

Modelling and simulation of a rotating electrolyser

Introduction

It has been demonstrated that imposing an external gravity field on an electrolyser can improve its efficiency.

This effect is believed to be a result of bubbles being removed faster from the catalyst surface and/or gas dissolved in the water being transported away such that the nucleation rate at the catalyst surface is reduced. Both these phenomena will lead to a reduced bubble coverage and therefore a reduced bubble overpotential.

Primary objective

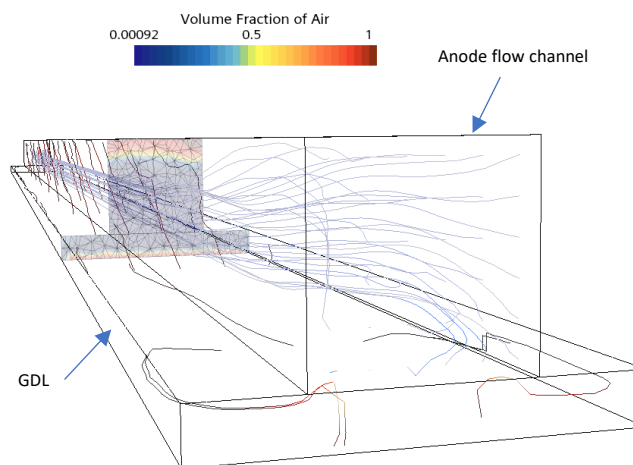
- Create a model describing the bubble evolution and lifetime at the catalyst surface.
- Use numerical methods to determine the steady-state bubble coverage at the catalyst surface.
- Determine the overpotential associated with the bubble coverage and compare with experimental results.

Secondary objectives

- Develop and improve on existing numerical methods and tools.

Cross-disciplinarity

The project belongs to the fields of computer science and hydrogen technology. It is therefore important to bring contributions to both of these fields in an efficient and appropriate fashion.



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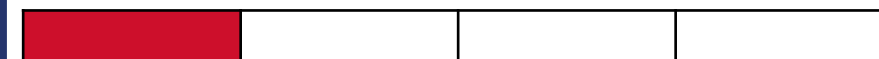
Related projects: HyValue

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Estimated progress of the PhD project:

Just started ... < 50 % > 50 % Almost done ☺



Publications

N/A