

AATSR Level 2 (ATS_NR__2P) Product Quality Readme Information

This file presents the Product Quality Readme (PQR) information for the AATSR Level 2 ATS_NR__2P products.

All PQRs are retained for reference in this file, even those pertaining to historically available datasets only, hence there is an explicit statement in each PQR noting whether it is still applicable to the most recent AATSR dataset.

The Third AATSR Reprocessing Dataset (IPF 6.05)

Users are strongly recommended to use the most recent AATSR dataset: Third Reprocessing data products were generated in 2013, and information on the updates and improvements expected was published in the [User Note for the Third AATSR Reprocessing](#). Users can identify third reprocessing products using the following information:

- The IPF software version contained within the main product header of third reprocessing products is "AATS/6.05".
- The Processing Stage Flag contained within the product name and main product header has been incremented to U, for example:
ATS_NR__2PUUPA20120308_005911_000065273112_00246_52415_6357.N1.

Index of PQRs for IPF 6.05

An index of the PQRs applicable to the third reprocessing dataset (IPF 6.05) is given in Table 1. Full details of these PQRs are available in the [PQRs for IPF 6.05](#) section below.

Table 1 AATSR PQRs applicable to IPF 6.05

PQR Reference	PQR Title
ENVI-GSOP-EOGD-QD-04-0059	L1b PQRs with an impact on the ATS_NR__2P product
ENVI-GSOP-EOGD-QD-04-0060	Placeholders for cloud parameters used in the ATS_NR__2P product
ENVI-GSOP-EOGD-QD-14-0125	Presence of NDVI at night

Index of historical PQRs

An index of the historical PQRs is given in Table 2. The relationship between historical data and these PQRs can be deduced by inspecting the [AATSR IPF Change Log](#). Full details of these PQRs are available in the [Historical PQRs](#) section below.

Table 2 Historical AATSR PQRs

PQR Reference	PQR Title
ENVI-GSOP-EOGD-QD-04-0059	L1b PQRs with an impact on the ATS_NR__2P product
ENVI-GSOP-EOGD-QD-04-0061	Placeholder for LST used in the ATS_NR__2P product
ENVI-GSOP-EOGD-QD-04-0062	Limitations of the current AATSR LST retrieval
ENVI-GSOP-EOGD-QD-14-0126	Latitude Dependent Bias Correction

References

Table 3 lists a set of AATSR references that users may find useful when using AATSR data.

Table 3 AATSR References

Item	Available from
Envisat and AATSR Product Specifications	https://earth.esa.int/support-docs/productspecs/index.htm
AATSR Product Handbook and related Technical Notes	http://envisat.esa.int/handbooks/
Additional information on AATSR	https://earth.esa.int/web/sppa/mission-performance/esa-missions/envisat/aatsr/sensor-description
AATSR IPF Change Log	https://earth.esa.int/web/guest/-/aatsr-ipf-change-log
Other referenced documents	ESA library

PQRs for IPF 6.05

Field:	Contents:
PQR Title	L1b PQRs with an impact on the ATS_NR__2P product
PQR Reference	ENVI-GSOP-EOGD-QD-04-0059
Affected Data Sets	Various; items in bold are applicable to IPF 6.05
Description	<p>L2 gridded data are affected by the following PQRs against the ATS_TOA_1P product, from which they are derived:</p> <ul style="list-style-type: none"> • PQR ENVI-GSOP-EOGD-QD-04-0063: Sub-optimal geolocation and view colocation. • PQR ENVI-GSOP-EOGD-QD-04-0064: Availability of VC1 files and calibration of visible channel data. <i>Note that this only affects the NDVI.</i> • PQR ENVI-GSOP-EOGD-QD-04-0066: Calibration of visible channels during and immediately after outgassings. Note that this only affects the NDVI. • PQR ENVI-GSOP-EOGD-QD-14-0119: Visible channel calibration drift correction. <i>Note that this only affects the NDVI.</i> • PQR ENVI-GSOP-EOGD-QD-14-0121: Banding problem in consolidated data (errors loading 12 μm gross cloud tests LUT) • PQR ENVI-GSOP-EOGD-QD-14-0122: 12 μm brightness temperature discrepancy • PQR ENVI-GSOP-EOGD-QD-14-0123: Instrument pixels coordinates regridding x/y offset • PQR ENVI-GSOP-EOGD-QD-14-0124: Child product first MDS/ADS record displacement
Prepared by	IDEAS AATSR QC Team
Originator	P. Goryl
Approver	P. Lecomte

Field:	Contents:
PQR Title	Placeholders for cloud parameters used in the ATS_NR__2P product
PQR Reference	ENVI-GSOP-EOGD-QD-04-0060
Affected Data Sets	All data
Description	<p>The following placeholders are used for cloud parameters in the ATS_NR__2P product to allow for the development of new or improved algorithms in the future:</p> <ul style="list-style-type: none"> • Cloud Top Temp – In products generated with processor versions prior to v6.0, and for sea pixels in all cases, this field is filled with the 11 μm BT. For land pixels, see note below. • Cloud Top Height – In products generated with processor versions prior to v6.0, and for sea pixels in all cases, this field is set to zero. <p>Note. In all products generated with IPF v6.0 and later, the land surface temperature (LST) is calculated for all land pixels whether flagged cloudy or not, and the corresponding field therefore contains the LST. These pixels are flagged as 'marginal cloud' in the confidence word.</p> <p>For more information, refer to the technical note: 'Improvements to the AATSR IPF relating to Land Surface Temperature Retrieval and Cloud Clearing over Land' by A. R. Birks (September 2007).</p> <p>Data from 3rd reprocessing: This PQR is still applicable, as no change has been implemented for the cloud parameters.</p>
Prepared by	IDEAS AATSR QC Team
Originator	P. Goryl
Approver	P. Lecomte

Field:	Contents:
PQR Title	Presence of NDVI at night
PQR Reference	ENVI-GSOP-EOGD-QD-14-0125 (issue date: 12 May 2014)
Affected Data Sets	All data
Description	<p>NDVI values are calculated whenever visible channel data are present, and as visible channels are present in the AATSR telemetry at all times, the NDVI is calculated for both day and night data. There is no trap for night-time data.</p> <p>However, at night, the visible channels are dominated by noise, making these NDVI values essentially meaningless. Users are therefore advised to disregard the values in the AATSR NDVI field at night.</p> <p>Similar issues are discussed in the L1b PQR ENVI-GSOP-EOGD-QD-04-0065: Exception values and corresponding flags in the visible channel at night.</p> <p>Data from 3rd reprocessing: This PQR is still applicable, as no change has been implemented to address this behaviour.</p>
Prepared by	IDEAS+ AATSR QC Team
Approver	P. Goryl

Historical PQRs

Field:	Contents:
PQR Title	L1b PQRs with an impact on the ATS_NR__2P product
PQR Reference	ENVI-GSOP-EOGD-QD-04-0059
Affected Data Sets	Various; items in bold are historical
Description	<p>L2 gridded data are affected by the following PQRs against the ATS_TOA_1P product, from which they are derived:</p> <ul style="list-style-type: none"> • PQR ENVI-GSOP-EOGD-QD-04-0063: Sub-optimal geolocation and view colocation. • PQR ENVI-GSOP-EOGD-QD-04-0064: Availability of VC1 files and calibration of visible channel data. <i>Note that this only affects the NDVI.</i> • PQR ENVI-GSOP-EOGD-QD-04-0066: Calibration of visible channels during and immediately after outgassings. <i>Note that this only affects the NDVI.</i> • PQR ENVI-GSOP-EOGD-QD-14-0119: Visible channel calibration drift correction. <i>Note that this only affects the NDVI.</i> • PQR ENVI-GSOP-EOGD-QD-14-0121: Banding problem in consolidated data (errors loading 12 μm gross cloud tests LUT) • PQR ENVI-GSOP-EOGD-QD-14-0122: 12 μm brightness temperature discrepancy • PQR ENVI-GSOP-EOGD-QD-14-0123: Instrument pixels coordinates regridding x/y offset • PQR ENVI-GSOP-EOGD-QD-14-0124: Child product first MDS/ADS record displacement
Prepared by	IDEAS AATSR QC Team
Originator	P. Goryl
Approver	P. Lecomte

Field:	Contents:
PQR Title	Placeholder for LST used in the ATS_NR__2P product
PQR Reference	ENVI-GSOP-EOGD-QD-04-0061
Affected Data Sets	All data processed before IPF v5.58
Description	<p>Before the introduction of a valid retrieval, the following placeholder was used for LST in the ATS_NR__2P product during the early part of the mission to allow for the development of a new algorithm in the future:</p> <ul style="list-style-type: none"> • Land Surface Temp – filled with 11 μm BT <p>(See also PQR ENVI-GSOP-EOGD-QD-04-0062: Limitations of the current AATSR LST retrieval.)</p> <p>Data from 3rd reprocessing: This PQR is not applicable, as a later IPF version was used.</p>
Prepared by	IDEAS AATSR QC Team
Originator	P. Goryl
Approver	P. Lecomte

Field:	Contents:
PQR Title	Limitations of the current AATSR LST retrieval
PQR Reference	ENVI-GSOP-EOGD-QD-04-0062
Affected Data Sets	All data processed with IPF v5.58 to IPF v6.0
Description	<p>From 10 March 2004, the placeholder for LST was replaced by a valid LST retrieval. However, this retrieval was experimental and subject to the following limitations:</p> <ol style="list-style-type: none"> 1) Poor performance of cloud-clearing over land; 2) LST was not calculated for pixels flagged as cloudy, although in many cases the pixels in question were wrongly identified and were in fact clear; 3) LST processing over lakes was not implemented; 4) Discontinuities appear at surface classification cell boundaries. <p>The performance of the LST retrieval was improved with the implementation of IPF 6.0 on 28 March 2007. Namely, the LST algorithm was updated and improvements made to the treatment of pixels in areas of marginal cloud and inland lakes. These improvements are detailed in the technical note: Improvements to the AATSR IPF relating to Land Surface Temperature Retrieval and Cloud Clearing over Land by A.R. Birks (September 2007).</p> <p>Data from 3rd reprocessing: This PQR is not applicable, as a later IPF version was used.</p>
Prepared by	IDEAS AATSR QC Team
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Field:	Contents:
PQR Title	Latitude Dependent Bias Correction
PQR Reference	ENVI-GSOP-EOGD-QD-14-0126 (issue date: 12 May 2014)
Affected Data Sets	All data processed before 3 rd reprocessing
Description	<p>Prior to the introduction of new coefficients for use in the 3rd reprocessing (see later), the coefficients used for the dual view retrieval of Sea Surface Temperature (SST) are global, so although the mean retrieval error averaged over all atmospheric profiles is zero, there is a latitude dependent bias, which can be shown by plotting the retrieval error as a function of the latitude of the profile.</p> <p>The effect was more pronounced in the “4 channel” retrievals, which do not use the 3.7 micron channel data but only the 11 and 12 micron channels dual view data. It was significantly less pronounced in the “6 channel” retrievals, where the 3.7 micron data is used in both views. The 3.7 micron data are not used during the day, and may not be available at night, so a correction was needed to bring the “4 channel” retrievals into line with the “6 channel” retrievals.</p> <p>Details of the derivation of the correction are contained in the AATSR Technical Note: Latitude Dependent Bias Correction, by A. R. Birks (June 2006).</p> <p>This document also includes a table of the correction itself, and the methods for applying the correction to the averaged (ATS_AR__2P) and the full resolution (ATS_NR__2P) SSTs.</p> <p>New SST coefficients were developed based on findings from the ARC (ATSR Reprocessing for Climate) project, which removed the latitude-dependent bias. Further information on these coefficients is available in the Technical Note: AATSR SST retrieval: updated retrieval coefficients based on ARC project findings (UL-SST-P04) by O. Embury and G. Corlett; see also QC reports from the 3rd reprocessing.</p> <p>Data from 3rd reprocessing: This PQR is not applicable, as new SST coefficients were used in the reprocessing.</p>
Prepared by	IDEAS+ AATSR QC Team
Approver	P. Goryl

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