عنوان مقاله:

Numerical Study of Turbulent Fluid Flow and Heat Transfer in a Channel with a Corrugated Wall

محل انتشار:

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خلاصه مقاله:

In this paper, a numerical simulation of the steady two-dimensional incompressible airflow with forced convective heat transfer in the turbulent regime was done in a channel with a corrugated wall. The Navier-Stokes and energy equations, in conjunction with two equations of the realizable k-ε turbulence model were solved by the finite volume method. To discretize the governing equations, a second-order upwinding scheme, and to couple the pressure and velocity fields, the SIMPLE algorithm was applied. It is found that the height of the channel, corrugation angle, and Reynolds number affect the flow and heat transfer. It is found that the optimum heat transfer is achieved in channel height of 1.5 cm, corrugation angle of 60°, and Reynolds number of 4000. By using the corrugated channels in heat exchangers, it is possible to enhance the heat transfer and decrease their size.

کلمات کلیدی:

Convective heat transfer, Corrugated channel, Navier-Stokes equations, Realizable k-ε turbulence model

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