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论文

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### 飞机机轮摆振的数字仿真

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### SIMULATION OF AIRCRAFT WHEEL SHIMMY

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摘要

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**摘要** 采用液压减摆器的流体力学模型代替摆振分析中常用的线性或二次阻尼系数,模型中考虑了油液压缩性的影响,采用变化的油液体积弹性模量。采用仿真方法研究飞机机轮的摆振问题。应用快速富氏变换从时域响应获取摆振频率信息。仿真结果与 O批 K8飞机的滑行实测结果进行了考核对比,仿真所得摆振幅度、频率和含气率等因素对摆振的影响均与实测吻合

**关键词:** 机轮摆振 起落架 起落架减摆器 数字仿真 液压阻尼器

**Abstract:** A hydraulic model of landing gear shimmy dampers is introduced into the shimmy equations replacing the linear or quadratic damping coefficients. The fluid compressibility caused by contained free air is taken into consideration in the differential equation of the dampers, in which variable bulk moduli are adopted. Then the shimmy equations are employed to simulate the aircraft nose landing gear shimmy. The shimmy frequencies are obtained through the FFT. The simulation results, such as the amplitudes and the frequencies of shimmy, the effects of the fluid compressibility, etc. agree well with those measured in the taxi test of the prototype of K8 aircraft.

**Keywords:** wheel shimmy landing gears landing gear shimmy dampers digital simulation hydraulic damper s

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