



航空学报 » 2006, Vol. 27 » Issue (3) :374-379 DOI:

论文

最新目录 | 下期目录 | 过刊浏览 | 高级检索

<< Previous Articles | Next Articles >>

飞翼式微型飞行器飞行动力学特性研究

郑祥明, 昂海松, 黄达

南京航空航天大学, 江苏 南京 210016

Research on Flight Dynamics of Flying Wing Micro Air Vehicles

ZHENG Xiang-ming, ANG Hai-song, HUANG Da

Nanjing University of Aeronautics and Astronautics, Nanjing 210016, China

摘要

参考文献

相关文章

Download: PDF (379KB) HTML OKB Export: BibTeX or EndNote (RIS) Supporting Info

摘要 微型飞行器(MAV)非线性飞行力学特性研究是MAV设计中的一个重要环节。由于MAV具有自身尺寸微小,飞行速度低等特点,其空气动力学低雷诺数效应十分明显。飞翼式MAV的非常规气动布局也使得其飞行力学特性与常规飞行器有很大差异。以低雷诺数风洞实验为基础,研究了飞翼式MAV空气动力学特性,提出了1种针对飞翼式飞行器的动阻尼导数计算方法。在飞翼式MAV飞行速度范围内将其运动方程分段线性化以研究其飞行力学特性数值规律。结果表明,飞翼式MAV各项飞行品质指标与常规飞行器存在很大差异,在整个飞行范围内其飞行动力学特性呈非线性变化规律。本文的研究对实现飞翼式MAV自主飞行控制具有重要意义。

关键词: 飞翼式微型飞行器 非线性飞行动力学 低雷诺数风洞试验 飞行品质 动导数

Abstract: Research on nonlinear dynamics of Micro Air Vehicles (MAV) plays an important role in MAV design. The Aerodynamics of MAV is under a serious influence of Low Reynolds Numbers because of its micro size and low speed. Furthermore, its special design in configuration makes it more different from other aerocrafts in characters of flight dynamics. A group of piecewise linearized dynamic equations based on low Reynolds Numbers tunnel testing are used to study the flight qualities of MAV, furthermore, a new method for calculating the dynamic derivatives of flying wing aerocrafts is presented. The nonlinear transformations of flight dynamics characters in different flight states are discovered, which provide the necessary mathematical model for autonomic flight control for MAV.

Keywords: flying wing MAV nonlinear flight dynamics low Reynolds numbers tunnel testing flight qualities dynamic derivative

Received 2004-11-29; published 2006-06-25

引用本文:

郑祥明;昂海松;黄达. 飞翼式微型飞行器飞行动力学特性研究[J]. 航空学报, 2006, 27(3): 374-379.

ZHENG Xiang-ming; ANG Hai-song; HUANG Da. Research on Flight Dynamics of Flying Wing Micro Air Vehicles[J]. Acta Aeronautica et Astronautica Sinica, 2006, 27(3): 374-379.

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

- ▶ 郑祥明
- ▶ 昂海松
- ▶ 黄达