

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

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Subject Category: Space Technology

URL: <https://www.jss.jaxa.jp/en/ar/e2020/14391/>

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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 JSS2 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 JSS2 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 JSS2 in preparation for reprocessing of L1 products on JSS2 since observation by TANSO FTS-2 and TANSO-CAI-2 started.

In FY2020, we have updated the L1 processing algorithm for TANSO-FTS-2 two times and TANSO-CAI-2 one time and reprocessed the past observation data on JSS2 each time.

The version-up history of GOSAT-2 TANSO-FTS-2 1B product is shown below.

- Version 102.102 : May.2020 FCE correction and complex sensitivity calibration algorithm correction (TIR), Corrects the brightness degradation correction factor and the brightness conversion factor. (SWIR), Adding Attributes

- Version 200.200 : Oct.2020 Adoption of polarization correction for TIR calibration equation, Data format change for adding calibration supplemental information

The version-up history of GOSAT-2 TANSO-CAI-2 1A product is shown below.

- Version 102.102 : May.2020 Adding Attributes, Bug fixes

The FTS-2 L1B and CAI-2 L1B product has been available to general users from "GOSAT-2 Product Archive" (<https://prdct.gosat-2.nies.go.jp/en/index.html>) 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)

- **Resources Used(JSS2)**

Fraction of Usage in Total Resources*1(%): 0.10

Details

Computational Resources		
System Name	Amount of Core Time (core x hours)	Fraction of Usage*2(%)
SORA-MA	0.00	0.00
SORA-PP	29,529.51	0.23
SORA-LM	0.00	0.00
SORA-TPP	0.00	0.00

File System Resources		
File System Name	Storage Assigned (GiB)	Fraction of Usage*2(%)
/home	150.14	0.14
/data	129,955.90	2.51
/ltmp	30,747.78	2.62

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.

- **Resources Used(JSS3)**

Fraction of Usage in Total Resources*1(%): 0.07

Details

Computational Resources		
System Name	Amount of Core Time (core x hours)	Fraction of Usage*2(%)
TOKI-SORA	0.00	0.00
TOKI-RURI	18.90	0.00
TOKI-TRURI	0.00	0.00

File System Resources		
File System Name	Storage Assigned (GiB)	Fraction of Usage*2(%)
/home	164.44	0.11
/data	98,347.03	1.65
/ssd	690.73	0.36

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.