

The results were obtained using the coldEngineFoam solver of OpenFOAM version 2.3.0

The solver was modified to output the wallheat transfer for every timestep. It can be found in the folder **mycoldEngineFOAM**.

The folder **geo2** contains starting data and mesh for the simple gas spring with geometry 2 with air.

- To change to Helium replace the file „**thermophysicalProperties**“ in geo2/constant with the file **thermophysicalPropertiesHelium** and change its name back to thermophysicalProperties.
- To change piston speed open the file geo2/constant/engineGeometry and change the number of rpm.

The folder **geo1** contains the starting data and mesh for the simple gas spring with geometry 1 with helium.

- To change piston speed open the file geo2/constant/engineGeometry and change the number of rpm.

The folders **geo1adiabat** and **geo2adiabat** contain the starting data for the adiabatic cases.

The folder **Grid** contains the starting data including the mesh for the simulations with turbulence grid. To change piston speed open the file geo2/constant/engineGeometry and change the number of rpm.

The folder **Gridadiabat** contains the starting data for the adiabatic simulations with turbulence grid.