عنوان مقاله:

Analysis of Dual Solutions of Unsteady Micropolar Hybrid Nanofluid Flow over a Stretching/Shrinking Sheet

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خلاصه مقاله:

An unsteady boundary layer flow of a micropolar hybrid nanofluid over a stretching/shrinking sheet is analyzed. The nonlinear ordinary differential equations of the problem have been solved using the efficient implicit Runge–Kutta–Butcher method along with Nachtsheim–Swigert iteration technique. For a certain set of parameters, numerical results expose dual solutions with the change of the velocity ratio parameter. The dual solutions are presented in a wide range of the physical parameters. Using a lot of numerical data, the critical values of the velocity ratio parameter, local friction factor, local couple-stress and local Nusselt number for the existence of dual solutions are expressed as a function of the physical parameters. These expressions might be useful for the development of new technology or for the future experimental investigation.

کلمات کلیدی:

Dual solutions, Micropolar Fluid, Hybrid nanofluid, stretching or shrinking sheet

لینک ثابت مقاله در پایگاه سیویلیکا:

https://civilica.com/doc/1222013