

Topic

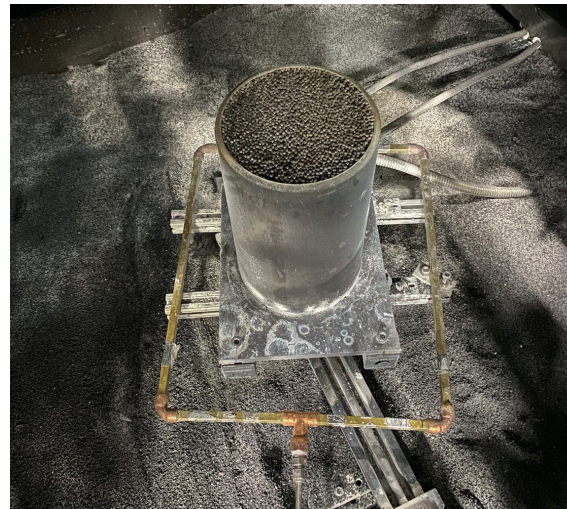
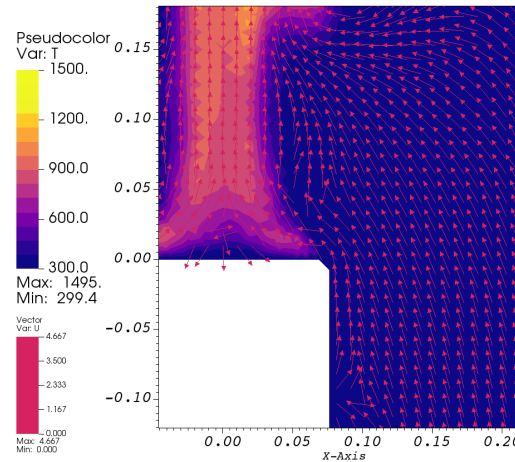
Extinction modeling with CFD for selected benchmark case of MaCFP workshop.

Background

The simulation of fire phenomena is progressing a lot. E.g. calculations of smoke distribution are wide spread in industry. However, the important topics of fire spread and flame extinction are still very challenging.

Extinction depends on multiple factors which evolve over time and directly affects flame and fire spread; the main factors for extinction are the environmental oxygen concentration, temperature or flame residence time.

The thesis is aimed to support the preparation of applications for further funding in fundamental extinction modeling. The main focus is on the impact of the inlet boundary condition of the burner. As a base the FM Global experimental data of the MaCFP workshop will be applied during this thesis.



Main Steps

Steps:

1. Literature Study
 - Reduced oxygen environment on combustion
 - Modeling approaches for extinction
2. Run initial setup
3. Evaluate changes of inlet geometry (slightly shifted inlet and addition of porosity)
4. Evaluate relevance of turbulent boundary condition

Tools

- OpenFOAM (FDS)
- VisIt, Python

Requirements

- High motivation
- Interest in CFD and combustion in a scientific context