



航空学报 » 2002, Vol. 23 » Issue (4) :356-359 DOI:

论文

最新目录 | 下期目录 | 过刊浏览 | 高级检索

<< Previous Articles | Next Articles >>

飞行器机动飞行时发动机转子等变速运动的动力学特性研究

林富生¹, 孟光^{1,2}

1. 上海交通大学振动、冲击、噪声国家重点实验室 上海 200030; 2. 佛山大学 思源机电一体化研究所 广东佛山 528000

DYNAMICS OF A MANEUVERING ROTOR IN CONSTANT ACCELERATION AND DECELERATION

LIN Fu-sheng¹, MENG Guang^{1,2}

1. State Key Laboratory of Vibration, Shock and Noise, Shanghai Jiaotong University, Shanghai 200030, China; 2. Siyuan Mechatronics Institute, Foshan University, Foshan 528000, China

摘要

参考文献

相关文章

Download: PDF (281KB) HTML 0KB Export: BibTeX or EndNote (RIS) Supporting Info

摘要 建立了位于机动飞行器内单盘 Jeffcott转子系统的动力学模型,研究了飞行器飞行速度和加速度变化对飞行器内等加速、等减速两种等变速运行转子振幅响应曲线的影响,模拟了飞行器在垂直平面作正弦曲线轨迹运动时相应的响应曲线。结论表明飞行器的速度和加速度变化会改变飞行器内等变速转子的振幅大小和响应曲线趋势,飞行器在垂直平面作正弦曲线轨迹的机动飞行时,飞行器动作的幅度和周期的影响都很明显。对重力参数和不平衡参数的影响也作了研究

关键词: 机动飞行 转子动力学 瞬态响应

Abstract: The mathematical model of a maneuvering rotor is derived. The dynamical characteristics of a rotor during acceleration and deceleration are studied. The influences of the gravity and balance parameters are also considered. The conclusions show that: (1)if the velocity and acceleration of the aircraft are changed, the amplitude response of the rotor is varied too; (2)the velocity and acceleration of the aircraft in the vertical direction affect the response of the rotor obviously; (3)when the aircraft runs in the way of a sine curve in the vertical plane the response curve is also periodic after one or two periods; (4)in most cases studied in this paper, the response curve, mainly the amplitude value, is influenced by the gravity and unbalance parameters; (5)the response is influenced largely by the amplitude and period of the sine curve when the aircraft maneuvers in the vertical plane. The curve trend may be much different when the initial rotating speed is lower before acceleration or higher before deceleration. The change of gravity affects the trends of the response obviously. The unbalance parameter has little influence. The conclusion can be used to diagnose the faults of the aircraft rotor on line.

Keywords: maneuvering rotor unbalance aircraft fault diagnosis rotor dynamics

Received 2001-10-29; published 2002-08-25

引用本文:

林富生;孟光;. 飞行器机动飞行时发动机转子等变速运动的动力学特性研究[J]. 航空学报, 2002, 23(4): 356-359.

LIN Fu-sheng; MENG Guang;. DYNAMICS OF A MANEUVERING ROTOR IN CONSTANT ACCELERATION AND DECELERATION[J]. Acta Aeronautica et Astronautica Sinica, 2002, 23(4): 356-359.

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

- ▶ 林富生
- ▶ 孟光