

光纤传感和光通信

用单轴转台标定光纤陀螺捷联系统的方法

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摘要:

针对以六面体作为安装支架的三轴光纤陀螺捷联系统,提出了一种用单轴转台作为标定设备的低成本标定方法。六面体支架有3个面为未安装陀螺的平面,需用游标量角器量出这3个面的相互夹角,并根据这3个面建立机体坐标系,在该坐标系下给出了陀螺输出模型。标定时依次将六面体的3个平面贴于单轴转台的台面进行标定实验,推导了光纤陀螺标度因数和安装误差的求解公式。对标定的精度进行了分析,并与传统的方法对比做了实验验证,结果表明该方法可满足系统要求。

关键词: 光纤陀螺 捷联系统 单轴转台 标定

Calibrating FOG SINS by single axis table

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Abstract:

A low cost calibration method for fiber optic gyroscope (FOG) strapdown inertial navigation system (SINS) by single axis table was studied with the system installed in a hexahedron. There are three empty surfaces without FOG in the hexahedron, so angle between three surfaces was measured by nonius protractor. A body reference frame was established according to the three surfaces, and the output model of FOG was given. During the calibration, three surfaces of the hexahedron were put on the surface of single axis table in turn. Calculation formula of FOG's scale factor and mounting misalignment was deduced. The accuracy of the calibration was discussed, and test experiment was done. The result shows the system requirement is met.

Keywords: fiber optic gyroscope strapdown inertial navigation system single axis table calibration

收稿日期 修回日期 网络版发布日期

DOI:

基金项目:

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