

Temperature Test of Fluxgate Magnetometer Sensor for Deep Space Exploration

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The observation of interplanetary magnetic field is very important for clarifying the interaction between solar wind and planetary magnetosphere structures. Fluxgate magnetometer is popular and stable magnetometer for magnetic field observation. A planetary exploration named the Bepi-Colombo Mercury Magnetospheric Orbiter (MMO) is the cooperative project between Japan and Europe. A ring-core-type fluxgate magnetometer made in Japan will be installed on the satellite for observing the Mercury magnetosphere. But it is known that the magnetometer sensor is not good temperature specific characteristic, because the sensor is exposed in space.

It is assumed that the temperature around Mercury changes from -100 to +175C, so we have to test exposed sensors range from -160 to +200C. We have developed a wide-range-temperature testing system and tested some kinds of sensors. We obtained data on sensor sensitivity, offset drift, and noise level over the wide range.

In this paper, we will report the temperature testing system and results of sensor characteristics for the Bepi-Colombo MMO fluxgate magnetometer.