

Examination of ISAS's scientific satellitedata processing using JSS

Report Number: R22EEU30800

Subject Category: Space and Astronautical Science

URL: <https://www.jss.jaxa.jp/en/ar/e2022/20858/>

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● Abstract

Examine and demonstrate technologies for parallel processing of scientific satellite data at ISAS.

● Reasons and benefits of using JAXA Supercomputer System

The resources required for fast data reprocessing are increasing due to the sophistication of observation equipment and longer operations.

● Achievements of the Year

Digital altitude data (~60k files, approx. 2 TB) of the lunar surface acquired by KAGUYA up to around 2009 were processed for conversion into HEALpix for global data used in the field of astronomy. Simple parallelization and the use of sparse matrices in TensorFlow enabled fast conversion of the all-moon spherical data into an array of approximately 700 GB of data.

● Publications

- Peer-reviewed papers

"Development of HEALPix-based KAGUYA's lunar desital elevation database and data provision system", KOBAYASHI, Nene; KAJIURA, Rio; NAKAHIRA, Satoshi; YAMAMOTO, Yukio; UCHIDA, H., Akihito; EBISAWA, Ken; Journal of Space Science Informatics Japan: (In review)

- **Usage of JSS**

- **Computational Information**

Process Parallelization Methods	Since the input data is divided, job submission optimization tools were used to execute the jobs simultaneously.
Thread Parallelization Methods	N/A
Number of Processes	100 - 500
Elapsed Time per Case	6 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	20.73	0.00
TOKI-ST	29,510.05	0.03
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	28.33	0.03
/data and /data2	17,920.00	0.14
/ssd	801.33	0.11

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage* ² (%)
J-SPACE	5.94	0.03

*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.