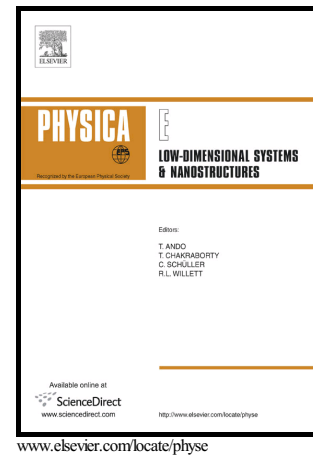


Different nano particles volume fraction and Hartmann number effects on flow and heat transfer of water-silver nanofluid under the variable heat flux

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# Different Nano particles volume fraction and Hartmann number effects on flow and heat transfer of water-silver nanofluid under the variable heat flux

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## Abstract

Nanofluid flow and heat transfer composed of water-silver nanoparticles is investigated numerically inside a microchannel. Finite volume approach (FVM) is applied and the effects of gravity are ignored. The whole length of Microchannel is considered in three sections as  $l_1=l_3=0.151$  and  $l_2=0.71$ . The linear variable heat flux affects the microchannel wall in the length of  $l_2$  while a magnetic field with strength of  $B_0$  is considered over the whole domain of it. The influences of different values of Hartmann number ( $Ha=0, 10, 20$ ), volume fraction of the nanoparticles ( $\phi=0, 0.02, 0.04$ ) and Reynolds number ( $Re=10, 50, 200$ ) on the hydrodynamic and thermal properties of flow are reported. The investigation of slip velocity variations under the effects of a magnetic field are presented for the first time (to the best knowledge of author) while the non-dimensional slip coefficient are selected as  $B=0.01, 0.05, 0.1$  at different states.

**Keywords:** magnetic field; Nano particles; Hartmann number; water-silver nanofluid

## Nomenclature

Non-dimensional slip coefficient ( $=\beta/h$ )

$B$

The power of the magnetic field

$B_0$

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