基于自适应遗传算法的三轴磁强计误差校正方法

作　者：卢兆兴,张金生,王仕成,蔡欣华

单　位：第二炮兵工程大学301教研室

摘　要：

三轴磁强计被广泛应用于空间磁场的测量与研究。分析三轴不正交对三轴磁强计测量结果带来的影响，得到三轴磁强计的误差校正公式，建立求解非正交误差角的最优化数学模型，并运用自适应遗传算法对模型进行求解，实现对磁强计固有参数的辨识和测量误差的校正。通过FGM-2000三轴磁力仪实测实验对校正方法进行验证，结果表明，校正方法效果明显，仪器的测量误差减小了88.1%，测量精度显著提高。

关键词：三轴磁强计，自适应遗传算法，参数辨识，误差校正

Calibration for Tri-axial Magnetometer Based on Adaptive Genetic Algorithm

Author's Name:

Institution:

Abstract:

Tri-axial magnetometers are widely used in geomagnetic measurement and study. The influence on the measurement results caused by tri-axial nonorthogonality is analyzed, and the calibration formula is established, an optimization mathematical model is established to get the nonorthogonal error angles, and the Adaptive Genetic Algorithm is used to solve the model, in order to achieve the identification of intrinsic parameters and the calibration of measurement errors. The measurement experiment of FGM-2000 tri-axial magnetometer is done to verify the calibration method, and results show that the effect is obvious, the measurement error is reduced 88.1% and the measurement accuracy is significantly improved.

Keywords: tri-axial magnetometer, Adaptive Genetic Algorithm, parameter identification,

查看pdf文件