



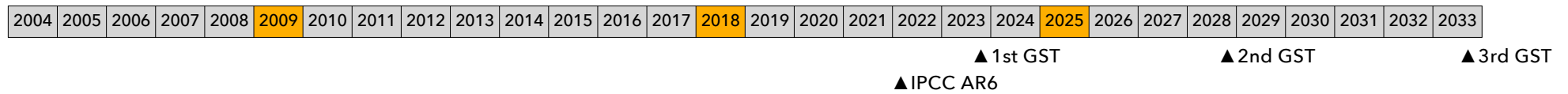
Interface with users of GOSAT-GW TANSO-3 observation: observation requests, product downloads, and acquisition of information



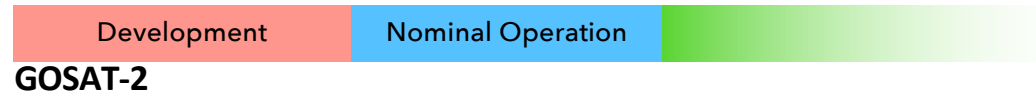
Hisashi Yashiro, Takafumi Sugita, Tazu Saeki, Yu Someya, Tamaki Fujinawa,
Yukio Yoshida, Satoshi Kikuchi, Fumie Kawazoe, Akihide Kamei,
Hiroshi Tanimoto, and Tsuneo Matsunaga

National Institute for Environmental Studies (**NIES**), Tsukuba, Japan

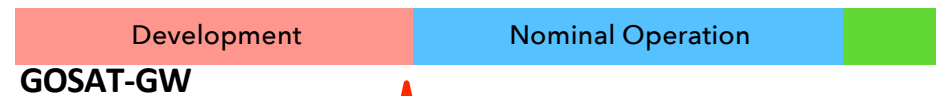
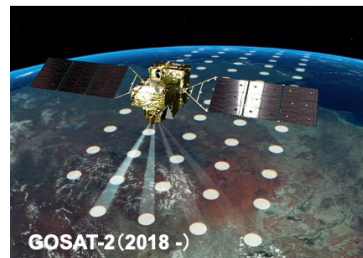
Timeline of GOSAT series operations



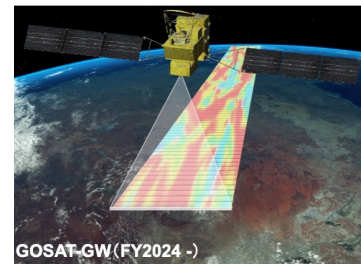
GOSAT



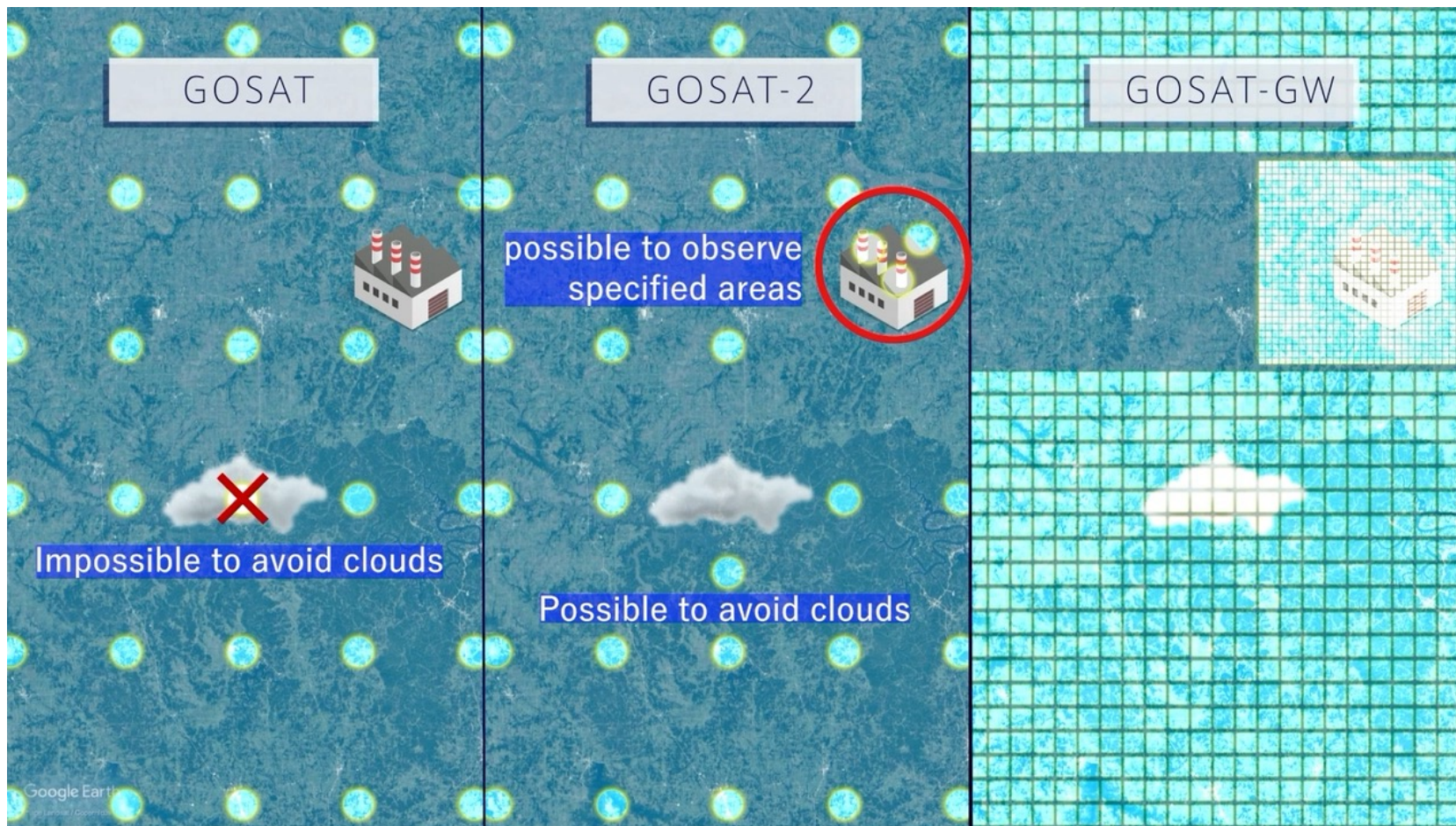
GOSAT-2



GOSAT-GW



**Planned launch date:
June 24, 2025!**



TANSO-3 Standard Products



- ◆ **Level 1B** (geolocated and calibrated spectral radiance)
 - ◆ **Wide-mode**: one file per cycle*
 - ◆ **Focus-mode**: one file per scene*
- ◆ **Level 2** (atmospheric products derived from the L1B)
 - ◆ **Wide-mode GHG**: one file per day*
(including full-physics XCO₂, XCH₄, proxy XCH₄, and SIF)
 - ◆ **Wide-mode NO₂**: one file per day*
 - ◆ **Focus-mode GHG**: one file per scene*
 - ◆ **Focus-mode NO₂**: one file per scene*
 - ◆ **Quick delivery products** are planned for **focus-mode GHG & NO₂**

Wide-mode: 911km swath, 10km footprint, no pointing

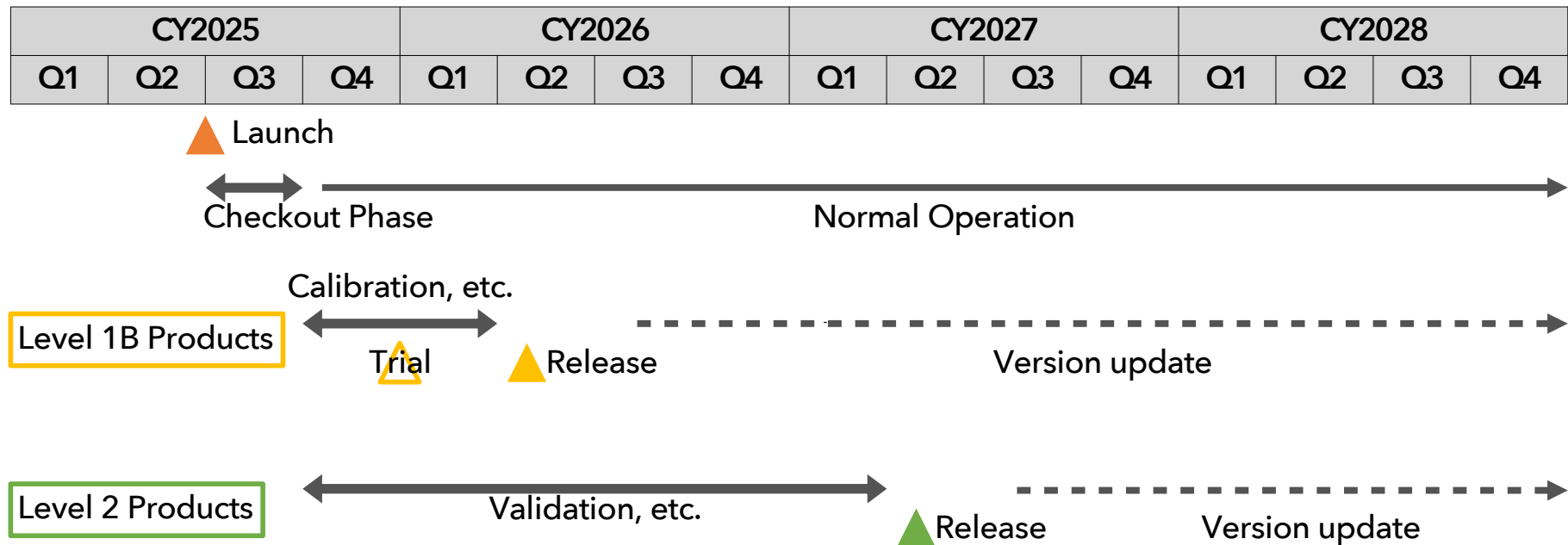
Focus-mode: 90km swath, 1-3km footprint, AT/CT pointing

* One cycle means the orbital period between the descending point and the next descending point.

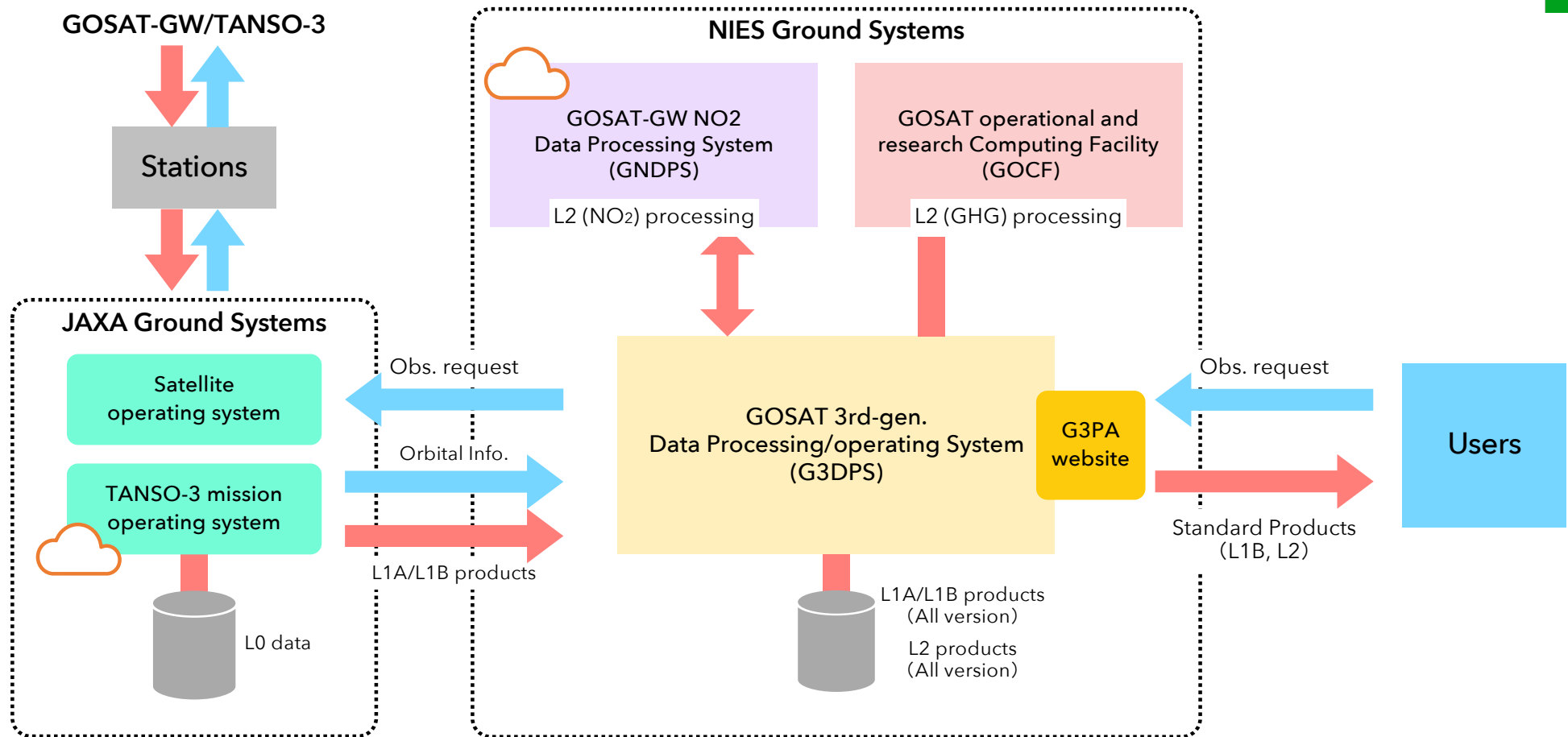
* The scene corresponds to each pointing request. Daily data contains 14-15 cycles.

- Daytime data only
- File format: HDF5 (readable by NetCDF4 library)

TANSO-3 Product release schedule



NIES Ground System for GOSAT-GW



G3PA website



GOSAT-GW TANSO-3 Product Archive

News

Product Search ▾

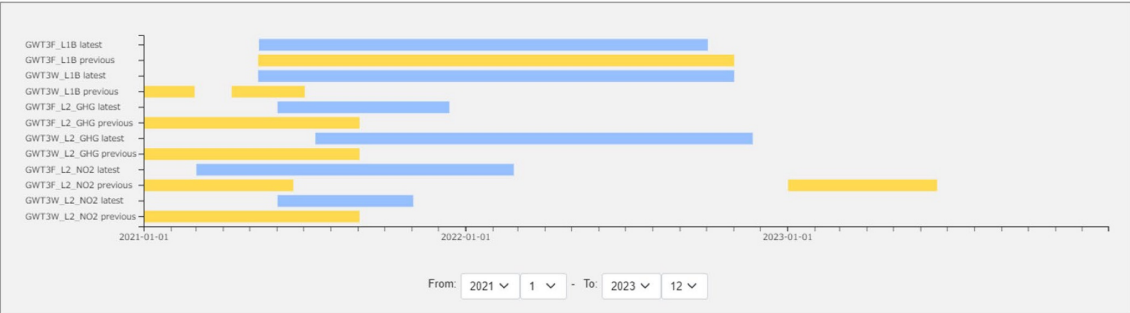
Observation Request

Documents ▾

Support ▾

GOSAT-GW TANSO-3 Product Archive provides distribution services for TANSO-3 products observed by GOSAT-GW

TANSO-3 product availability



From: 2021 ▾ 1 ▾ - To: 2023 ▾ 12 ▾

Latest news

2024-06-05	Maintenance	Announcement of network maintenance (June 16, 2024)
2021-01-01	Observation	Important notice for the temporarily observation data stop of XXXX for the propriety decision of the GOSAT-GW maneuver operation
2020-06-01	Website update	Notice of Website Update
2020-03-01	Maintenance	Website Maintenance Notice YYYY-MM-DD

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<https://product.gosat-gw.nies.go.jp/> (will open this year)

NIES

衛星観測センター
Satellite Observation Center

7

G3PA website: Product Search & Download

GOSAT-GW TANSO-3 Product Archive

Home > Product search > Search & Download

(1) News
Product Search (1)
Search & Download (2)
Browser Search Method
Command Search Method
About Data
Observation Request
Documents
Support

Search & Download

Processing level
☐ L1A
☐ L1B
☒ L2

Observation mode
☒ Wide-mode
☐ Fine-mode

Product (Mandatory)
☒ GOSAT-GW TANSO-3 Wide-mode L2 GHG Product
☒ GOSAT-GW TANSO-3 Wide-mode L2 NO2 Product

Search periods
[Product Maintenance Status](#)
From: To:

Area specification
☒ Not specified
☐ Point
☐ Rectangle

Version (Mandatory)
☒ Current version
☒ Previous version

Detail option

5000 km

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Downloading with Python scripts is also available.

G3PA website: Observation Request

News

Product Search

Observation Request

Request Application

Request History

Application Method

Documents

Support

Observation request history search

Observation start date (Mandatory)

2024-02-26

Observation end date (Mandatory)

2024-03-04

☐ Include wide-area observation

Search

Clear search conditions

GOSAT-GW TANSO-3 Product Archive

[Home](#) > [Observation Request](#) > [Request History](#)

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Observation request history details

Observation request

Request answer

Item name	Value
Adoption status	Adopt
Sensor start date / time	2024-02-26 03:16:42
Sensor start total orbit no.	1270
Sensor start path no.	25
Sensor start argument of latitude [deg]	35.796
Sensor end date / time	2024-02-26 03:17:09
Sensor end total orbit no.	1270
Sensor end path no.	25
Sensor end argument of latitude [deg]	37.483
Image center point(latitude) [deg]	36.418
Image center point(longitude) [deg]	147.863
Image center point(altitude) [m]	0
Sunglint occurrence results	-
Reason for rejection	-
Product quality warning	-

Observation request history list

Cancel observation requests (for selected)

Clear all filters

Export to KMZ

Map display	Select	Application status	Observation request ID	Observation start date / time	Observation end date / time	Observation point name	Latitude [deg]	Longitude
☐	☐	Planning	20240226NO1F150003	2024-02-26 03:16:42	2024-02-26 03:17:09	PointA	36.418	-
☐	☐	Canceled	20240227NO1F250003	2024-02-27 00:02:22	2024-02-27 00:02:28	PointH	-74.649	-
☐	☐	Canceled	20240229NO1F150003	2024-02-29 03:16:45	2024-02-29 03:17:12	PointA	36.418	-
☐	☐	Canceled	20240301NO1F250003	2024-03-01 00:02:25	2024-03-01 00:02:31	PointH	-74.649	-
☐	☐	Canceled	20240303NO1F150003	2024-03-03 03:16:48	2024-03-03 03:17:15	PointA	36.418	-
☐	☐	Planning	20240304NO1F250002	2024-03-04 00:02:28	2024-03-04 00:02:34	PointH	-74.649	-

Display 1-6 items / Total 6 items (0 selected)

Number of lines All 1

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Facility and Algorithm for GHG retrieval processing



GOSAT operational/research Computing Facility (GOCF)

- 200TFLOPS, CPU-only
- 1PByte SSD Lustre
- Infiniband HDR
- Planned to expand

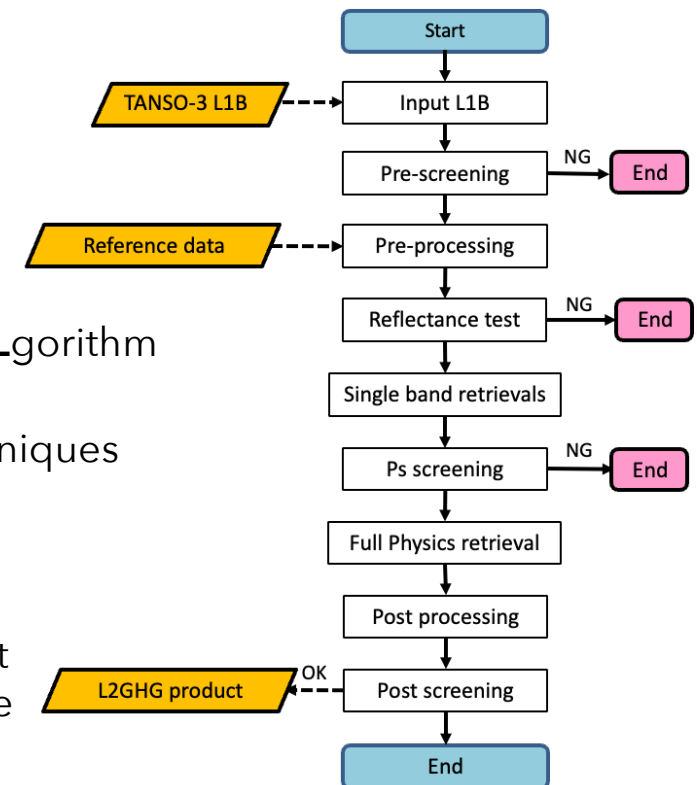


Located on the room of Center for Computational Sciences, Tsukuba University



GOSAT Retrieval ALgorithm (GORAL)

- Gas retrieval techniques
 - Full Physics
 - Proxy Method
- Cloud screenings
 - Reflectance Test
 - Surface Pressure



GHG Retrieval simulations

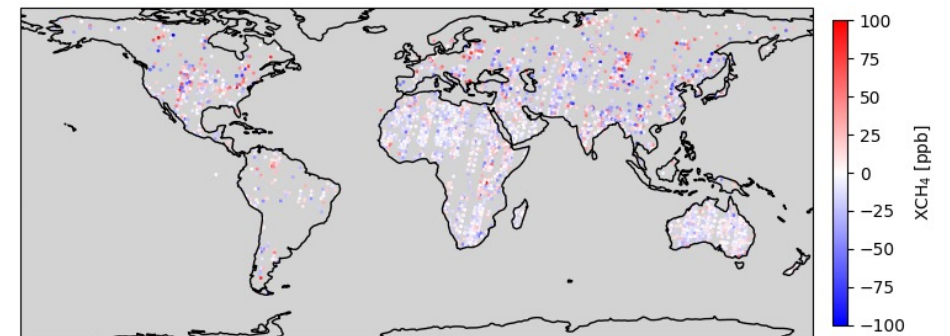
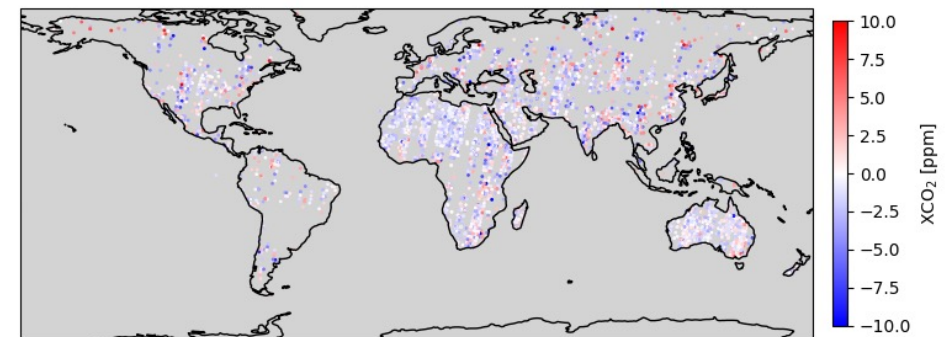
- Retrieval simulations for the focus mode were performed using the ILSF and measurement noise obtained from the TANSO-3 engineering model
- Measured spectra is simulated based on the GOSAT-2 retrieval results, including GHG concentrations, other atmospheric and surface states

Number of points: about 4700

a priori: same as GOSAT-2 retrievals

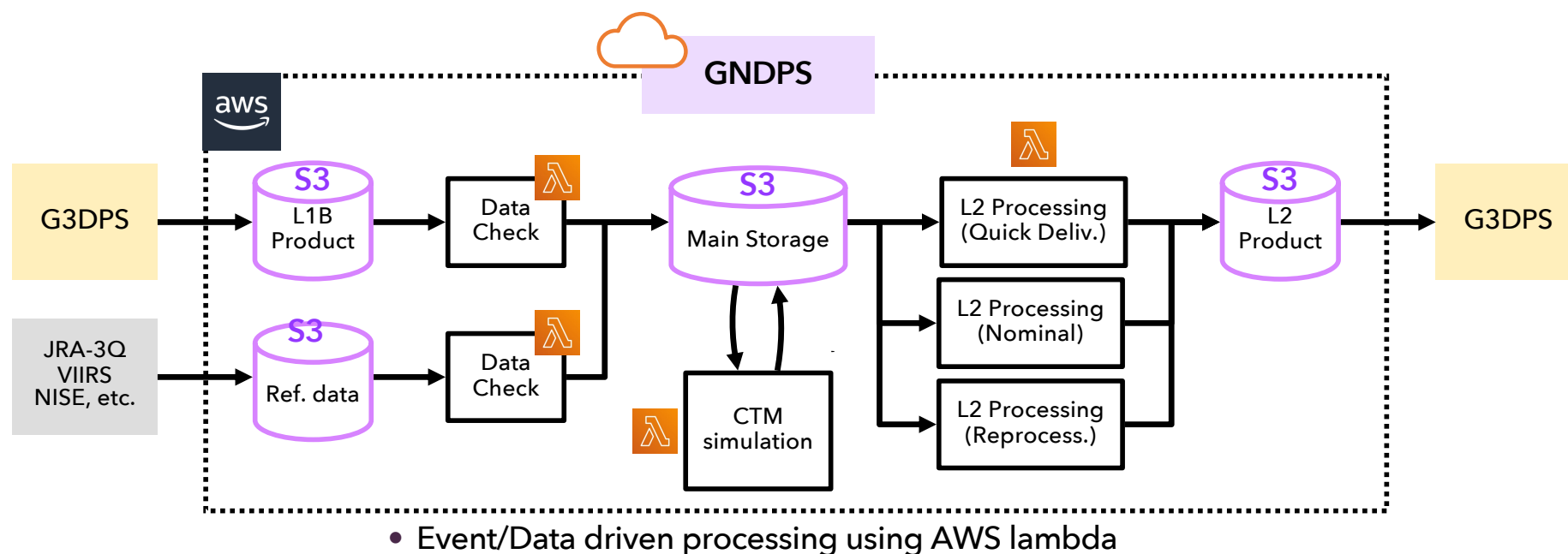
Covariance settings for CO₂ and CH₄ : three times larger than GOSAT-2

Mode		Bias	Std
Focus (3km)	XCO ₂ (ppm)	-0.56	2.65
	XCH ₄ (ppb)	-2.5	24.4
Focus (1km)	XCO ₂ (ppm)	-0.96	3.91
	XCH ₄ (ppb)	-2.7	35.2

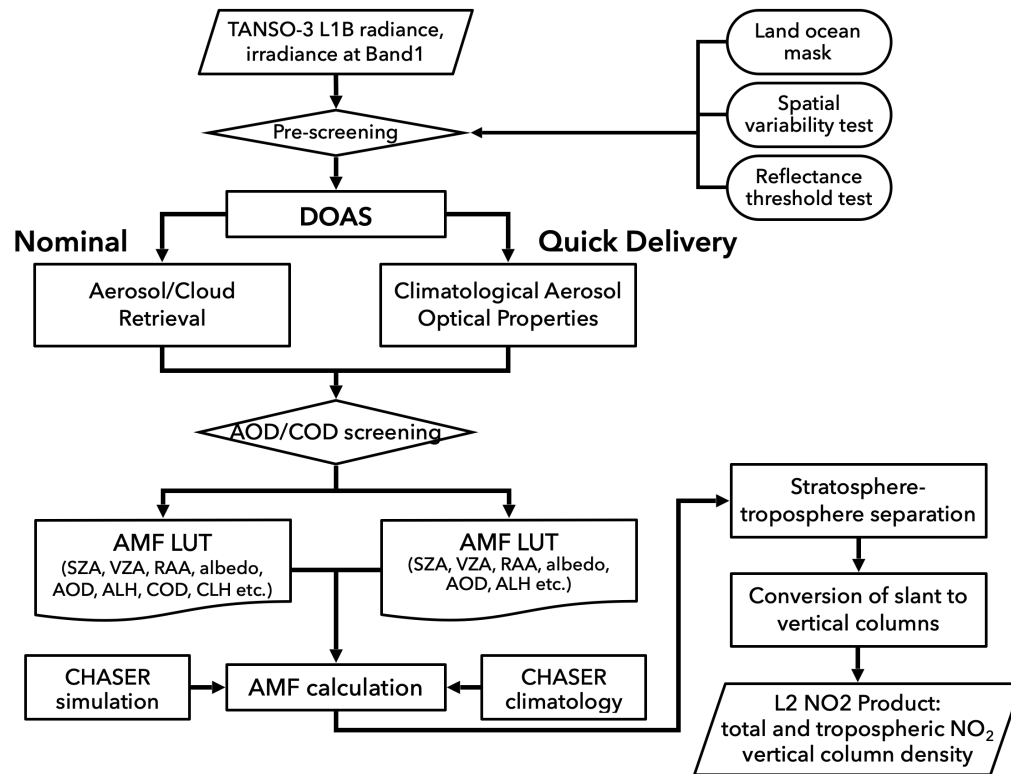


Differences in the retrieved and true XCO₂ and XCH₄

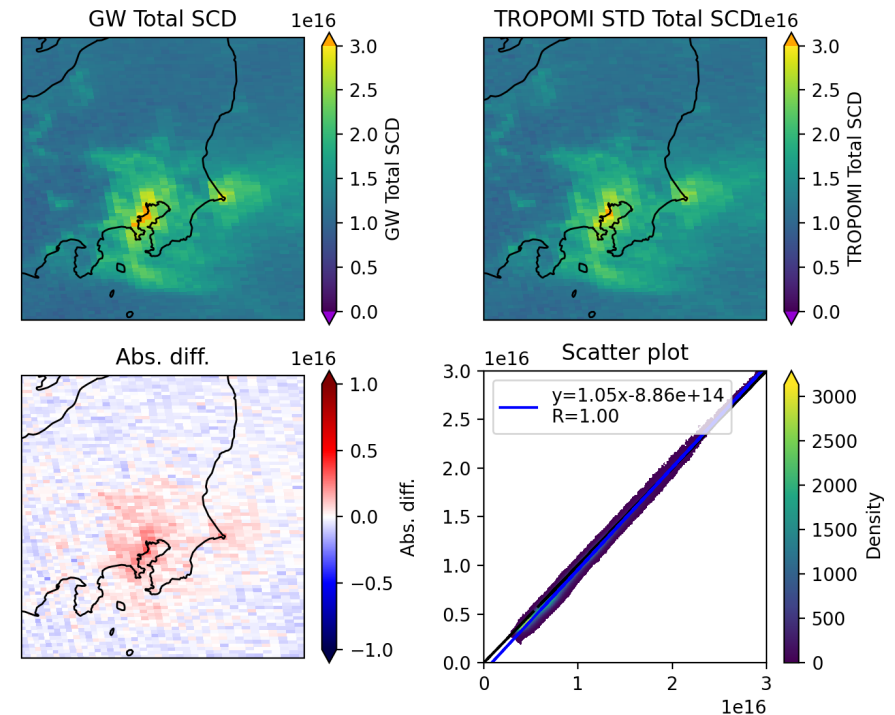
Facility and Algorithm for NO₂ retrieval processing (1)



Facility and Algorithm for NO₂ retrieval processing (2)



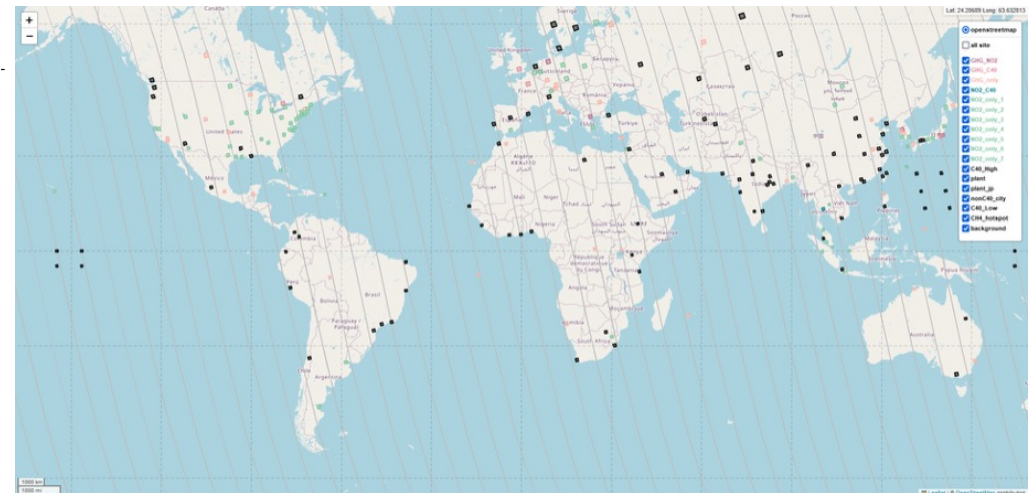
Verification results using the TROPOMI data
Total NO₂ SCD



Handling Policy of Observation Requests



- ◆ **Pointing resource for the focus-mode observation is limited**
 - ◆ As a rough guide, 25~35 times per day
 - ◆ By referring to the NWP, we will save the pointing resources
- ◆ **Priority Order of Observation Requests**
(Please see <https://gosat-gw.nies.go.jp/en/request.html>)
 - ◆ Calibration and Validation
 - ◆ Observations to support policy led by the Japanese government (e.g., MOE): Megacities, point sources, etc.
 - ◆ Observations based on the NIES's research plan
 - ◆ For academic research purposes, requests from the foreign governments, requests from the private companies



NIES Official website:
<https://gosat-gw.nies.go.jp/en/>

