

<<工程中的振动同步与控制同步>>

图书基本信息

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前言

A synchronous phenomenon is a form of movement naturally existing in nature as well as in human society and production. Most synchronous phenomena are naturally formed during the evolution process of the natural world and the human society. However, in engineering and technology, it is often created artificially to satisfy people's needs. In most cases, these synchronous phenomena are beneficial to human beings, but are harmful in other cases. For example, synchronous satellites in space orbit in synchronization about the earth. Another example of the synchronization phenomena is in radiobroadcast, one of the most common ways to transmit information in human lives. In order to receive the expected sounds from radio stations, the receiving frequency of the radios must match the sending frequency from the radio stations, which is so-called sending-receiving synchronization. But in other circumstances, the synchronization phenomenon may be unwanted as they may be hazardous and harmful. For example, soldiers are forbidden from marching synchronously in a group on a wire bridge, because the resonant forces produced by the synchronized running may cause a disaster. The synchronous phenomena and their issues can be found anywhere in the natural world and fields of engineering and technology.

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内容概要

《工程中的振动同步与控制同步（英文版）》是在完成“关于机械系统控制同步理论及其应用的研究”、“多机机械系统广义同步与定速比传动智能控制的理论及其应用的研究”等国家自然科学基金项目及其他相关科研项目的基础上，撰写的一部专著。

书中以非线性动力学理论和现代控制理论及智能控制理论为基础，研究了双机或多机机械系统的振动同步、控制同步和复合同步，还研究了机械系统定速比控制问题。

书中较详细地研究了实现振动同步、控制同步和复合同步的基本理论与方法及具体措施，介绍了作者长期从事这一课题研究的实际经验，在讲述理论与方法的过程中，举出了若干工程应用实例。

《工程中的振动同步与控制同步（英文版）》可供大专院校师生阅读与参考，还可供从事机械工程、控制工程与动力学研究与设计的科技人员参考使用。

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插图：There is a variety of plane motion self synchronous vibrating machines being widely used in industry for material feeding, conveying, screening, cooling, drying, forming and casting, such as the self synchronous vibrating feeder, the self synchronous vibrating conveyor, the self synchronous vibrating cooler, the self synchronous vibrating probability screen, the self synchronous vibrating dryer, the self synchronous vibrating sand-dropping machine, the self synchronous straight line vibrating screen, the self synchronous cold and the hot ore vibrating screen, etc. These machines have the following advantages. (1) The drive system is much simpler than a forced synchronous system with a mechanical transmission chain due to that there is not a gearbox in a self synchronous system. (2) Easy for lubrication, maintenance and service without gearboxes. (3) The amplitude of resonant vibration can be significantly reduced for some of self synchronous vibrating machines during the starting or the stopping process. (4) Most self synchronous vibrating machines used in industry are directly driven by exciting motors, which make the drive systems even simpler and easily installed, and offer a significant cost savings. (5) Easy to realize a seriation, generalization and standardization.

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