

工程与应用

双机驱动振动系统的控制研究与仿真分析

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摘要 同步问题是多机驱动系统需要解决的核心问题。通过建立双机驱动振动系统的动力学模型和感应电机的数学模型, 运用动力学理论分析了振动系统的动力学特性, 得到了系统实现频率俘获的条件和对两个两偏心转子相位差进行控制的策略。分别运行自同步条件下的仿真程序和基于振动系统频率俘获条件的相位差控制仿真程序, 计算机仿真结果表明对振动系统施加控制后, 该系统能够快速实现速度同步和相位同步, 验证了控制策略的有效性。

关键词 [振动系统](#) [动力学分析](#) [频率俘获](#) [控制](#) [仿真](#)

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Control study and simulation analysis of vibration system driven by two motors

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Abstract

Synchronization problem is the key of system driven by two or more motors. The dynamic model of vibration system driven by two motors and the mathematics model of induction motor are established. The dynamic characteristic of vibration system is analyzed by using dynamic theory, and the conditions of realizing frequency capture and the scheme to control phase difference of the two eccentric rotors are obtained. The computer simulation program in self-synchronous condition and that based on phase difference control of realizing frequency capture's conditions are run, and results of computer simulations show that the vibration system can realize speed synchronization and phase synchronization rapidly after has been controlled. The simulation results verify the effectiveness of the control scheme.

Key words [vibration system](#) [dynamic analysis](#) [frequency capture](#) [control](#) [simulation](#)

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