Abstract Submitted
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**Boundary layer similarity flow driven by power-law shear over a nonlinearly stretching surface** DANIEL KUBITSCHEK, PATRICK WEIDMAN, University of Colorado — Similarity solutions of the boundary layer equations describing wall-bounded flow driven by rotational velocities, $U(y) = y^\alpha$, as $y \to \infty$, over a nonlinearly stretching surface, $U(x) = \lambda x^\sigma$ for permissible exponents, $\sigma = \alpha/(\alpha + 2)$, are presented. An exact solution is presented for $\alpha = -1/2$ in terms of Airy functions. Numerical results for the wall shear stress and sample velocity profiles in the range $-2/3 < \alpha \leq 5/4$ are computed. The limiting values for $\lambda < 0$ are determined, for each value of $\alpha$, beyond which no solutions are found. The existence of solutions in the range $-2/3 < \alpha < -1/2$ is confirmed and the necessary condition, given by M. Guedda (2007), is shown to be satisfied.

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