

## عنوان مقاله:

Effect of Property Variation on the Fluid Flow and Thermal Behavior in a Vertical Channel

## محل انتشار:

دوماهنامه مکانیک سیالات کاربردی, دوره 12, شماره 4 (سال: 1398)

تعداد صفحات اصل مقاله: 12

## نویسندگان:

K. Roy - Department of Mechanical Engineering, National Institute of Tecnology, Silchar, Assam, 788010, India

B. Das - Department of Mechanical Engineering, National Institute of Tecnology, Silchar, Assam, 788010, India

## خلاصه مقاله:

Natural convection in a vertical fin array is studied numerically for Non-Boussinesq and Boussinesq fluid with the effect of property variations. Simulations are carried out for the specified range: non-dimensional fin spacing = 0.2 to 0.5, non-dimensional clearance = 0.05 to 0.4 and Grashof number =  $1.86 \times 10^5$  to  $8.64 \times 10^5$ . Computations are executed to plot the isotherms contours across the section close to the outlet to exemplify the effect of non-Boussinesq fluid in natural convection for variable properties. Computation demonstrates a maximum of 9% higher overall Nu for fixed property Boussinesq fluid than compared to the non-Boussinesq fluid. And for the Boussinesq fluid with the thermo-physical property maintained constant, the results obtained for local Nusselt number is consistently higher than compared to the inconsistent thermo-physical property. Also temperature drop close to the tip of the fin is higher at higher Gr, indicating higher heat transfer rate. Finally, for overall Nusselt number a correlation with the governing parametyers for the present investigation is developed.

## کلمات کلیدی:

Boussinesq, Natural convection, Non, Variable property, Nusselt number

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1369662>

