ACTA AERONAUTICA ET ASTRONAUTICA SINICA

论文

最新目录 | 下期目录 | 过刊浏览 | 高级检索   << ◀◀ 前一篇 | 后一篇 ▶▶ >>

跨音速叶轮机械叶片的完全三维设计方法

刘秋生, 张增产, 沈孟育

清华大学工程力学系, 北京00084

THE MIXED DIRECT-INVERSE PROBLEM OF THE THREE DIMENSIONAL TRANSONIC RLOW IN THE TURBOMACHINERY

Liu Qiusheng, Zhang Zengchan, Shen Mengyu

Department of Engineering Mechanics, Tsing hua University, Beijing, 100084

摘要	参考文献	相关文章

Download: PDF (402KB)   HTML 0KB   Export: BibTeX or EndNote (RIS)   Supporting Info

摘要 设计方法由一种平面叶栅跨音速流动反问题推广得到,其特点是既计及叶片气动性能,又能在一定程度上兼顾强度、冷却、工艺等方面的要求。由于应用了一种适合叶轮机械中三维流动特点的广义ＶｏｎＭｉｓｅｓ坐标系,克服了反问题所特有的求解域边界不定的困难;并使正问题计算和反问题设计统一在同一算法之中。典型算例的结果表明:提出的跨音速叶片完全三维设计理论模型是合理的。

关键词: 跨音速流   涡轮机叶片   三维流   设计

Abstract： Introducing two stream functions,the mixed direct-inverse problem of the transonic now in the plane cascade is extended to the case of 3- D flow in turbomachinery;a generalized von Mises coordinate system is proposed to overcome the difflcalty of the undeterinined solution region boundaries inherent in the inverse problem.In this coordinate system,a rotating finite dif-ference scheme for the streamline governing equations is constructed.The present method incor-porates calculating the flow field,designing and modifying the blade contour into a unified algorithm.And the superiority of the inverse problem formulation is that one can consider not only the aerodynamic properties of the turbomachinery blade,but also the demands on the strength,cooling,manufacturing,etc.Numerical results show that the present mathematical model is reasonable,and the numerical solution method has the advantages of high accuracy and very rapid convergence.

Keywords： transonic flow   turbomachine blades   three dimensional flow   design

Service
▶ 把本文推荐给朋友
▶ 加入我的书架
▶ 加入引用管理器
▶ Email Alert
▶ RSS

作者相关文章
▶ 刘秋生
▶ 张增产
▶ 沈孟育

引用本文:

刘秋生;张增产;沈孟育. 跨音速叶轮机械叶片的完全三维设计方法[J]. 航空学报, 1994, 15(12): 1417-1423.

Liu Qiusheng;Zhang Zengchan;Shen Mengyu. THE MIXED DIRECT-INVERSE PROBLEM OF THE THREE DIMENSIONAL TRANSONIC RLOW IN THE TURBOMACHINERY[J]. Acta Aeronautica et Astronautica Sinica, 1994, 15(12): 1417-1423.