عنوان مقاله:

Numerical study of turbulent forced convection jet flow of nanofluid in a converging sinusoidal channel

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نویسندگان:

.A. Taheri - *School of Mechanical Engineering, Mazandaran University of Science and Technology, Babol, Iran*

E. Aboukazempour Amiri - *Department of Mechanical Engineering, Iran University of Science and Technology, .Narmak, Tehran, Iran*

.A. Ramiar - *School of Mechanical Engineering, Babol University of Technology, P. O. Box ۴۸۴, Babol, Iran*

.A. A. Ranjbar - *School of Mechanical Engineering, Babol University of Technology, P. O. Box ۴۸۴, Babol, Iran*

.M. Rahimi-Esbo - *School of Mechanical Engineering, Babol University of Technology, P. O. Box ۴۸۴, Babol, Iran*

خلاصه مقاله:

Research in convective heat transfer using suspensions of nanometer-sized solid particles in base liquids started only over the past decade. Recent investigations on nanofluid, as such suspensions are often called, indicate that the suspended nanoparticles remarkably change the transport properties and heat transfer characteristics of the suspension. Bending walls can also improve heat transfer by increasing the total heat transfer from a surface and changing the behavior of the flow. In this paper two-dimensional incompressible nanofluid flow in a confined sinusoidal converging jet in turbulent flow regime is numerically investigated. Results have been shown for the flow structure at different Reynolds numbers for steady asymmetric jet development at various values of the duct-to-jet width ratio (aspect ratio), different amplitudes of surface undulation and different volume fractions of nanoparticles. For considering unsteady treatment of the flow, the streamlines and temperature contours result for the unsteady problem is presented and compared with the steady results. The present computations are in a very good agreement with experimental results in open literature. The results show that by increasing the Reynolds number, aspect ratio, .amplitude and volume fraction the average the Nusselt number will increase

کلمات کلیدی:

Aspect Ratio, nanoparticles, Nusselt number, Recirculation region, Wavy wall