Spacecraft attitude determination and three-axis magnetometer calibration

Huang L., Jing W.-X.

Department of Aerospace Engineering, Harbin Institute of Technology, Harbin 150001, China

Abstract: The paper presents three novel altitude determination fillers for a low-Earth spacecraft with a three-axis magnetometer and a three-axis gyro, which on purpose are designed to remove the effects of magnetometer biases, scale factors and non-orthogonality corrections on accuracy of normal attitude determination. The first filler is an augmented UKF by augmenting the original state with those calibration parameters. The rest two fillers are dual UKFs which include an attitude determination filler and a magnetometer calibration parameter filler and they are different in using the geomagnetic field observation. Computer-based simulations are used to test the validity of the three fillers and compare their performances.

Author Keywords: Computer-based simulation; Geomagnetic attitude determination; Low-Earth spacecraft; Three-axis magnetometer

Year: 2008

Source title: Yuhang Xuebao/Journal of Astronautics

Volume: 29

Issue: 3

Page : 854-859

Cited by: 1

Link: Scorpus Link

Document Type: Article

Source: Scopus

Authors with affiliations:

1. Huang, L., Department of Aerospace Engineering, Harbin Institute of Technology, Harbin 150001, China
2. Jing, W.-X., Department of Aerospace Engineering, Harbin Institute of Technology, Harbin 150001, China