R009-09
A 会場 ： 11/24　PM2（16:05-18:05）
16:05〜16:20:00

#益永 圭 [1)], 原田 裕己 [2)], 横田 勝一郎 [3)], 寺田 直樹 [4)], 桂華 邦裕 [5)], 堺 正太朗 [6)], 松岡 彩子 [2)], 齋藤 義文 [7)], 加藤 大羽 [8)]
([1] 山形大, [2] 京都大学, [3] 大阪大学大学院, [4] 東北大学, [5] 東京大学, [6] 慶應義塾大学, [7] 宇宙航空研究開発機構, [8] 日立製作所

Spatial and temporal variability of low-energy lunar Ions: Insights from Kaguya/IMA observations

#Kei Masunaga[1)], Yuki HARADA[2)], Shoichiro YOKOTA[3)], Naoki TERADA[4)], Kunihiro KEIKA[5)], Shotaro SAKAI[6)], Ayako MATSUOKA[2)], Yoshifumi SAITO[7)], Daiba KATO[8)]
([1]Yamagata University, [2]Kyoto University, [3]Osaka University, [4]Tohoku University, [5]University of Tokyo, [6]Keio University, [7]JAXA, [8]Hitach Ltd.

We analyzed ˜1 year of time-of-flight (TOF) data obtained from the Ion Mass Analyzer (IMA) on the Kaguya spacecraft to investigate the spatial and temporal variations of low-energy ions originating from the lunar surface and exosphere. In this study, we focused on the large-scale distribution and variability of ion fluxes of multiple species (He+, C+, O+, Na+, Al+, K+, Ar+). We assumed the low-energy ions (<300 eV) were accelerated along the motional electric field of the solar wind until the ions were detected by IMA. Mapping the observed fluxes at every footpoint of the motional electric field, we found that low-energy ions were more abundant on the dawnside than on the duskside. In addition, we examined possible drivers of temporal variations by categorizing the data according to meteor shower periods, solar wind flux levels, and solar EUV irradiance. We found that the low-energy ion fluxes during meteor shower periods increased compared to non-shower periods, whereas variations correlated with solar wind fluxes and EUV irradiance were less significant. These results suggest that micrometeoroid impacts are a major source of low-energy ions released from the lunar surface, while solar wind and EUV effects play secondary roles. This study demonstrates that ion measurements provide valuable insights into both surface composition and transient release processes, with implications for future observations by the Mass Spectrum Analyzer (MSA) on the MMX mission to study the Phobos surface.