ATSR Level 1B (ER*n*_AT_1_RBT) Product Notices

This Readme file contains the Product Notice (**PN**) information for the ATSR-1 and ATSR-2 Level 1B products: ER1_AT_1_RBT and ER2_AT_1_RBT, respectively.

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Applicable Datasets

The PNs listed here are applicable to the Fourth Reprocessing ATSR-1 and ATSR-2 L1B datasets, released to users in 2024.

Users are strongly recommended to use these datasets as they are the most recently generated. The products are available in SENTINEL-SAFE-like/NetCDF format.

Product Notice Index

The Product Notice Index is displayed in Table 1.

Table 1: Product Notice Index

Product Notice Reference	Product Notice Title
INC0023756	Exception flags are missing from cosmetically filled pixels
INC0023758	The duplicate pixel flag has not been raised to show an orphan pixel exists
INC0023759	Orthogeolocation of measured pixels could fall outside the tie-point grid
INC0023760	Equal spatial (rather than time) intervals exist in the tie-point grid in the along-track direction
INC0023761	startOffset and trackOffset xml values do not contain the correct information to allow expected image- and tie-point grid alignment
INC0025390	(A)ATSR wrong Fill Value on geodetic variables

Product Notices

Field:	Contents:
Product Notice Title	Exception flags are missing from cosmetically filled pixels
PN Reference	INC0023756 (14 November 2022) Associated with PRB0045133/CHG0032632
Affected Data Sets	All data
Description	Due to the conical scanning radiometer viewing the Earth's curved surface, transfer of measured data onto the 1-km (quasi-Cartesian) image grid will result in some empty 1-km image grid pixels. This is especially true for the forward view, which views the Earth's surface at an acute angle, but can also apply to the nadir view away from the nadir. The L1B processor uses a cosmetic-filling technique for the 1-km image grid, whereby a neighbouring "real" data measurement is copied into an empty 1-km pixel. The cosmetic fill flag within the confidence word is activated to indicate to the user that the pixel measurement is not original and has been copied from a nearby measurement. While the measurement itself has been copied over, the related exception flags have not been, and so the cosmetically filled pixels have no exception information associated with them. Users may wish to take the above in consideration if inspecting all data, including cosmetically filled pixels, and filtering for exception flags. **Data from 4th reprocessing:** This is a new PN, and is applicable to 4th reprocessing products
Prepared by	IDEAS-QA4EO AATSR QC Team
Originator	S. Pinori
Approver	P. Goryl

Field:	Contents:
Product Notice Title	The duplicate pixel flag has not been raised to show an orphan pixel exists
PN Reference	INC0023758 (14 November 2022) Associated with PRB0045135/CHG0032633
Affected Data Sets	All data
Description	Due to the conical scanning radiometer viewing the Earth's curved surface, transfer of measured data onto the 1-km (quasi-Cartesian) image grid will sometimes result in there being more than one eligible measurement to be placed inside a 1-km image pixel. This primarily affects the nadir view, but can sometimes apply to the forward view. If a measurement cannot be placed within a 1-km pixel for this reason, its details, and relevant ancillary information, are saved within the 'orphan' data sections of the product. When the above event occurs, the duplicate pixel flag, within the confidence word, should be activated for the receiving 1-km pixel. This has not happened. Users may wish to take the above into account if inspecting the gridded data for the existence of duplicate (orphan) pixels. A duplicate measurement may exist for a certain pixel, but this cannot readily be known if inspecting via the duplicate pixel flag. Instead, users are advised to search the orphan data sections of the product. **Data from 4th reprocessing:** This is a new PN, and is applicable to 4th reprocessing products
Prepared by	IDEAS-QA4EO AATSR QC Team
Originator	S. Pinori
Approver	P. Goryl

Field:	Contents:
Product Notice Title	Orthogeolocation of measured pixels could fall outside the tie-point grid
PN Reference	INC0023759 (14 November 2022) Associated with PRB0045136/CHG0032634
Affected Data Sets	All data
Description	The 16-km tie-point grid should extend beyond the range of the 1-km image grid. Some slowly varying information is stored on the 16-km grid that does not need to be available at 1-km resolution. However, due to grid manipulation during processing, it can sometimes be the case that the orthogeolocation of the individual measurements, contained within the geodetic_in and geodetic_io data files, can fall outside (before) the first 16-km tie-point gridline. The alignment between the tie-point grid and the image grid has been validated and any differences are within expected tolerances. Users are advised to read the related PN INC0023761. Orthogeolocations of sampled individual measurements (within geodetic_in and geodetic_io) have been validated, and are within expected tolerances. **Data from 4th reprocessing:** This is a new PN, and is applicable to 4th reprocessing products
Prepared by	IDEAS-QA4EO AATSR QC Team
Originator	S. Pinori
Approver	P. Goryl

Field:	Contents:
Product Notice Title	Equal spatial (rather than time) intervals exist in the tie-point grid in the along-track direction
PN Reference	INC0023760 (14 November 2022) Associated with PRB0045137/CHG0032635
Affected Data Sets	All data
Description	The along-track intervals of the 16-km tie-point grid should be defined in relation to the satellite orbit along-track timings. These would be very close to, but not exactly, 16 km in spacing. However, the 16-km tie-point grid has along-track intervals that are specified exactly at intervals of 16 km, and so the grid does not follow the required relationship. The alignment between the tie-point grid and the image-grid has been validated and any differences are within expected tolerances. Users are advised read the related PN INC0023761. **Data from 4th reprocessing:** This is a new PN, and is applicable to 4th reprocessing products
Prepared by	IDEAS-QA4EO AATSR QC Team
Originator	S. Pinori
Approver	P. Goryl

Field:	Contents:
Product Notice Title	startOffset and trackOffset xml values do not contain the correct information to allow expected image- and tie-point grid alignment
PN Reference	INC0023761 (14 November 2022) Associated with PRB0045138/CHG0032636
Affected Data Sets	All data
Description	The startOffset and trackOffset values within the product xfdumanifest.xml file, along with the associated resolutions for both 16-km tie-point and 1-km image grids, should allow for a straightforward relationship between the grids. Due to very early application of SENTINEL-SAFE format, and subsequent grid manipulation during processing, the stated values do not follow the expected relationship, but one does exist. Users can refer to the User Documentation for (A)ATSR 4th Reprocessing Level 1B products, or make use of the additional notes given below. Sampled orthogeolocations of the individual measurements (within geodetic_in and geodetic_io) have been validated, and are within expected tolerances. **Data from 4th reprocessing:** This is a new PN, and is applicable to 4th reprocessing products
Prepared by	IDEAS-QA4EO AATSR QC Team
Originator	S. Pinori
Approver	P. Goryl

Field:	Contents:
PN Reference	Additional notes for PN Reference INC0023761

The colocation of image and tie-point data (i.e. interpolation of the 16-km grid data to match the 1-km image grid data) cannot easily be made since the startOffset and trackOffset values for both grids are not correctly stated in the manifest file. Helpful investigations by Brockmann Consult generated an equation that aligns the grids initially, after which the usual interpolation can take place. This is done automatically within SNAP, but users who are dealing with the product data independently will find the following useful.

For SNAP, an offset is required which defines the location of the first tie-point in relation to the image grid, which are X-Offset and Y-Offset, and shown in Figure 1.

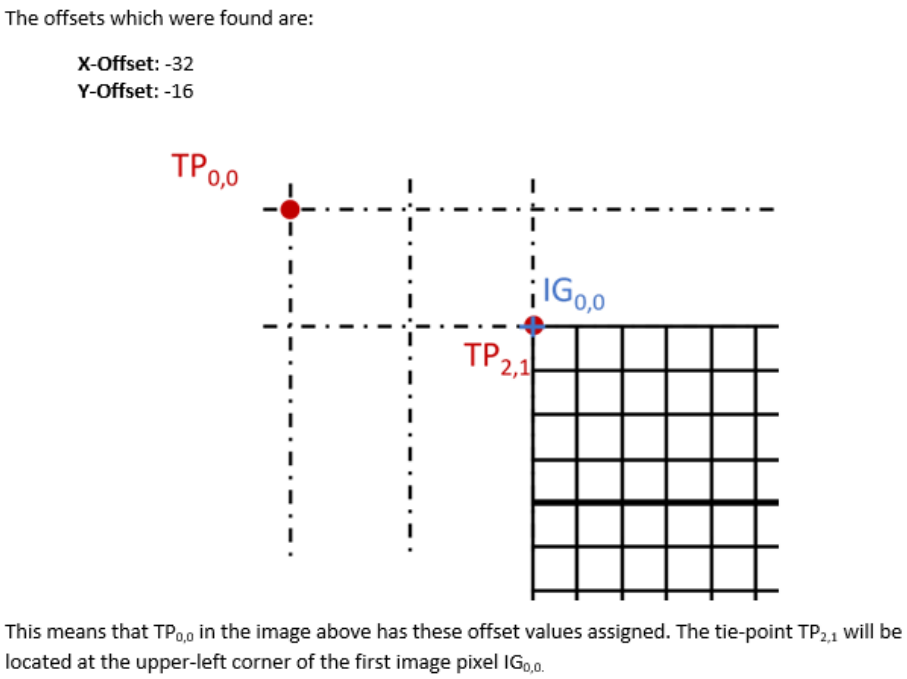

Figure 1: Offsets that initially pin the image and tie-point grids.
(Acknowledgement: M. Peters, Brockmann Consult)

The values are as given in Figure 1, or users can use the relationship below to generate the X-Offset and Y-Offset, where `tp` are tie-point and `img` are nadir image grid values for offsets and resolutions as already stated in the manifest metadata:

```
X-Offset= imgTrackOffset - ((tpTrackOffset - 1) *
          (tpResolution / imgResolution))

Y-Offset= (tpStartOffset - 1) * (tpResolution /
          imgResolution) - imgStartOffset
```

Once the corners of the grids are aligned correctly, as stated above, then the usual relationship between the grids regarding interpolation of the 16-km grid data to match the 1-km grid data can take place as usual.

Field:	Contents:
Product Notice Title	(A)ATSR wrong Fill Value on geodetic variables
PN Reference	INC0025390 (4 February 2024) Associated with PRB0045305/CHG0033129
Affected Data Sets	All data
Description	Some values at the beginning and at the end of each product in latitude_in, latitude_io, longitude_in, longitude_io (in geodetic_in.nc or geodetic_io.nc) are anomalous. The intent was to flag them as _FillValue (-999999999) but actually there are lots of -999 at the beginning and end of each orbit (which is not the _FillValue of the latitude/longitude stated in the variable attributes, but should be the _FillValue of e.g. the altitude) Moreove, latitude_tx (or longitude_tx) do not have "_FillValue" as attribute of the variable. This implies that the -999999999 values are not filtered out when reading or plotting. **Data from 4th reprocessing:** This is a new PN, and is applicable to 4th reprocessing products
Prepared by	IDEAS-QA4EO AATSR QC Team
Originator	S. Pinori
Approver	P. Goryl

Change Log

ISSUE	DATE	REASON
1.0	16 February 2023	First official release
1.1	2 March 2024	Added INC0025390: (A)ATSR wrong Fill Value on geodetic variables