

R009-04

B会場：11/24 PM1 (13:15-15:15)

14:00~14:15

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Solar wind interaction with multiple lunar crustal magnetic anomalies: Kaguya low-altitude observations

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The solar wind interaction with lunar crustal magnetic anomalies (LMAs) gives rise to various electromagnetic phenomena (e.g. formation of Hall electric fields due to ion-electron decoupling, nonadiabatic solar wind ion reflection, and plasma wave excitation). Understanding the nature of the solar wind-LMA interaction is important because it greatly affects the spatial structure and temporal variability of electromagnetic fields, which control the dynamics of charged particles near the lunar surface. However, the solar wind-LMA interaction has not been fully understood due to the small vertical spatial scales ($< \sim 50$ km) of LMAs compared to the typical altitude of lunar orbiters ($> \sim 100$ km) and the difficulty of direct observations of the interaction regions. In this study, we focus on Kaguya low-altitude observations, to comprehensively characterize the solar wind ion reflection and plasma wave excitation in the central region of the solar wind-LMA interaction over multiple LMAs with various horizontal extents. We observe relatively stronger solar wind ion reflection and whistler mode waves at 1-10 Hz over spatially extended LMAs than over spatially isolated LMAs. On the other hand, strong broadband electrostatic noise at 1-10 kHz tends to be observed over both spatially isolated and extended LMAs in the central interaction region. Also, our results suggest that direct measurements at low altitudes where Hall electric fields are formed are essential for understanding the detailed physics of the solar wind-LMA interaction. Based on the results derived from Kaguya low-altitude observations, we discuss implications for future low-altitude or lander missions to LMA.