液压二次调节加载系统负载干扰的主动抑制

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关键词： 液压 二次调节 加载系统 动态特性 负载干扰

摘 要： 建立了液压二次调节加载系统仿真模型，通过仿真与试验结果对比，验证了模型的准确性。分析了典型的转速-转矩控制方式液压二次调节加载系统中，转矩变化通过被试件的机械耦合通道所引起的转速波动问题。结果表明，液压二次调节加载系统中并不存在明显的耦合干扰现象，加载元件对输入元件转速的影响主要表现为一种负载干扰。采用结构不变性原理，设计了前馈补偿环节对转速进行了近似补偿，实现了对这种负载干扰的主动抑制。

In order to study the dynamic characteristics of the hydrostatic secondary control load simulation system, the numerical simulation models of secondary unit were given by using MSC.Easy5 software. It is an efficient way to describe state-oriented discontinuities and to facilitate efficient numerical integration of the secondary control systems. The comparative analysis of the results of numerical simulation and test on frequency response characteristic of speed controlled unit demonstrated the simulation models of secondary controlled system were adequately accurate. The speed variation for a jump in torque on a typical test bench where the speed controlled unit was coupling with the torque controlled one via specimen has been discussed. Simulation result showed that the mechanical coupling had little effect on hydrostatic secondary control load simulation system. The speed variation of the speed controlled unit was mainly affected by load disturbance. Depending on the principle of structure invariance, an approximate feed-forward compensator was designed to resist load disturbance and promote the control quality.

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