

SEM032-15

会場:展示ホール7別室2

時間: 5月25日14:15-14:30

高アルベド地域における月地殻磁場マッピング(II)かぐや低高度データによるマップ

Surface magnetic field mapping on high albedo marking areas of the moon (II) Improvements using Kaguya low altitude data

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The correlation between high albedo markings (HAM) on the surface of the moon and strong magnetic anomalies has been claimed since the early time of the lunar magnetic field study (e.g. Hood and Schubert, 1980). Hood et al. (2001) mapped the smoothed magnetic field strength over the Reiner Gamma region using Lunar Prospector magnetometer (LP?MAG) data, and suggested that the position of them matches each other well. In the last JpUG meeting, we provided the low altitude magnetic anomaly map over HAMs from LP?MAG data and showed that the correlation between HAM and horizontal component (Bh) of the lunar magnetic field was much better than total force (Bf). In this paper, we present the maps drawn using Kaguya Lunar Magnetometer (Kaguya?LMAG) data.

The resolution and cleanness of the magnetic anomaly map depends primarily on the altitude of the observation. Kaguya spacecraft flew lower than 10km over the South Pole Aitken basin, where strong magnetic anomalies are observed, in the last month of its mission. It improved the anomaly maps of the area including Abel, Gerasimovich (Crisium Antipode) and Mare Ingenii (Imbrium Antipode) regions.

We have developed a method to restore the 3-d magnetic field from satellite field observations (EPR method which stands for Equivalent Pole Reduction; Toyoshima et al. 2008). Applying EPR to the areas, we calculate the magnetic anomalies at near surface (5km) altitude, and mapped to see how the anomaly and the HAM correlate each other.

The maps are improved strikingly, because of the low altitude, and they indicates that the high Bh closely relate to HAM to the detailed pattern. It is especially true for Mare Ingenii. Mare Ingenii is famous for the beautiful swirls in it. The Bh high is observed almost all the swirls even the size of less than 10km. This correlation strongly supports the hypothesis that the swirls as well as HAMs are formed by the reduction of solar wind particles, which are trapped or reflected by the magnetic field.

キーワード:磁気異常,反射率異常,スワール,月磁気

Keywords: Lunar magnetic anomaly, High albedo marking, Swirl, Equivalent source mapping