Greenhouse gases Observing SATellite-2 (GOSAT-2) Project

● Responsible Representative

SUTO, Hiroshi, GOSAT-2 Project Team, Space Technology Directorate I

● Contact Information

Rio Kajiura(kajiura.rio@jaxa.jp)

● Members

Makiko Hashimoto, Shin Ishida, Kenji Kowata, Fumie Kataoka, Yuki Kobayashi, Nobuhiro Kikuchi, Taro Makino, Tomoyuki Mabuchi, Hiroshi Suto, Hideki Suetake, Shigeaki Wada, Yugi Yata

● Abstract

GOSAT-2 project retrieve and estimate the global concentration distribution of major greenhouse gases including the sources and natural absorbers with high level of accuracy to contribute to environmental administration as follows.

- Improved precision of climate change predictions

- Early detection of changes in the Earth system

- Better understanding of emission reduction level of the anthropogenic greenhouse gases and changing natural sink

- Contribution to air pollution monitoring policies

Also, GOSAT-2 project researches and develops new earth observation technologies required for future earth observing satellites.

Ref. URL: http://global.jaxa.jp/projects/sat/gosat2/

● Reasons and benefits of using JAXA Supercomputer System

GOSAT-2 project utilizes JSS3 as one of the GOSAT-2 Mission Operation System which processes the observation data of GOSAT-2. When processing algorithm is updated, JSS2 reprocesses all data observed in the past. Also, JSS2 is used as a remote storage of all data required for its reprocessing.

As the reprocessing targets of GOSAT-2 products extends to all data observed in the past, more computer resources (core, memory, storage, etc.) are required than in the real-time processing.

It is necessary to use JSS3 to shorten the reprocessing time and to provide the reprocessing products to GOSAT-2 users in a more timely manner.

● **Achievements of the Year**

We have been transmitting L0 data from the GOSAT-2 Mission Operation System to JSS3 in preparation for reprocessing of L1 products on JSS3 since observation by TANSO FTS-2 and TANSO-CAI-2 started.

March through April in FY2023, we have updated the L1 processing algorithm as follows;

- Version 220.221;

[L1A] None.

[L1B] Apply the corrected radiance factor using the radiance degradation factor reflecting the the on-orbit calibration data for the first five years after launch and the alternative calibration.

- Version 230.230;

[L1A] Update SWIR voltage conversion factor./Bug fix: L1 processing using time error information./Bug fix: Incorrect the observation time due to the L0 condition.

[L1B] Enable SWIR radiance variation correction./Bug fix: Same as above (L1A).

The FTS-2 L1A/B and CAI-2 L1A products have been available to general users from "GOSAT-2 Product Archive" (https://prdct.gosat-2.nies.go.jp/index.html.en) since July 2019.

● **Publications**

N/A

● **Usage of JSS**

● **Computational Information**

Process Parallelization Methods	N/A
Thread Parallelization Methods	OpenMP
Number of Processes	1
Elapsed Time per Case	5 Minute(s)

- **JSS3 Resources Used**

Fraction of Usage in Total Resources[1](%): 0.05

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage[2](%)
TOKI-SORA	0.00	0.00
TOKI-ST	57,467.63	0.06
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

- **JSS3 Resources Used**

Fraction of Usage in Total Resources[1](%): 0.05

File System Resources		
File System Name	Storage Assigned (GiB)	Fraction of Usage[*2] (%)
/home	200.00	0.13
/data and /data2	409,600.00	1.96
/ssd	0.00	0.00

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage[*2] (%)
J-SPACE	339.45	1.11

[*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.