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论文

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利用刚度非线性特性可控支承控制转子振动

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VIBRATION CONTROL OF A ROTOR SYSTEM UTILIZING A BEARING HOUSING WITH CONTROLLABLE SPRING NONLINEARITY

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摘要

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**摘要** 对利用支承刚度非线性特性主动控制转子振动方法进行了深入理论和实验研究。发现该方法不仅可大幅度降低转子通过临界转速时振动的幅值,而且还能避免用挤压油膜阻尼器控制经常出现的双稳态、“闭锁”、非协调进动等有害的非线性振动

**关键词:**

**Abstract:** On the basis of characteristics of vibration in the rotor system with spring nonlinearity, a new method for vibration control has been developed. In the method, the spring characteristics of the bearing housing are controlled to be of softening nonlinearity when the rotor supported on it is accelerated and of hardening one when the rotor is decelerated. So the amplitude of vibratory response of the rotor system on the bearing housing always varies along the smallest solution curve in the whole operating process. Its dynamic behaviour is predicted and verified by experiments. Both theoretical and experimental results show that not only the vibratory amplitudes and the transmitted forces are suppressed greatly but also nonlinear vibration performance of the rotor supported on squeeze film dampers such as “lock up” at rotor pin\|pin critical speeds and asynchronous vibration can be avoided.

**Keywords:**

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