

## Experimental Validation of a Computational Fluid Dynamics Model for PEM Fuel Cells

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The CFD (Computational Fluid Dynamics) model developed by USC (University of South Carolina) has been validated through an experimental investigation. A set of experimental apparatus was prepared to obtain the average current density distributions and the channel pressure drops for a single fuel cell with a 50 cm<sup>2</sup> active area. A CFD simulation was performed using the USC model, which is able to predict the gas concentrations, current densities, pressure drops, etc. for the fuel cell. The initial model parameters of the model resulted in a large discrepancy between the simulation results and the experimental ones. However, optimal electro-chemical parameters, which best fits the simulation results with the experimental ones, were found through extensive CFD simulations and experiments. It is expected that the USC model and optimal electro-chemical parameters can be used to design optimal flow-fields of bipolar-plates.