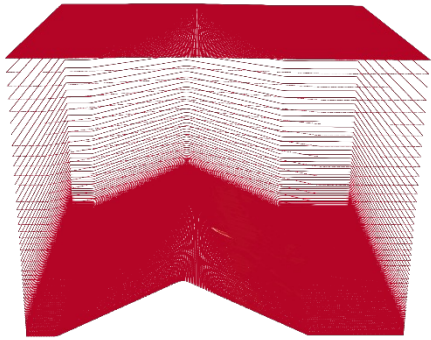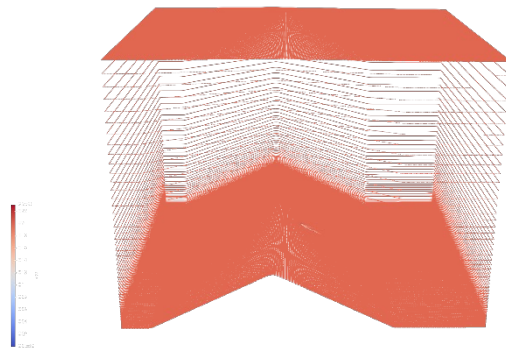# Wild Fire (B)

Stuart Heeb
Johannes Kurz
Yitong Xia
Yingyan Xu
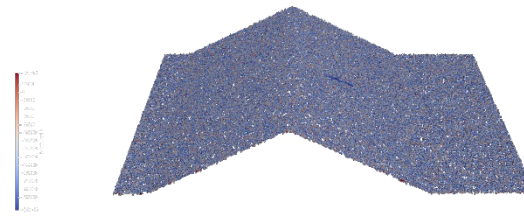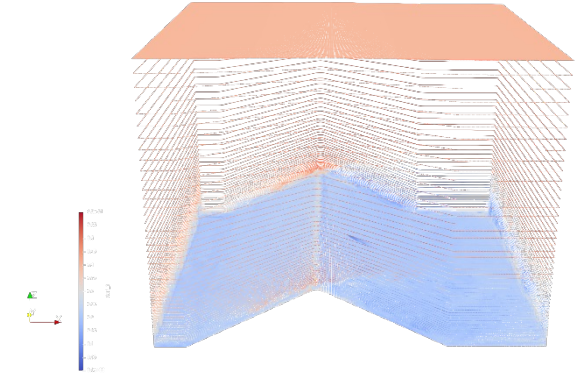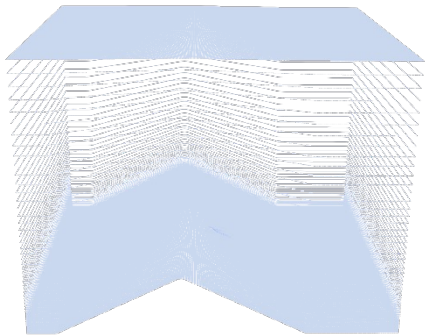
What is the data set about?

O2: oxygen

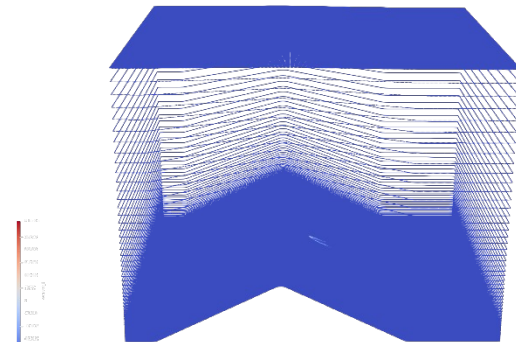*frhosiesrad:* fire-induced radiative heat transfer

rhof: bulk density of dry fuel

u, v, w: velocity field of wind
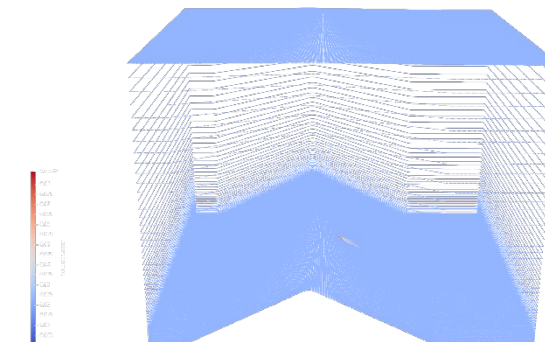
convht: convective heat transfer

rhowwatervapor: bulk density of the moisture released due to burning

theta: temperature

What kind of data is given?

- Time series data of necessary physical parameters for visualizing burning, stored in Curvilinear Grids that outline the terrain surface.

- All quantitative data.

- Convert to Uniform Rectilinear Grids.

ResampleToImage
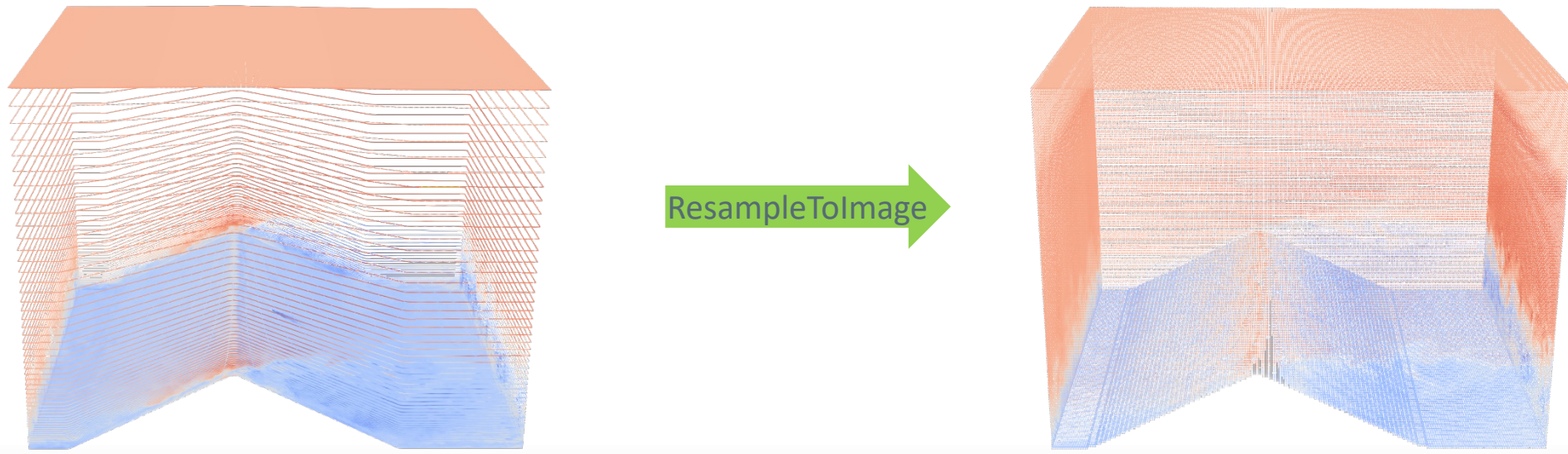
What do you want to visualize?

- Which variables of the data set do you want to show?
  - Temperatures under burning process.
  - Bulk density (vegetation density) under burning process.
  - Wind velocity and vorticity field.
- Which features or structures of the data set do you want to concentrate on?
  - Velocity and vorticity field of wind.
  - Influences of terrain, atmosphere, moisture and fire state on Vorticity-driven Lateral Spreading (VLS) behvior.
- Do you derive quantitative information from features of the data set?
  - Spread extent of wildfire.
  - Vorticity from velocity field.
- What is the story that you want to communicate?
  - Temporal evolution of wild fire burning on vegetation.
  - Impacts of different environmental factors on wild fire spreading.

Project Start

How do you visualize it?

- Wind: derive wind vorticity field and streamline.
- Vegetation: coloring according to the density of bulk.
- Terrain: visualize in 3D surface mesh, inferred from the curvilinear grid.
- Smoke & Fire: Coloring and animating smoke and fire according to the temperature. Maybe use volume rendering to improve visualization quality.

Timeline

- Until the milestone presentation (24.04.2023) we have finished:
  - Building code pipelines.
  - Visualizing wild fire.

- Until the final presentation (22.05.2023) we have finished:
  - Visualizing wind, vegetation, terrain.