Quadratic Convective Flow of a Micropolar Fluid in a Non-Darcy Porous Medium with Convective Boundary Condition

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Abstract : The objective of the present study is to investigate the effect of nonlinear temperature and concentration on the mixed convective flow of micropolar fluid over an inclined flat plate in a non-Darcy porous medium in the presence of convective boundary condition. In order to analyze all the essential features, the transformed nonlinear conservation equations are worked out numerically by spectral method. By insisting the comparison between vertical, horizontal and inclined plates, the physical quantities of the flow and its characteristics are exhibited graphically and quantitatively with various parameters. An increase in the coupling number and inclination of angle tend to decrease the skin friction, mass transfer rate and the reverse change is there in wall couple stress and heat transfer rate. The nominal effect on the wall couple stress and skin friction is encountered whereas the significant effect on the local heat and mass transfer rates are found for high enough values of Biot number.