Analysis of landing site candidates for system-level technical studies

Report Number: R23EB0101
Subject Category: Space Exploration
URL: https://www.jss.jaxa.jp/en/ar/e2023/23739/

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Abstract

Using existing multiband image data, we calculate the Hapke parameter map for the lunar polar region (over 60 degrees in latitude for both north and south poles) and use it to calculate the photometrically normalized color mosaic maps. These data products are necessary to study landing sites and route plannings for JAXA's up coming lunar polar missions.

Reasons and benefits of using JAXA Supercomputer System

To process large amounts of planetary remote-sensing data ranging from terabytes to petabytes and to obtain high-resolution results in a relatively short time scale, a parallel computer with a very large number of cores, such as JSS3, is very effective.

Achievements of the Year

A color mosaic map of the lunar South Pole region was created using data from the Multi-Band Imager onboard JAXA's lunar exploration satellite SELENE. By using topographic data with higher precision and resolution and by precisely removing shadow areas observed by ray tracing calculations, we succeeded in creating a product with fewer false colors and higher precision than ever before. Based on the new polar maps, high-resolution maps of the latitudinal dependence of the degree of space weathering and iron content were created, and better understanding of the effects of space weathering and crustal growth mechanisms on the Moon's surface was achieved.

Publications

N/A

Usage of JSS

Computational Information

Process Parallelization Methods	MPI
Thread Parallelization Methods	Manual parallelization by own script
Number of Processes	12 - 36
Elapsed Time per Case	1 Hour(s)

JSS3 Resources Used

Fraction of Usage in Total Resources[*1](%): 0.00

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage[*2](%)
TOKI-SORA	0.00	0.00
TOKI-ST	394.94	0.00
TOKI-GP	0.00	0.00
TOKI-XM	0.00	0.00
TOKI-LM	0.00	0.00
TOKI-TST	0.00	0.00
TOKI-TGP	0.00	0.00
TOKI-TLM	0.00	0.00

File System Resources		
File System Name	Storage Assigned (GiB)	Fraction of Usage*2 (%)
/home	208.59	0.17
/data and /data2	59,783.52	0.37
/ssd	30,720.00	2.90

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage*2 (%)
J-SPACE	0.00	0.00

*1: Fraction of Usage in Total Resources: Weighted average of three resource types (Computing, File System, and Archiver).

*2: Fraction of Usage：Percentage of usage relative to each resource used in one year.

- **ISV Software Licenses Used**

ISV Software Licenses Resources		
	ISV Software Licenses Used (Hours)	Fraction of Usage*2 (%)
ISV Software Licenses (Total)	0.00	0.00

*2: Fraction of Usage：Percentage of usage relative to each resource used in one year.