[1]刘 涛,赵国荣,徐珂文.基于某种无陀螺惯性测量单元的安装误差补偿[J].弹箭与制导学报,2012,6:154-158.

LIU Tao,ZHAO Guorong,XU Kewen.Installation Error Compensation of an Allocation Scheme of GFIMU[J].,2012,6:154-158.

基于某种无陀螺惯性测量单元的安装误差补

《弹箭与制导学报》[ISSN:1673-9728/CN:61-1234/TJ] 期数: 2012年第6期 页码: 154-158 栏目: 相关技术 出版日期: 2012-12-25

Title: Installation Error Compensation of an Allocation Scheme of GFIMU

作者: 刘 涛; 赵国荣; 徐珂文
海军航空工程学院,山东烟台 264001

Author(s): LIU Tao; ZHAO Guorong; XU Kewen
Naval Aeronautical and Astronautical University, Shandong Yantai 264001, China

关键词: 无陀螺惯性测量单元; 加速度计安装误差; 标定; 补偿

Keywords: GFIMU; installation error of accelerometer; calibration; compensation

分类号: V241.62

DOI: -

文献标识码: A

摘要: 加速度计的安装误差对无陀螺惯性测量单元的精度影响十分显著。分析了一种典型的九加速度计配置方案,针对其构型特点,讨论了加速度计的安装方向和位置误差,给出了标定方法和误差计算公式,采用总体最小二乘法求解其中的超定方程,并设计了补偿方案。仿真试验结果表明该补偿方案将角速度解算误差的均值和方差均减小2个数量级,消除89.5%的东向导航误差。

Abstract: The installation error of accelerometer has great influence on the precision of gyroscope free inertial measurement unit(GFIMU). A typical allocation scheme with 9 accelerometers was analyzed. Based on its configuration characteristic, the orientation and location errors of accelerometers were discussed. Then a calibration idea and calculating formula of error were put forward and the total least squares was adopted to solve the problem of over-determined equation. Then a compensation scheme was designed. Different calculating methods of angular-rate(assistant method and intelligent weighted method)were used in the

simulation. The result shows that the compensation scheme can reduce the mean and variance of calculating error by two orders of magnitude and eliminate 89.5% of navigation error.

参考文献/REFERENCES

[1] 马澍田,陈世有,李艳梅.无陀螺捷联惯导系统[J].航空学报,1997, 18(4):484-488.
[2] T L Chen.Design and analysis of a fault-tolerant coplanar gyro free inertial measurement unit[J].