Exact Analysis of Classical & Fractional Models of Second Grade Fluid

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Condition: New. Publisher/Verlag: LAP Lambert Academic Publishing | Classical and Generalized Models of Second Grade Fluid | Second grade fluid is an important and simplest subclass of differential type fluids. Therefore, this book considers second grade fluid to study magnetohydrodynamic flow over a vertically oscillating plate. The effects of porosity and thermal radiation are also considered. This work is divided into two main parts. In the first part, the second grade fluid is used to study analysis of heat and mass transfer with classical derivatives whereas in the second part the analysis of heat transfer is studied using the concept of Caputo-Fabrizio derivatives of fractional order. The mathematical model in each part is developed in terms of partial differential equations with initial and boundary conditions and then written in dimensionless form. The Laplace transform method is used to obtain closed-form solutions. The starting solutions obtained are presented as the sum of steady-state and transient solutions. Expressions for skin friction coefficient, Nusselt and Sherwood numbers are also determined.To highlight the significance in terms of the generality of obtained solutions, the results of various published papers are recovered as limiting cases. | Format: Paperback | Language/Sprache: english | 84 pp.

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