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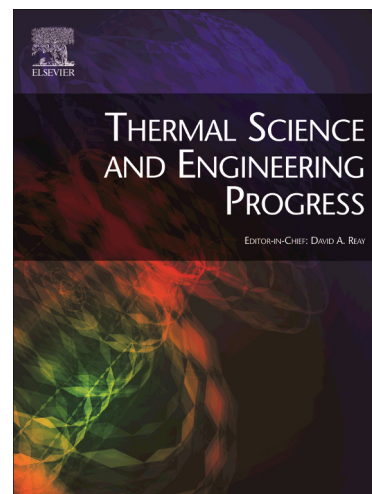
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Abstract

In the present work, an interesting and simple analytic solution to wall jet flow of nanofluids is presented. The concept of exponentially decaying wall jet flows (those integral constraint proposed by Glauert is retained) is targeted. A general scheme for momentum similarity equation is considered in which the effects of suction together with moving wall are allowed. A parametric two-phase modeling framework is brought into account to study the wall jet flow of nanofluids. The only simplification is with respect to thermophoresis effect elimination which in particular reveals some facts regarding the effectiveness of boundary conditions for particle transport equation. In this regard, a brief discussion is initially provided as may be of help to a better understanding of the nanoparticles behavior at the wall. Finally, closed form analytic expressions are obtained for heat and mass transfer characteristics of wall jet flow of nanofluids. It is hopeful that the rate of heat and mass transfer as well as temperature and concentration distributions can be better understood by the means of the presented formulae.

Keywords

Wall Jet Flow of Nanofluids; Exact Closed Form Solution to Heat and Mass Transfer Characteristics; Similarity Solution; Two-Phase Modeling

Nomenclature

u	X- Component Velocity	T	Temperature
v	Y- Component Velocity	C	Concentration
ψ	Stream Function	D_T	Thermophoresis Diffusion rate
ν	Kinematic Viscosity	α	Thermal Diffusivity
U_0	Reference Velocity	Pr	Prandtl Number
M	Dimensionless Flux of Exterior Momentum Flux	Sc	Schmidt Number
τ	$(\rho C_p)_{np} / (\rho C_p)_{bf}$	N_t	Thermophoresis Parameter
D_B	Brownian Diffusion Rate	N_b	Brownian Parameter

Introduction

To start, it is worth mentioning Glauert as the pioneer who first introduced the wall jet [1]. The similarity solution for such a flow proposed once by Glauert was subject to a fixed wall

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