A magnetic disturbance compensation method based on magnetic dipole magnetic field distributing theory

Yang Y.-T., Shi Z.-Y., Guan Z.-Z., Li Y.-Z.
Artillery Engineering Department, Ordnance Engineering College, Shijiazhuang 050003, China

Abstract: The interference of carrier magnetic field to geomagnetic field has been a difficult problem for a long time, which has influence on navigation compass deviation and geomagnetic measurement. How to eliminate the effect of inherent and induced magnetic fields of carrier on the measuring accuracy of geomagnetics was researched to increase the accuracy of geomagnetic measurement suitable for the need of geomagnetic matching localization. The magnetic dipole magnetic field distributing theory was applied to deduce the magnetic composition in a position where the sensor is installed on the carrier. A geomagnetic measurement model was established with the ideal sensor magnetic measurement data. And a geomagnetic measurement compensation model including the magnetic disturbance of carrier and the error of sensor was built based on the analysis of the magnetic sensor error, in which the parameter meaning is specific and the errors of carrier magnetic field and magnetic sensor can be compensated in any case. The experimental results show that the model has higher geomagnetic measurement accuracy than that of others.
Author Keywords: Connatural magnetic field; Electromagnetics; Geomagnetic measurement; Induced magnetic field; Magnetic dipole

Year: 2008
Source title: Binggong Xuebao/Acta Armamentarii
Volume: 29
Issue: 12
Page : 1485-1491
Link: Scorpus Link
Document Type: Article
Source: Scopus
Authors with affiliations:

1. Yang, Y.-T., Artillery Engineering Department, Ordnance Engineering College, Shijiazhuang 050003, China
2. Shi, Z.-Y., Artillery Engineering Department, Ordnance Engineering College, Shijiazhuang 050003, China
3. Guan, Z.-Z., Artillery Engineering Department, Ordnance Engineering College, Shijiazhuang 050003, China
4. Li, Y.-Z., Artillery Engineering Department, Ordnance Engineering College, Shijiazhuang 050003, China