论文

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高超音速化学非平衡钝劈绕流数值计算

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NUMERICAL CALCULATIONS OF HYPERSONIC NONEQUILIBRIUM FLOW OVER A BLUNT WEDGE

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摘要	参考文献	相关文章

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摘要

自1970年Davis提出粘性激波层方法以来,用数值方法求解高超音速轴对称钝体绕流问题国内外已做了大量工作,但至今仍未见到关于平面问题的计算结果。对于平面问题,虽然方程在形式上比轴对称简单,但由于二维效应,激波层较厚,用文献[2]的方法向下游区推进有困难。另外,在驻点线上采用极限关系式虽能克服方程的奇性,但驻点解对流向步长$\Delta\xi$有依赖。

关键词： 数值计算   高超音速流   粘性流   化学反应流   二维流动   钝体

Abstract：

A numerical method is used to compute the hypersonlc, nonequilibrium, viscous shock-layer flow over a blunt wedge. A truncated series is used to develop the differential equations at the stagnation streamline. As a result, the initial value for the viscous shock-layer equations can be improved. The continuity equation and the transversal momentum equation are solved in a coupled way, so that the calculations can be matched with the solutions at far downstream of the planar blunt-bodies. The numerical results are given and compared with those from other methods.

Keywords： numerical calculation   hypersonic flow   viscous flow   chemical reacting flow   planar flow   blunt body

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