

1086-76-2448

Antonio Mastroberardino* (axm62@psu.edu), 4205 College Drive, Erie, PA 16563. *On the limitations of Kummer's function in heat transfer problems.*

The study of two-dimensional boundary layer flow over a moving surface in a fluid at rest was initiated by Sakiadis. Crane extended the work of Sakiadis by obtaining an exact analytical solution for the case of a linearly stretching surface. In regard to several recent studies that incorporate a viscoelastic fluid and heat transfer analysis, I will demonstrate that the reported solutions of the thermal energy equation given in terms of Kummer's function do not converge at the boundary, and therefore, the values of the wall temperature gradient and wall temperature for the two general types of non-isothermal boundary conditions are incorrect. In contrast I will show that the homotopy analysis method (HAM) provides accurate values of the relevant boundary derivatives via a graphical and numerical demonstration of convergence. (Received September 25, 2012)