

## Magnetohydrodynamic Flows in a Misaligned Duct under a Uniform Magnetic Field

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**Abstract :** This study numerically investigates three-dimensional liquid-metal (LM) magnetohydrodynamic (MHD) flows in a misaligned duct under a uniform magnetic field. The duct consists of two misaligned horizontal channels (one is inflow channel, the other is outflow channel) and one central vertical channel. Computational fluid dynamics simulations are performed to predict the behavior of the MHD flows, using commercial code CFX. In the current study, a case with Hartmann number 1000 is considered. The electromagnetic features of LM MHD flows are elucidated to examine the interdependency of the flow velocity, current density, electric potential, pressure drop and Lorentz force. The results show that pressure decreases linearly along the main flow direction.

**Keywords :** CFX, liquid-metal magnetohydrodynamic flows, misaligned duct, pressure drop

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