BBR L1 PRODUCT DEFINITION DOCUMENT

VOLUME B: CALIBRATION PRODUCTS

ECGP

DRL REF: ECGP-TS-02

Prepared by: ECGP Team

Approved by:

Authorized by:

Code:	EC.ICD.GMV.BBR.00002
Version:	02.08
Date:	09/12/2024
Internal code:	GMV 21584/15 V11/24

DOCUMENT STATUS SHEET

Version	Date	Pages	Changes
01.00	15/05/2015	17	Version for the TRR2 First issue of the document. Calibration products information is extracted from EC.ICD.GMV.BBR.00001 0.1 Draft and included in this Volume.
01.01	22/07/2015	15	Version for the TRR2 Close-out Following RIDs have been implemented: • RID-TRR2-43: Clarified that the headers are also included in the netCDF4/HDF5 datablock (sections 4.8, 4.9 and 4.10) • RID-TRR2-42: Section 4 of version 01.00 removed. Subsections 7.x of version 01.00 reviewed. • RID-TRR2-20: Cal/Val Tools removed because they are not part of the ECGP • RID-TRR2-47: Packaging of L0 and L1 products in a ZIP file. Additional changes:
01.02	11/03/2016	15	Version for the AR2 Following changes have been implemented: • Unused dimensions removed from the Table 4.1 (i.e. latlon and Edges) • PDGS ICD document updated in the list of applicable documents
02.00	27/03/2017	14	Redline version generated by ESA + Additonal changes from GMV • Interface change for the BBR calibration products implementing EarthCARE metadata convention.

02.01	14/07/2017	15	Version for the ECGP V3.1:
			• Product Format Version Specified in the scope section.
			• JIRA Issue ECGP-86;EC-GSCDR-198 sensing time in annotation header without GPS
			  ○ time_synchronisation_status field added to BBRBLACKBODY and BBRVOLTAGEANDNOISE
			• JIRA Issue ECGP-85; EC-GSCDR-67 BBR_LIN_1B open/closed aperture variable
			  ○ voltage_closed field added to table 4.4
			• JIRA Issue ECGP-83; EC-GSCDR-59 Frequency of BBR_LIN_1B
			  ○ Table 4.5 updated: BBR_LIN_1B product is generated once per frame.
			• JIRA Issue ECGP-82; EC-GSCDR-52 VisCal set-up description out of date
			  ○ Table 4.5 updated: BBR_SOL_1B generation frequency updated

02.02	08/12/2017	14	Version for the ECGP V3.2 closeout:
			• JIRA Issue ECGP-173:
			  ○ #25 blackbody_radiance changed from double to float
			  ○ Time units corrected

02.03	07/12/2020	14	Version for BBR V3.4: • Product format verion for BBR_LIN_1B and BBR_SOL_1B set to 03.01 • Changes in the headers due to the change of ADS XML Library 16.3 (No enumerated values for header fields / Changes in the SPH)

02.04	28/03/2023	17	Changes:
			• No changes in the format of the product, only changes in the document
			• Applicable documents updated
			• [ECL1-531] Reorganization of the PDD.
			  ○ Specific section for the dimensions of each calibration product
			  ○ Quality flags included in each Datablock table to avoid referring to sections in the document that could lead the reader to think that we are refereeing to "groups" in the NetCDF format
			• Specific Product Header sections aligned with the output products begin generated by ECGP BBR V4.1

02.05	09/10/2023	18	Version for the BBR V4.2-rc1: • Format of the Specific Product Header in the HDR file has changed. Instead of writing the variables in the SPH as <variableName>value</variableName> they are written like: <variableName> <description>description text</description>

Version	Date	Pages	Changes
			<units>if applicable</units> <scalar>value</scalar> </variableName> • Description and Units are also written in the h5 (in previous version it was not). • Product format version has been bumped to 4.0 because this change breaks backward compatibility if a processor is reading information from the SPH in the HDR file.
02.06	12/04/2024	17	Version for the BBR V4.3-rc1: • Flags in Calibration products reviewed according to https://csde.esa.int/confluence/display/EarthCARE/BBR+Quality+Flags) ○ SOL: Following flags removed ▪ invalid_flag ▪ high_radiance_noise_flag ▪ low_quality_spacecraft_state_flag ▪ gain_offset_frozen_flag ▪ nominal_calibrated_row_count ▪ nonnominal_calibrated_row_count ○ SOL: Following flag with an additional dimension (across_track) ▪ pixel_saturation_flag ○ LIN. Following flags removed: ▪ invalid_flag ▪ high_radiance_noise_flag ▪ low_quality_spacecraft_state_flag ▪ gain_offset_frozen_flag ▪ nominal_calibrated_row_count ▪ nonnominal_calibrated_row_count • Product format version has been bumped to 5.0 because this change breaks backward compatibility.
02.07	02/08/2024	27	Version for the BBR V4.x: • [ECSYSTEM-938] BBR quality statistics added • MinorFormatVersion has been bumped for LIN and SOL products because new fields are added to QualityStatistics.
02.08	09/12/2024	27	Version for the BBR V4.5-rc1: • [ECL1-697] LW Gain stored in each calibration cycle to be dumped in the B-LIN. ○ Product format minor version increased because there are new fields added to the product. This change does not break backward compatibility ○ New fields: ▪ longwave_gain • [ECL1-698] B-SOL product computation updated according to ATBD EC-TN-SEA-BBR-0005 v 14.0 November 2024 ○ Product format minor version increased because there are new fields added to the product. This change does not break backward compatibility ○ New fields: ▪ monitor_photodiode_signal_closed ▪ longwave_gain ▪ longwave_offset ▪ shortwave_gain ▪ shortwave_offset

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

1. INTRODUCTION

1.1. PURPOSE

This document has been produced in the frame of the "EarthCARE Ground Processor" project and its purpose is to describe the format and content of the L1 calibration products for the BBR processor.

1.2. SCOPE

This document has been derived from the original ICD where all interfaces (commanding, monitoring, input and output data) were described. In this document, the information related to BBR L1 Calibration Products has been extracted from the original ICD and has been included in this dedicated document.

The versions of the product formats defined in this document are:

- BBR_SOL_1B: 05.02
- BBR_LIN_1B: 05.02

and must be reflected in the "formatMajorVersion" and "formatMinorVersion" of the MainProductHeader.

2. APPLICABLE AND REFERENCE DOCUMENTS

2.1. APPLICABLE DOCUMENTS

The following documents, of the exact issue shown, form part of this document to the extent specified herein. Applicable documents are those referenced in the Contract or approved by the Approval Authority. They are referenced in this document in the form [AD.X]:

Table 2.1: Applicable Documents

Ref.	Title	Code	Version	Date
[AD.1]	Earth Observation Mission CFI Software - General Software User Manual	EO-MA-DMS-GS-0002	4.20	30/10/2020
[AD.2]	ECSIM Interface Control Document	ECSIM-DMS-TEC-ICD01-R	1.7	18/11/2008
[AD.3]	Architecture of the ESSS and ECGP	EC.TN.ASD.SY.00017	7	19/12/2014
[AD.4]	Volume 0 Products Definitions - Introduction	EC.ICD.ASD.SY.00004	8	12/12/2014
[AD.5]	Volume 1 Products Definitions - Common Products Definitions	EC.ICD.ASD.SY.00005	12	25/07/2019
[AD.6]	ESSS and ECGP Common Interface Control Document	EC.ICD.ASD.SY.00009	8	09/12/2014
[AD.7]	Requirements for the ESSS & ECGP	EC.RS.ASD.SYS.00007	8	26/5/2010
[AD.8]	BBR ECGP Algorithm Theoretical Baseline Document	EC-TN-SEA-BBR-0005	14	11/2024
[AD.9]	EarthCARE PDGS Generic IPF Interface Specifications	EACA-GSEG-EOPG-TN-15-0001	01.04	01/09/2017
[AD.10]	Space Engineering - Software	ECSS-E-ST-40	C	6/03/2009
[AD.11]	Volume 3a Products Definitions – BBR L0 Products Definitions	EC.ICD.ASD.ATL.00019	6	11/12/2014
[AD.12]	Volume 6 Products Definitions – Auxiliary Data	EC.ICD.ASD.SY.00025	6	12/12/2014
[AD.13]	Earth Explorer Ground Segment File Format Standard	PE-TN-ESA-GS-0001	2.0	03/05/2012
[AD.14]	ECGP Interface Control Document (ICD)	EC.ICD.GMV.SY.00001	04.04	12/04/2024
[AD.15]	BBR L1 Product Definition – Volume B: Nominal Products	EC.ICD.GMV.BBR.00001	02.06	12/04/2024

2.2. REFERENCE DOCUMENTS

The following documents, although not part of this document, amplify or clarify its contents. Reference documents are those not applicable and referenced within this document. They are referenced in this document in the form [RD.X]:

Table 2.2: Reference Documents

Ref.	Title	Code	Version	Date
[RD.1]	List of Acronyms and Abbreviations	EC.LI.ASD.SY.00001	4	10/01/2013

3. TERMS, DEFINITIONS AND ABBREVIATED TERMS

3.1. DEFINITIONS

Concepts and terms used in this document and needing a definition are included in the following table:

Table 3.1: Definitions

Concept / Term	Definition

3.2. ACRONYMS

General EarthCARE abbreviations are in [RD.1]. Specific abbreviations used in this document are given below.

Acronyms used in this document and needing a definition are included in the following table:

Table 3.2: Acronyms

Acronym	Definition
ATLID	ATmospheric LIDar
BBR	EarthCARE Broadband Radiometer
CCDB	Characterisation/Calibration Database
ECGP	EarthCARE Level-1 Ground Processor
ESSS	EarthCARE Satellite System Simulator
FHN	Friedrichshafen – Germany
GERB	Geostationary Earth Radiation Budget
GUI	Graphical User Interface
HMI	Human-Machine Interface
H/W	Hardware
ICD	Interface Control Document
IMDD	Instrument Measurement Data Definition
ISP	Instrument Source Packet
LW	Long-Wave
MDS	Measurement Data Stream
MSI	MultiSpectral Imager
PCD	Product Confidence Data
PDD	Product Definition Document
PDGS	Payload Data Ground Segment
SCOE	Spacecraft Check-Out Equipment
SRDB	Spacecraft Reference Data Base
SW	Short-Wave
S/W	Software
TDS	Test Data Set
TOA	Top Of Atmosphere
TW	Total Wave
UV	Ultra-Violet
WGS	World Geodetic System

4. BBR L1 CALIBRATION PRODUCTS

BBR L1 Calibration Products are generated by the BBR L1 Processor.

4.1. TRANSFER MECHANISM

All EarthCARE Products are composed by two physical files:

- One XML for the headers (*filemane*.HDR)
- One binary file for the records containing the data (*filename*.h5)

Both files are located into a ZIP package with the same name (i.e. *filename.ZIP)*.

4.2. FILE NAMING CONVENTION

The file naming convention for the EarthCARE Products is described in [AD.5].

4.3. SIZE AND FREQUENCY OF TRANSFERS

Being 1/8 of orbit the nominal time frame for the EarthCARE L1 products, the size of the BBR L1 products is given for such time frame i.e. 1/8 of orbit. Following table summarises the sizes and frequency of generation of BBR L1 Calibration products. This information has been extracted from ECGP BBR L1 V2 implementation.

Table 4.1: BBR L1 products size and frequency of transfers

Product type	Size	Frequency of transfer	Comments
BBR_SOL_1B	0.13 MB	Once per orbit (not systematically)	Once per orbit over a period of several days, at intervals separated by months.
BBR_LIN_1B	0.13 MB	8 per orbit.	

4.4. DATA DEFINITION

BBR L1 Products have different components, but there is a common structure for all of them. In this structure is included the Fixed Product Header and the main Product Header which are identical for all products and so it is described below.

4.5. DATA STRUCTURE

BBR Calibration Products have different components, but there is a common structure for all of them. This structure is presented in the table below.

Table 4.2: BBR Calibration Product logical structure

HeaderData
FixedProductHeader
VariableProductHeader
MainProductHeader
SpecificProductHeader
ScienceData

According to the above structure, the products are physically composed by:

- Headers (first three parts) included in the XML file
- Datablock included in the netCDF4/HDF5 binary file (which also contains the headers)

There are two different BBR Calibration Products, sharing this structure. In this structure it is included the Fixed Product Header and the Main Product Header which are identical for all products and so it is described only once below.

4.6. BBR_SOL_1B

This is the Solar calibration BBR L1 product. The BBR Solar Calibration data product is a collection of the SW ageing views over time. It is separated in the four components described below

4.6.1. BBR_SOL_1B FIXED PRODUCT HEADER

The Fixed Product Header is common for all ECGP products and is defined in Products Definitions Volume 1 [AD.5].

4.6.2. BBR_SOL_1B MAIN PRODUCT HEADER

The Main Product Header for the BBR SOL L1B Products is identical to the Main Product Header defined in Products Definitions Volume 1 [AD.5] but with following predefined values specific to BBR L1B SOL product:

- fileCategory = "BBR_"
- productType = "SOL_"
- productLevel = "1B"

4.6.3. BBR_SOL_1B SPECIFIC PRODUCT HEADER

The Specific Product Header for the EarthCARE L1 Products follows the specification defined in section 6.1 of [AD.5], which defines following elements:

In case of BBR_SOL_1B, the SpecificProductHeader sub-group contains:

Table 4.3: BBR SOL L1 SPH structure

Group/Field Name	# Dims	Dimensions	Type	Units	Description
InputFileList	0	-	NC_STRING	N/A	String containing the logical file names (without extension) of all input files used by the processor to generate the product.
ConfigurationParameters	0	-	NC_STRING	N/A	Copy of the processor configuration file
QualityStatistics	0	-	NetCDF Group	N/A	This group contains an arbitrary number of quality statistics parameters. See following table

Table 4.4: BBR SOL L1 QualityStatistics group

Group/Field Name	# Dims	Dimensions	Type	Units	Description
aft_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
aft_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
aft_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
aft_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
aft_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
aft_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
aft_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
aft_high_spacecraft_slew_flag_count	0	-	NC_INT	unitless	Number of named flags set
aft_sun_not_in_field_of_view_flag_count	0	-	NC_INT	unitless	Number of named flags set

Group/Field Name	# Dims	Dimensions	Type	Units	Description
nadir_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
nadir_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
nadir_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
nadir_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
nadir_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
nadir_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
nadir_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
nadir_high_spacecraft_slew_flag_count	0	-	NC_INT	unitless	Number of named flags set
nadir_sun_not_in_field_of_view_flag_count	0	-	NC_INT	unitless	Number of named flags set
fore_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
fore_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
fore_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
fore_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
fore_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
fore_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
fore_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
fore_high_spacecraft_slew_flag_count	0	-	NC_INT	unitless	Number of named flags set
fore_sun_not_in_field_of_view_flag_count	0	-	NC_INT	unitless	Number of named flags set

QualityStatistics group contents for this product is still TBD

4.6.4. BBR_SOL_1B DIMENSIONS

Following table contains all dimensions used in the definition of the BBR SOL Calibration product.
"Name" is used in the description of the product datablock below (for brevity).
"Dimension label" is the actual name of the dimension in the NetCDF product.

Table 4.5: BBR SOL NetCDF Dimensions

Name	Description	N Elements	Dimension label
t	Dimension used to define variables depending on the number of samples recorded during the measurement time	Variable	along_track
view	Dimension used to define variables that are Telescope dependant. (AFT/NADIR/FORE)	3	view
pixel	Dimension used to define variables that contain arrays of pixels	30	across_track
band	Band (SW/TW)	2	band
mpd	Monitoring photodiode (red/green/blue)	3	mpd

4.6.5. BBR_SOL_1B SCIENCE DATA

The Datablock of this product is formatted as NetCDF/HDF5 file and has the following fields:

Table 4.6: BBR SOL L1 Datablock structure

Group/Field Name	# Dims	Dimensions	Type	Units	Description
time	2	view, t	NC_DOUBLE	seconds since 2000-1-1 00:00:00.0 0:00	Acquisition time
filter_identifier	2	view, t	NC_BYTE	unitless	Which filter sector is used for the SW measurement, 1 = Quartz_1, 2 = Quartz_2
monitor_photodiode_signal	4	mpd, view, band, t	NC_FLOAT	BU	Signal levels from the Monitoring Photodiodes
monitor_photodiode_signal_closed	4	mpd, view, band, t	NC_FLOAT	BU	Signal levels from the Closed Monitoring Photodiodes
voltage_difference	3	view, t, pixel	NC_FLOAT	V	Detector reading difference with/without filter (i.e. Vsw(Viscal) - Vsw(quartz))
longwave_gain	3	view, t, pixel	NC_FLOAT	unitless	longwave gain
longwave_offset	3	view, t, pixel	NC_FLOAT	unitless	longwave offset
shortwave_gain	3	view, t, pixel	NC_FLOAT	unitless	shortwave gain
shortwave_offset	3	view, t, pixel	NC_FLOAT	unitless	shortwave offset
range_to_sun	2	view, t	NC_FLOAT	m	The range to the sun
solar_array_rotation_angle	2	view, t	NC_FLOAT	deg	Solar array rotation angle
solar_azimuth_at_sensor	2	view, t	NC_FLOAT	deg	Azimuth of the sun in instrument frame
solar_elevation_at_sensor	2	view, t	NC_FLOAT	deg	Elevation of the sun in instrument frame
blackbody_temperature_out_of_limits_flag	2	view, t	NC_BYTE	unitless	If true, at least one of the blackbody temperatures against which this telescope is calibrated is outside the range over which it has been calibrated.
i1_vs_i2_mismatch_flag	2	view, t	NC_BYTE	unitless	The weighted sum of the differences between i1 and i2 from the detector exceeds some threshold, indicating high scene contrast within aperture measurements.
high_telescope_drift_flag	2	view, t	NC_BYTE	unitless	The temperature of the telescope foreoptics was drifting larger than some set threshold during this period
pixel_saturation_flag	2	view, t, pixel	NC_BYTE	unitless	Some of the constituent pixels are saturated within this product
telescope_temperature_out_of_limits_flag	2	view, t	NC_BYTE	unitless	The temperature of the telescopes was, during this period, out of accuracy limits (but within limits causing FDIR functions to start) indicating that the detector is operating in a regime for which it has not been calibrated
raw_mismatch_flag	2	view, t	NC_BYTE	unitless	If the telescope was in raw mode, and there was a mismatch between the ground computed values and the on-board computed values. True indicates that the on-board LUT has been corrupted, so the confidence in the radiance measurement is suspect.
chopper_nonadjacency_flag	2	view, t	NC_BYTE	unitless	If true, the subtraction of chopper background has not been performed on the adjacent chopper measurement, due to ISP loss. This indicates that the measurement

Group/Field Name	# Dims	Dimensions	Type	Units	Description
					may be polluted by uncorrected foreoptics temperature
high_spacecraft_slew_flag	2	view, t	NC_BYTE	unitless	The spacecraft attitude was changing at unacceptably high rates
sun_not_in_field_of_view_flag	2	view, t	NC_BYTE	unitless	The sun position is not in the fov (so ignore)
state_vector_quality_status	2	view, t	NC_INT	unitless	S/C State Vector Quality field copied from the ISP Private Science Data Header
time_synchronisation_status	2	view, t	NC_BYTE	unitless	Long name: Instrument time synchronisation status Status of the time synchronisation between the instrument and the satellite Bit 3: Time Type 0 = Elapsed Time (ET); 1 = OBT Bit 4: Sync. Source 0 = internal; 1 = external Bit 5: Ext. Sync. Source Detail 0 = MIL-Bus Major Frame; 1 = 1Hz Pulse Bit 6: Sync. Status 0 = NoSync; 1 = InSync Bit 7: …Synchronization Enabled/Disabled 0 = Disabled; 1 = Enabled

4.7. BBR_LIN_1B

This is the Linear calibration BBR L1 product. The BBR Linear Calibration data product is a collection of the measured gain (and offset) while viewing the BBs during a linearity check. It is separated in the four components described below.

4.7.1. BBR_LIN_1B FIXED PRODUCT HEADER

The Fixed Product Header is common for all ECGP products and is defined in Products Definitions Volume 1 [AD.5].

4.7.2. BBR_LIN_1B MAIN PRODUCT HEADER

The Main Product Header for the BBR SOL L1B Products is identical to the Main Product Header defined in Products Definitions Volume 1 [AD.5] but with following predefined values specific to BBR L1B SOL product:

- fileCategory = "BBR_"
- productType = "LIN_"
- productLevel = "1B"

4.7.3. BBR_LIN_1B SPECIFIC PRODUCT HEADER

The Specific Product Header for the EarthCARE L1 Products follows the specification defined in section 6.1 of [AD.5], which defines following elements:

In case of BBR_LIN_1B, the SpecificProductHeader sub-group contains:

Table 4.7: BBR LIN L1 SPH structure

Group/Field Name	# Dims	Dimensions	Type	Units	Description
InputFileList	0	-	NC_STRING	N/A	String containing the logical file names (without extension) of all input files used by the processor to generate the product.
ConfigurationParameters	0	-	NC_STRING	N/A	Copy of the processor configuration file

Group/Field Name	# Dims	Dimensions	Type	Units	Description
QualityStatistics	0	-	NetCDF Group	N/A	This group contains an arbitrary number of quality statistics parameters. See following table

Table 4.8: BBR LIN L1 QualityStatistics group

Group/Field Name	# Dims	Dimensions	Type	Units	Description
bb_warm_aft_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_warm_aft_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_warm_aft_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_warm_aft_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_warm_aft_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_warm_aft_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_warm_aft_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_warm_nadir_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_warm_nadir_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_warm_nadir_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_warm_nadir_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_warm_nadir_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_warm_nadir_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_warm_nadir_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_warm_fore_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_warm_fore_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_warm_fore_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_warm_fore_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_warm_fore_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_warm_fore_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set

Group/Field Name	# Dims	Dimensions	Type	Units	Description
bb_warm_fore_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_aft_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_aft_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_aft_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_aft_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_aft_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_aft_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_aft_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_nadir_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_nadir_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_nadir_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_nadir_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_nadir_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_nadir_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_nadir_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_fore_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_fore_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_fore_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_fore_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_fore_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_fore_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
bb_cold_fore_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_aft_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_aft_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set

Group/Field Name	# Dims	Dimensions	Type	Units	Description
tw_warm_aft_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_aft_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_aft_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_aft_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_aft_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_nadir_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_nadir_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_nadir_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_nadir_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_nadir_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_nadir_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_nadir_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_fore_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_fore_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_fore_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_fore_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_fore_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_fore_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_warm_fore_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_aft_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_aft_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_aft_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_aft_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_aft_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set

Group/Field Name	# Dims	Dimensions	Type	Units	Description
sw_warm_aft_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_aft_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_nadir_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_nadir_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_nadir_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_nadir_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_nadir_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_nadir_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_nadir_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_fore_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_fore_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_fore_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_fore_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_fore_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_fore_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_fore_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_aft_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_aft_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_aft_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_aft_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_aft_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_aft_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_aft_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_nadir_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set

Group/Field Name	# Dims	Dimensions	Type	Units	Description
tw_cold_nadir_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_nadir_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_nadir_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_nadir_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_nadir_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_nadir_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set

Group/Field Name	# Dims	Dimensions	Type	Units	Description
sw_cold_nadir_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_fore_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_fore_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_fore_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_fore_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_fore_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_fore_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_fore_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_nadir_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_nadir_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_nadir_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_nadir_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_nadir_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_nadir_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_fore_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_fore_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_fore_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_fore_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_fore_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_fore_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_warm_fore_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_aft_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set

Group/Field Name	# Dims	Dimensions	Type	Units	Description
tw_cold_aft_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_aft_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_aft_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_aft_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_aft_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_aft_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_nadir_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_nadir_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_nadir_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_nadir_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_nadir_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_nadir_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_nadir_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set

Group/Field Name	# Dims	Dimensions	Type	Units	Description
sw_cold_aft_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_fore_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_fore_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_fore_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_fore_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_fore_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_fore_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_fore_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_aft_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_aft_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_aft_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_nadir_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_nadir_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_nadir_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_nadir_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set

Group/Field Name	# Dims	Dimensions	Type	Units	Description
tw_cold_nadir_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_nadir_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_nadir_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
tw_cold_fore_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_aft_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_pixel_saturation_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_telescope_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_raw_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_nadir_chopper_nonadjacency_flag_count	0	-	NC_INT	unitless	Number of named flags set

Group/Field Name	# Dims	Dimensions	Type	Units	Description
sw_cold_fore_blackbody_temperature_out_of_limits_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_fore_i1_vs_i2_mismatch_flag_count	0	-	NC_INT	unitless	Number of named flags set
sw_cold_fore_high_telescope_drift_flag_count	0	-	NC_INT	unitless	Number of named flags set

QualityStatistics group contents for this product is still TBD

4.7.4. BBR_LIN_1B DIMENSIONS

Following table contains all dimensions used in the definition of the BBR SOL Calibration product.
"Name" is used in the description of the product datablock below (for brevity).
"Dimension label" is the actual name of the dimension in the NetCDF product.

Table 4.9: BBR SOL NetCDF Dimensions

Name	Description	N Elements	Dimension label
t	Dimension used to define variables depending on the number of samples recorded during the measurement time	Variable	along_track
view	Dimension used to define variables that are Telescope dependant. (AFT/NADIR/FORE)	3	view
pixel	Dimension used to define variables that contain arrays of pixels	30	across_track

4.7.5. BBR_LIN_1B SCIENCE DATA

The Datablock of this product is formatted as NetCDF/HDF5 file and have following fields:

Table 4.10: BBR LIN L1 Datablock structure

Group/Field Name	# Dims	Dimensions	Type	Units	Description
BB_cold	0	-	BBRBlackBody Group		See section 4.7.5.1 for details about contents and structure of this group
BB_warm	0	-	BBRBlackBody Group		See section 4.7.5.1 for details about contents and structure of this group
SW_cold	0	-	BBRVoltageAndNoise Group		See section 4.7.5.2 for details about contents and structure of this group
SW_warm	0	-	BBRVoltageAndNoise Group		See section 4.7.5.2 for details about contents and structure of this group
TW_cold	0	-	BBRVoltageAndNoise Group		See section 4.7.5.2 for details about contents and structure of this group
TW_warm	0	-	BBRVoltageAndNoise Group		See section 4.7.5.2 for details about contents and structure of this group

4.7.5.1. Blackbody fields (BBRBlackBody)

Following table describes the structure of the BB_cold and BB_warn in BBR LIN L1 Datablock.

Table 4.11: BBRBlackBody fields

Field Name	# Dims	Dimensions	Type	Units	Description
time	2	view, t	NC_DOUBLE	seconds since 2000-1-1 00:00:00.0 0:00	Acquisition time
blackbody_index	2	view, t	NC_SHORT	unitless	Black body index (1 to 4)
blackbody_radiance	2	view, t	NC_FLOAT	W/(m2 sr)	Black body radiance
blackbody_temperature	2	view, t	NC_FLOAT	K	Black body temperature
environment_temperature	2	view, t	NC_FLOAT	K	Environment temperature
longwave_gain	3	view, t, pixel	NC_FLOAT	unitless	longwave gain
blackbody_temperature_out_of_limits_flag	2	view, t	NC_BYTE	unitless	If true, at least one of the blackbody temperatures against which this telescope is calibrated is outside the range over which it has been calibrated.
i1_vs_i2_mismatch_flag	2	view, t	NC_BYTE	unitless	The weighted sum of the differences between i1 and i2 from the detector exceeds some threshold, indicating high scene contrast within aperture measurements.
high_telescope_drift_flag	2	view, t	NC_BYTE	unitless	The temperature of the telescope foreoptics was drifting larger than some set threshold during this period
pixel_saturation_flag	2	view, t	NC_BYTE	unitless	Some of the constituent pixels are saturated within this product
telescope_temperature_out_of_limits_flag	2	view, t	NC_BYTE	unitless	The temperature of the telescopes was, during this period, out of accuracy limits (but within limits causing FDIR functions to start) indicating that the detector is operating in a regime for which it has not been calibrated
raw_mismatch_flag	2	view, t	NC_BYTE	unitless	If the telescope was in raw mode, and there was a mismatch between the ground computed values and the on-board computed values. True indicates that the on-board LUT has been corrupted, so the confidence in the radiance measurement is suspect.
chopper_nonadjacency_flag	2	view, t	NC_BYTE	unitless	If true, the subtraction of chopper background has not been performed on the adjacent chopper measurement, due to ISP loss. This indicates that the measurement may be polluted by uncorrected foreoptics temperature
state_vector_quality_status	2	view, t	NC_INT	unitless	S/C State Vector Quality field copied from the ISP Private Science Data Header
time_synchronisation_status	2	view, t	NC_BYTE	unitless	Long name: Instrument time synchronisation status Status of the time synchronisation between the instrument and the satellite Bit 3: Time Type 0 = Elapsed Time (ET); 1 = OBT Bit 4: Sync. Source 0 = internal; 1 = external Bit 5: Ext. Sync. Source Detail 0 = MIL-Bus Major Frame; 1 = 1Hz Pulse Bit 6: Sync. Status 0 = NoSync; 1 = InSync Bit 7: …Synchronization Enabled/Disabled

Field Name	# Dims	Dimensions	Type	Units	Description
					0 = Disabled; 1 = Enabled

4.7.5.2. Voltage and quality fields (BBRVoltageAndNoise)

Following table describes the structure of the SW_cold, SW_warn, TW_cold and TW_warn in BBR LIN L1 Datablock.

Table 4.12: BBRVoltageAndQuality fields

Field Name	#Dims	Dimensions	Type	Units	Description
time	2	view, t	NC_DOUBLE	seconds since 2000-1-1 00:00:00.0 0:00	Acquisition time
voltage	3	view, t, pixel	NC_FLOAT	V	Pixel average voltage
voltage_closed	3	view, t, pixel	NC_FLOAT	V	Pixel average "closed" voltage
noise	3	view, t, pixel	NC_FLOAT	BU	Pixel noise
exposures_count	2	view, t	NC_SHORT	unitless	Number of exposures
invalid_flag	2	view, t	NC_BYTE	unitless	Whether the record is invalid i.e. broken by cal targets, caldrum slews etc. such that the product is missing along-track data
high_radiance_noise_flag	2	view, t	NC_BYTE	unitless	If true, the detector noise assessment from the previous black body readings exceeded some threshold, indicating that the error in this reading is too high.
blackbody_temperature_out_of_limits_flag	2	view, t	NC_BYTE	unitless	If true, at least one of the blackbody temperatures against which this telescope is calibrated is outside the range over which it has been calibrated.
gain_offset_frozen_flag	2	view, t	NC_BYTE	unitless	The integrated time (in s) from all the rows in the product since the last gain/offset calculation was valid
i1_vs_i2_mismatch_flag	2	view, t	NC_BYTE	unitless	The weighted sum of the differences between i1 and i2 from the detector exceeds some threshold, indicating high scene contrast within aperture measurements.
high_telescope_drift_flag	2	view, t	NC_BYTE	unitless	The temperature of the telescope foreoptics was drifting larger than some set threshold during this period
pixel_saturation_flag	2	view, t	NC_BYTE	unitless	Some of the constituent pixels are saturated within this product
telescope_temperature_out_of_limits_flag	2	view, t	NC_BYTE	unitless	The temperature of the telescopes was, during this period, out of accuracy limits (but within limits causing FDIR functions to start) indicating that the detector is operating in a regime for which it has not been calibrated
raw_mismatch_flag	2	view, t	NC_BYTE	unitless	If the telescope was in raw mode, and there was a mismatch between the ground computed values and the on-board computed values. True indicates that the on-board LUT has been corrupted, so the confidence in the radiance measurement is suspect.
chopper_nonadjacency_flag	2	view, t	NC_BYTE	unitless	If true, the subtraction of chopper background has not been performed on the adjacent chopper measurement, due to ISP

Field Name	#Dims	Dimensions	Type	Units	Description
					loss. This indicates that the measurement may be polluted by uncorrected foreoptics temperature
low_quality_spacecraft_state_flag	2	view, t	NC_BYTE	unitless	The reported spacecraft state quality (from the spacecraft) is lower than the allowed threshold.
nominal_calibrated_row_count	2	view, t	NC_SHORT	unitless	Number of rows used in the integration which are calibrated using the nominal calibration processing.
nonnominal_calibrated_row_count	2	view, t	NC_SHORT	unitless	Number of rows used in the integration which are calibrated using the fall-back calibration processing due to missing LIN measurements for averaging.
state_vector_quality_status	2	view, t	NC_INT	unitless	S/C State Vector Quality field copied from the ISP Private Science Data Header
time_synchronisation_status	2	view, t	NC_BYTE	unitless	Long name: Instrument time synchronisation status Status of the time synchronisation between the instrument and the satellite Bit 3: Time Type 0 = Elapsed Time (ET); 1 = OBT Bit 4: Sync. Source 0 = internal; 1 = external Bit 5: Ext. Sync. Source Detail 0 = MIL-Bus Major Frame; 1 = 1Hz Pulse Bit 6: Sync. Status 0 = NoSync; 1 = InSync Bit 7: …Synchronization Enabled/Disabled 0 = Disabled; 1 = Enabled

END OF DOCUMENT