

Documents

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Natural Convection Analysis in a Cavity with an Inclined Elliptical Heater Subject to Shape Factor of Nanoparticles and Magnetic Field
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Abstract

The objective of the present study is to peruse the natural convection in the cavity containing inclined elliptical heater under shape factor of nanoparticles and magnetic field. The control volume-based finite element method is used for solving conservation equations. Numerical results show very good grid independency and very good compromise with other works. The result shows the heat transfer grows via mounting nanofluid volume fraction. The increment of Ra number also leads the heat transfer to ascend. Heat transfer of nanofluid with three different shapes of nanoparticles is studied, and results show the platelet nanoparticle is better than the other ones. The influence of magnetic field on heat transfer is also investigated and discussed. The obtained outcomes represent that at a certain Rayleigh number, the average Nusselt number descends with the ascendant of Hartmann number. Finally, the new correlation is reported for calculating the Nu number in these geometries. © 2019, King Fahd University of Petroleum & Minerals.

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