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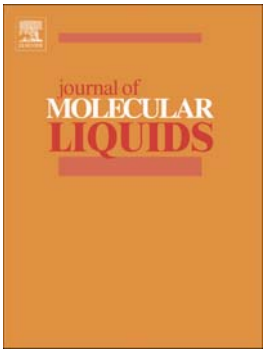

On 2D stratified flow of an Oldroyd-B fluid with chemical reaction: Application of non-Fourier's heat flux theory

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ACCEPTED MANUSCRIPT

On 2D stratified flow of an Oldroyd-B fluid with chemical reaction: Application of non-Fourier's heat flux theory

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Abstract: This research work explores the double stratified flow of an Oldroyd-B liquid induced by linear stretching surface with first order chemical reaction. Characteristics of heat transfer are investigated by considering non-Fourier heat flux model. Formulation is arranged for variable thermal conductivity. Flux model under consideration is the modified form of Fourier's classical expression which studies the fascinating characteristic of thermal relaxation time. Implementation of appropriate transformations yields ordinary differential systems which are then computed through homotopic procedure. Impacts of various sundry parameters on the non-dimensional velocity, temperature, concentration and Sherwood number are scrutinized. Moreover it is seen that temperature distribution has opposite behavior for thermal relaxation time and variable thermal conductivity parameter.

Keywords: Double stratification; Oldroyd-B fluid; Chemical reaction; non-Fourier heat flux theory.

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