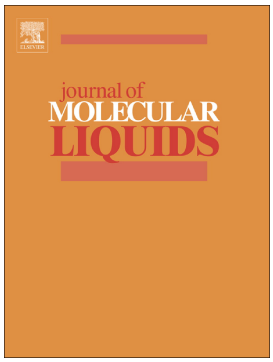

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Thermal and concentration diffusion in Jeffery nanofluid flow over an inclined stretching sheet: A generalized Fourier's and Fick's perspective

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Abstract:

Recent study illustrates the systematic survey of boundary layer heat and mass diffusion (Cattaneo-Christov model) of Jeffery fluid passed by an inclined stretching surface in the occurrence of magnetic field. Prevailing non-linear PDEs are converted into non-linear ODEs and then the problem is solved via RK-4 technique (using coefficients of Cash and Craps). The related important physical parameters such as M magnetic parameter, λ_T thermal buoyancy parameter, λ_C concentration buoyancy parameter, γ inclined stretching sheet parameter, $\Pr$ Prandtl number, N_b Brownian motion parameter, N_t thermophoresis parameter and Le Lewis number are plotted graphically for velocity, temperature and concentration distributions. In order to check the double diffusive phenomenon, the impact of fluid relaxation parameter δ_m, thermal relaxation parameter δ_e and nanoparticle concentration relaxation parameter δ_c are reflected through tables and graphs. The main theme of present article is to explore its unique attempt towards the generalized version of conventional Fourier's law and Fick's law at nanostructure