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可变形翼战术导弹多体动力学特性(PDF)

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Title: Multi body Dynamics of Tactical Missile with Morphing Wings

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关键词: 变形翼; 战术导弹; 多体动力学; 协同仿真

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摘要: 弹翼外形随飞行环境合理变化能提高导弹的飞行性能。为揭示变翼对导弹飞行动力学特性的影响机理，基于集中质量假设，利用动量及动量矩定理，构建了变翼导弹的多体动力学模型。首次提出一种基于Missile DATCOM的协同求解方法，以解决多体运动与瞬变气动的交叉问题。仿真研究表明，所提出的协同求解方法能快速有效地解算耦合快变气动参数的多体运动方程；变翼展与变后掠对应的移动质量及变翼速度因素对导弹飞行动力学特性有重要影响。

Abstract: The flight performance of missile can be improved by a set of adaptive wings Assume that all the mass of each wing is concentrated on its center of gravity; the dynamical model of morphing missile is developed to reveal the effect of morphing wings on flight dynamics using the multi body theorem of momentum and angular momentum A collaborative methodology introducing Missile DATCOM to flight dynamics is firstly used to research multi body motion coupled with transient aerodynamics The results demonstrate that the proposed solution to the coupled multi body dynamics is feasible; Morphing wings with span and sweep variation have a remarkable effect on dynamical characteristics of missile

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