
Contribution ID: **253** Type: **Poster**

# The influence of heat transfer on MHD flow in the blanket at high Hartmann Number

*Tuesday 6 June 2017 13:40 (2 hours)*

In the breeding blanket fusion reactor, the dynamic viscosity of liquid metal (LM) is influenced by heat transfer, leading to the change of velocity distribution. The effect of heat transfer on magnetohydrodynamic(MHD) flow in a rectangular duct at high Hartmann Number is investigated by a coupling method. In this method, the velocity field is calculated through a second-order projection method, coupling with the temperature distribution calculated by a finite volume method. The numerical result without temperature influence is validated by Hunt's and Shercliff's analytical solutions, and shows very good accuracy. On the basis of the numerical code, the velocity distribution of a Hunt's case with temperature influence is simulated. The simulation result indicates that the velocity field is different from the benchmark solution as the result of the influence of heat transfer.

## Eligible for student paper award?

Yes

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**Session Classification:** T.POS: Poster Session T

**Track Classification:** Blankets and tritium breeding