# CAD/CFD simulation of bipolar plates for PEM fuel cells

**Task description**

As part of the research project „GENIE – Generation of innovative PEM fuel cells“, the effects of the bipolar plates design on the media flow field as well as on the bipolar plates manufacturing process will be analysed.

Bipolar plates (shortly: BPP) are one of the key structural and functional components of the Proton Exchange Membrane (PEM) fuel cell stack. Their geometry is responsible for the quality of fuel and oxidant supply distribution to the Membrane Electrode Assembly (MEA) as well as for the temperature gradient across the membrane surface and the collection of the product water. Bipolar plates account also for a large proportion in volume, weight and cost of fuel cells. In this regard, liquid-cooled metal bipolar plates might well take over the role of current graphite BPP solution as soon as the PEM fuel cell technology approaches the series mass production goal. This is due to the relatively lower production costs and increased flow-field design capabilities.

This master thesis should cover both 1) flow-field performances towards media supply, temperature distribution and water removal as well 2) BPP manufacturing possibilities via moulding and welding of the two BPP halves.

**Assignment**

- Literature research on state of the art flow fields (4 weeks)
- Definition of design requirements and constraints (4 weeks)
- Iterative design loops based on CAD/CFD simulation (12 weeks)
- Writing of thesis report (4 weeks)

**Start:** as of now

**Duration**: ca. 6 months

**Paid Master Thesis**

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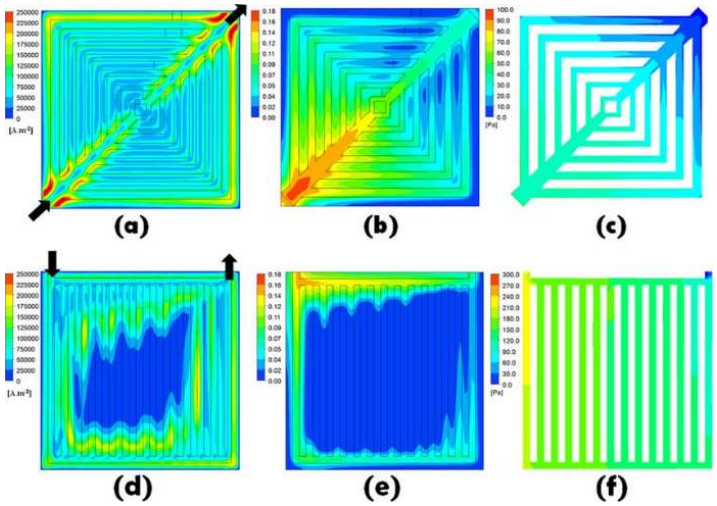


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