



航空学报 » 1994, Vol. 15 » Issue (8) :968-970 DOI:

论文

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轴对称流中音速线附近的特征线方程

钱翼稷<sup>1</sup>, H. Sobieczky<sup>2</sup>

1. 北京航空航天大学流体力学研究所,北京,100083; 2. 德国宇航院

### CHARACTERISTIC EQUATION NEAR THE SONIC LINE OF AXISYMMETRIC FLOW

Qian Yiji<sup>1</sup>, H. Sobieczky<sup>2</sup>

1. Institute of Fluid Mechanics, Beijing University of Aeronautics and Astronautics, Beijing, 100083; 2. Deutsche Forschungs-und Versuchsanstalt for Luft-und Raumfahrt

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摘要 从 Oswatitsch 的无粘、跨音速、轴对称无旋流的基本方程出发,在细长体条件下,通过新变量将物理面上的运动方程变成形式简单的速度面方程。利用音速线附近条件对速度面方程进行积分,可得解析解;由此可按 Courant 理论推导出音速线附近的特征线方程,结果表明,特征线有两族,均为 2 / 3 次幂曲线,其数学形式与平面流相同。

关键词: 轴对称流 跨音速流 特征方程

Abstract: Under the assumption of slender body, starting from Oswatitsch's non-viscous transonic axisymmetric irrotational basic equation, the motion equation of physical plane is transferred to hodograph equation in simpler form by new variables. Then, the latter is integrated by the conditions in the vicinity of the sonic line and the analytic solution can be acquired. And then, a characteristic equation in the vicinity of the sonic line is derived by Courant's theory, which is an analytic expression. It indicates that there are two families of characteristics and they are all curves of 2/3 power.

Keywords: axisymmetric flow transonic flow characteristic equations

Received 1992-10-10; published 1994-08-25

引用本文:

钱翼稷; H. Sobieczky. 轴对称流中音速线附近的特征线方程[J]. 航空学报, 1994, 15(8): 968-970.

Qian Yiji; H. Sobieczky. CHARACTERISTIC EQUATION NEAR THE SONIC LINE OF AXISYMMETRIC FLOW[J]. Acta Aeronautica et Astronautica Sinica, 1994, 15(8): 968-970.

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