Aligned magnetic field flow of Williamson fluid over a stretching sheet with convective boundary condition

N S Arifin[a]; S M Zokri[a]; A R M Kasim[a]; M Z Salleh[a] and N F Mohammad[b]
[a] Applied & Industrial Mathematics Research Group, Faculty of Industrial Sciences & Technology, Universiti Malaysia Pahang, 26300 Gambang, Kuantan, Pahang, Malaysia
[b] Department of Computational and Theoretical Sciences, Kulliyyah of Sciences, International Islamic University Malaysia, 25200 Kuantan, Pahang, Malaysia

ABSTRACT
The analysis on mathematical model of Williamson fluid on the convective boundary layer flow and heat transfer over a horizontal stretching sheet has been carried out. The model is constructed by introducing the aligned magnetic field on the flow region under the case of convective boundary conditions which is implies the fluid heated from the stretching surface. The numerical method of Runge-Kutta Fehlberg (RKF45) is employed to the ordinary differential equations after being transformed from the governing equations by using suitable similarity transformation. The solutions of several influencing parameters on the velocity and temperature profiles are discussed and displayed in graphical form. The results of this study indicate that the increasing magnetic field parameter decreases the fluid velocity which suppressed the fluid motion.