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中等后掠机翼平面参数设计与实验研究

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Design and Wind Tunnel Experimental Investigation of Middling Sweepback Wing Plane Parameter

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摘要

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摘要 采用Euler数值计算方法,对60多种中等后掠角及展弦比的切尖菱形机翼、双三角机翼纵向气动特性进行了计算、分析和比较,从中筛选出16种切尖菱形机翼、14种双三角机翼进行了全机高速风洞实验研究,给出了机翼的展弦比、前缘后掠角、根梢比(后缘前掠角)及几何扭转变化对全机升力、阻力及俯仰力矩的影响曲线和数据分析,在此基础上提出了用于定量估算两类机翼纵向气动特性的关系式及修正因子。本文研究结果为建立战斗机机翼气动设计数据库及飞机气动布局设计提供了实用的数据和设计参考。

关键词: 切尖菱形机翼 双三角机翼 后掠角 展弦比 风洞实验 气动特性

Abstract: The aerodynamic characteristics of the cuted tip rhombus wing and double-delta wing of middling sweepback angle and aspect ratio about sixty type are investigated by a numerical method based on Euler equations. The high speed wind tunnel tests of selected sixteen cuted tip rhombus wing and fourteen double-delt wing are performed, in order to study the effects of wing plane parameters(leading edge sweepback angle, aspect ratio, taper ratio and geometric twist) on longitudinal aerodynamic characteristics. The curves of test and empirical formula for quantitative estimate longitudinal aerodynamic characteristics of this two kind wings are introduced. Researched results of this paper provide practical data and design references for constituted data-base of wing aerodynamical desing and aircraft aerodynamical configuration research.

Keywords: cuted tip rhombus wing double-delta wing sweepback angle aspect ratio wind tunnel test aerodynamic characteristics

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