Project 2

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I. Nomenclature

f = equation introduced in similarity solution
η = variable introduced in similarity solution to relate y and x

II. Introduction

Falkner-Skan equations are a set of nonlinear differential equations that describe the flow of a viscous, incompressible fluid over a flat plate. The equations are a generalization of the Blasius equation, which is obtained by setting the pressure gradient to zero.
The following paper will present a numerical solution to the Falkner-Skan equations for different values of the parameter β.

III. Procedure

The equations are:

$$f''' + f f'' + \beta(1 - f'^2) = 0 \tag{1}$$

With the following boundary conditions:

$$f(0) = f'(0) = 0, \quad f'(\infty) = 1 \tag{2}$$

IV. Results

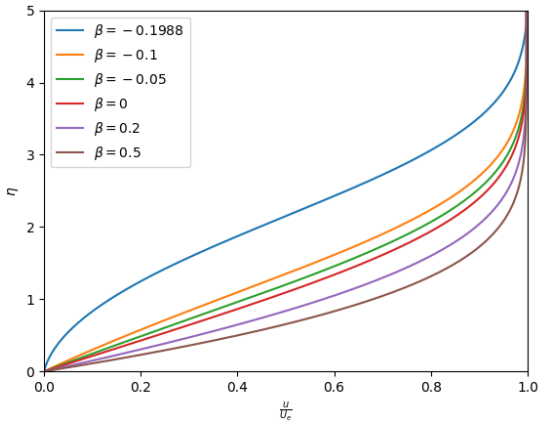

Fig. 1 Falkner-Skan flow for different betas

V. Conclusion

Additional work has been done to solve the Falkner-Skan equations for different values of β.

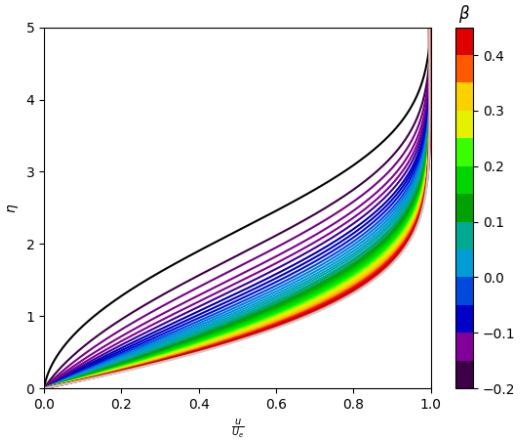

Fig. 2 Falkner-Skan flow for different betas