



航空学报 » 2004, Vol. 25 » Issue (3) :242-247 DOI:

论文

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### 导弹飞控系统可靠性仿真研究

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### Study on Reliability Simulation for Missile's Flight Control System

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摘要

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**摘要** 提出了在几种主要因素影响下进行飞控系统性能和可靠性一体化分析的方法。建立了风、结构误差(包括弹体质量分布不对称、弹体不同轴、翼面安装角误差和舵面机械零位误差)、推力偏心和硬件故障等因素的扰动模型,给出了可靠性仿真的方法、实施步骤、具体算法流程和可靠性指标的计算公式。以某型导弹飞控系统作为案例,进行了大量仿真,分析了风等因素对该系统可靠性的影响。通过算例证明,所建立的扰动模型和可靠性分析方法是正确的。

**关键词:** 可靠性仿真 风 结构误差 推力偏心 硬件故障 飞行控制系统 导弹

**Abstract:** This paper proposes an approach of integrated analysis of performance and reliability for missile's flight control system under the effects of some important factors. The disturbance models of wind, structural errors (including missile mass asymmetry, body un-coaxial, airfoil installation angle error and rudder null position), thrust deviation and hardware failure are established. The method of reliability simulation, approach of implementation, detailed algorithm process and formulas of computing reliability are given. A  $\times$ -missile's flight control system is taken as example, and the effects of these factors on the missile's reliability are analyzed by plenty of simulations. The disturbance models and integrated analysis of reliability are proved right by the simulation tests.

**Keywords:** reliability simulation wind structural error thrust deviation hardware failure flight control system missile

Received 2003-05-15; published 2004-06-25

#### 引用本文:

陈云霞;康锐;孙宇锋. 导弹飞控系统可靠性仿真研究[J]. 航空学报, 2004, 25(3): 242-247.

CHEN Yun-xia;KANG Rui;SUN Yu-feng. Study on Reliability Simulation for Missile's Flight Control System[J]. Acta Aeronautica et Astronautica Sinica, 2004, 25 (3): 242-247.

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