

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

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Subject Category: Space Technology

URL: <https://www.jss.jaxa.jp/en/ar/e2023/23640/>

### ● Responsible Representative

KUZE Akihiko, GOSAT-2 Project Team, Space Technology Directorate I

### ● Contact Information

Yoko Ueda([ueda.yoko@jaxa.jp](mailto:ueda.yoko@jaxa.jp))

### ● Members

Makiko Hashimoto, Kenji Kowata, Fumie Kataoka, Yuki Kobayashi, Nobuhiro Kikuchi, Taro Makino, Tomoyuki Mabuchi, Takaaki Nishino, Kohei Sugimoto, Hiroshi Suto, Yoko Ueda, 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 FY2022, we have updated the L1 processing algorithm as follows;

- Version 220.220;

[L1A/B] Change maximum signal position detection range when equidistant conversion is performed/Fixing of laser wavelength indication value/  
Correction the problem that a missed observation point occurs depend on the status of L0 data

[L1B] Update TIR Nonlinear Correction Coefficients, Table of Internal Transmittance and Scan Mirror Reflectance

- 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.

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(%): 0.01

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage*2(%)
TOKI-SORA	0.00	0.00
TOKI-ST	45,331.87	0.05
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	100.00	0.08
/data and /data2	256,000.00	1.58
/ssd	0.00	0.00

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage*2 (%)
J-SPACE	293.25	1.06

\*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* <sup>2</sup> (%)
ISV Software Licenses (Total)	0.00	0.00

\*<sup>2</sup>: Fraction of Usage : Percentage of usage relative to each resource used in one year.