## Documents

Alsabery, A.I., Armaghani, T., Chamkha, A.J., Sadiq, M.A., Hashim, I.

**Effects of two-phase nanofluid model on convection in a double lid-driven cavity in the presence of a magnetic field**

(2019) *International Journal of Numerical Methods for Heat and Fluid Flow*, 29 (4), pp. 1272-1299. Cited 3 times.

**Abstract**

Purpose: The aim of this study is to investigate the effects of two-phase nanofluid model on mixed convection in a double lid-driven square cavity in the presence of a magnetic field. The authors believe that this work is a good contribution for improving the thermal performance and the heat transfer enhancement in some engineering instruments. Design/methodology/approach: The current work investigates the problem of mixed convection heat transfer in a double lid-driven square cavity in the presence of magnetic field. The used cavity is filled with water-Al2O3 nanofluid based on Buongiorno's two-phase model. The bottom horizontal wall is maintained at a constant high temperature and moves to the left/right, while the top horizontal wall is maintained at a constant low temperature and moves to the right/left. The left and right vertical walls are thermally insulated. The dimensionless governing equations are solved numerically using the Galerkin weighted residual finite element method. Findings: The obtained results show that the heat transfer rate enhances with an increment of Reynolds number or a reduction of Hartmann number. In addition, effects of thermophoresis and Brownian motion play a significant role in the growth of convection heat transfer. Originality/value: According to above-mentioned studies and to the authors' best knowledge, there has no study reported the MHD mixed convection heat transfer in a double lid-driven cavity using the two-phase nanofluid model. Thus, the authors of the present study believe that this work is valuable. Therefore, the aim of this comprehensive numerical study is to investigate the effects of two-phase nanofluid model on mixed convection in a double lid-driven square cavity in the presence of a magnetic field. The authors believe that this work is a good contribution for improving the thermal performance and the heat transfer enhancement in some engineering instruments. © 2018, Emerald Publishing Limited.

2-s2.0-85058122003
**Document Type:** Article
**Publication Stage:** Final
**Source:** Scopus