# Release Notes
# for GOSAT-2 TANSO-FTS-2 Level 1 Product
# (R2026-A1)

Rev.NC Mar 2026

Japan Aerospace Exploration Agency

# Revision History

| Rev. | Date | Page | Description |
|---|---|---|---|
| NC | Mar 2026 | - | First version. |
| | | | |

# 1.Purpose

This document describes the release notes of GOSAT-2 TANSO-FTS-2 Level 1A, 1B product. The applied version numbers are shown in Table1-1 and Table1-2.

The GOSAT-2 TANSO-FTS-2 Level 1A products and Level 1B products (Common file) are internal products and are not distributed to general users.

The GOSAT-2 TANSO-FTS-2 Level 1B products (SWIR/TIR band file) are standard products and are available to general users.

Table1-1 Version for GOSAT-2 TANSO-FTS-2 Level 1A Product

| Release Version | HDF5 files of product | Algorithm Version | Parameter Version |
|---|---|---|---|
| **R2026-A1** | Common file | **240** | **240** |
| | SWIR band file | **240** | **240** |
| | TIR band file | **240** | **240** |

Table1-2 Version for GOSAT-2 TANSO-FTS-2 Level 1B Product

| Release Version | HDF5 files of product | Algorithm Version | Parameter Version |
|---|---|---|---|
| **R2026-A1** | Common file | **240** | **240** |
| | SWIR band file | **240** | **240** |
| | TIR band file | **240** | **240** |

# 2. Release Notes

The important information on this release are shown in Table 2-1. Correction's summary and datasets are described in Table 2-2. The format is unchanged from V200.200.

Table 2-1 Information for GOSAT-2 TANSO-FTS-2 Level 1B product

| No. | information | Dataset |
|---|---|---|
| 1. | The solar irradiance reference spectrum was changed to the Total and Spectral Solar Irradiance Sensor-1 (TSIS-1) Hybrid Solar Reference Spectrum (HSRS) and the radiance conversion factor for SWIR was updated later than V202202.<br>The SWIR radiance later than V220221 has been recorded the calibrated radiance by applying the updated radiance degradation factor based on the on-orbit monthly Lunar calibration and the annual Railroad Valley vicarious calibration in the 5-year nominal operation. It was confirmed that the updated calibrated radiance was improved by comparing with the GOSAT calibrated radiance V300300.<br>For the spectral radiance values of Band 1P and Band 1S, the radiometric degradation coefficients for data acquired after November 15, 2022—when the radiometric responsivity showed a recovery trend—were revised based on Lunar calibration and instrument function laser response. The radiometric degradation coefficients have been kept constant for data acquired after November 6, 2025. Improvements were confirmed through cross-comparison with GOSAT V300300 (from V240240 onward). | /SoundingData/Radiance<br>(L1B SWIR) |
| 2. | The along-track (AT) slant observation of GOSAT-2 TIR radiance is evaluated from intercomparison of Metop-B/IASI and Aqua/AIRS cross-track (CT) slant observations. The AT=-20deg backward observation of TIR V210210 radiance had biases over +1K in high-temperature, in 680 $cm^{-1}$ and 1030 $cm^{-1}$ of Band 5, and 1300 $cm^{-1}$ of Band 4. The AT=+15deg forward observation of that had biases around -0.5K in high-temperature, in 1300 $cm^{-1}$ of Band 4. Whereas, these biases have been almost eliminated and improved later than V220220. The FTS-2 observed the Railroad Valley playa US, a vicarious calibration site, where is homogeneous in the FTS-2 large FOV, with multiple AT view angles from forward +20 deg to backward -20 deg. The relation between AT forward and backward view radiances showed relatively better symmetry in 680 $cm^{-1}$ of Band 5 later than V220220. | /SoundingData/Radiance<br>/SoundingData/Radiance_finiteFOVcorr<br>(L1B TIR) |
| 3. | The geometric accuracy has been evaluated to be 230 m absolute accuracy by evaluation of the FOV monitor camera and inter-band registration of 0.01 FOV by evaluation of the Lunar calibration later than V101101. | /SoundingGeometry<br>(L1B SWIR/TIR) |
| 4. | The wavenumber step has been changed since July 13, 2019 after changing the sampling laser temperature. | /SoundingData/WavenumberInfo<br>(L1B SWIR/TIR) |

Table 2-2 Changes in the products of GOSAT-2 TANSO-FTS-2 Level 1A and Level 1B products

| No. | information | Dataset |
|---|---|---|
| 1. | Review of the sensitivity degradation correction coefficients for SWIR Band 1P/Band 1S<br>Based on the calibration assessment using Lunar calibration and instrument function laser response, it was confirmed that the radiance of Band 1P and Band 1S—which had been decreasing with an exponential trend since launch—began to show a recovery trend around 2023.<br>Based on these assessment results, the validity of the radiometric degradation correction coefficient model was re-evaluated, and necessary revisions were implemented. Specifically, the same correction coefficients as the previous model are applied up to November 15, 2022, while a new model reflecting the gradual recovery in radiometric responsivity is applied for data acquired after that date. The recovery period is modeled using two separate phases. For future periods, the correction coefficients are fixed at constant values for data acquired after November 6, 2025.No changes have been made for Band 2P/Band 2S or Band 3P/Band 3S. | /SoundingData/Radiance |

## 3. Version-up History

The version-up history of GOSAT-2 TANSO-FTS-2 Level 1A, 1B product is shown in Table 3-1 and Table3-2.

Table 3-1 Version-up history of Level 1A

| Release | Version | Date | Major Updates |
|---|---|---|---|
| R2019-A3 | 002.004 | Apr. 2019 | Preparation for initial calibration version (L+6M) |
| R2019-A5 | 100.100 | Jul. 2019 | After initial calibration version (L+9M) |
| R2019-A6 | 101.101 | Sep. 2019 | Bug fixes |
| R2020-A1 | 102.102 | May 2020 | Adding attributes<br>Bug fixes |
| R2020-A2 | 200.200 | Oct. 2020 | Data format change for adding calibration supplemental information |
| R2021-A1 | 200.201 | Mar.2021 | Private version |
| R2021-A2 | 201.201 | Aug. 2021 | Change in TIR calibration formula (non-linearity correction in spectral domain) |
| R2021-A3 | 202.202 | Nov. 2021 | No change other than the version number increment |
| R2021-A4 | 210.210 | Jan. 2022 | Adjustment for the ZPD position misalignment<br>Correction for the discontinuous data of the satellite location |
| R2022-A0 | 211.211 | Jan. 2023 | Update of the interferometer sampling delay value<br>Prototype version |
| R2023-A1 | 220.220 | Apr. 2023 | Fixing of the laser wavelength indication value<br>Change of the ZPD position search range in the uniform optical-path-difference conversion<br>Correction of the problem case that one sounding data defects due to the status of L0 data |
| R2024-A1 | 220.221 | Apr. 2024 | No change other than the version number increment |
| R2025-A1 | 230.230 | May. 2025 | Update of voltage conversion coefficients for the SWIR band<br>Bug fixes |
| R2026-A1 | 240.240 | Mar.2026 | No change other than the version number increment |

Table 3-2 Version-up history of Level 1B

| Release | Version | Date | Major Updates |
|---|---|---|---|
| R2019-A3 | 002.004 | Apr. 2019 | Preparation for initial calibration version (L+6M)<br>Released to RA users |
| R2019-A5 | 100.100 | Jul. 2019 | After initial calibration version (L+9M)<br>Released to General users |
| R2019-A6 | 101.101 | Sep. 2019 | Bug fixes |
| R2020-A1 | 102.102 | May 2020 | FCE correction and complex sensitivity calibration algorithm correction (TIR)<br>Updates of the radiance degradation factor and the radiance conversion factor (SWIR)<br>Adding Attributes<br>Bug fixes |
| R2020-A2 | 200.200 | Nov. 2020 | Adoption of polarization correction for TIR calibration equation<br>Data format change for adding calibration supplemental information |
| R2021-A1 | 200.201 | Mar.2021 | Private version |
| R2021-A2 | 201.201 | Aug. 2021 | Change in TIR calibration formula (non-linearity correction in spectral domain)<br>Change in TIR scan mirror reflectance calculation formula |
| R2021-A3 | 202.202 | Nov. 2021 | Update of the non-linearity correction for TIR<br>Update of the pointing mirror reflectance for TIR<br>Update of the radiance conversion factor for SWIR<br>Prototype version |

| Release | Version | Date | Major Updates |
|---|---|---|---|
| R2021-A4 | 210.210 | Jan. 2022 | Adjustment for the ZPD position misalignment<br>Correction for the discontinuous data of the satellite location |
| R2022-A0 | 211.211 | Jan. 2023 | Update of the interferometer sampling delay value<br>Update of the pointing mirror reflectance for TIR<br>Prototype version |
| R2023-A1 | 220.220 | Apr. 2023 | Updates of the non-linearity correction, the internal optical transmittance and the pointing mirror reflectance for TIR<br>Fixing of the laser wavelength indication value<br>Change of the ZPD position search range in the uniform optical-path-difference conversion<br>Correction of the problem case that one sounding data defects due to the status of L0 data |
| R2024-A1 | 220.221 | Apr. 2024 | Updates of the radiance calibration for SWIR (radiance degradation factor, wavenumber gap correction in multiplying radiance conversion factor) |
| R2025-A1 | 230.230 | May. 2025 | Activation of radiance variation correction in the SWIR Band<br>Bug fixes |
| R2026-A1 | 240.240 | Mar.2026 | Revision of sensitivity degradation correction coefficients for SWIR Band 1P/Band 1S |