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| Title | Utilization of updated version of heat flux model for the radiative flow of a non-Newtonian material under Joule heating: OHAM application | | |
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| Abstract |  |
| This study reports the thermal analysis and  species transport to manifest non-Newtonian materials  flowing over linear stretch sheets. The heat transfer phenomenon  is presented by the Cattaneo–Christov definition  of heat flux. Mass transportation is modeled using  traditional Fick’s second law. In addition, the contribution  of Joule heating and radiation to thermal transmission is  also considered. Thermo-diffusion and diffusion-thermo  are significant contributions involved in thermal transmission  and species. The physical depiction of the scenario  under consideration is modeled through the boundary  layer approach. Similar analysis has been made to convert  the PDE model system into the respective ODE. Then,  the transformed physical expressions are calculated for  momentum, thermal, and species transport within the  boundary layer. The reported study is a novel contribution  due to the combined comportment of thermal relaxation  time, radiation, Joule heating, and thermo-diffusion, which  are not yet explored. Several engineering systems are based  on their applications and utilization. | |