عنوان مقاله:

Optimizing naturally driven air flow in a vertical pipe by changing the intensity and location of the wall heat flux

محل انتشار:

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خلاصه مقاله:

Heat transfer from the internal surfaces of a vertical pipe to the adjacent air gives rise to the air flow establishment within the pipe. With the aim of optimizing the convective air flow rate in a vertical pipe, the details of theflow and thermal fields were investigated in the present study. Conservation equations of mass, momentum, and energy were solved numerically using simple implicit forward-marching finite difference scheme for a twodimensionalaxis-symmetric flow. In order to evaluate and optimize the air flow rate passing through the pipe, the position and intensity of the wall heat flux were altered when the total employed heat transfer rate was constant.Based on the results of the numerical analysis, relatively more air flow rate was achieved when more intensified heat flux was employed at the lowestpart of the vertical pipe. This finding was then validated using a simpleexperimental setup. The results of the present study could be useful in the design and application of buoyancy-assisted natural ventilation systems

کلمات کلیدی:

Natural ventilation, vertical pipe, wall heat flux