EarthCARE Project

Ground Segment

EarthCARE ESA Product List

DOCUMENT CHANGE RECORD

ISSUE	DATE	CHANGE
Issue 1.1	10 Dec 2009	Issue based on inputs from JADE #2 and JMAG #15 (table only) Level 2 products only Joint ESA-JAXA product table
Issue 1.2	9 Jun 2010	Updated using inputs from JADE #3 (table only)
Issue 1.3	15 Jun 2010	Updated using inputs from T.Y. Nakajima on MSI (table only)
Issue 2 PreDP	8 Sep 2011	Issue for ESA GS-PDR Project Pre-Data Pack release (table only) Added level 0 and level 1 products Removed JAXA products, limiting the list to ESA products Updated to reflect outcome of EarthCARE level 2 stage 1 activities Aligned with EarthCARE Production Model EC-ICD-ESA-SYS-0380
Issue 2	1 Nov 2011	Issue for Overall Configuration and Interface Design Review (OCIDR) Added cover pages to table Removed aerosol parameters from ACM-CAP product
Issue 3 PreDP	5 Jul 2013	Introduction (sections 1 to 3.1): Updated document references OCIDR RID ALL CPR-3 (MH-01): Clarified MSI L1b vs L1c grids OCIDR RID ALL CPR-5 (MH-03): Clarified use of grid spacing range (example: "native-JSGh") OCIDR RID ALL CPR-17 (TI-03): Clarified convention for second part of product identifier OCIDR RID ALL PROJ-26 (CS-09): Clarified vertical grid spacing Data product tables (section 3.2): OCIDR RID ALL AOB-5 (KW-01): Clarified BBR calibration data volume OCIDR RID ALL CPR-6 (MH-04): Added B-RAD horizontal resolution OCIDR RID ALL PROJ-83 (tw-all-04): Corrected BBR sampling L0: Marked M-ANC product for deletion (merged into M-L0) L1b: Marked M-CAL for split into 3 products L1d: Added X-JSG and X-MET products Moved ACM-MO as AMB-MO from L1d to L2b L2a CPR: Added C-FMR, C-CD, C-TC, and C-CLD products (details on

		CPR L2a products were not yet available in issue 2)
		L2a BBR: Removed B-FLX product
		L2b Radiation: Combined radiative transfer products ACM-R1D and ACM-R3D into single product ACM-RT, changed BM-FLX to [AC]BM-FLX to allow for future advanced algorithms using profiler information
		L2b Clouds and aerosols: Removed ACM-TCD, ACM-VM, and ACM-FOA products, added ACM-COM product (composite product)
Issue 3	20 Sep 2013	Section 2: [AD1] new issue number not yet available, otherwise issue numbers updated to GS-PDR versions
Issue 3.1	11 Nov 2013	Introduction (sections 1 to 3.1):
		Section 3.1: GSPDR-ALL-DAT-4 (CC_11): Made text on level 1d products unambiguous GSPDR-ALL-DAT-55 (TF-15): Simplified description of JSGh GSPDR-ALL-DAT-56 (TF-16): Clarified how error descriptors are accounted for in data volume estimates
		Data product tables (section 3.2):
		Sizing: GSPDR-ALL-DAT-36 (FN_10) b: Corrected "across-track" to "along-track" for ATLID sampling
		L1b: GSPDR-ALL-DAT-36 (FN_10) c: Corrected BBR_LIN frequency
Issue 4	2 Mar 2017	Issue for ESA GS-CDR Major re-write, updating to latest development status. One page per data product. Data volume budget is now maintained as a separate document [RD4], updated more frequently than this document.
Issue 5	30 May 2017	Issue for Validation AO Section 1.2: Removed reference to mission objectives AM-MO: Added product size estimates
Issue 6	13 Sep 2023	Updated product size estimates for level 2 products (now with compression) Changed comment regarding internal product compression Added new calibration products M-DRK, M-TRF Added C-APC Changed ACM-3D to ACMB-3D Removed references to data volume budget Added reference to AMT special issue on EarthCARE

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1 Introduction

1.1 The EarthCARE mission

Earth Explorer Missions are part of the Earth Observation Envelope Programme (EOEP). They are missions led by the European Space Agency (ESA) to cover primary research objectives.

The EarthCARE Mission has been approved for implementation as the sixth Earth Explorer Mission. The mission is being implemented in collaboration with Japan Aerospace Exploration Agency (JAXA) which provides the Cloud profiling Radar (CPR) in the scope of this cooperation.

The EarthCARE mission has been specifically defined with the basic objective of improving the understanding of cloud-aerosol-radiation interactions so as to include them correctly and reliably in climate and numerical weather prediction models. Specifically, the scientific objectives are:

- The observation of the vertical distributions of atmospheric liquid water and ice on a global scale, their transport by clouds and their radiative impact.

- The observation of cloud distribution ('cloud overlap'), cloud-precipitation interactions and the characteristics of vertical motions within clouds.

- The observation of the vertical profiles of natural and anthropogenic aerosols on a global scale, their radiative properties and interaction with clouds.

- The retrieval of profiles of atmospheric radiative heating and cooling through the combination of the retrieved aerosol and cloud properties.

EarthCARE will meet these objectives by measuring simultaneously the vertical structure and horizontal distribution of cloud and aerosol fields together with outgoing radiation over all climate zones. The EarthCARE observations will be performed in a synergistic manner to make maximum use of the instruments flying on the same satellite.

1.2 Purpose and Scope

This document presents the list of EarthCARE science data products recommended by the European and Canadian members of the EarthCARE Mission Advisory Group (MAG) to be developed and generated operationally by or under the supervision of ESA.

For each data product, main parameters, grid spacing and resolution, product size estimates, and responsible institutions are listed.

The Product List is closely linked to the Production Model [RD1] which presents the dependencies between products. Product formats follow ESA's Earth Observation File Format Standard [RD2] and its tailoring for EarthCARE [RD3]. They are described in detailed Product Specifications (PDDs). This document provides references to these PDDs.

A separate product list is being maintained by JAXA for data products developed and generated under their responsibility. Both lists are annexed to the Mission Requirements Document [AD1].

A special issue on EarthCARE of the journal Atmospheric Measurement Techniques provides descriptions of the science behind the EarthCARE data products, and outlines of the algorithms used to generate them [RD4].

2 Documents

2.1 Applicable Documents

[AD1] EarthCARE Mission Requirements Document, EC-RS-ESA-SY-0012, Issue 5.1

[AD2] EarthCARE System Requirements Document for Phases B/C/D/E1, EC-RS-ESA-SY-0001, Issue 1A (20 May 2008)

2.2 Reference Documents

[RD1] EarthCARE Production Model, EC-TN-ESA-SYS-0380, Issue 8 (13 Sep 2023)

[RD2] Earth Observation Ground Segment File Format Standard, PE-TN-ESA-GS-0001, Issue 2.0 (3 May 2012)

[RD3] Tailoring of the Earth Observation File Format Standard for the EarthCARE Ground Segment, EC-TN-ESA-GS-0218, Issue 4 (2 Mar 2017)

[RD4] EarthCARE Level 2 algorithms and data products, Special Issue, Atmospheric Measurement Techniques, 2023. https://amt.copernicus.org/articles/special_issue1156.html

3 EarthCARE Product List

3.1 Overview

EarthCARE data products produced by ESA (total: 47)

EarthCARE data products are referenced by their identifiers, see next page for details.

Level 0 products (4)

Annotated instrument science packets, one product per instrument. The CPR level 0 product is produced by ESA.

> A-L0   M-L0   B-L0   C-L0

Level 1b products (14), calibration products shown in *italics*

Fully calibrated and geolocated instrument science measurements on the native instrument grid for ATLID and MSI and the BBR single pixel product B-SNG, integrated 10 km along track for the nominal BBR product B-NOM.

The CPR level 1b product C-NOM is not listed here as it is produced by JAXA

> A-NOM   M-NOM   B-NOM
>
> *A-DCC*   *M-BBS*   B-SNG
>
> *A-CSC*   *M-SD1*   *B-SOL*
>
> *A-FSC*   *M-SD2*   *B-LIN*
>
>   *M-DRK*
>
>   *M-TRF*

Level 1c product (1)

MSI nominal level 1b data interpolated to a spatial grid common to all MSI bands. The grid spacing is similar to the one of MSI nominal level 1b.

> M-RGR

Level 1d products (2)

Auxiliary products: ECMWF meteorological fields limited to EarthCARE swath and spatial grid shared by all instruments ("joint standard grid")

> X-MET   X-JSG

Level 2a products (15)

Single instrument products. There is no BBR level 2a product.

> A-FM   M-CM   C-FMR
>
> A-AER   M-COP   C-CD
>
> A-ICE   M-AOT   C-TC
>
> A-TC   C-CLD
>
> A-EBD   C-APC
>
> A-CTH
>
> A-ALD

Level 2b products (11)

Synergy products (using data from two or more instruments)

> AM-MO   AC-TC   BM-RAD   ACM-CAP   ACMB-DF
>
> AM-CTH   BMA-FLX   ACM-COM

AM-ACD   ACMB-3D

ACM-RT

3.2   Guidelines

Section 3.3 provides a brief description of each EarthCARE data product, on one page per product.

For each product, the following information is given:

Product level

This is shown as L0, L1b, L1c, L1d, L2a, L2b in the upper left corner. L1b calibration products are marked there as such.

There is one level 0 product per instrument containing all measurement modes.

There is one nominal level 1b product per instrument.

Product identifier

The product identifier is a short unique label for a product. It is shown in the upper right corner. It consists of two parts separated by a hyphen, e.g., ACM-CAP.

The first part denotes the instrument or combination of instruments from which a product has been derived:

     A   ATLID

     C   CPR

     M   MSI

     B   BBR

     AM   ATLID + MSI

     ACM ATLID + CPR + MSI

     etc.

For synergy products, the order of instruments reflects the relevance of the instrument for the product, with the most relevant product listed first. E.g., BM-RAD is primarily based on information from the BBR, with corrections applied based on MSI measurements. If two instruments are equally relevant, letters are used in alphabetic order.

The second part indicates the main parameter or group of parameters (e.g., CTH for cloud top height, CAP for cloud and aerosol properties). This part has 2 or 3 letters: typically 2 letters when it is described by 2 words such as MO - Merged Observations, TC - Target Classification, 3 letters otherwise.

The product identifier is used in the Production Model [RD1] and the ATBDs and Product Specifications for each product.

Description

Summary of main product contents.

File type

This is the 10-letter file type used in the filename of the product according to [RD3], see there for details. It has the form

    FFFFXXXXLL

with

    FFFF   File type indicating instrument or instrument combination
                 3 letters + underscore. If only two letters are used (as for 2-instrument synergy products),
                 the third letter is an underscore as well. For four-instrument synergy products the file type
                 is ALL_. Examples: ATL_, AM__, BMA_, ALL_.

XXXX   Product type as per second part of the product identifier (except for level 0 where it is `NOM_`)
            3 letters + underscore. If only two letters are used (e.g., in A-TC, AM-MO),
            the third letter is an underscore as well. Examples: `NOM_`, `EBD_`, `TC__`.

LL   Product level. Examples: `0_`, `2A`.

Processor

The processor generating the product. For processors generating only a single product, the processor name is identical to the product identifier. Some processors generate more than one product, e.g., the level 2a processor A-PRO generates products A-AER, A-ICE, A-TC, and A-EBD.

Primary parameters

The main parameters in the product. This is a very selective list. Refer to the individual PDDs for the full list of parameters.

Extent

The coverage of a product in the three dimensions along track, across track and vertical.

Along-track extent (= granularity of the product): Normally, this is one frame which is 1/8 of an orbit plus some configurable frame margin (in the tables this is abbreviated as "frame", but is understood to include the margin). Frames start and end at predefined latitude boundaries (± 22.5°, ± 67.5°). The calibration products are an exception: they usually cover the duration of the calibration which is shorter than one frame.

Across-track extent: For MSI and BBR, this is the swath width. For ATLID and CPR it is not applicable.

Vertical extent: For ATLID and CPR, this is the vertical range covered. For MSI and BBR it is not applicable.

"Native" refers to the extent for the corresponding level 0 product, see there (p. 11-14).

Sampling

Distance between subsequent data points within a product, i.e., grid spacing.

"N/A" if the respective dimension does not exist in the product (e.g., vertical dimension for MSI and BBR, across-track dimension for ATLID and CPR), or if there is only a single data point within this dimension (e.g., across-track dimension for nadir-only products such as B-NOM or ACM-CAP).

"Native" refers to the sampling for the corresponding level 0 product, see there.

"JSG" (Joint Standard Grid) refers to the sampling *for the respective dimension* (along track, across track or vertical) in the X-JSG product, see there (p. 31). As the JSG uses the ATLID vertical grid, "JSG" and "native" are synonymous for the vertical dimension of ATLID products.

Resolution

This is the actual spatial resolution. It may differ from the instrument spatial resolution in case measurements have been averaged in on-ground processing. It may also differ from the sampling as measurements may be oversampled (as with the CPR vertical dimension) or undersampled (as with the ATLID along-track dimension).

Level 1 along-track spatial resolution is determined by the instrument, as a convolution of its instantaneous field of view (IFOV) and the satellite along-track movement during the on-board integration, and any additional integration performed on ground in the L1 processor (the latter applies to B-NOM only).

Level 2 spatial resolution is defined as the spatial integration range of the retrieval.

All resolutions are indicative only. Often the resolution is variable depending on the scene, or the product is provided for a set of resolutions (such as B-NOM, BM-RAD, BMA-FLX). This is indicated by the word "variable", a range of resolutions, or the set of resolutions used in the product.

"Native" refers to the resolution for the corresponding level 0 product, see there.

Data volume [MB/product]

The size of a single data product, in MB. This is a conservative estimate, including a margin indicated below. Typically, product sizes are given for products using internal compression.

Data volume [GB/day]

The average data volume of all products of a given type for a day, in GB. This is calculcated from the data volume per product by multiplying it with the average number of products per day. So typically, but not always, this is the data volume per product times the number of frames per day (124.4). Exceptions are calibration products which are generated less frequently, and X-MET which has some redundant coverage in order to increase data availability.

Data volume margin assumed [%]

The margin included in the size estimates above.

Volume margins cover development margins and frame margins (the extra along-track extent of a product before the start and after the end of a frame).

They are typically 20% for L0, L1b, L1c, 50% for L1d, and 100% for L2.

Developer

The institution or company implementing the processor. Only the main developer is listed here. There may be additional institutions contributing parts of the code or specifying the algorithms and/or data products.

Product description (PDD) reference

The document reference of the Product description. Issue numbers are deliberately not given, in order to avoid the need to update this document for every update of a PDD.

Product format versions are referenced in the PDDs.

Comments

Any other information relevant to the product.

3.3   Product list

L0	A-L0

Description	ATLID level 0 product		
File type	ATL_NOM_0_		
Processor	L0		
Primary parameters	ATLID annotated instrument science packets		
	along track	across track	vertical
Extent	frame	N/A	–0.5 to 40 km
Sampling	≈N·140 m where N is co-adding factor	N/A	≈100 m (z < 20 km) ≈500 m (z > 20 km)
Resolution	similar to sampling	N/A	similar to sampling
Data volume [MB/product]	78		
Data volume [GB/day]	9.7		
Data volume margin assumed [%]	20		
Developer	GMV		
Product Description (PDD) reference	EC.ICD.ASD.ATL.00018		
Comments	Onboard co-adding factor N=2 is the baseline. Data volumes are given for N=1 (worst case). Instrument is tilted in pitch direction to point 3° backwards wrt nadir, i.e., profiles are not exactly vertical.		

L0	M-L0		
Description	MSI level 0 product		
File type	MSI_NOM_0_		
Processor	L0		
Primary parameters	MSI annotated instrument science packets		
	along track	across track	vertical
Extent	frame	≈170 km (40/130 km)	N/A
Sampling	≈500 m	≈500 m	N/A
Resolution	similar to sampling	similar to sampling	N/A
Data volume [MB/product]	91		
Data volume [GB/day]	11		
Data volume margin assumed [%]	20		
Developer	GMV		
Product Description (PDD) reference	EC.ICD.ASD.MSI.00020		
Comments	Instrument is tilted in roll direction in order to avoid sunglint, therefore swath is asymmetric wrt nadir. The larger part is in the anti-sun direction, i.e., to the "left" which is in the east for the descending (i.e. daytime) part of the orbit. Data volume assuming full transmission of VNS data during eclipse (worst case).		

L0			B-L0
Description	BBR level 0 product		
File type	BBR_NOM_0_		
Processor	L0		
Primary parameters	BBR annotated instrument science packets		
	along track	across track	vertical
Extent	frame	≈18 km (nadir view) ≈28 km (fore/aft views)	N/A
Sampling	≈830 m (all views)	≈600 m (nadir view) ≈950 m (fore/aft views)	N/A
Resolution	≈600 m (nadir view) ≈1700 m (fore/aft views)	similar to sampling	N/A
Data volume [MB/product]	13		
Data volume [GB/day]	1.6		
Data volume margin assumed [%]	20		
Developer	GMV		
Product Description (PDD) reference	EC.ICD.ASD.BBR.00019		
Comments	Along-track sampling and data volumes are given for nominal chopper drum speed 261 rpm = 4.35 Hz. In-orbit chopper-drum speed will be somewhat lower, leading to larger along-track sampling distances and lower data volumes. Short-wave (SW) and total-wave (TW) measurements are alternating along track. The along-track sampling distance is given from one SW to the next SW measurement (or from one TW to the next TW measurement). Instrument requirements are defined for 10x10 km^2 integrated ground pixels. Spatial integration from individual pixels reported in the Level 0 product is required to achieve a sufficiently high signal-to-noise ratio and is performed in the L1 processor resulting in the B-NOM product.		

L0	C-L0		
Description	CPR level 0 product		
File type	CPR_NOM_0_		
Processor	L0		
Primary parameters	CPR annotated instrument science packets		
	along track	across track	vertical
Extent	frame	N/A	–0.5 to 20 km (max)
			–0.5 to 16 km (min)
Sampling	≈500 m	N/A	≈100 m
Resolution	≈1 km	N/A	≈500 m
Data volume [MB/product]	28		
Data volume [GB/day]	3.5		
Data volume margin assumed [%]	20		
Developer	GMV		
Product Description (PDD) reference	SEC-080015 This is an ISP definition, not a L0 product definition. The L0 product contains the annotation headers in addition which are generic (the same for all EarthCARE L0 products).		
Comments	This product is generated by ESA and forwarded to JAXA for processing to L1b. Vertical extent varies with predefined latitude bands.		

L1b	A-NOM		
Description	ATLID nominal L1 product		
File type	ATL_NOM_1B		
Processor	ATLID L1		
Primary parameters	Attenuated backscatter for the three ATLID channels (Rayleigh, co-polar Mie, cross-polar Mie)		
	along track	across track	vertical
Extent	frame	N/A	native
Sampling	native	N/A	native
Resolution	native	N/A	native
Data volume [MB/product]	760		
Data volume [GB/day]	95		
Data volume margin assumed [%]	20		
Developer	GMV		
Product Description (PDD) reference	EC.ICD.GMV.ATL.00001 (ATLID L1 PDD vol. A)		
Comments	Data volume given for co-adding factor 1 (worst case). Data volume is reduced by almost a factor of 2 for co-adding factor 2 (baseline).		

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L1b Calibration	A-DCC		
Description	ATLID dark signal calibration product		
File type	ATL_DCC_1B		
Processor	ATLID L1		
Primary parameters	Dark signal maps for the three ATLID channels		
	along track	across track	vertical
Extent	calibration	N/A	N/A
Sampling	N/A	N/A	N/A
Resolution	N/A	N/A	N/A
Data volume [MB/product]	24		
Data volume [GB/day]	< 0.001		
Data volume margin assumed [%]			
Developer	GMV		
Product Description (PDD) reference	EC.ICD.GMV.ATL.00002 (ATLID L1 PDD vol. B)		
Comments			

L1b Calibration	A-CSC		
Description	ATLID coarse spectral calibration product		
File type	ATL_CSC_1B		
Processor	ATLID L1		
Primary parameters	Rayleigh cross-talk derived for a sequence of laser frequencies and frequency at which this cross-talk has a minimum		
	along track	across track	vertical
Extent	calibration	N/A	N/A
Sampling	N/A	N/A	N/A
Resolution	N/A	N/A	N/A
Data volume [MB/product]	114		
Data volume [GB/day]	< 0.001		
Data volume margin assumed [%]			
Developer	GMV		
Product Description (PDD) reference	EC.ICD.GMV.ATL.00002 (ATLID L1 PDD vol. B)		
Comments			

L1b Calibration			A-FSC
Description	ATLID fine spectral calibration product		
File type	ATL_FSC_1B		
Processor	ATLID L1		
Primary parameters	Rayleigh cross-talk derived for a sequence of laser frequencies and frequency at which this cross-talk has a minimum		
	along track	across track	vertical
Extent	calibration	N/A	N/A
Sampling	N/A	N/A	N/A
Resolution	N/A	N/A	N/A
Data volume [MB/product]	47		
Data volume [GB/day]	0.007		
Data volume margin assumed [%]			
Developer	GMV		
Product Description (PDD) reference	EC.ICD.GMV.ATL.00002 (ATLID L1 PDD vol. B)		
Comments	Similar to A-CSC, except that calibration is over a narrower spectral range with smaller frequency steps		

L1b	M-NOM		
Description	MSI nominal L1 product		
File type	`MSI_NOM_1B`		
Processor	MSI L1		
Primary parameters	Radiances (VNS channels) and brightness temperatures (TIR channels)		
	along track	across track	vertical
Extent	frame	native	N/A
Sampling	native	native	N/A
Resolution	native	native	N/A
Data volume [MB/product]	1344		
Data volume [GB/day]	167		
Data volume margin assumed [%]	20		
Developer	GMV		
Product Description (PDD) reference	EC.ICD.GMV.MSI.00001 (MSI L1 PDD vol. A)		
Comments	Geolocations are provided per band.		

L1b Calibration	M-BBS		
Description	MSI black body/deep space calibration product		
File type	MSI_BBS_1B		
Processor	MSI L1		
Primary parameters	Measurements from blackbody and deep space calibration views		
	along track	across track	vertical
Extent	calibration	N/A	N/A
Sampling	N/A	N/A	N/A
Resolution	N/A	N/A	N/A
Data volume [MB/product]	< 1		
Data volume [GB/day]	< 0.001		
Data volume margin assumed [%]	N/A		
Developer	GMV		
Product Description (PDD) reference	EC.ICD.GMV.MSI.00002 (MSI L1 PDD vol. B)		
Comments			

L1b Calibration	M-SD1
Description	MSI nominal solar diffuser calibration product
File type	MSI_SD1_1B
Processor	MSI L1
Primary parameters	Measurements from sun calibration views via the nominal (primary) diffuser

	along track	across track	vertical
Extent	calibration	N/A	N/A
Sampling	N/A	N/A	N/A
Resolution	N/A	N/A	N/A
Data volume [MB/product]	< 1		
Data volume [GB/day]	< 0.001		
Data volume margin assumed [%]	N/A		
Developer	GMV		
Product Description (PDD) reference	EC.ICD.GMV.MSI.00002 (MSI L1 PDD vol. B)		
Comments			

L1b Calibration	M-SD2		
Description	MSI redundant solar diffuser calibration product		
File type	MSI_SD2_1B		
Processor	MSI L1		
Primary parameters	Measurements from sun calibration views via the redundant (secondary) diffuser		
	along track	across track	vertical
Extent	calibration	N/A	N/A
Sampling	N/A	N/A	N/A
Resolution	N/A	N/A	N/A
Data volume [MB/product]	< 1		
Data volume [GB/day]	< 0.001		
Data volume margin assumed [%]	N/A		
Developer	GMV		
Product Description (PDD) reference	EC.ICD.GMV.MSI.00002 (MSI L1 PDD vol. B)		
Comments	The redundant diffuser will be used less frequently than the nominal diffuser, in order to monitor any differences in degradation between the two diffuser plates.		

L1b Calibration	M-DRK		
Description	MSI VNS dark signal calibration product		
File type	MSI_DRK_1B		
Processor	MSI L1		
Primary parameters	VNS dark signals		
	along track	across track	Vertical
Extent	Calibration	N/A	N/A
Sampling	N/A	N/A	N/A
Resolution	N/A	N/A	N/A
Data volume [MB/product]	< 1		
Data volume [GB/day]	< 0.001		
Data volume margin assumed [%]	N/A		
Developer	GMV		
Product Description (PDD) reference	EC.ICD.GMV.MSI.00002 (MSI L1 PDD vol. B)		
Comments	Acquired during VNS calibration and "VNS DAY" on-board procedures.		

L1b Calibration	M-TRF		
Description	MSI TIR sensitivity reference parameters calibration product		
File type	MSI_TRF_1B		
Processor	MSI L1		
Primary parameters	TIR temperatures and voltages to be used in TIR sensitivity corrections		
	along track	across track	vertical
Extent	calibration	N/A	N/A
Sampling	N/A	N/A	N/A
Resolution	N/A	N/A	N/A
Data volume [MB/product]	< 1		
Data volume [GB/day]	< 0.001		
Data volume margin assumed [%]	N/A		
Developer	GMV		
Product Description (PDD) reference	EC.ICD.GMV.MSI.00002 (MSI L1 PDD vol. B)		
Comments	Acquired during TIR calibrations (cold space measurements)		

L1c	M-RGR
Description	MSI regridded L1 product
File type	`MSI_RGR_1C`
Processor	MSI L1
Primary parameters	Radiances (VNS channels) and brightness temperatures (TIR channels), spatially interpolated to a reference band

	along track	across track	vertical
Extent	frame	native (reference band)	N/A
Sampling	native (reference band)	native (reference band)	N/A
Resolution	similar to native	similar to native	N/A

Data volume [MB/product]	330
Data volume [GB/day]	41
Data volume margin assumed [%]	20
Developer	GMV
Product Description (PDD) reference	EC.ICD.GMV.MSI.00001 (MSI L1 PDD vol. A)
Comments	The reference band is configurable. Geolocations are provided for the reference band.

L1b	B-NOM		
Description	BBR nominal L1 product		
File type	BBR_NOM_1B		
Processor	BBR L1		
Primary parameters	Filtered radiances for short-wave (SW) and long-wave (LW), integrated spatially on 3 different scales		
	along track	across track	vertical
Extent	frame	nadir only, see Resolution	N/A
Sampling	1 km	N/A	N/A
Resolution	10 km	10 km (standard)	N/A
	10 km	n km with n < 10 (small)	
	10 km	full swath (full)	
Data volume [MB/product]	33		
Data volume [GB/day]	4.1		
Data volume margin assumed [%]	20		
Developer	GMV		
Product Description (PDD) reference	EC.ICD.GMV.BBR.00001 (BBR L1 PDD vol. A)		
Comments	Radiances integrated to 3 different pixel sizes (along x across track):		
	10 km x 10 km (standard)		
	10 km x n km (small)		
	10 km x full swath (full)		
	10 km along-track pixels are oversampled at 1 km.		
	Across-track integration is symmetric with respect to nadir.		
	Unfiltering (removing the effect of the instrument spectral response) is performed in level 2b processing resulting in the BM-RAD product.		
	Standard/small/full pixels are used in the BM-RAD and BMA-FLX products as well.		

L1b	B-SNG		
Description	BBR single pixel L1 product		
File type	BBR_SNG_1B		
Processor	BBR L1		
Primary parameters	Filtered radiances for short-wave (SW) and total-wave (TW), on native instrument grid		
	along track	across track	vertical
Extent	frame	native	N/A
Sampling	native	native	N/A
Resolution	native	native	N/A
Data volume [MB/product]	55		
Data volume [GB/day]	6.8		
Data volume margin assumed [%]	20		
Developer	GMV		
Product Description (PDD) reference	EC.ICD.GMV.BBR.00001 (BBR L1 PDD vol. A)		
Comments	Instrument requirements are defined for 10x10 km^2 integrated ground pixels. Spatial integration from individual pixels reported in the Level 0 product is required to achieve a sufficiently high signal-to-noise ratio. The B-SNG product gives the flexibility to the data product user to select the spatial integration domain.		

L1b Calibration			B-SOL
Description	BBR solar calibration product		
File type	BBR_SOL_1B		
Processor	BBR L1		
Primary parameters	Difference in detector signals with/without VIS filter for solar measurements, and corresponding monitoring signals from the Monitor Photodiodes (MPDs)		
	along track	across track	vertical
Extent	calibration	N/A	N/A
Sampling	N/A	N/A	N/A
Resolution	N/A	N/A	N/A
Data volume [MB/product]	0.16		
Data volume [GB/day]	<0.001		
Data volume margin assumed [%]	20		
Developer	GMV		
Product Description (PDD) reference	EC.ICD.GMV.BBR.00002 (BBR L1 PDD vol. B)		
Comments			

L1b Calibration		B-LIN
Description	BBR linearity calibration product	
File type	BBR_LIN_1B	
Processor	BBR L1	
Primary parameters	Detector signals (voltage and noise) for the warm and cold blackbody calibration measurements, and corresponding blackbody temperatures	
	along track	across track	vertical
Extent	calibration	N/A	N/A
Sampling	N/A	N/A	N/A
Resolution	N/A	N/A	N/A
Data volume [MB/product]	0.15		
Data volume [GB/day]	0.019		
Data volume margin assumed [%]	20		
Developer	GMV		
Product Description (PDD) reference	EC.ICD.GMV.BBR.00002 (BBR L1 PDD vol. B)		
Comments	Blackbody temperatures are controlled by heaters and measured by precision thermometers.		

L1d	X-MET
Description	ECMWF meteorological parameters on EarthCARE swath
File type	AUX_MET_1D
Processor	X-MET
Primary parameters	Selected meteorological parameters from ECMWF high-resolution forecasts (selection is configurable)

	along track	across track	vertical
Extent	frame	280 km (TBC) configurable	surface to 0.01 hPa (≈80 km)
Sampling	ECMWF model grid TCo1279: 8 km (equator) to 10 km (high latitudes)		variable, 137 σ levels
Resolution	about 8x sampling		similar to sampling

Data volume [MB/product]	180 (assuming compression)
Data volume [GB/day]	75 (assuming compression)
Data volume margin assumed [%]	50
Developer	S&T
Product Description (PDD) reference	EC-ICD-ESA-SYS-555
Comments	No EarthCARE data products used on input, only ECMWF model fields and the EarthCARE orbit scenario file. Across-track extent needs to cover complete MSI swath + orbit deadband + margin for spatial interpolation. Assuming compression to 60% of the original size. Production frequency: 4 runs per day Coverage per run: 20h (104 frames) (TBC)

L1d	X-JSG		
Description	Joint standard grid		
File type	AUX_JSG_1D		
Processor	X-JSG		
Primary parameters	Geolocation parameters for joint standard grid: latitude, longitude, altitude, surface elevation, land flag,		
	along track	across track	vertical
Extent	frame	MSI + margin	between 20 and 40 km, configurable
Sampling	2x CPR native (≈1 km)	1 km	ATLID native (≈ 100 m up to 20 km, then ≈500 m)
Resolution	N/A	N/A	N/A
Data volume [MB/product]	42 (assuming compression)		
Data volume [GB/day]	5.2 (assuming compression)		
Data volume margin assumed [%]	50		
Developer	S&T		
Product Description (PDD) reference	EC-ICD-ESA-SYS-556		
Comments	Derived from ATLID and CPR L1b geolocations. Used in synergy processing as common reference grid. Along-track sampling follows CPR sampling, so it is irregular in the same way: there's a gap after every 7th JSG along-track pixel. In case of missing CPR data, along-track sampling is at 1 km fixed. In case of missing ATLID data, vertical sampling is at 100 m / 500 m fixed. Assuming compression to 70% of the original size.		

L2a		A-FM
Description	ATLID feature mask	
File type	ATL_FM__2A	
Processor	A-FM	
Primary parameters	Probability of particle return detection	

	along track	across track	vertical
Extent	frame	N/A	native
Sampling	native	N/A	native
Resolution	native	N/A	native
Data volume [MB/product]	1.7		
Data volume [GB/day]	0.21		
Data volume margin assumed [%]	30		
Developer	KNMI		
Product Description (PDD) reference	A-FM_PDD		
Comments	The probability of particle return detection is given on a scale from 0 (clear sky) to 10 (clouds or aerosols present). There is no separation between clouds and aerosols in this product.		

L2a	A-AER		
Description	ATLID aerosol parameters		
File type	ATL_AER_2A		
Processor	A-PRO		
Primary parameters	Extinction, backscatter, and depolarisation for aerosol regions, aerosol layer information, aerosol type		
	along track	across track	vertical
Extent	frame	N/A	0.1–30 km
Sampling	JSG	N/A	JSG (= native)
Resolution	variable	N/A	JSG (= native)
Data volume [MB/product]	26		
Data volume [GB/day]	3.2		
Data volume margin assumed [%]	30		
Developer	KNMI		
Product Description (PDD) reference	A-AER_PDD		
Comments			

L2a	A-ICE		
Description	ATLID ice parameters		
File type	ATL_ICE_2A		
Processor	A-PRO		
Primary parameters	Ice water content and ice effective radius		
	along track	across track	vertical
Extent	frame	N/A	0.1–30 km
Sampling	JSG	N/A	JSG (= native)
Resolution	JSG	N/A	JSG (= native)
Data volume [MB/product]	1.8		
Data volume [GB/day]	0.22		
Data volume margin assumed [%]	30		
Developer	KNMI		
Product Description (PDD) reference	A-ICE_PDD		
Comments	Derived from ice cloud extinction and temperature using empirical relationships		

L2a		A-TC
Description	ATLID target classification	
File type	ATL_TC__2A	
Processor	A-PRO	
Primary parameters	Hydrometeor/aerosol type	

	along track	across track	vertical
Extent	frame	N/A	0.1–30 km
Sampling	JSG	N/A	JSG (= native)
Resolution	JSG, 11 JSG, 41 JSG	N/A	JSG (= native)

Data volume [MB/product]	3.3
Data volume [GB/day]	0.41
Data volume margin assumed [%]	30
Developer	KNMI
Product Description (PDD) reference	A-TC_PDD
Comments	

L2a	A-EBD		
Description	ATLID extinction, backscatter and depolarisation		
File type	ATL_EBD_2A		
Processor	A-PRO		
Primary parameters	Extinction, backscatter and depolarisation at 3 spatial resolutions		
	along track	across track	vertical
Extent	frame	N/A	0.1–30 km
Sampling	JSG	N/A	JSG (= native)
Resolution	JSG	N/A	JSG (= native)
Data volume [MB/product]	64		
Data volume [GB/day]	8.0		
Data volume margin assumed [%]	30		
Developer	KNMI		
Product Description (PDD) reference	A-EBD_PDD		
Comments			

L2a	A-CTH		
Description	ATLID cloud top height		
File type	ATL_CTH_2A		
Processor	A-LAY		
Primary parameters	Cloud top height		
	along track	across track	vertical
Extent	frame	N/A	N/A
Sampling	JSG	N/A	N/A
Resolution	1 or 11 JSG grid points (depending on cloud thickness)	N/A	native
Data volume [MB/product]	0.17		
Data volume [GB/day]	0.021		
Data volume margin assumed [%]	30		
Developer	TROPOS		
Product Description (PDD) reference	A-CTH_PDD		
Comments			

L2a	A-ALD		
Description	ATLID aerosol layer descriptors		
File type	ATL_ALD_2A		
Processor	A-LAY		
Primary parameters	Aerosol layer top/base height, optical thickness, extinction, backscatter, depolarisation		
	along track	across track	vertical
Extent	frame	N/A	N/A
Sampling	JSG	N/A	N/A
Resolution	11 JSG grid points	N/A	native
Data volume [MB/product]	0.41		
Data volume [GB/day]	0.051		
Data volume margin assumed [%]	30		
Developer	TROPOS		
Product Description (PDD) reference	A-ALD_PDD		
Comments			

L2a	M-CM		
Description	MSI cloud mask		
File type	MSI_CM__2A		
Processor	M-CLD		
Primary parameters	Cloud flag, cloud type, cloud phase		
	along track	across track	vertical
Extent	frame	native	N/A
Sampling	native	native	N/A
Resolution	native	native	N/A
Data volume [MB/product]	12		
Data volume [GB/day]	1.5		
Data volume margin assumed [%]	30		
Developer	TROPOS		
Product Description (PDD) reference	M-CM_PDD		
Comments			

L2a	M-COP		
Description	MSI cloud optical properties		
File type	MSI_COP_2A		
Processor	M-CLD		
Primary parameters	cloud optical thickness, cloud droplet/ice crystal effective radius, cloud water path		
	along track	across track	vertical
Extent	frame	native	N/A
Sampling	native	native	N/A
Resolution	native	native	N/A
Data volume [MB/product]	52		
Data volume [GB/day]	6.5		
Data volume margin assumed [%]	30		
Developer	TROPOS		
Product Description (PDD) reference	M-COP_PDD		
Comments			

L2a	M-AOT		
Description	MSI aerosol optical thickness		
File type	MSI_AOT_2A		
Processor	M-AOT		
Primary parameters	Aerosol optical thickness at 670 nm (land and ocean) and at 865 nm (ocean only)		
	along track	across track	vertical
Extent	frame	native	N/A
Sampling	native	native	N/A
Resolution	native	native	N/A
Data volume [MB/product]	20		
Data volume [GB/day]	2.5		
Data volume margin assumed [%]	30		
Developer	FU Berlin		
Product Description (PDD) reference	M-AOT_PDD		
Comments			

L2a	C-APC		
Description	CPR antenna pointing correction		
File type	CPR_APC_2A		
Processor	C-APC		
Primary parameters	CPR mispointing angles along track, and coefficients (mean, amplitude and phase) derived from a fit to these angles over a complete orbit, Doppler velocities corrected for CPR mispointing		
	along track	across track	vertical
Extent	orbit	N/A	native
Sampling	native	N/A	native
Resolution	native	N/A	native
Data volume [MB/product]	410		
Data volume [GB/day]	6.4		
Data volume margin assumed [%]	30		
Developer	McGill University		
Product Description (PDD) reference	C-APC PDD		
Comments			

L2a	C-FMR
Description	CPR feature mask and radar reflectivity
File type	CPR_FMR_2A
Processor	C-PRO
Primary parameters	Significant detection classification (feature mask), corrected radar reflectivity, path integrated attenuation (PIA), multiple scattering flag

	along track	across track	vertical
Extent	frame	N/A	native
Sampling	JSG	N/A	native
Resolution	≈JSG	N/A	native
Data volume [MB/product]	12		
Data volume [GB/day]	1.5		
Data volume margin assumed [%]	30		
Developer	McGill University		
Product Description (PDD) reference	C-FMR_PDD		
Comments			

L2a	C-CD		
Description	CPR Cloud Doppler parameters		
File type	CPR_CD__2A		
Processor	C-PRO		
Primary parameters	bias-corrected mean Doppler velocity and Doppler velocity best estimates using variable length-height integration window		
	along track	across track	vertical
Extent	frame	N/A	native
Sampling	JSG	N/A	native
Resolution	≈JSG	N/A	native
Data volume [MB/product]	12		
Data volume [GB/day]	1.5		
Data volume margin assumed [%]	30		
Developer	McGill University		
Product Description (PDD) reference	C-CD_PDD		
Comments	PDD: "Doppler measurements corrected for antenna mis-pointing, non-uniform beam filling, and velocity folding"		

L2a		C-TC
Description	CPR target classification	
File type	CPR_TC__2A	
Processor	C-PRO	
Primary parameters	Hydrometeor classification, Doppler classification, Convection classification, melting layer base and top height, cloud layer base and top heights	

	along track	across track	vertical
Extent	frame	N/A	native
Sampling	JSG	N/A	native
Resolution	≈JSG	N/A	native

Data volume [MB/product]	1.8
Data volume [GB/day]	0.22
Data volume margin assumed [%]	30
Developer	McGill University
Product Description (PDD) reference	C-TC_PDD
Comments	

L2a	C-CLD		
Description	CPR cloud parameters		
File type	CPR_CLD_2A		
Processor	C-CLD		
Primary parameters	Cloud water content and characteristic diameters, liquid water path, ice water path		
	along track	across track	vertical
Extent	frame	N/A	native
Sampling	JSG	N/A	native
Resolution	≈JSG	N/A	native
Data volume [MB/product]	9.3		
Data volume [GB/day]	1.2		
Data volume margin assumed [%]	30		
Developer	McGill University		
Product Description (PDD) reference	C-CLD_PDD		
Comments			

L2b	AM-MO		
Description	ATLID/MSI merged observations		
File type	AM__MO__2B		
Processor	AM-MO		
Primary parameters	Selected parameters from ATLID and MSI L1b and L2a products interpolated to JSG, for use in synergistic processing		
	along track	across track	vertical
Extent	frame	MSI native	ATLID native
Sampling	JSG	JSG	JSG
Resolution	MSI/ATLID native	MSI native	ATLID native
Data volume [MB/product]	400 TBC		
Data volume [GB/day]	50 TBC		
Data volume margin assumed [%]	100		
Developer	TBD		
Product Description (PDD) reference	AM-MO_PDD		
Comments	Development not started yet		

L2b	AM-CTH		
Description	ATLID/MSI cloud top height		
File type	AM__CTH_2B		
Processor	AM-COL		
Primary parameters	Difference between ATLID and MSI cloud top height for the entire MSI swath		
	along track	across track	vertical
Extent	frame	native	N/A
Sampling	JSG	JSG	N/A
Resolution	JSG	JSG	N/A
Data volume [MB/product]	13		
Data volume [GB/day]	1.6		
Data volume margin assumed [%]	30		
Developer	TROPOS		
Product Description (PDD) reference	AM-CTH_PDD		
Comments			

L2b	AM-ACD		
Description	ATLID/MSI aerosol column descriptor		
File type	AM__ACD_2B		
Processor	AM-COL		
Primary parameters	Aerosol optical thickness at 355 and 670 nm (land and ocean) and at 865 nm (ocean only), corresponding Angstrom exponents, aerosol type		
	along track	across track	vertical
Extent	frame	native	N/A
Sampling	JSG	JSG	N/A
Resolution	11 JSG grid points	11 JSG grid points	N/A
Data volume [MB/product]	12		
Data volume [GB/day]	1.5		
Data volume margin assumed [%]	30		
Developer	TROPOS		
Product Description (PDD) reference	AM-ACD_PDD		
Comments			

L2b	AC-TC
Description	ATLID/CPR target classification
File type	AC__TC__2B
Processor	AC-TC
Primary parameters	ATLID and CPR detection status, ATLID/CPR target classification flag

	along track	across track	vertical
Extent	frame	N/A	0–20 km
Sampling	JSG	N/A	JSG
Resolution	≈JSG	N/A	JSG–500 m

Data volume [MB/product]	0.62
Data volume [GB/day]	0.077
Data volume margin assumed [%]	30
Developer	LATMOS
Product Description (PDD) reference	AC-TC_PDD
Comments	

L2b	BM-RAD
Description	BBR radiances (using MSI for corrections)
File type	BM__RAD_2B
Processor	BM-RAD
Primary parameters	Unfiltered short-wave (SW) and long-wave (LW) radiances, integrated spatially on 6 different scales

	along track	across track	vertical
Extent	frame	nadir only, see Resolution	N/A
Sampling	1 km	N/A	N/A
	JSG (≈ 1 km)		
Resolution	10 km	10 km (standard)	N/A
	10 km	n km with n < 10 (small)	
	10 km	full swath (full)	
	M JSG pixels	N JSG pixels	
	JSG	17 JSG pixels	
	JSG	17 JSG pixels	

Data volume [MB/product]	7.0
Data volume [GB/day]	0.87
Data volume margin assumed [%]	30
Developer	GMV
Product Description (PDD) reference	BM-RAD_PDD
Comments	Radiances are integrated on 6 different scales.
	The first 3 use B-NOM on input, so the radiances are integrated over the same areas as in B-NOM (standard/small/full pixels). Along-track sampling is 1 km for this group (as in B-NOM).
	The other 3 use B-SNG on input, integrating to:
	a configurable assessment domain (MxN JSG pixels),
	1x17 JSG pixels (nadir/fore/aft)
	1x17 JSG pixels correcting for the PSF (nadir only)
	Along-track sampling is 1 JSG pixel for this group.

L2b	BMA-FLX		
Description	BBR fluxes (using MSI and ATLID for corrections)		
File type	BMA_FLX_2B		
Processor	BMA-FLX		
Primary parameters	Instantaneous top-of-atmosphere short-wave (SW) and long-wave (LW) fluxes for the three BBR views (fore/nadir/aft) and combined, integrated spatially on 4 different scales		
	along track	across track	vertical
Extent	frame	nadir only, see Resolution	N/A
Sampling	1 km JSG (≈ 1 km)	N/A	N/A
Resolution	10 km 10 km 10 km M JSG pixels	10 km (standard) n km with n < 10 (small) full swath (full) N JSG pixels	N/A
Data volume [MB/product]	5.8		
Data volume [GB/day]	0.72		
Data volume margin assumed [%]	30		
Developer	GMV		
Product Description (PDD) reference	BMA-FLX_PDD		
Comments	Fluxes are integrated on 4 different scales. The first 3 use B-NOM on input, so the fluxes are integrated over the same areas as the radiances in B-NOM (standard/small/full pixels). Along-track sampling is 1 km for this group (as in B-NOM). The fourth one uses B-SNG on input, integrating to a configurable assessment domain (MxN JSG pixels along/across track). Along-track sampling is 1 JSG pixel for this resolution.		

L2b	ACM-CAP		
Description	Cloud and aerosol properties from ATLID/CPR/MSI		
File type	ACM_CAP_2B		
Processor	ACM-CAP		
Primary parameters	Liquid cloud/ice cloud/rain water content and effective radius or diameter, aerosol number concentration and extinction		
	along track	across track	vertical
Extent	frame	1 km (nadir only)	0-20 km
Sampling	JSG	N/A	JSG
Resolution	JSG	JSG	JSG
Data volume [MB/product]	52		
Data volume [GB/day]	6.5		
Data volume margin assumed [%]	30		
Developer	ECMWF		
Product Description (PDD) reference	ACM-CAP_PDD		
Comments	From the PDD: "This product uses all the information to try to obtain the best possible estimate of cloud, aerosol and precipitation properties in any situation. A combined approach is essential if integral measurements (e.g. path-integrated attenuation and solar radiances) are to be used when multiple species are present in the profile. With a variational methodology, the retrievals have the prospect of being more accurate and with the most robustly derived error statistics than any alternative approach, making it attractive for use in scene construction. Moreover, this has the potential to be a flagship product for EarthCARE, exploiting its "synergy by design" ethos with the three key instruments mounted on the same platform for the first time."		

L2b	ACM-COM
Description	ATLID/CPR/MSI composite product
File type	ACM_COM_2B
Processor	ACM-COM
Primary parameters	Cloud water/ice content, cloud particle size, aerosol optical depth at 355 nm, aerosol type

	along track	across track	vertical
Extent	frame	1 km (nadir only)	0-20 km
Sampling	JSG	N/A	JSG
Resolution	JSG	JSG	JSG

Data volume [MB/product]	30
Data volume [GB/day]	3.7
Data volume margin assumed [%]	30
Developer	Environment Canada
Product Description (PDD) reference	ACM-COM_PDD
Comments	Cloud and aerosol parameters are provided for 2 "atmospheres": 1. copied from ACM-CAP 2. merged from various L2a products similar to the CloudSat-CALIPSO-CERES Merged (C3M) product from NASA Langley Downstream processors ACM-RT and ACMB-DF "are designed to be flexible in terms of total number of atmospheres produced by ACM-COM" and will act on both atmospheres.

L2b	ACMB-3D
Description	3D scene construction
File type	ALL_3D__2B
Processor	ACMB-3D
Primary parameters	For each off-nadir pixel (recipient pixel), the index of the nadir pixel (donor pixel) considered to be most similar to the off-nadir pixel. Nadir pixel indices of starting points of assessment domains

	along track	across track	vertical
Extent	frame	configurable, typical: ≈70 km	N/A
Sampling	JSG	JSG	N/A
Resolution	JSG	JSG	N/A

Data volume [MB/product]	3.0
Data volume [GB/day]	0.37
Data volume margin assumed [%]	30
Developer	Environment Canada
Product Description (PDD) reference	ACMB-3D_PDD
Comments	From the PDD: "To assess retrieved cloud and aerosol properties using BBR data, it is necessary to compute TOA fluxes and radiances for domains with nominal areal extents of ~100 km2 centred on the L2 crosssectional plane. Since the L2-plane is only ~1 km wide, this requires construction of 3D domains around it. 3D scenes are not produced by this product. All it produces are integer pointers that tie off-L2-plane JSG columns to like columns on the L2-plane. These pointers are used directly in the 3D radiative transfer algorithms and to average 1D radiative transfer results. As such, only virtual 3D domains are used for EarthCARE."

L2b	ACM-RT
Description	Broadband radiances and fluxes derived from 1D and 3D radiative transfer models using ATLID/CPR/MSI cloud and aerosol parameters on input, for the two atmospheres from ACM-COM
File type	ACM_RT__2B
Processor	ACM-RT
Primary parameters	1D heating rate and flux profiles (SW and LW), 1D direct and diffuse surface irradiance (SW), 3D heating rate profiles (SW), 3D flux profiles (SW and LW), 3D fluxes and radiances (SW and LW)

	along track	across track	vertical
Extent	frame	nadir only, see Resolution	same as X-MET
Sampling	1D: JSG 3D: selected assessment domains	N/A	same as X-JSG for range covered by X-JSG, same as X-MET above
Resolution	1D: JSG (≈1 km) 3D: M JSG pixels	1D: JSG (1 km) 3D: N JSG pixels	see Sampling

Data volume [MB/product]	99
Data volume [GB/day]	12.3
Data volume margin assumed [%]	30
Developer	Environment Canada
Product Description (PDD) reference	ACM-RT_PDD
Comments	From the PDD: "The 1D shortwave and longwave radiative transfer (RT) models get applied to each JSG column along a (5,000 km) frame. Level fluxes and layer heating rates are reported. Due to uncertainties regarding computational resources, the 3D RT models are applied to assessment domains. These domains are selected and ranked in ACMB-3D."
	Assessment domain size MxN JSG pixels is configurable. Typically M would be a multiple of 7 (due to the periodicity of the along-track grid of X-JSG, see there), and N would be between 1 and 11. An example would be M=21 and N=5, staying close to the "standard" 100 km^2 pixel size.

L2b	ACMB-DF		
Description	Radiative closure assessment, comparing broadband radiances and fluxes measured by BBR (BM-RAD and BMA-FLX) to broadband radiances and fluxes derived from radiative transfer models (ACM-RT), for the two atmospheres from ACM-COM		
File type	ALL_DF__2B		
Processor	ACMB-DF		
Primary parameters	Radiances and fluxes measured by BBR and derived from radiative transfer models, their uncertainties, and probabilities that BBR measurements and model results agree within ±10 W/m^2		
	along track	across track	vertical
Extent	frame	nadir only, see Resolution	N/A
Sampling	selected assessment domains	N/A	N/A
Resolution	M JSG pixels	N JSG pixels	N/A
Data volume [MB/product]	0.5		
Data volume [GB/day]	0.062		
Data volume margin assumed [%]	30		
Developer	Environment Canada		
Product Description (PDD) reference	ACMB-DF_PDD		
Comments	SW and LW radiances are compared for the 3 BBR viewing directions. SW and LW fluxes are compared at a reference level. All comparisons will be made for assessment domain means. Probabilities of differences being within ±10 W/m^2 are reported as well.		