

Performance evaluation of the fluxgate magnetometer installed on the ERG satellite

NOMURA, Reiko^{1*} ; MATSUOKA, Ayako¹ ; TERAMOTO, Mariko¹

¹ISAS, JAXA

We conducted the performance evaluation tests on 5-8 November 2014, on the fluxgate magnetometer (MGF) being installed on the ERG satellite. The MGF is required to have the accuracy of 5nT (0.03%) with a 8000nT range when it measures the magnetic field in the Earth's inner magnetosphere. In order to evaluate its measurement accuracy, we investigated the in/output linearity of ADC by comparing the digital outputs to the continuous input voltage ($\sim 0\text{-}\pm 3\text{V}$). We also investigated the ADC noise dependence on the analog input voltage for 30s digital outputs every 0.15V inputs from ~ 0 to $\pm 3\text{V}$.

The MGF measures the magnetic field by returning feedback currents into the sensor. It required to evaluate the time delay of responses to the magnetic field variation and the maximum magnetic field variation which the MGF can response. We derived the time delay with the correlation analysis between the input voltage (10Hz sin waves with $\sim \pm 4000\text{nT}$ amplitudes) and the digital outputs. We also investigated the maximum frequency of the magnetic field variation by adding large amplitude (1-4V) sine waves (9-36Hz).

In our presentation, we report those performance evaluation results.