



Pressure peaking phenomenon for LH2 releases in confined spaces – CFD modelling

6th stakeholders' workshop

Belfast, United Kingdom

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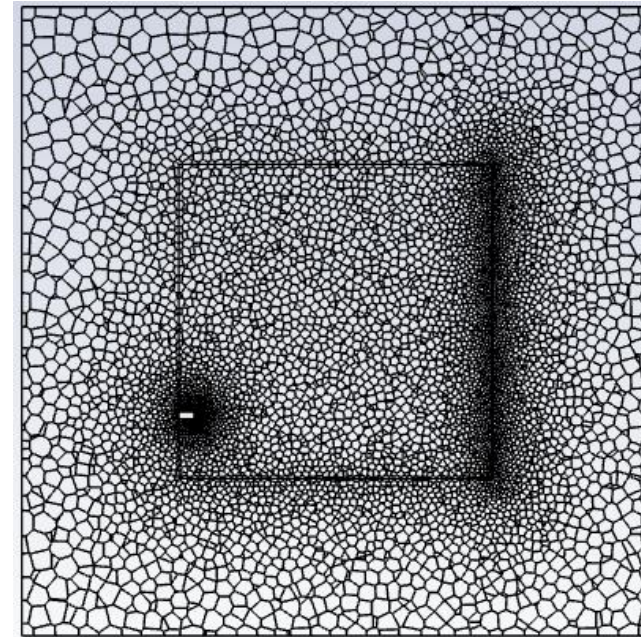
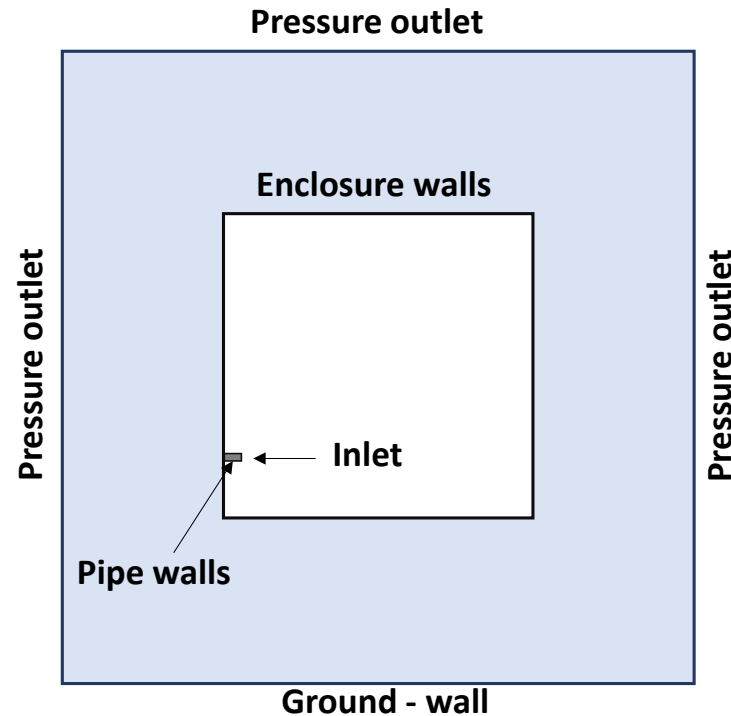
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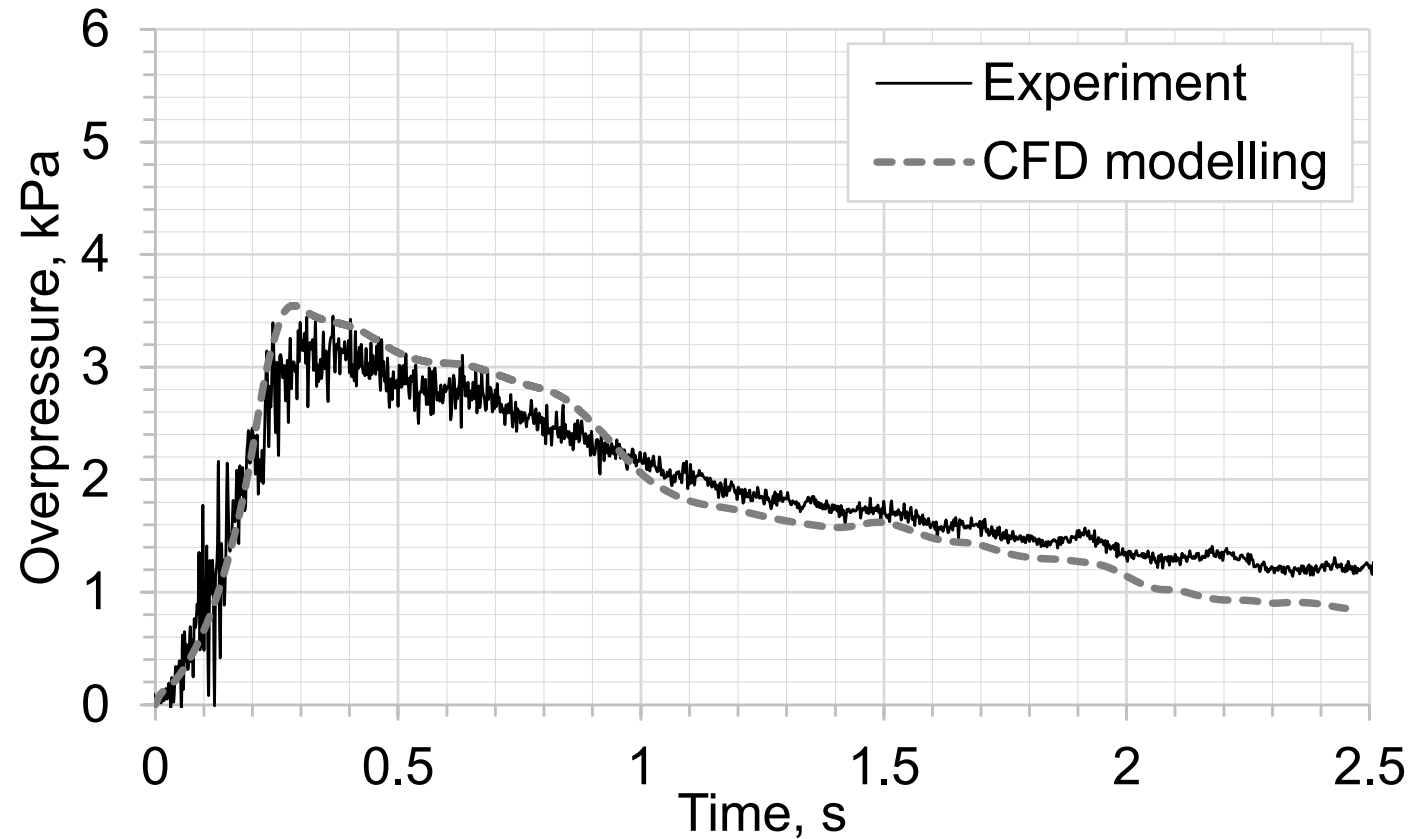
CFD approach and numerical domain

- SST κ - ω approach for turbulence modelling.
- Volume of Fluid for multiphase modelling with Lee's model for evaporation and condensation.
- NIST properties database to characterise the two-phase hydrogen flow and mixture with air.
- The numerical domain is a polyhedral grid including the enclosure and external atmosphere.



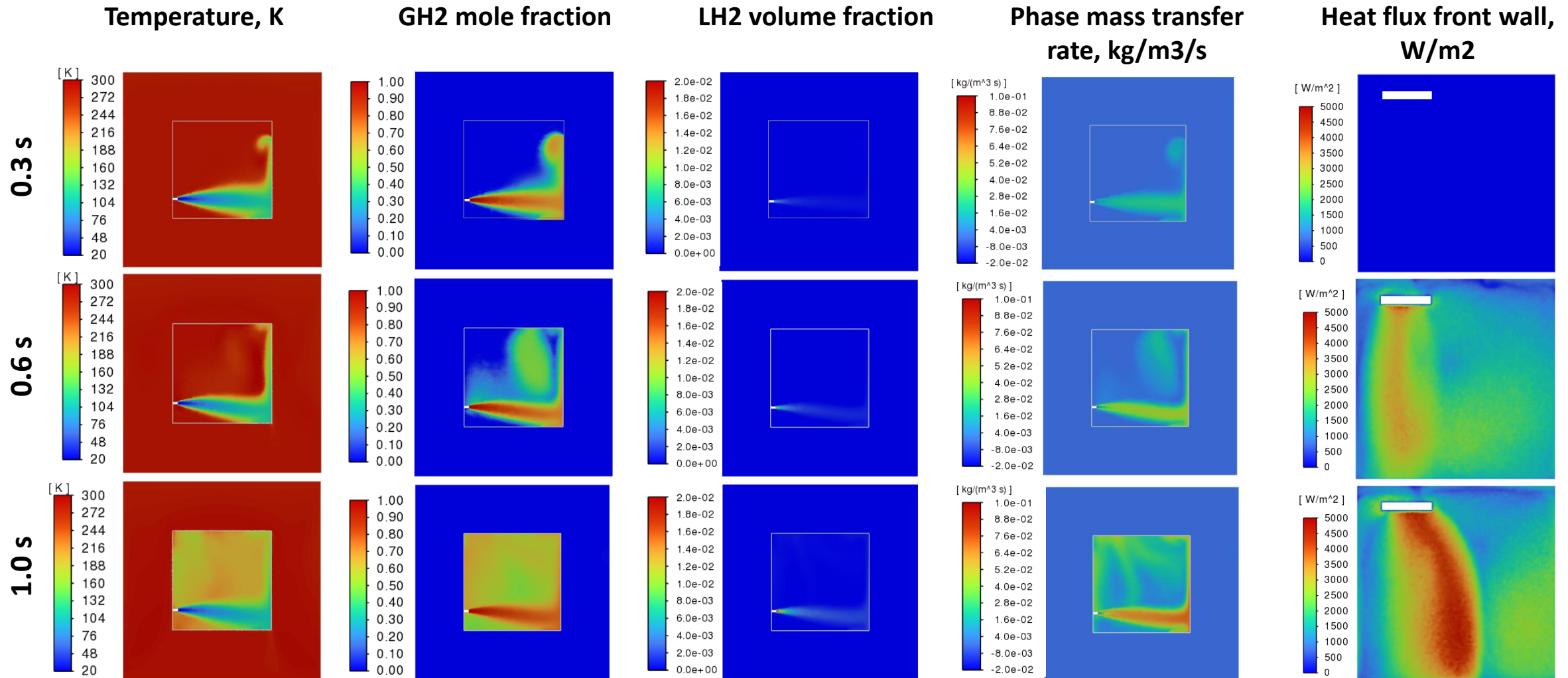
CFD results: overpressure dynamics

Test 3: one passive vent open



CFD results: mass and heat transfer dynamics

Test 3: one passive vent open



Conclusions and future research

- The PPP overpressure peak occurs within the first fractions of seconds from the start of the release.
- The PPP overpressure peak and dynamics is strictly dependent on the characteristics and phase composition of the multiphase flow, which can significantly vary during the initial stage of the LH2 release.
- Accurate modelling requires precise definition of the experimental set-up and measurements across the entire line from a storage tank through the piping system to the atmosphere.
- Further research should be performed on advancing the understanding of two-phase flows from LH2 equipment.



Thank you for your attention

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