Release Notes

for GOSAT-2 TANSO-FTS-2 Level 1 Product

(R2021-A4)

Rev.NC Jan. 2022

Japan Aerospace Exploration Agency

Revision History

Rev.	Date	Page	Description
NC	Jan. 2022	-	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
R2021-A4	Common file	**210**	**210**
	SWIR band file	**210**	**210**
	TIR band file	**210**	**210**

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

Release Version	HDF5 files of product	Algorithm Version	Parameter Version
R2021-A4	Common file	**210**	**210**
	SWIR band file	**210**	**210**
	TIR band file	**210**	**210**

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.

In addition, V202.202 has been updated as a prototype version so that has not been provided to users. V210.210 is released as an official version and is provided to users.

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

No.	Information	Dataset
1.	The SWIR radiance has been recorded the calibrated radiance by applying the bias correction estimated from the inter-comparison of the GOSAT later than V101101. In addition, the degradation factor estimated from solar calibration was applied later than V102102. 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.	/SoundingData/Radiance (L1B SWIR)
2.	The nadir observation of TIR V201201 radiance was evaluated to had biases of -0.3 K in low-temperature, +0.3K in high-temperature in 680 cm^{-1} of Band 5, and +0.3 K in 1300 cm^{-1} of Band 4, that was estimated from inter-comparison of Aqua/AIRS and Metop-B/IASI nadir observations. Whereas, the bias around 1300 cm^{-1} region of Ban 4 has been almost eliminated and improved later than V202202. The along-track (AT) slant observation of GOSAT-2 TIR radiance is evaluated from inter-comparison of Aqua/AIRS and Metop-B/IASI cross-track (CT) slant observations. The AT=+18deg observation of TIR V201201 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=+7deg observation of that had biases around +0.5K in low-temperature. Whereas, these biases have been almost eliminated and improved later than V202202.	/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.	Update of the non-linearity correction for TIR (V202.202 and later) The non-linearity correction was revised by comparison with the latest other satellite data.	/SoundingData/Radiance /SoundingData/Radiance_finiteFOVcorr /SoundingData/Radiance_outband (L1B TIR)
2.	Update of the scan mirror reflectance for TIR (V202.202 and later) TIR scan mirror reflectance and optical transmittance were updated by comparison with other satellite data, mainly AT direction slant viewing observations.	/SoundingData/Radiance /SoundingData/Radiance_finiteFOVcorr /ScanMirror/Reflectivity (L1B TIR)
3.	Update of the radiance conversion factor for SWIR (V202.202 and later) SWIR radiance conversion factor was updated by comparison with the Total and Spectral Solar Irradiance Sensor-1 (TSIS-1) Hybrid Solar Reference Spectrum (HSRS).	/SoundingData/Radiance (L1B SWIR)
4.	Adjustment for the ZPD position misalignment (V210.210) In the uniform OPD-sampling process, when the ZPD position was shifted from the sampling center, an interferogram was filled with zeros at the sampling edges because of the insufficient number of samples. Adjustment of the ZPD position misalignment was implemented to obtain the effective number of samples in the uniform OPD-sampling process (Changed the sampling process from fixed value to maximum data position).	/SoundingData/Interferogram /SoundingData/FringeInfo/beginFringe (L1A SWIR/TIR) /SoundingData/Rawspectrum /SoundingData/Rawspectrum_outband /SoundingData/Radiance /SoundingData/Radiance_outband /SoundingData/Radiance_finiteFOVcorr /QualityInfo/ (L1B SWIR/TIR)
5.	Correction for the discontinuous data of the satellite location (V210.210) There was an issue that some packet data were rewound and repeated in the acquisition time of the source orbit data. A complete removal process for anomaly in the source orbit data was implemented not to generate discontinuous data of the satellite location, etc. in the interpolation processing.	/OnboardOrbitData /AttitudeData /CAMData (L1A Common, L1B Common)

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

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
R2021-A3	202.202	Nov. 2021	Update of the non-linearity correction for TIR Update of the scan 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