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Interactive comment on "An initial investigation of the long-term trends in the fluxgate magnetometer (FGM) calibration parameters on the four Cluster spacecraft" *by* L. N. S. Alconcel et al.

Anonymous Referee #2

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The long term behavior of the calibration parameters of the four flux gate magnetometers aboard the Cluster constellation spacecrafts is estimated in the paper. It is very important and actual task both for proper scientific interpretation of the acquired magnetic filed data and for evaluation of magnetometers quality with a purpose to improve it in future missions. For estimating the calibration parameters of the magnetometers the two methods, which exploit a rotation of the magnetic field in respect to the magnetometer axes, are used. A Fourier analysis method is used in the case, when the rotation was caused by the spin of the spacecraft. The offset of the component aligned along the spacecraft spin-axis could not be estimated by the first approach and to re-

solve this problem a solar wind analysis method, which uses the rotational behavior of the solar wind magnetic field fluctuations, is applied. Both methods have restrictions and limitations and authors note at the section 2.6, that "...the accuracy of the recovered parameters is strongly dependent upon the quality of the data available...". Unfortunately, no quantitative estimations of the systematic errors of the in-flight calibration procedures are given in the paper. From this point of view it is unclear how to distinguish between the errors originated in the instrument itself and the errors appeared due to calibration procedures imperfection. For example, the standard deviations of the azimuthal angle of the spin axis component (coordinate X) at the spacecraft 3 varies from 0.0578 to 8.3095 degrees of arc (Table 5). Are these deviations caused by the real yaw of this component or by the systematic errors of the calibration method? In my opinion, the uncertainty level of the calibration methods have to be given for each estimated parameter – offsets, gains, angles.

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