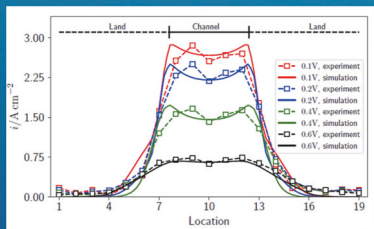
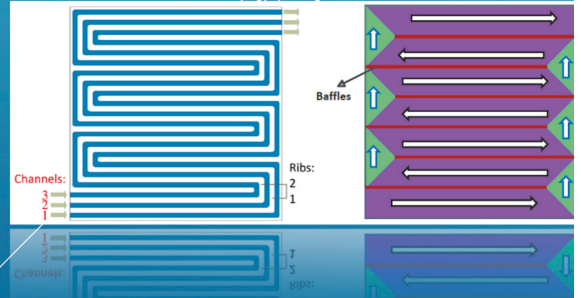
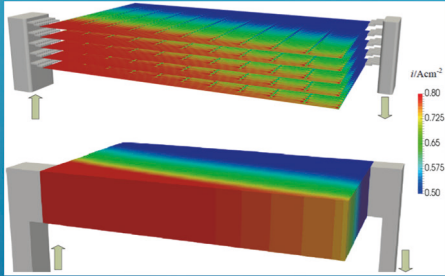
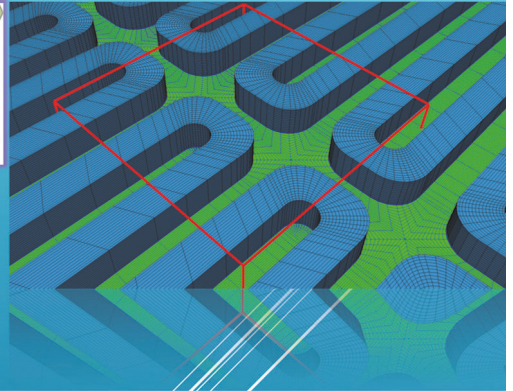
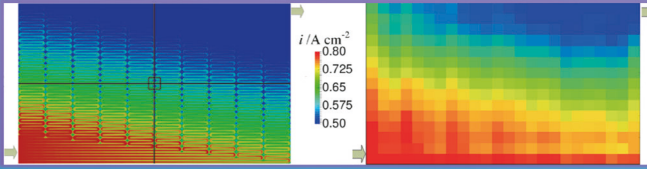


$$\frac{\partial r s_{\varphi} \rho_{\varphi} \mathbf{U}_{\varphi}}{\partial t} + r s_{\varphi} \rho_{\varphi} \mathbf{U}_{\varphi} \cdot \nabla(\mathbf{U}_{\varphi}) = -\frac{r s_{\varphi}}{\tau^2} \nabla p_{\varphi} + \frac{r s_{\varphi} \rho_{\varphi}}{\tau} \mathbf{g} + \nabla \cdot \left(\frac{r s_{\varphi} \mu_{\varphi}}{\tau^2} \nabla \mathbf{U}_{\varphi} \right) + \frac{r \mathbf{M}_{\varphi}}{\tau} - s_{\varphi} r \mathbf{F}_D$$



$$\frac{\partial s_{\varphi} \rho_{\varphi} \mathbf{U}_{\varphi}}{\partial t} + s_{\varphi} \rho_{\varphi} \mathbf{U}_{\varphi} \cdot \nabla(\mathbf{U}_{\varphi}) = -s_{\varphi} \nabla p_{\varphi} + s_{\varphi} \rho_{\varphi} \mathbf{g} + \nabla \cdot (s_{\varphi} \mu_{\varphi} \nabla \mathbf{U}_{\varphi}) + \mathbf{M}_{\varphi} - \frac{s_{\varphi} \mu_{\varphi} \mathbf{U}_{\varphi}}{k k_{rel, \varphi}}$$

Modeling and Simulation of Polymer Electrolyte Fuel Cells

Shidong Zhang

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