Optimization of Channel Design for Solid Oxide Fuel Cell

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This work presents three-dimensional (3D), computational fluid dynamics (CFDs) electrochemical model for solid oxide fuel cells (SOFCs) with two finite layers. Energy, mass, momentum, and species transport were simulated by the commercial CFD code FLUENT. The developed model recounts the detailed electrochemical reactions on the triple phase boundary (TPB) electrochemical active area in Ni/YSZ cermet anodes and LSM/YSZ composite. A parametric study was performed with the fully developed laminar flow at the fuel/air channel with co-, counter- and cross-flow configuration. The temperature distribution in various channel design was studied to analyze the efficient channel design for better heat control.
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