver: interFoam
Geometry: 2-dimensional
Tutorial: damBreak