

基于小尺寸Hopkinson杆的动态校准系统

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摘要:

针对高g值高安装谐振频率加速度计动态校准过程中高g值窄脉冲加速度激励信号难以产生的难题, 提出了基于小尺寸Hopkinson杆的动态校准系统。该系统采用压缩空气作为激励源, 小尺寸精密校准杆作为加载装置来产生窄脉冲加速度激励信号, 并通过轴向激光干涉仪进行激励信号的测量。且校准实验结果表明, 该系统可以充分激起安装谐振频率为180kHz的高g值加速度计B&K 8309的高阶谐振频率, 校准结果较为理想。

关键词: 测试计量技术及仪器; 动态校准; 窄脉冲激励; 小尺寸Hopkinson杆; 高安装谐振频率; 高g值加速度计

The Dynamic Calibration System based on Micro-Hopkinson Bar

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Abstract:

In order to generate narrow shock pulse excited a high-g accelerometer with high resonance frequency, a dynamic calibration system based on the micro-Hopkinson bar was put forward. Compressed air was used for excitation source in this calibration system, micro alignment bar was used as a loading device, and axial laser interferometer was used for measuring the excitation signal. It was demonstrated that this system is effective for amplitude-frequency response characteristic calibration of a high-g accelerometer such as B&K 8309 whose resonance frequency is 180kHz, and various resonance frequencies of 8309 were excited using the narrow shock pulse which was generated by the above system.

Keywords: high-g accelerometer; measuring and testing technologies and instruments; dynamic calibration; narrow shock pulse excitation; micro-Hopkinson bar; high resonance frequency; high-g accelerometer calibration; narrow shock pulse; micro-Hopkinson bar

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