Release Notes
for GOSAT-2 TANSO-FTS-2 Level 1 Product
(R2025-A1)

Rev.NC May 2025

Japan Aerospace Exploration Agency

Revision History

Rev.	Date	Page	Description
NC	May 2025	-	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
R2025-A1	Common file	**230**	**230**
	SWIR band file	**230**	**230**
	TIR band file	**230**	**230**

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

Release Version	HDF5 files of product	Algorithm Version	Parameter Version
R2025-A1	Common file	**230**	**230**
	SWIR band file	**230**	**230**
	TIR band file	**230**	**230**

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. 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.	/SoundingData/Radiance (L1B SWIR)
2.	The along-track (AT) slant observation of GOSAT-2 TIR radiance is evaluated from inter-comparison 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 /SoundingData/Radiance_finiteFOVcorr (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 (L1B SWIR/TIR)
4.	The wavenumber step has been changed since July 13, 2019 after changing the sampling laser temperature.	/SoundingData/WavenumberInfo (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.	(1) Activation of the low frequency correction in the SWIR bands The low frequency correction, which estimates and corrects the fluctuation in an input radiance during a sounding based on the low-frequency components of the spectrum (ATBD Step S2), has been activated. In the previous versions up to V220221, this correction was not activated because a linear intensity variation was removed through the conversion from the uniform time-sampled interferogram to the optical path difference sampled interferogram. Since, the spectra applied this correction were confirmed to become closer to the theoretical ones, the correction is activated by V230230. (2) Update of the voltage conversion coefficients The low frequency correction impacts on the DC component of the interferogram. The voltage conversion coefficients obtained from the pre-flight test showed discrepancy from the expected modulation efficiency (AC/DC) on orbit. The improved coefficients were estimated from the target observation data collected over the Railroad Valley from 2019 to 2024.	/SoundingData/Interferogram (L1A SWIR) /SoundingData/Radiance /SoundingData/RawSpectrum /SoundingData/RawSpectrum_outband /SoundingData/QualityInfo/SNR (L1B SWIR)
2.	Fixed a bug in reading the spacecraft time error information V230230 was corrected the processing logic for reading the time error information file, which defines the offset between the spacecraft time and the ground system time.	—
3.	Fixed a bug in handling multiple observations at the same mode and the sounding ID within an orbit data plus a margin V230230 was resolved an issue where the observation time was incorrectly determined when multiple observations with the same observation mode and the sounding ID existed within an orbit data plus a margin.	—

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 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 Correction for the discontinuous data of the satellite location
R2022-A0	211.211	Jan. 2023	Update of the interferometer sampling delay value Prototype version
R2023-A1	220.220	Apr. 2023	Fixing of the laser wavelength indication value Change of the ZPD position search range in the uniform optical-path-difference conversion 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 the voltage conversion coefficients for the SWIR bands Bug fixes

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) Released to RA users
R2019-A5	100.100	Jul. 2019	After initial calibration version (L+9M) 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) Updates of the radiance degradation factor and the radiance conversion factor (SWIR) Adding Attributes Bug fixes
R2020-A2	200.200	Nov. 2020	Adoption of polarization correction for TIR calibration equation 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) Change in TIR scan mirror reflectance calculation formula

Release	Version	Date	Major Updates
R2021-A3	202.202	Nov. 2021	Update of the non-linearity correction for TIR Update of the pointing mirror reflectance for TIR Update of the radiance conversion factor for SWIR Prototype version
R2021-A4	210.210	Jan. 2022	Adjustment for the ZPD position misalignment Correction for the discontinuous data of the satellite location
R2022-A0	211.211	Jan. 2023	Update of the interferometer sampling delay value Update of the pointing mirror reflectance for TIR 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 Fixing of the laser wavelength indication value Change of the ZPD position search range in the uniform optical-path-difference conversion 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 the low frequency correction in the SWIR bands Bug fixes