

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

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Subject Category: Space Technology

URL: <https://www.jss.jaxa.jp/en/ar/e2022/20880/>

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● 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.

In FY2022, we have updated the L1 processing algorithm as a minor version up (prototype; V211) and reprocessed the past 14 months observation data on JSS3 to provide them for NIES as sample data for evaluation. Additionally, we are going to update the algorithm as a major version up (V220) in the end of March, after starting the daily process, we will reprocess the past overall data on JSS3.

The version-up history of GOSAT-2 TANSO-FTS-2 L1 product for this fiscal year (including planned upgrade) is shown below.

- Version 211.211: Jan.2023

[L1A/B] Update of the interferometer delay value

[L1B] Update of the scan mirror reflectance for TIR

- Version 220.220 : Mar.2023

[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

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(%): 0.00

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage*2(%)
TOKI-SORA	0.00	0.00
TOKI-ST	20,668.24	0.02
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	176.76	0.16
/data and /data2	205,467.62	1.58
/ssd	767.62	0.11

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage* ² (%)
J-SPACE	221.57	0.98

*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.