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基于高冲击激励的加速度计参数辨识的研究

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摘　要：

加速度计的动态校准在国内外计量领域越来越受到重视，本文参考国内外最新的加速度计动态校准方法，主要阐述了基于高冲击激励下加速度计动态特性参数辨识的问题。该方法根据加速度计的物理结构建立了其状态空间模型，利用外差式激光干涉仪测量并经过相应处理得到了输入加速度计的激励信号。利用得到的输入-输出数据，通过最小化其状态空间模型的预测误差序列得到了被校加速度计的动态特性的参数，通过在不同的冲加速度峰值下进行了试验并比较表明该方法的有效性。

关键词：计量学；参数辨识；冲击激励；状态空间模型；动态特性；传递函数

Study for parameters identification of a accelerometer

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Abstract:

Dynamic calibration for accelerometer is of growing importance in metrology at home and abroad. A signal processing method for identifying the parameters of the accelerometer is presented in the paper according the latest calibration method. The method is based on the state-space model description of the relationship between input, noise and output signals for the accelerometer. Based on the displacement signals measured by the Heterodyne interferometry, the acceleration input signal is derived. Utilizing the input-output data, the parameters of the model for the accelerometer are estimated by minimizing the prediction error sequence of the states-space model, and the method is applied to different shock intensities, and the effective of the method is confirmed by the results.

Keywords: Metrology；Parameters identification；Shock excitation；　State-space model；Dynamic characteristic；　Transfer function

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