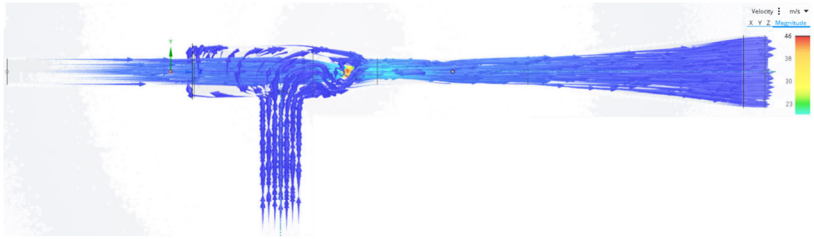
Ejector Geometry Design Analysis Procedure For Fuel Cell Drives

Master's Thesis, Project Report

The Chair of Alternative Vehicle Drives (ALF) conducts research in the fields of electromobility, hydrogen power, and PEM fuel cells. As is the case with traditional power drives, fuel cell electric drives esentially depend on peripheral components for a normal, sustained functioning, so these components are also part of our research area. The operation of fuel cell systems for powertrains necessitates a continuous anode fuel recirculation, which is carried out by a pumping device carefully designed or selected for the task. For low to medium power units subject to narrow operating load ranges, ejectors (jet pumps) have found a niche use, mainly due to their simplicity, reliability, and low maintenance cost. The downside is that the fixed geometry of an ejector has to be designed very carefully to cover its required operating range.

The main objective of the project is to develop a methodology and tools for the design, and control of hydrogen ejectors for fuel cell applications. Within the scope of this research work, the following subtasks are expected to be implemented:

- Literature and market research
- Definition of ejector parametric performance maps as requirement from fuel cell system operation dynamics
- Model evaluation and comparison of different geometries
- Evaluation of the results and transfer into a scientific paper format



Supervisor: Adrian Maroni M. Sc.