Abstract Submitted
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Obliquely-intersecting Hiemenz stagnation-point flows PATRICK WEIDMAN, University of Colorado — The interaction of two obliquely-intersecting Hiemenz stagnation point flows normal to a flat plate is studied. One flow of strain rate a aligned along the x-axis intersects the other of strain rate b at angle Phi from the x-axis. When transformed to principal axes, a similarity reduction of the Navier-Stokes equation yields two ordinary differential equations with coefficients depending on the strain rate ratio Sigma = b/a and Phi. These equations are then tranformed to Howarth's equations via a two-parameter mapping. The large-Sigma asymptotic behavior of solutions for the limiting angles Phi = 0 and 90 deg. are determined. Numerical solutions of the principal axes equations for values of Sigma in the saddle-point and nodal-point regions at Phi = 0, 15, 30, 45, 60, 75 and 90 deg. compare precisely with those obtained from the two-parameter mapping. Plots of the wall shear stress parameters, the normalized displacement thicknesses and sample velocity profiles are presented.

Patrick Weidman
University of Colorado

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