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## 常数机动载荷对航空发动机转子系统振动特性的影响

Effect of constant maneuver load on vibration characteristics of  
aero-engine's rotor system

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中文摘要:

考虑了一个带有非线性弹性支承的偏置圆盘Jeffcott转子系统, 研究了常数机动载荷对该系统振动特性的影响. 通过数值计算发现: 常数机动载荷取不同值时, 系统的幅频特性曲线可能出现滞后区变窄、消失以及二次跳跃现象; 频率比不同值时, 系统振幅与常数机动载荷关系曲线差别较大, 在特定转速下, 先将常数机动载荷缓慢增加至一定值, 再缓慢降低至零, 可能引起系统由小振幅稳态解跳跃至大振幅稳态解而无法恢复; 转子轴心偏移量随着常数机动载荷增加而增大, 受系统工作转速影响不大.

英文摘要:

An asymmetric placed Jeffcott rotor system with nonlinear elastic support was considered, and the influences of constant maneuver load on the dynamics of the rotor system were studied numerically. By setting different constant maneuver loads, it was found that the relationship between the amplitude and the excitation frequency may lead to different phenomena including: hysteresis region narrowing, disappearance and secondary jump. With the variation of the frequency ratio, the relationship between the amplitude and the constant maneuver load is changed significantly. Under certain excitation frequency, if the constant maneuver load crosses a critical value, the amplitude of the system can jump from a small level to a large one, and not drop down even though the load is reduced to zero. In addition, the offset of the rotor's axis is not closely related to the excitation frequency, but mainly depended on the amount of the constant maneuver load.

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