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SOLVABILITY OF CERTAIN SELF-SIMILAR BOUNDARY VALUE PROBLEM ARISING IN HYDRODYNAMICS

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The paper [1] considers an urgent problem for the slip flow model in hydrodynamics. Introducing the self–similar variables one from the governing boundary layer equations and associated boundary conditions obtains the boundary value problem for the Blazius equation

$$f''' + \frac{1}{2}ff'' = 0;$$

$$f(0) = 0, \quad f'(0) - \kappa f''(0) = 0, \quad f'(\infty) = 1,$$

where the parameter $\kappa \in [0, +\infty)$ depends on the slip length, and following boundary value problem for the second order homogenous linear differential equation

$$\Theta'' + \frac{Pr}{2}(\Theta'f - \Theta f') = 0;$$

$$\Theta'(0) = -1, \quad \Theta(\infty) = 0.$$

The qualitative analysis and numerical solution of these problems with respect to parameters are carried out.

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