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用有限元素法分析转子-轴承系统动力学

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DYNAMIC ANALYSIS OF ROTOR-BEARING SYSTEMS BY FINITE ELEMENT METHOD

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摘要

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摘要 本文采用有限元素法分析转子-轴承系统的动力学问题。给出了模拟转子-轴承系统的动力分析程序（FEPRS程序），该系统由刚性盘、弹性分布参量有限转子元素及离散轴承组成。用该程序能计算任何复杂转子系统在各种进动状态下的进动频率，并由计算机自动绘制相应的振型曲线。

关键词：

Abstract: The finite element, method is used to analyze dynamic problems of rotor-bearing systems. The system motion equations are presented in a fixed and a rotating coordinate systems. Nelson's element is extended to considering transverse shear effects, which are of great importance for complicated aircraft engines. A program (FEPRS) is presented for dynamic modelling of the rotor-bearing system which consists of rigid disks, distributed parameter finite rotor elements and discrete bearings. The whirl frequencies can be calculated for complicated rotor-bearing systems in various whirl states, and mode shapes can be automatically drawn by implementing this program on a computer. A lot of practical examples have been analyzed. The results are satisfactory in comparison with experimental data.

Keywords:

Service

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