

*Uniqueness of Axially Symmetric Subsonic Flow  
past a Finite Body\**

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We shall be concerned here with the steady irrotational flow of an ideal compressible fluid past a fixed body, and in particular with its unique dependence on the Mach number at infinity. For the case of *plane subsonic* flow there is an essentially complete solution of this problem due to BERS [1], who has shown that with the circulation prescribed, either directly or by means of the Kutta-Joukowski condition, there is at most one subsonic flow past the body with given Mach number at infinity. In his proof, which by its nature seems limited to plane flows, BERS makes essential use of the hodograph transformation and of the properties of pseudo-analytic functions and quasi-conformal mappings. However, when the flow is *symmetric* about a line parallel to the uniform stream, these analytical tools are unnecessary and the uniqueness theorem can be proved by elementary means based on the maximum principle for elliptic differential equations (*cf.* [2]). In this paper we shall extend the same method to prove uniqueness of axially symmetric flows. The possibility of such an extension is of interest in itself in view of the fact that these flows cannot be treated by methods based on the hodograph transformation.

Specifically, we consider axially symmetric subsonic flows past a certain class

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