

## Numerical Analysis of Liquid Metal Magnetohydrodynamic Flows in a Manifold with Three Sub-Channels

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**Abstract :** In the current study, three-dimensional liquid metal (LM) magneto-hydrodynamic (MHD) flows in a manifold with three sub-channels under a uniform magnetic field are numerically investigated. In the manifold, the electrical current can cross channel walls, thus having influence on the flow distribution in each sub-channel. A case with various arrangements of electric conductivity for different parts of channel walls is considered, yielding different current distributions as well as flow distributions in each sub-channel. Here, the imbalance of mass flow rates in the three sub-channels is addressed. Meanwhile, predicted are detailed behaviors of the flow velocity, pressure, current and electric potential of LM MHD flows with three sub-channels. Commercial software CFX is used for the numerical simulation of LM MHD flows.

**Keywords :** CFX, liquid metal, manifold, MHD flow

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