

## MHD Flow in a Curved Duct with FCI under a Uniform Magnetic Field

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**Abstract :** The numerical investigation of the three-dimensional liquid-metal (LM) magnetohydrodynamic (MHD) flows in a curved duct with flow channel insert (FCI) is presented in this paper, based on the computational fluid dynamics (CFD) method. A uniform magnetic field is applied perpendicular to the duct. The interdependency of the flow variables is examined in terms of the flow velocity, current density, electric potential and pressure. The electromagnetic characteristics of the LM MHD flows are reviewed with an introduction of the electric-field component and electro-motive component of the current. The influence of the existence of the FCI on the fluid flow is investigated in detail. The case with FCI slit located near the side layer yields smaller pressure gradient with stable flow field.

**Keywords :** curved duct, flow channel insert, liquid-metal, magnetohydrodynamic

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