

论文

钻锚机钻臂模态参数的高精度提取方法及实验

董洪波, 姚宁平, 张幼振, 杜小山, 祁克玉

中煤科工集团西安研究院, 陕西 西安710077

摘要:

研究了一种钻锚机钻臂模态参数的精确提取方法, 并通过仿真和实验对方法的有效性和可靠性进行了验证。实验结果表明, 该方法能够从脉冲响应信号中高精度的提取结构的模态参数(模态频率、阻尼比), 不受多阶模态响应信号叠加的影响, 有效地解决了传统模态参数提取方法的不足。利用本方法获得的模态参数, 为钻锚机钻臂有限元模型的更新与修正, 为其动态特性的预估和优化设计提供了参考。

关键词: 钻锚机钻臂; 模态参数提取; 有限元模型修正

High-precision modal parameters identification method and modal experiment of roof bolter' s drilling arm

Abstract:

A novel method was proposed to identify the modal parameters of roof bolter' s drilling arm with high precision. In order to verify this method, we made an experiment, and the results showed that the method had a good validity and reliability. The proposed method is less affected by mode superposition and can overcome the disadvantages of traditional modal parameters identification method. Furthermore, the method can help to update the FEM model of roof bolter' s drilling arm and the identified modal parameters also provide basic data to further dynamic analysis and optimum design.

Keywords: roof bolter' s drilling arm; modal parameter identification; finite element model updating

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通讯作者: 董洪波

作者简介: 董洪波(1979—), 男, 辽宁朝阳人, 工程师, 博士

作者Email: hongbo\_dong@163.com

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