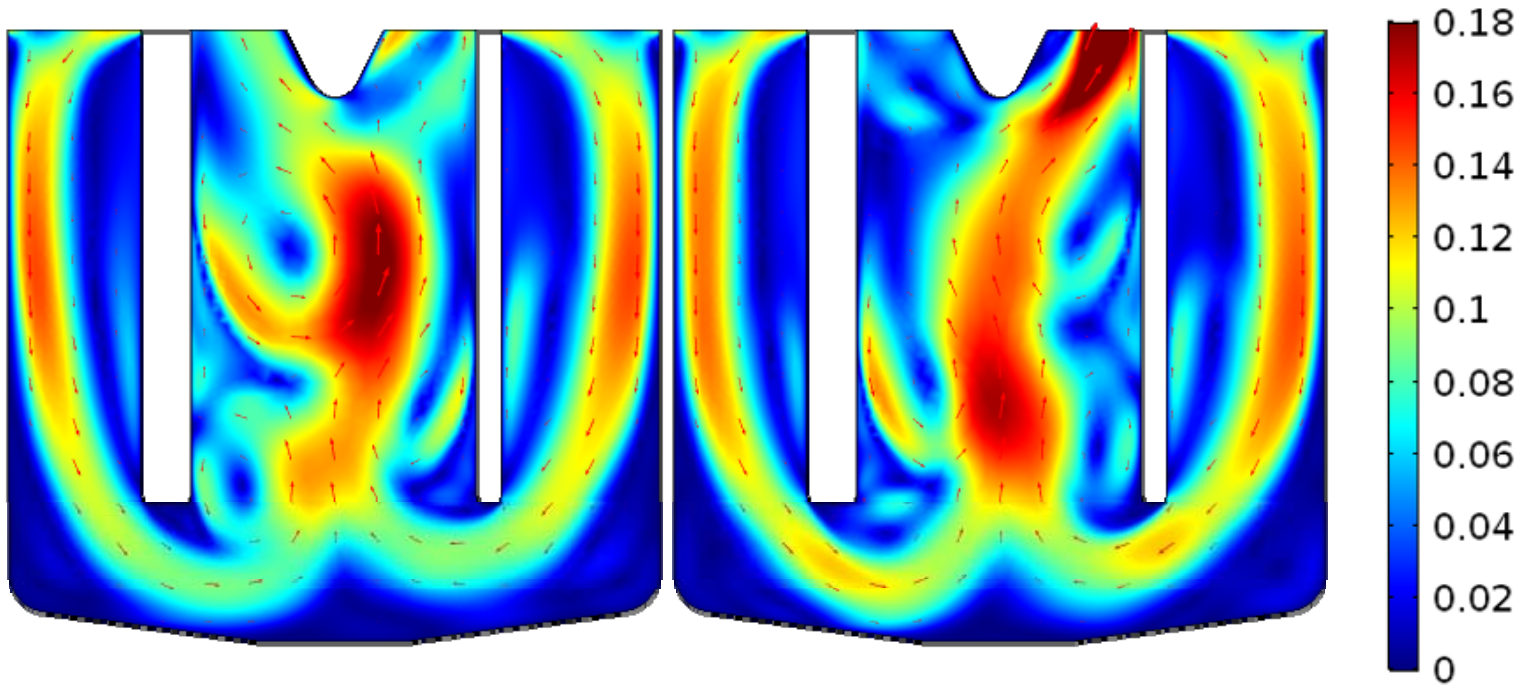
Fluorine electrolysis cells: transient modelling with spatially-dependent gas properties using COMSOL®



MEng Chemical Engineering, University of Pretoria

MEO1

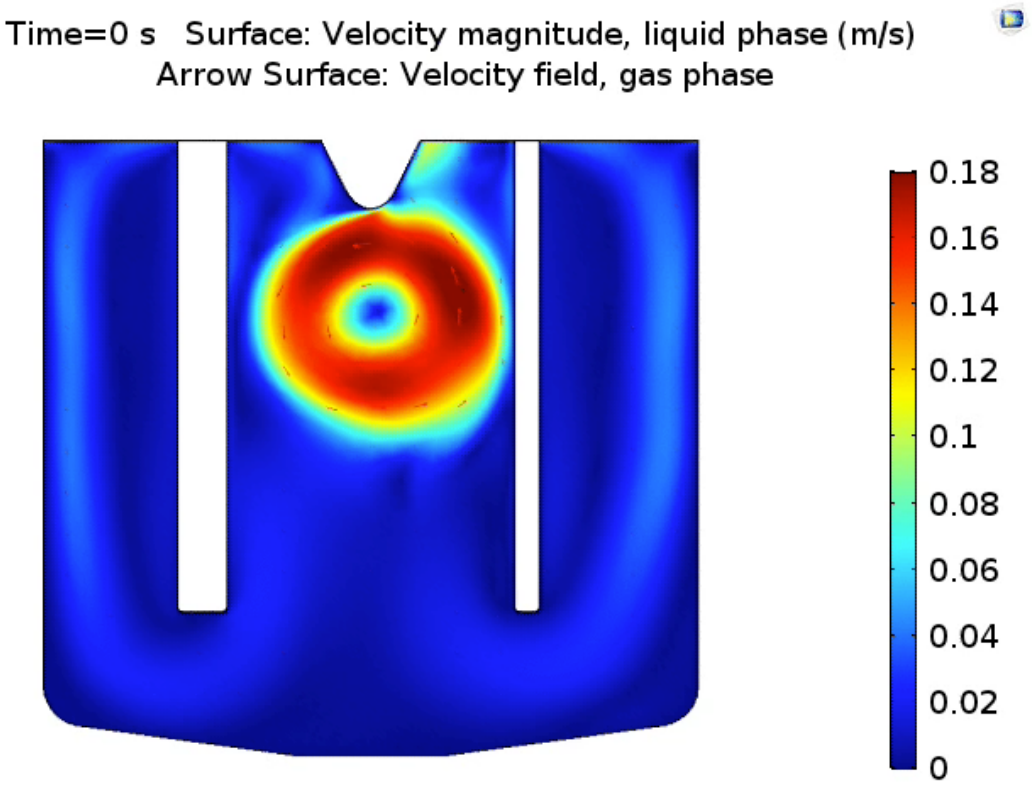
Modelling- model set-up

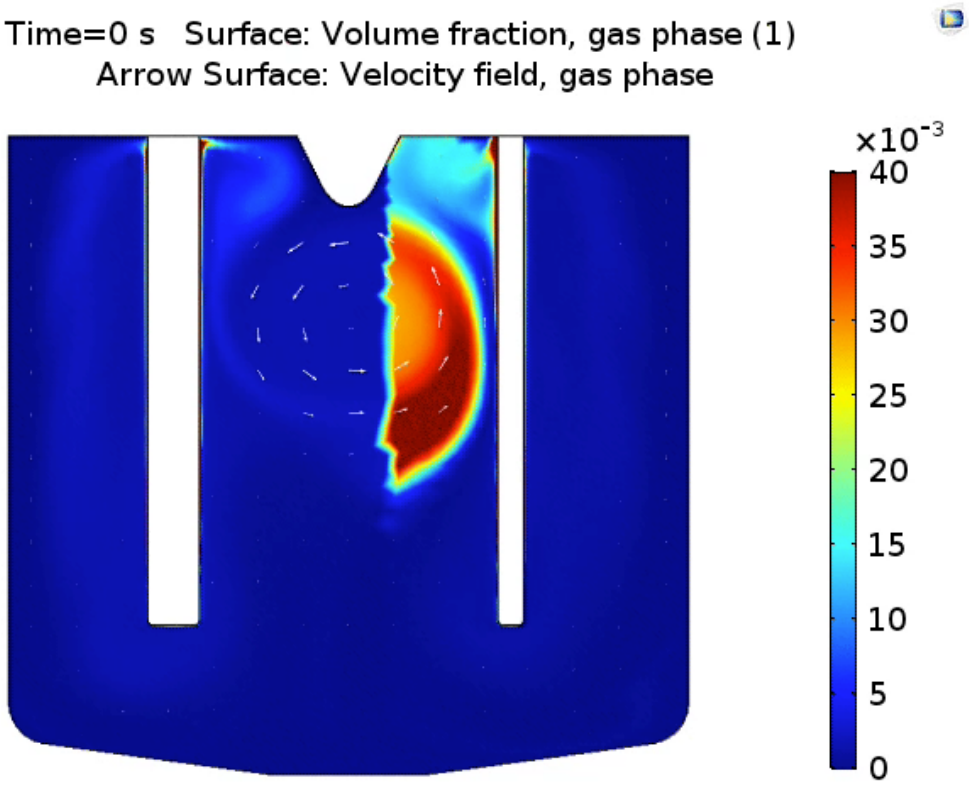
1. Secondary current distribution with Butler-Volmer kinetics and double layer capacitance
2. Heat transfer in fluids
3. Electrochemical heating multiphysics
4. Laminar bubbly flow with spatial dependent gas properties

MEO1 Table for model here

Mr. E Oosthuizen; 18.10.2018

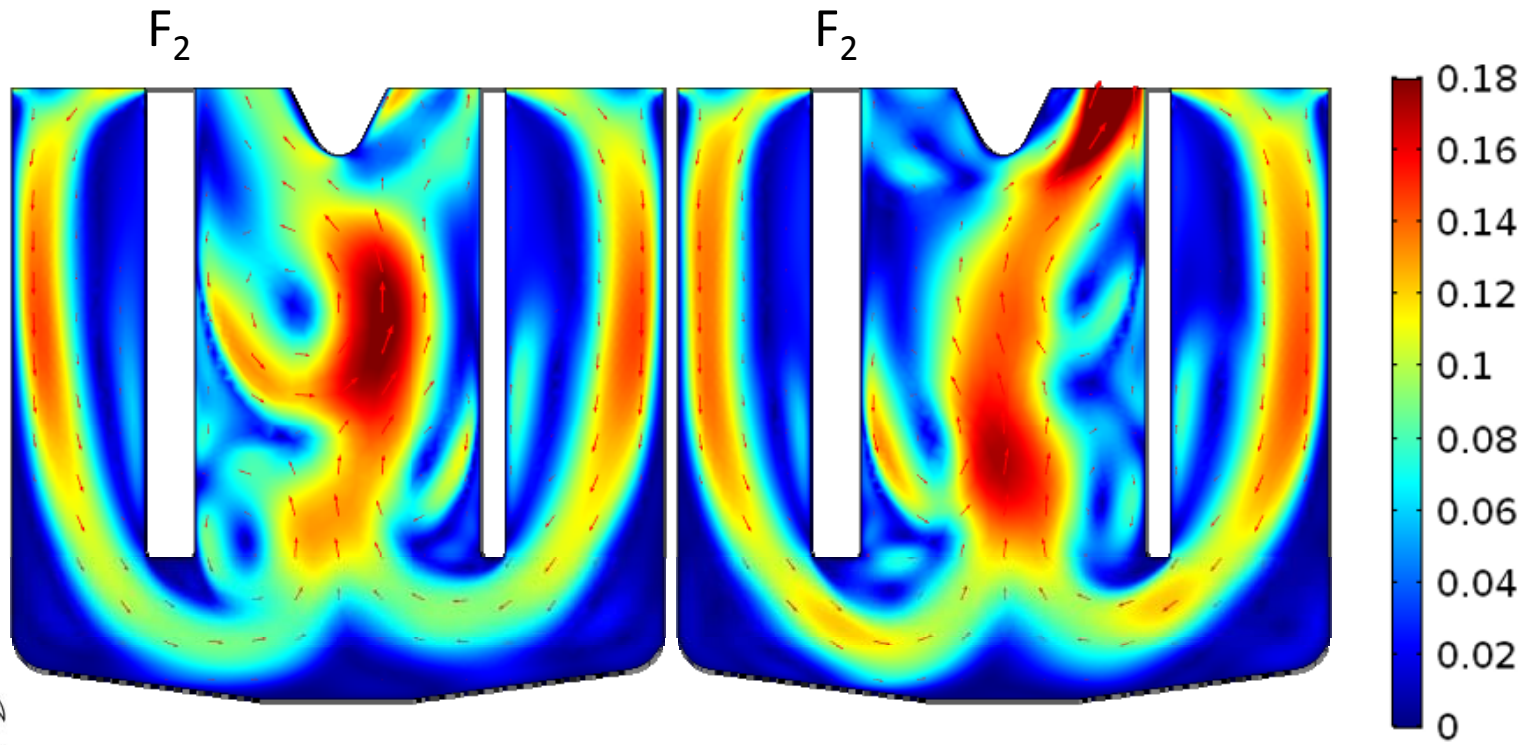
Modelling- results for 2D parallel plate geometry, spatial gas





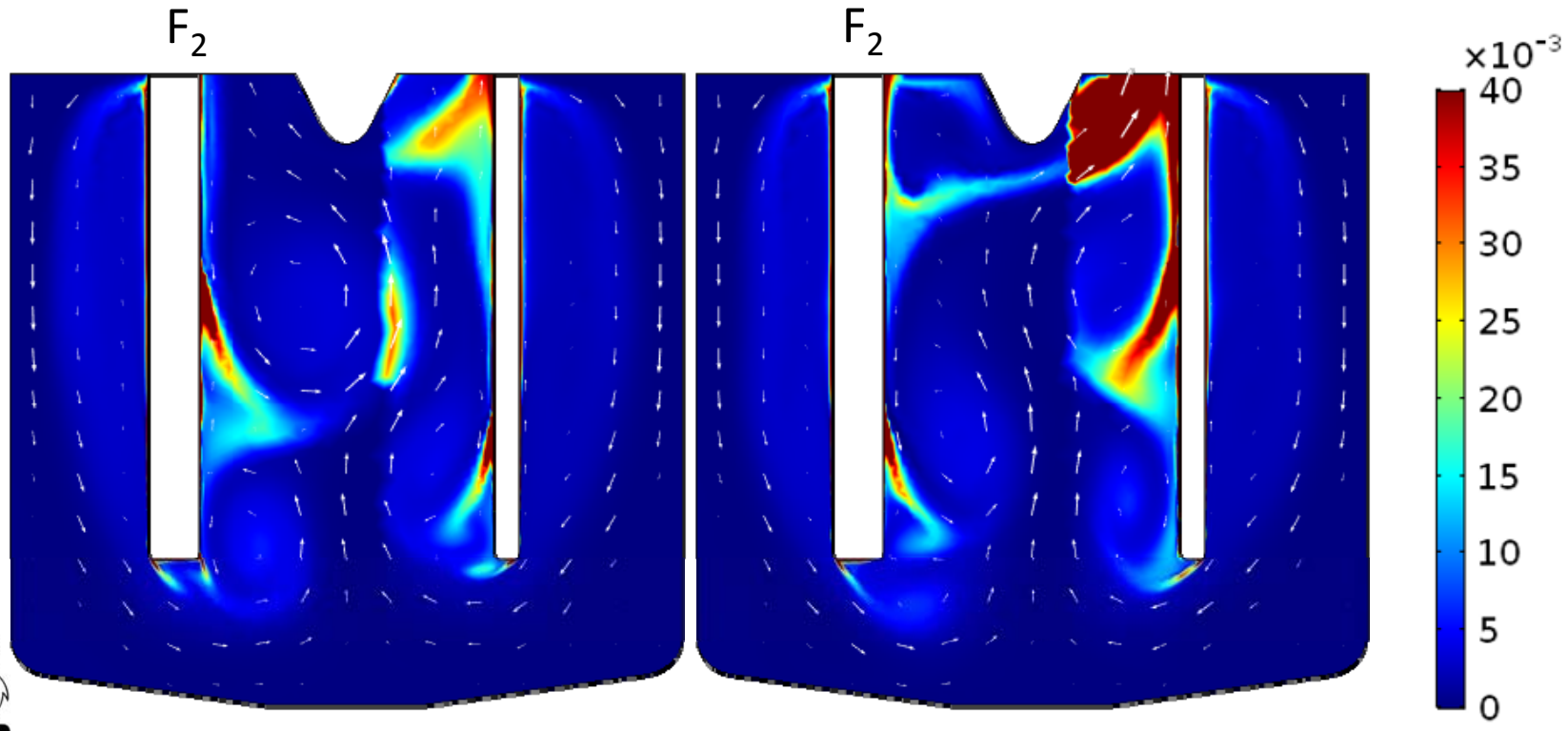
Modelling- results for 2D parallel plate geometry, spatial gas

Liquid phase velocity magnitude ($m \cdot s^{-1}$)

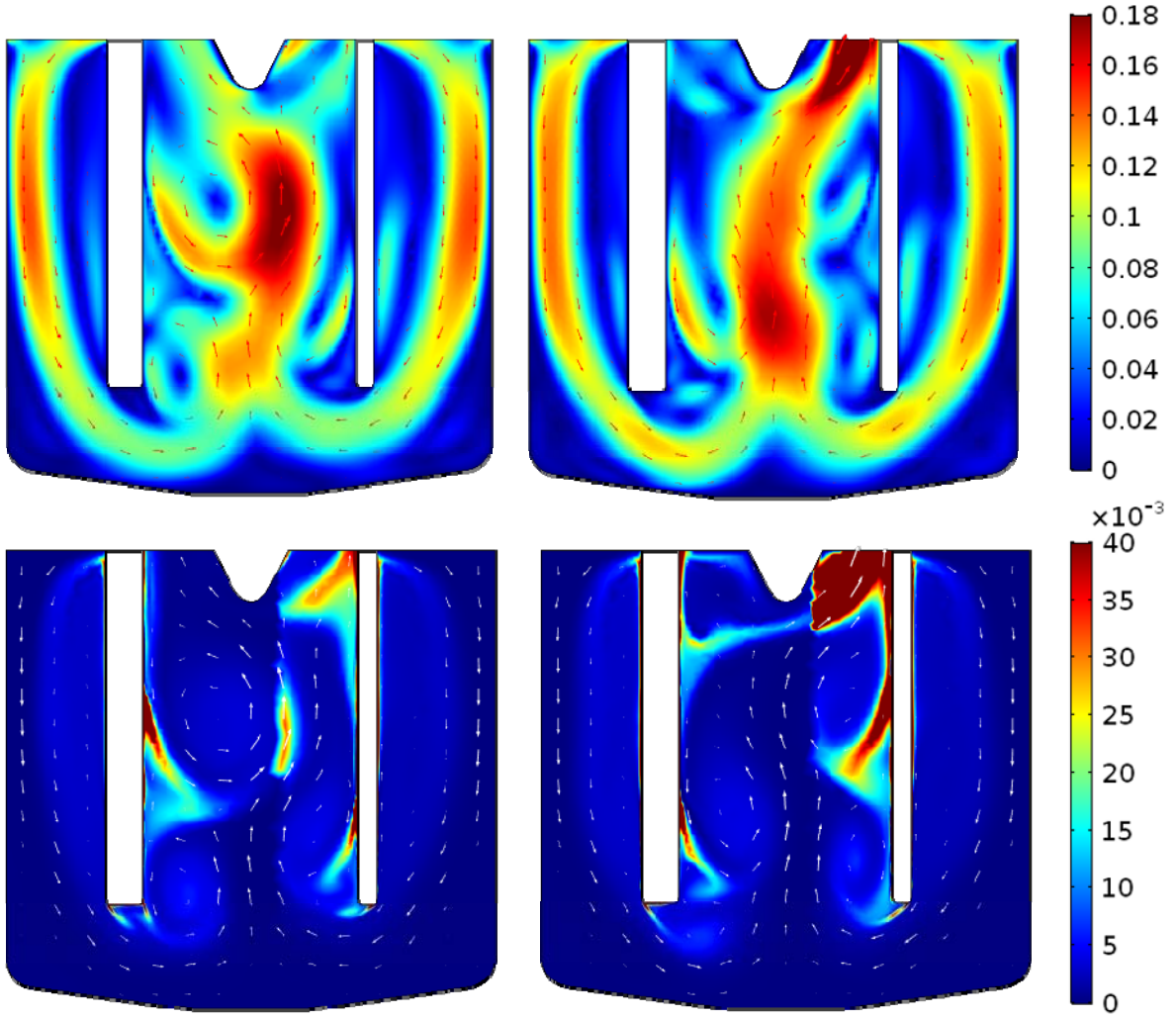


Modelling- results for 2D parallel plate geometry, spatial gas

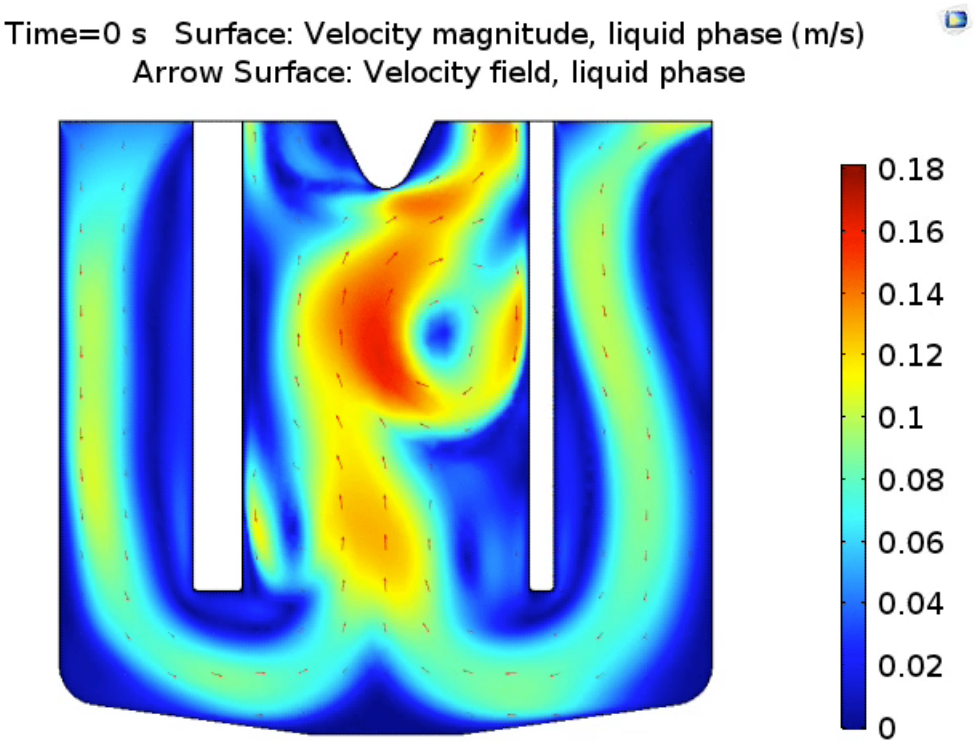
Gas phase volume fraction

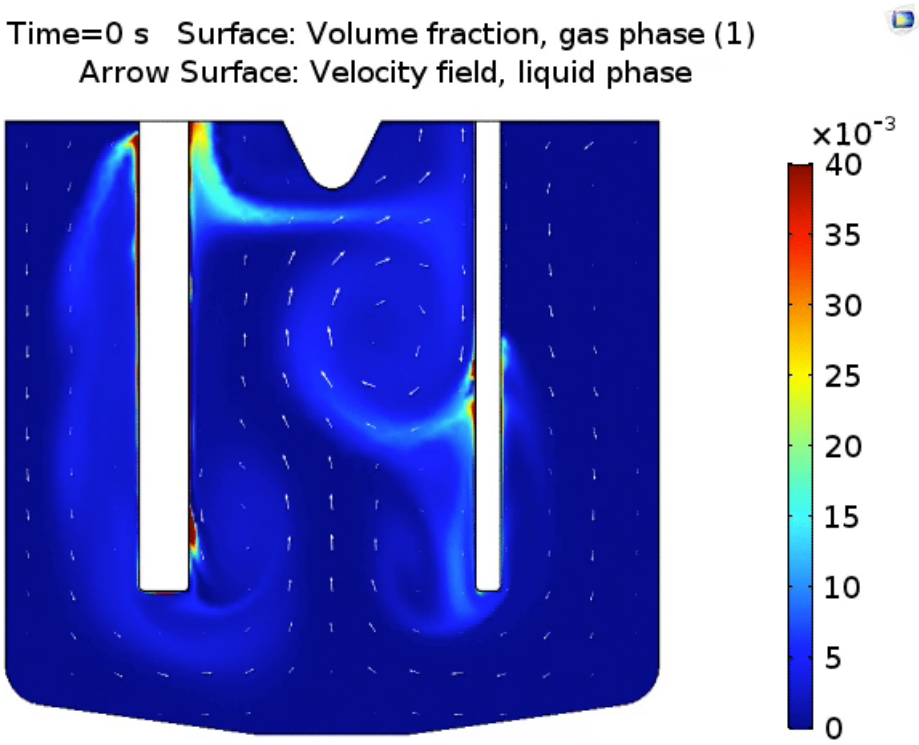


Modelling- results for 2D parallel plate geometry, spatial gas



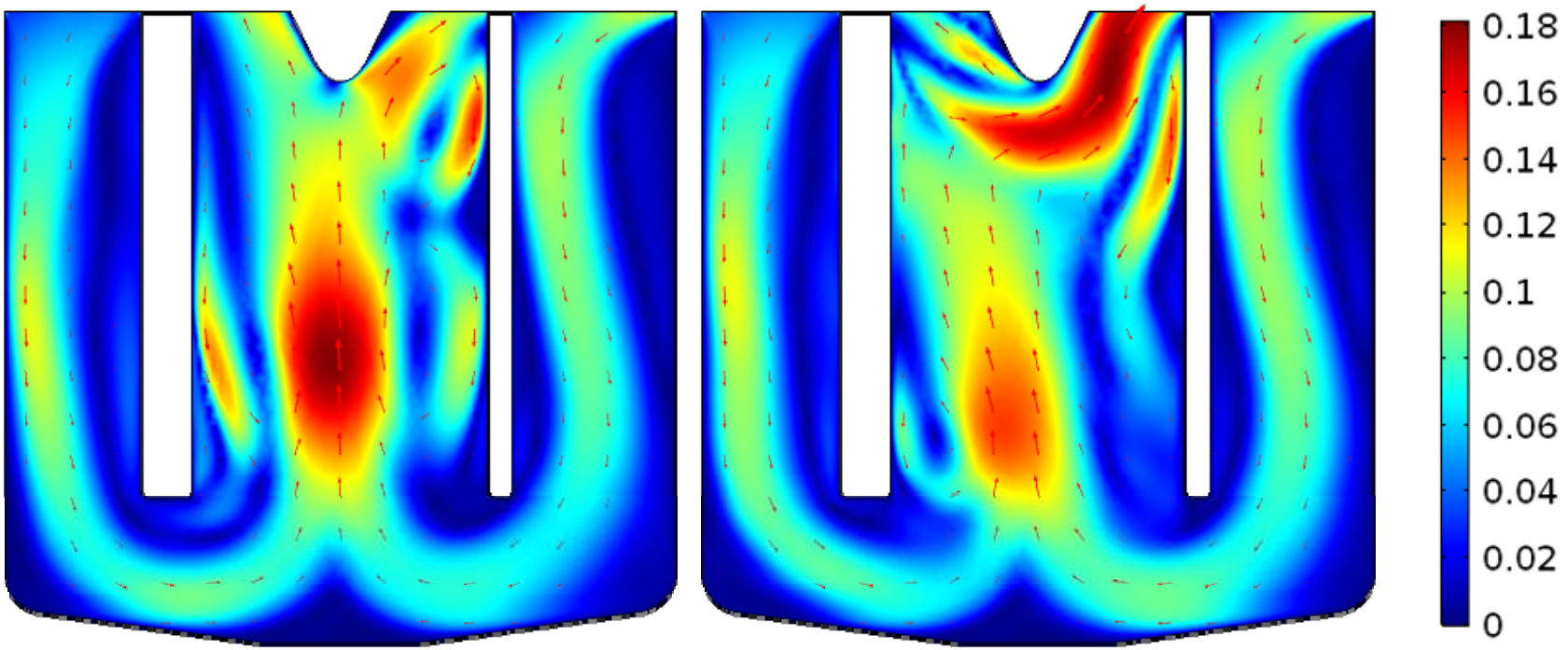
Modelling- results for 2D parallel plate geometry, non-spatial gas



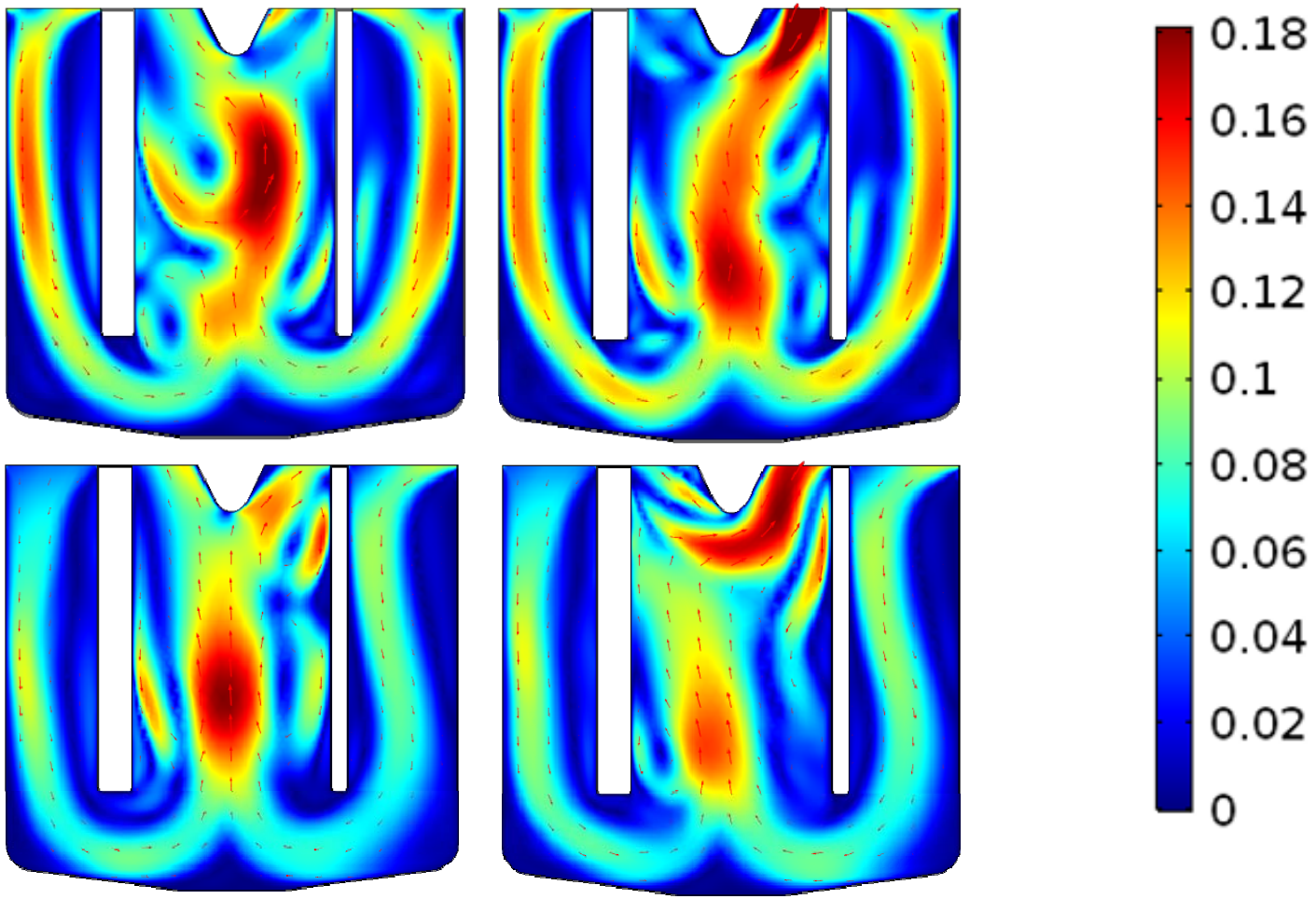


Modelling- results for 2D parallel plate geometry, non-spatial gas

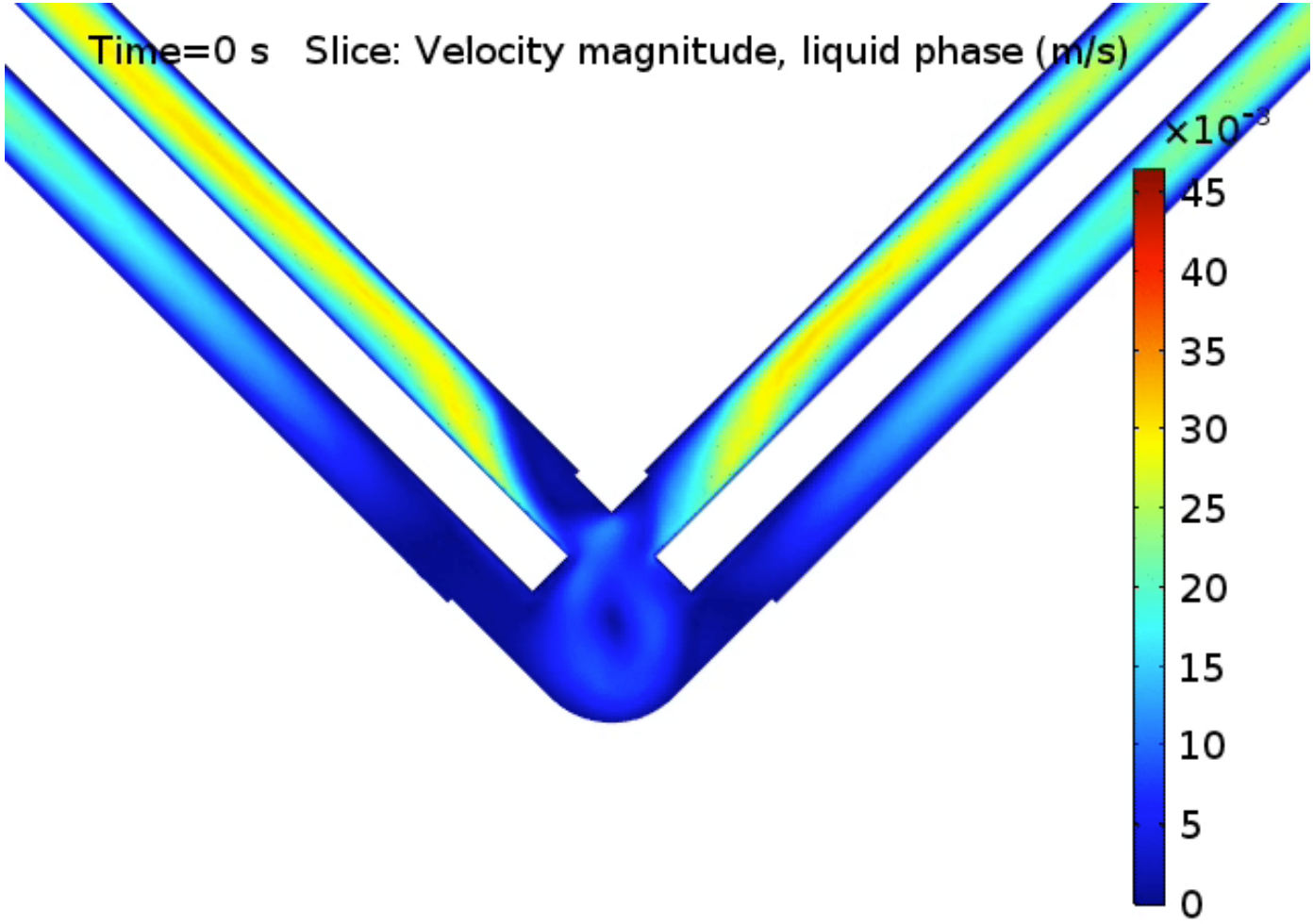
Liquid phase velocity magnitude ($m \cdot s^{-1}$)



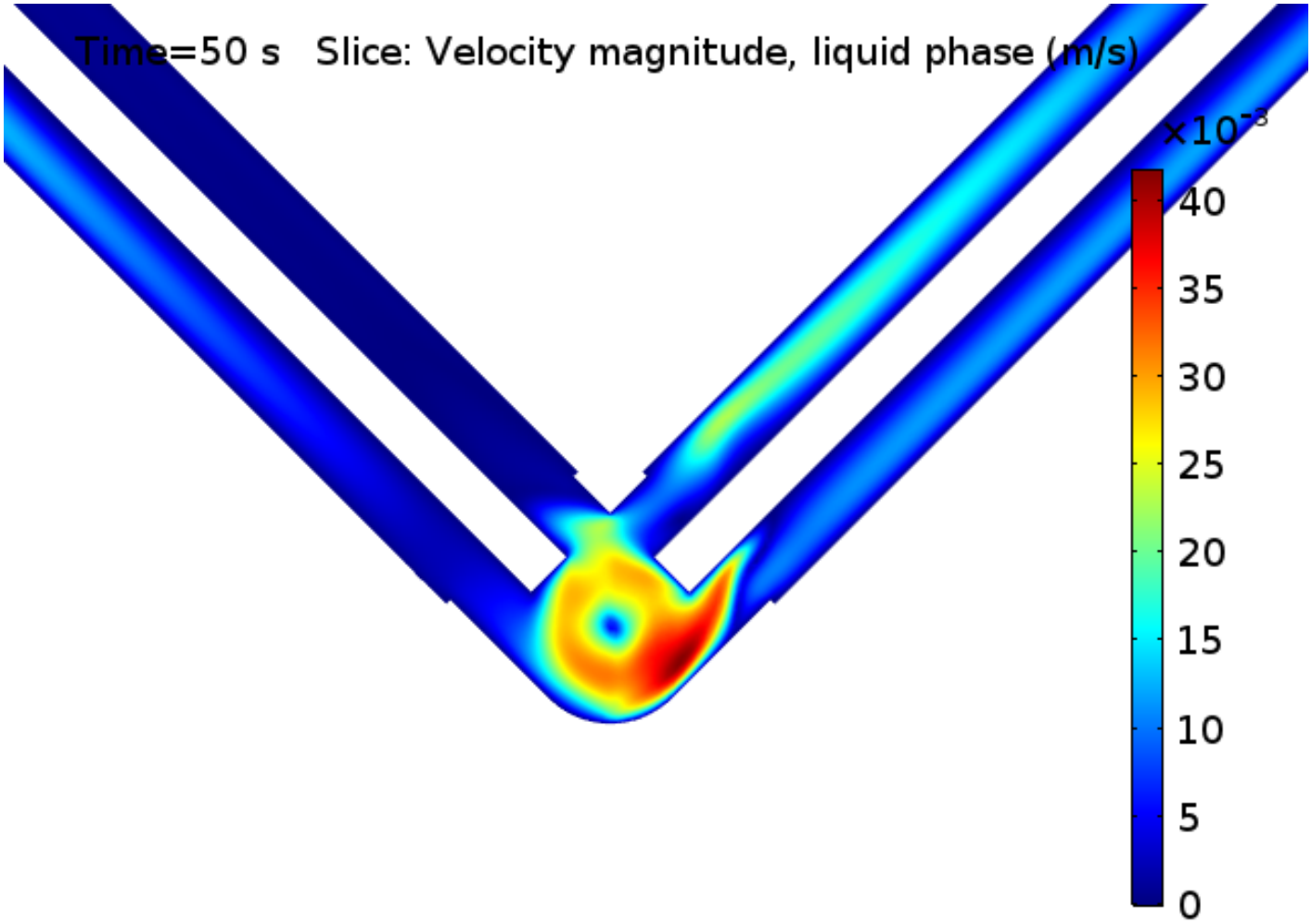
Modelling- results for 2D parallel plate geometry, spatial gas



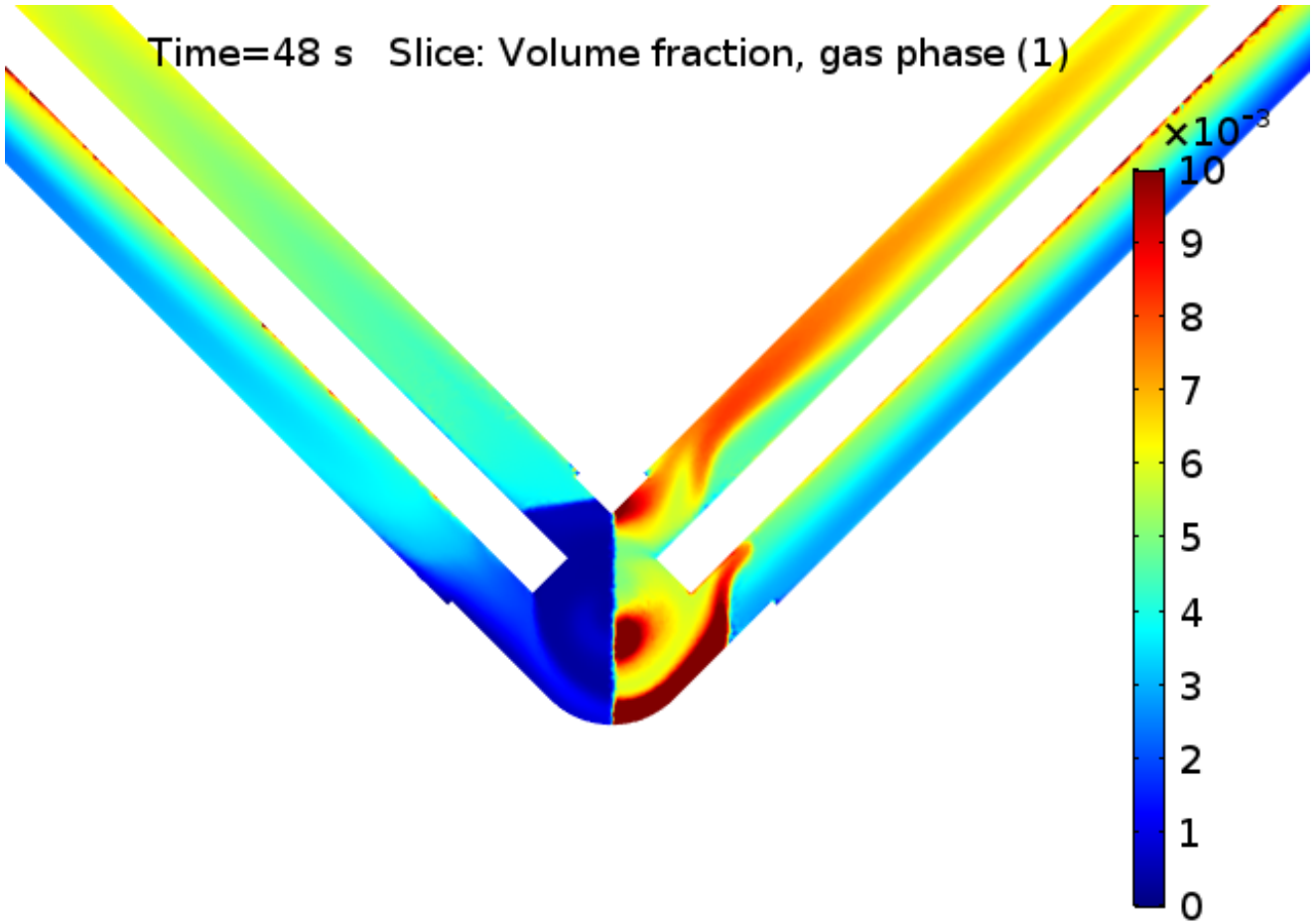
Modelling- results for 3D Pauling cell geometry, spatial gas



Modelling- results for 3D Pauling cell geometry, spatial gas



Modelling- results for 3D Pauling cell geometry, spatial gas



Thank you

Modelling- results for 3D Pauling cell geometry, spatial gas