



## Short Period Magnetic Field Enhancements Detected by Kaguya Around the Moon in the Solar Wind

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Short-period magnetic enhancements were detected by the MAP-LMAG magnetometer onboard Kaguya orbiting the moon in the solar wind at the altitude of 100 km. The duration of the enhancement was typically 10 seconds, which corresponds to the scale size of 15 km and 0.5 degrees in latitude along the Kaguya orbit. The magnitude of the magnetic field enhanced up to 1.5 to 3.6 times as large as that of the preceding quiet periods which lasted for more than 5 minutes. No such magnetic enhancements were found in the simultaneous solar wind magnetic field observed by GEOTAIL or ACE in the upstream solar wind.

The short-period magnetic enhancements were categorized into 2 groups, with and without rotation of the magnetic field. The former appeared at the intrinsic magnetic rotation in the solar wind just like the hot flow anomalies [1–3] observed at the Earth's bow shock. The ions reflected at the Earth's bow shock are channeled back upstream along the current sheet when the motional electric field points toward the current sheet on both sides, and the magnetic fields bounding the expanding region are compressed. The same mechanism is expected at the moon reflecting the solar wind ions.

The latter, the magnetic enhancement without magnetic rotation, was observed at the terminator region in the solar wind condition preferable to the detection of the limb compression [4], that is, the magnetic field flaring away from the moon and the reduced dynamic pressure of the solar wind. Differently from the previously reported limb compression, there was no major magnetic anomalies below the spacecraft nor the magnetic field lines at the detection of the magnetic enhancement with no directional change. They were not detected recursively on the same location on the moon, because of the scale size smaller than the orbital separation in the next revolution of Kaguya. The duration was smaller than the temporal resolution of particle measurements of MAP-PACE onboard Kaguya.

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