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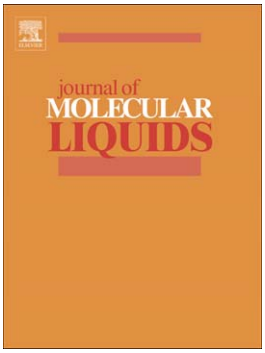

Simultaneous influences of mixed convection and nonlinear thermal radiation in stagnation point flow of Oldroyd-B fluid towards an unsteady convectively heated stretched surface

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PII: S0167-7322(16)32394-7
DOI: doi: 10.1016/j.molliq.2016.09.126
Reference: MOLLIQ 6404

To appear in: *Journal of Molecular Liquids*

Received date: 23 August 2016
Revised date: 21 September 2016
Accepted date: 30 September 2016

Please cite this article as: Tasawar Hayat, Sajid Qayyum, Ahmed Alsaedi, Muhammad Waqas, Simultaneous influences of mixed convection and nonlinear thermal radiation in stagnation point flow of Oldroyd-B fluid towards an unsteady convectively heated stretched surface, *Journal of Molecular Liquids* (2016), doi: 10.1016/j.molliq.2016.09.126

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Simultaneous influences of mixed convection and nonlinear thermal radiation in stagnation point flow of Oldroyd-B fluid towards an unsteady convectively heated stretched surface

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Abstract: Here stagnation point flow of an Oldroyd-B fluid towards unsteady stretched sheet is addressed. Mixed convection is present. Heat transfer is examined by considering nonlinear version of thermal radiation and Robin type boundary condition. Implementation of appropriate transformations yields nonlinear ordinary differential systems. Resulting systems have been solved for the convergent solutions. Impacts of different sundry variables on the non-dimensional velocity, temperature and local Nusselt number are scrutinized. It is anticipated that behaviors of thermal relaxation and retardation times on velocity distribution is reverse. Moreover it is also seen that temperature ratio and radiation parameters enhance the temperature distribution.

Keywords: Oldroyd-B fluid; stagnation point flow; mixed convection; nonlinear thermal radiation; convective heat transfer.

1 Introduction

The importance of non-Newtonian material is enhanced dramatically during the past decade. The recent researchers and scientists are engaged to explore the salient properties of non-

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