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Analytical investigation of nanoparticle migration in a duct considering thermal radiation

(2019) *Journal of Thermal Analysis and Calorimetry*, 135 (3), pp. 1629-1641. Cited 5 times.

Abstract

Buongiorno model is applied to investigate nanofluid migration through a permeable duct in the presence of external forces. Influences of radiation and Joule heating on first law equation are added. Final formulas are solved via differential transform method. Roles of suction, thermophoretic, radiation and Brownian motion parameters, Schmidt number, Hartmann number, Eckert number were presented. Results show that temperature gradient improves with the enhancement of Reynolds number, suction and Radiation parameters. Nu augments with the augmentation of Hartmann and Eckert numbers, while reverse behavior is seen for skin friction coefficient. Also, it can be concluded that Nusselt number enhances with the increase in radiation parameter but it decreases with the increase in Brownian motion. © 2018, Akadémiai Kiadó, Budapest, Hungary.

2-s2.0-85050209038

Document Type: Article

Publication Stage: Final

Source: Scopus