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MHD boundary layer heat and mass transfer flow over a vertical cone embedded in porous media filled with Al2O3-Water and Cu-Water Nanofluid
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Abstract
We have presented a numerical solution to the MHD boundary layer heat and mass transfer flow of Al2O3-water and Cu-water based nanofluids over a vertical cone saturated by porous media with heat generation/absorption, thermal radiation and chemical reaction in the present analysis. Though we have different varieties of nanofluids, we have considered Al2O3-water and Cu-water based nanofluids (with volume fraction 1% and 4%) in this problem. The governing partial differential equations describing the steady-state conservation of mass, momentum, energy as well as conservation of nanoparticles for nanofluids are transformed into the set of ordinary differential equations by using suitable similarity transformations and are solved numerically subject to the boundary conditions using an efficient, extensively validated, variational Finite element method. The influence of important non-dimensional parameters on velocity, temperature and nanoparticle concentration fields as well as the skin-friction coefficient, Nusselt number and Sherwood number are examined in detail and the results are shown in graphically and in tabular form to illustrate the physical importance of the problem.

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