GPM/DPR
L2/3 Product Format Documentation

Version 3.0

May, 2017

Japan Aerospace Exploration Agency

Revision history

revision	date	section	content, reason
Version 1.0	Sept. 2nd 2014	ALL	New
Version 2.0	Mar. 28th 2016	p.ii~vi	Correction of talble of contents
		p.56~	Addition Chapter 3 "Level 2 (2HSLH) Data Format Structure"
		p.60~	Addition Chapter 4 "Level 2(2HSLH) Contents of Objects in each Group"
		p.152~	Addition Chapter 8 " Level 3 (3GSLH) Data Format Structure "
		P.156~	Addition Chapter 9 " Level 3(3GSLH) Contents of Objects in each Group "
		p.164~	Addition Chapter 10 " Level 3 (3HSLH) Data Format Structure "
		p.168~	Addition Chapter 11 "Level 3(3HSLH) Contents of Objects in each Group "
		p.180~	A list of elements of each chapter is gathered in Chapter 12
		All page	Change of the chapter constitution
Version 3.0	May 9th 2016	P.7, P.15, P.25, P.56~P.61, P.226~227	Addition of TRG Group to MS swath of 2ADPR.
		P.11, P.41~42, P.190, P.198, P.206, P.214, P.222, P.231	Addtion of adjustFactor and snowIceCover to PRE Group.
		P.12, P.47, P.191, P.199, P.207, P.215, P.223, P.232	Addtion of flagHeavyIcePrecip and flagAnvil to CSF Group.
		P.13, P.51, P.224	Addition of flagSurfaceSnowfall and surfaceSnowfallIndex to Experimental Group.
		P.17	Addition of DOIauthority and DOIshortName to FileHeader meta data.
		P.78, P.84~85, P.141~P.150, P.248~249	Addition of the new channels to each data elements of 3DPRD.

Reference

(1) PRECIPITATION PROCESSING SYSTEM GLOBAL PRECIPITATION MEASUREMENT “File Specification for GPM Products”,

(2) PRECIPITATION PROCESSING SYSTEM GLOBAL PRECIPITATION MEASUREMENT “Metadata for GPM Products”,

(3) PRECIPITATION PROCESSING SYSTEM GLOBAL PRECIPITATION MEASUREMENT “File Specification for GPM Products”,

Table of Contents

1. Level 2 Data Format Structure

1.1. Dimension definition

Dimension definitions:

- nscan
  - Number of scans in the granule.
- nray
  - 49 Number of angle bins in each scan. (NS)
  - 25 Number of angle bins in each scan. (MS)
  - 24 Number of angle bins in each scan. (HS)
- nbin
  - 176 Number of range bins in each ray. (NS)
  - 176 Number of range bins in each ray. (MS)
  - 88 Number of range bins in each ray. (HS)
- nbin SZP
  - 7 Number of range bins for sigmaZeroProfile. (NS)
  - 7 Number of range bins for sigmaZeroProfile. (MS)
  - 5 Number of range bins for sigmaZeroProfile. (HS)
- nNP
  - 4 Number of NP kinds.
- nearFar
  - 2 Near reference, Far reference.
- foreBack
  - 2 Forward, Backword.
- method
  - 6 Number of SRT methods.
- nNode
  - 5 Number of binNode.
- nDSD
  - 2 Number of DSD parameters. Parameters are N0 and D0.
- LS
  - 2 Liquid, Solid.
- nNUBF
  - 3 Number of NUBF parameters.

“NS” is called as Normal scan Swath in 2AKu.

“MS” is called as Matched beam scan Swath and “HS” is called as High sensitivity beam scan Swath in 2AKa and 2ADPR respectively.

1.2. Data Format Structure for 2AKu

The Ku Level-2A product, 2AKu, is defined as a swath structure, which is called “NS”.

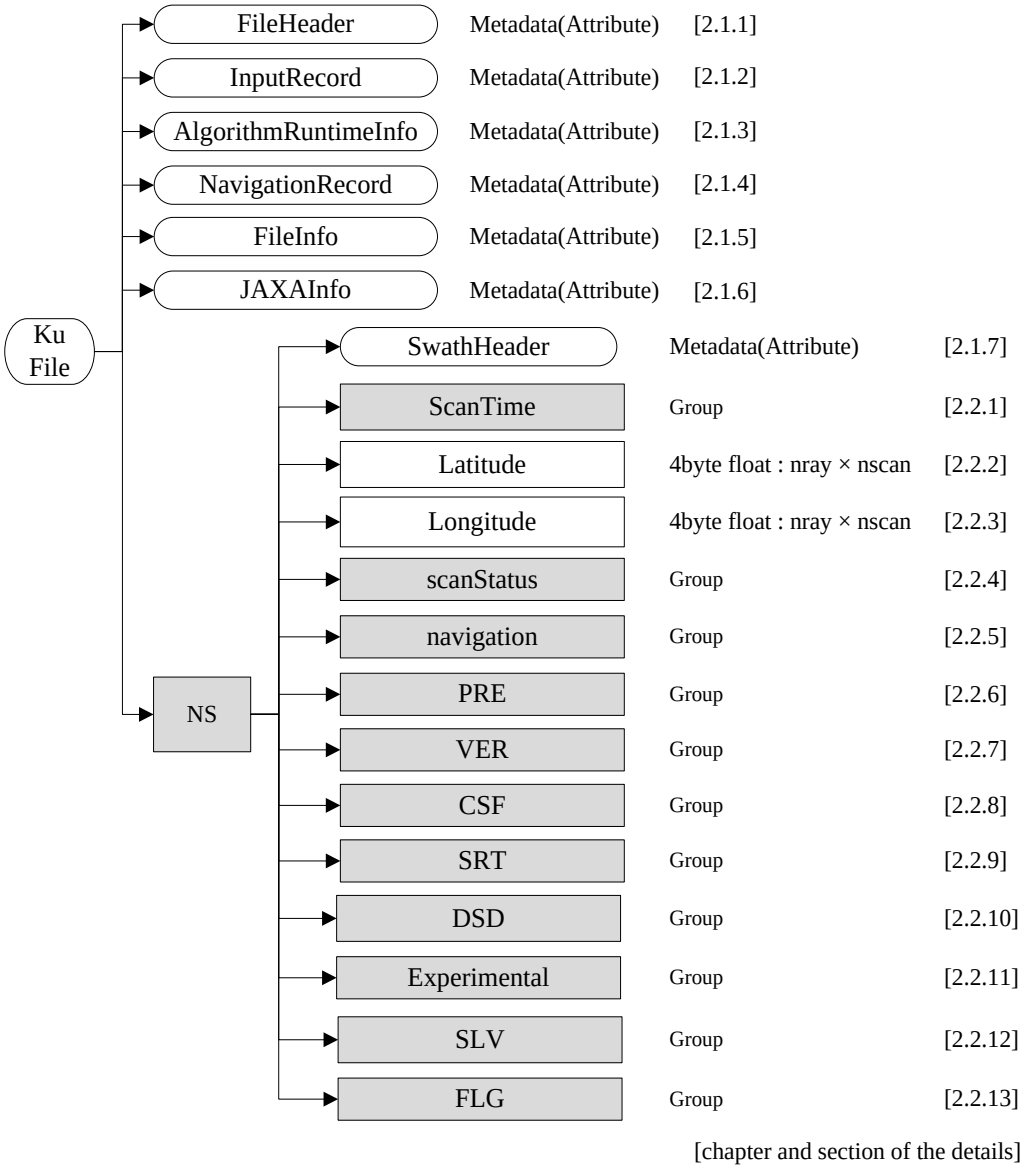


Figure 1.2-1 Data Format Structure for 2AKu

1.3. Data Format Structure for 2AKa

The Ka Level-2A product, 2AKa, is defined as two-swath structures, which are called “MS” and “HS”.

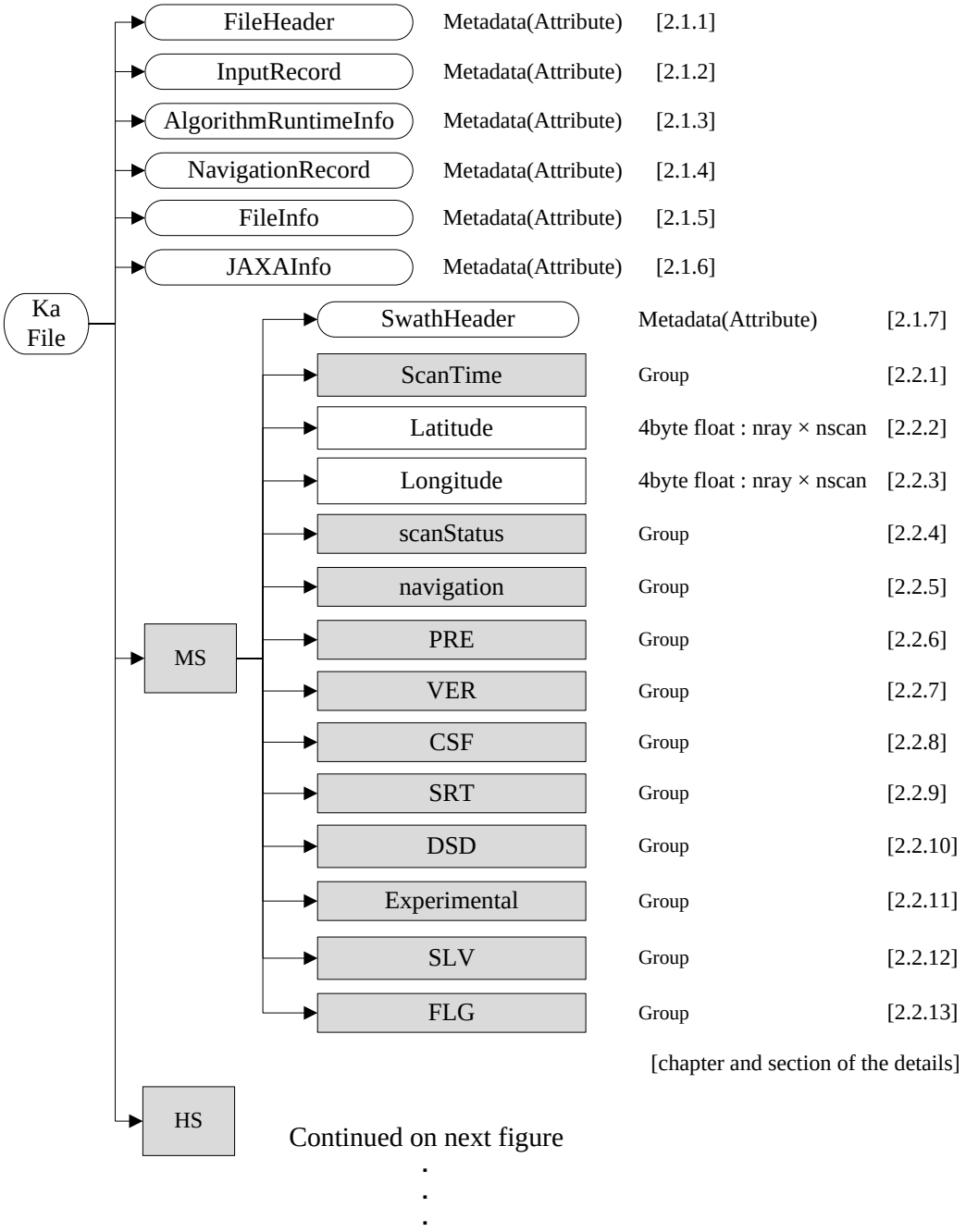


Figure 1.3-1 Data Format Structure for 2AKa

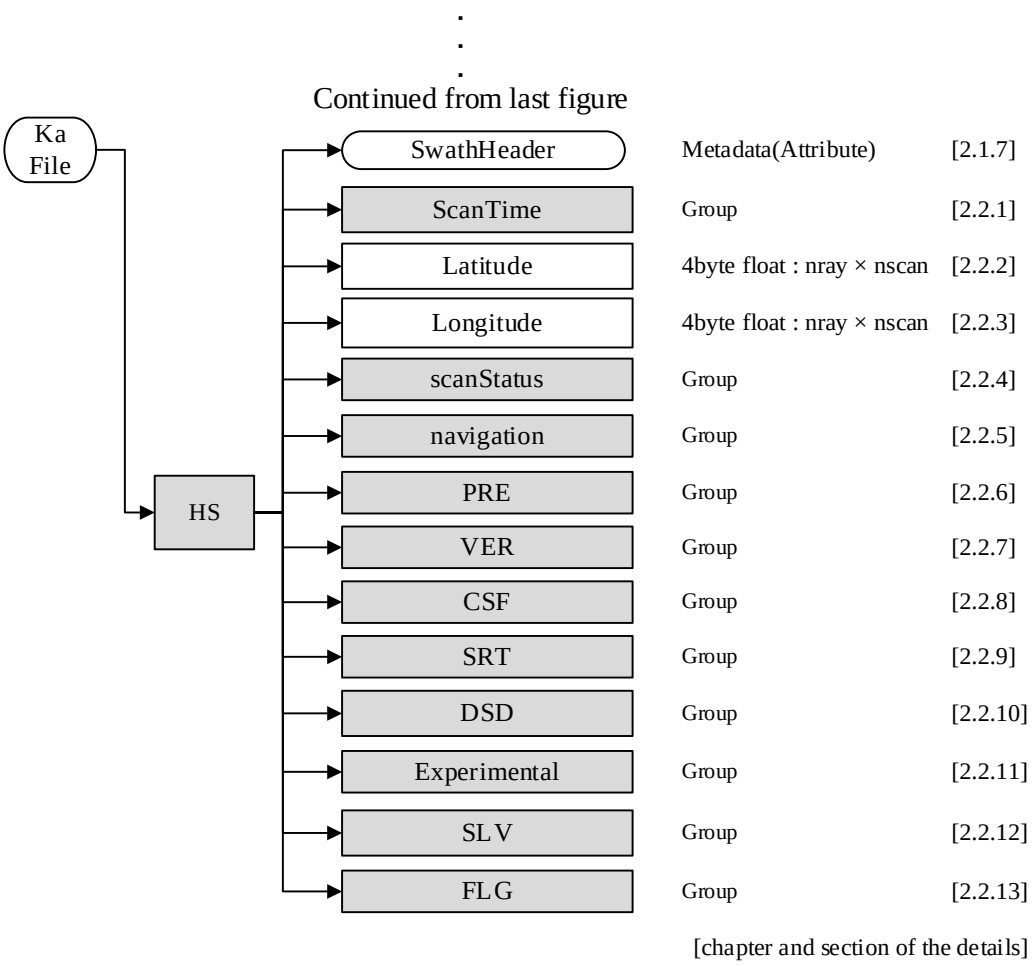


Figure 1.3-2 Data Format Structure for 2AKa

1.4. Data Format Structure for 2ADPR

The DPR Level-2A product, 2ADPR, is defined as three-swath structures, which are called “NS” , “MS” and “HS”.

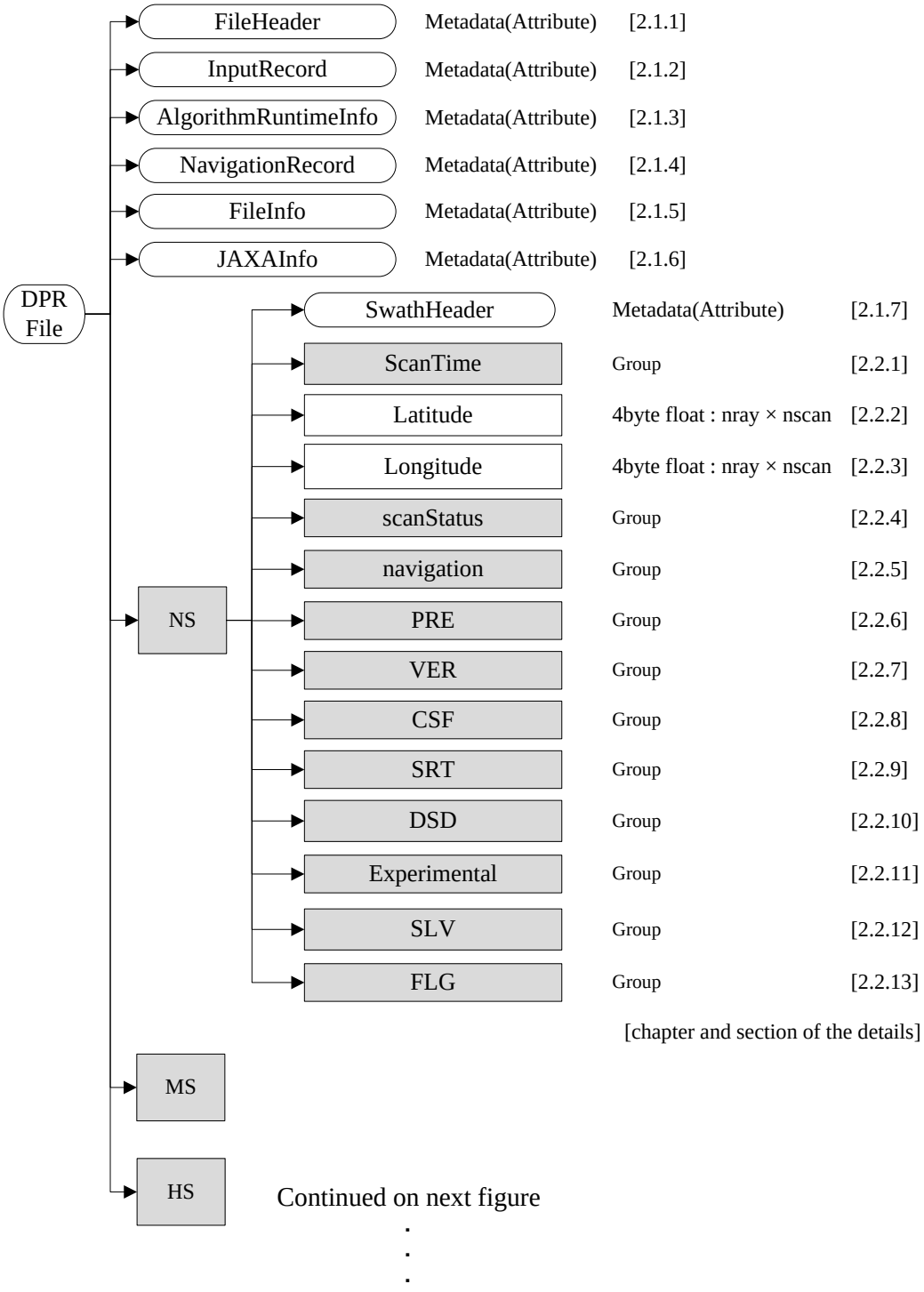


Figure 1.4-1 Data Format Structure for 2ADPR

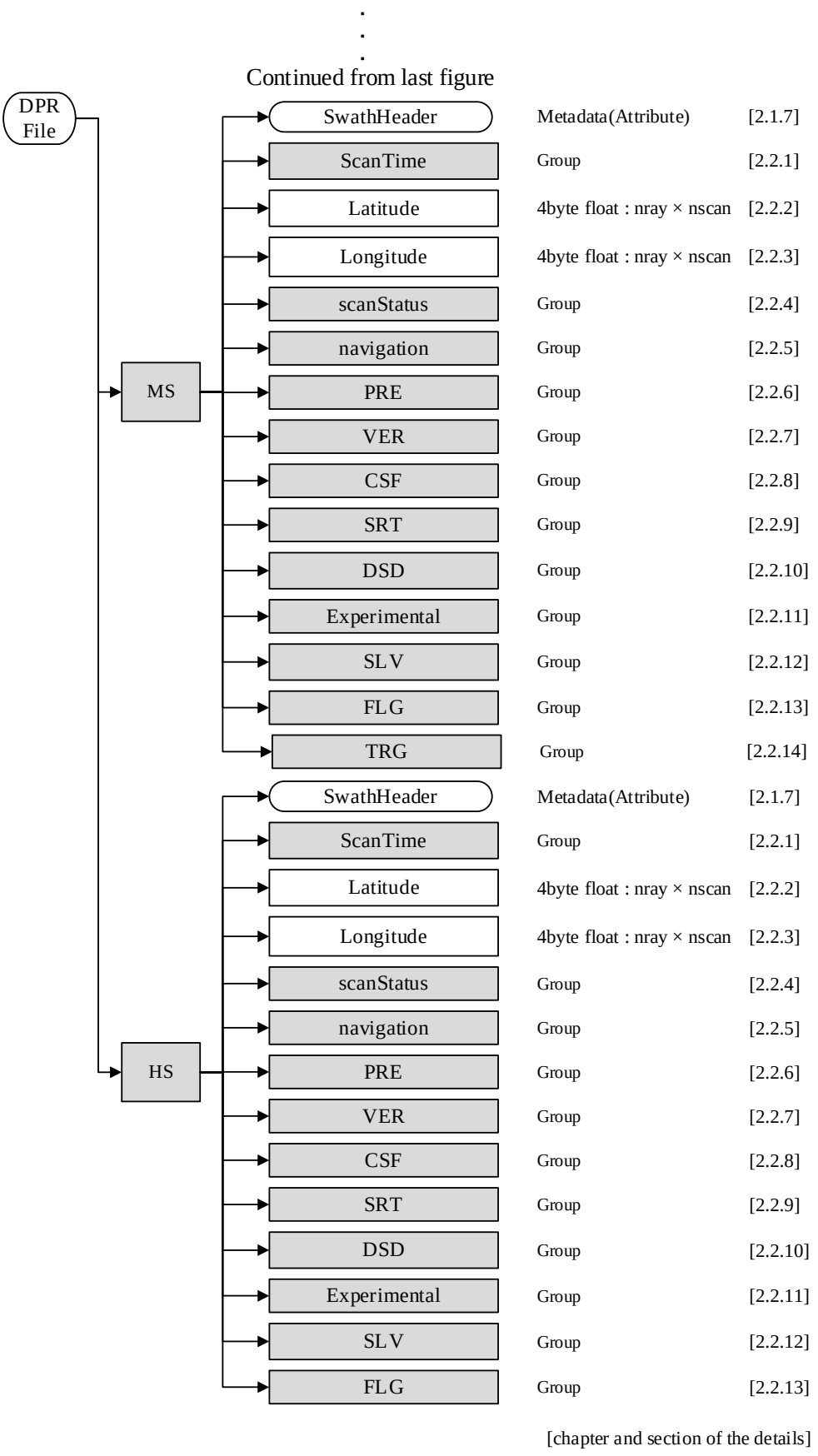


Figure 1.4-2 Data Format Structure for 2ADPR

1.5. Data Format Structure for each Group

Each group's structure is shown in this section. Structures in each grid are common. However, the number of rays and range bins are different as shown in section 1.1.

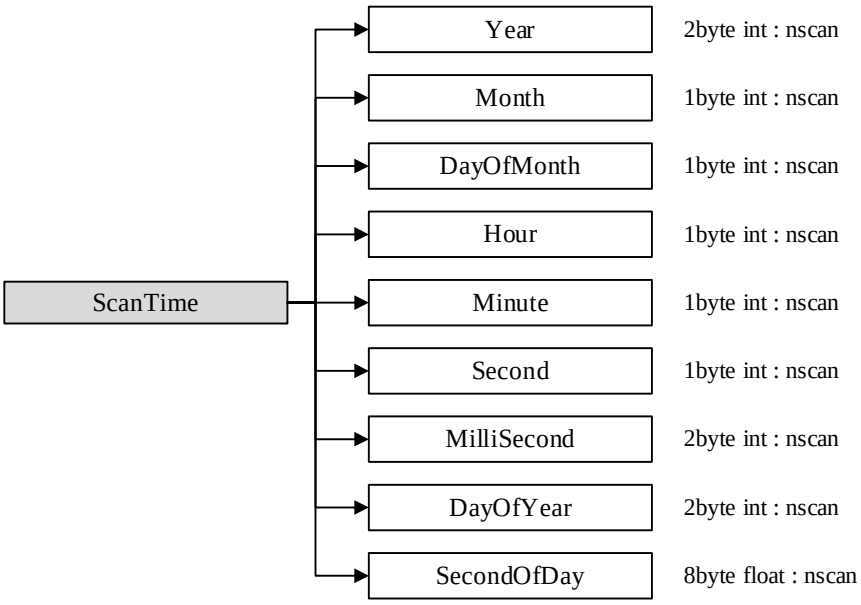


Figure 1.5-1 Data Format Structure for ScanTime Group

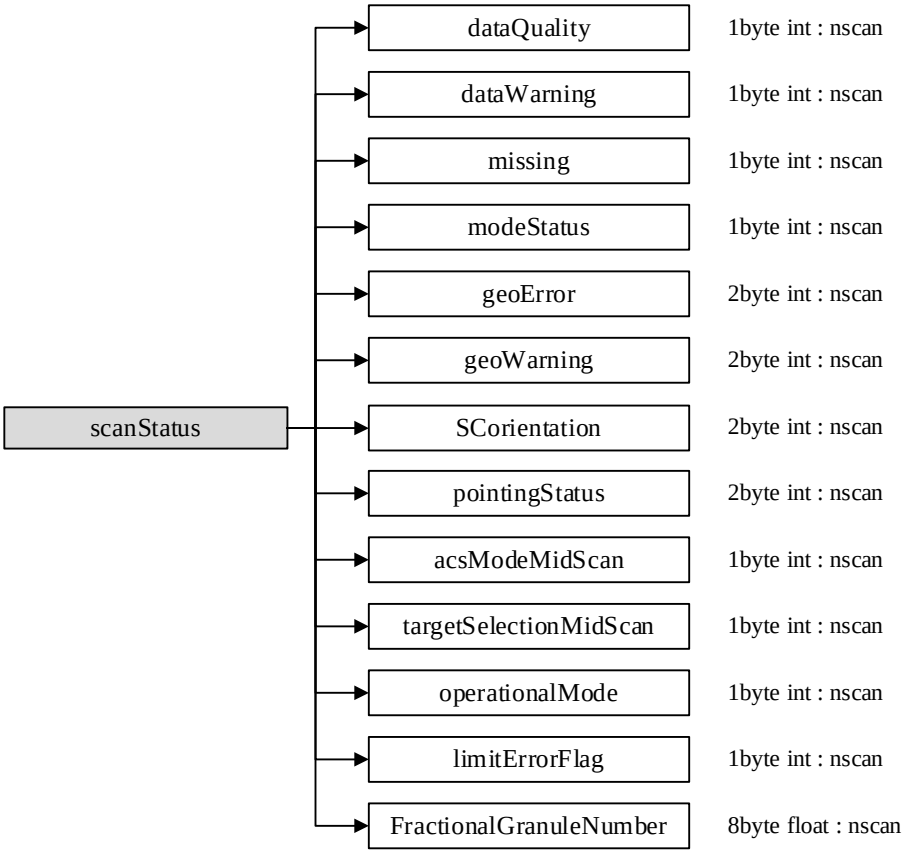


Figure 1.5-2 Data Format Structure for scanStatus Group

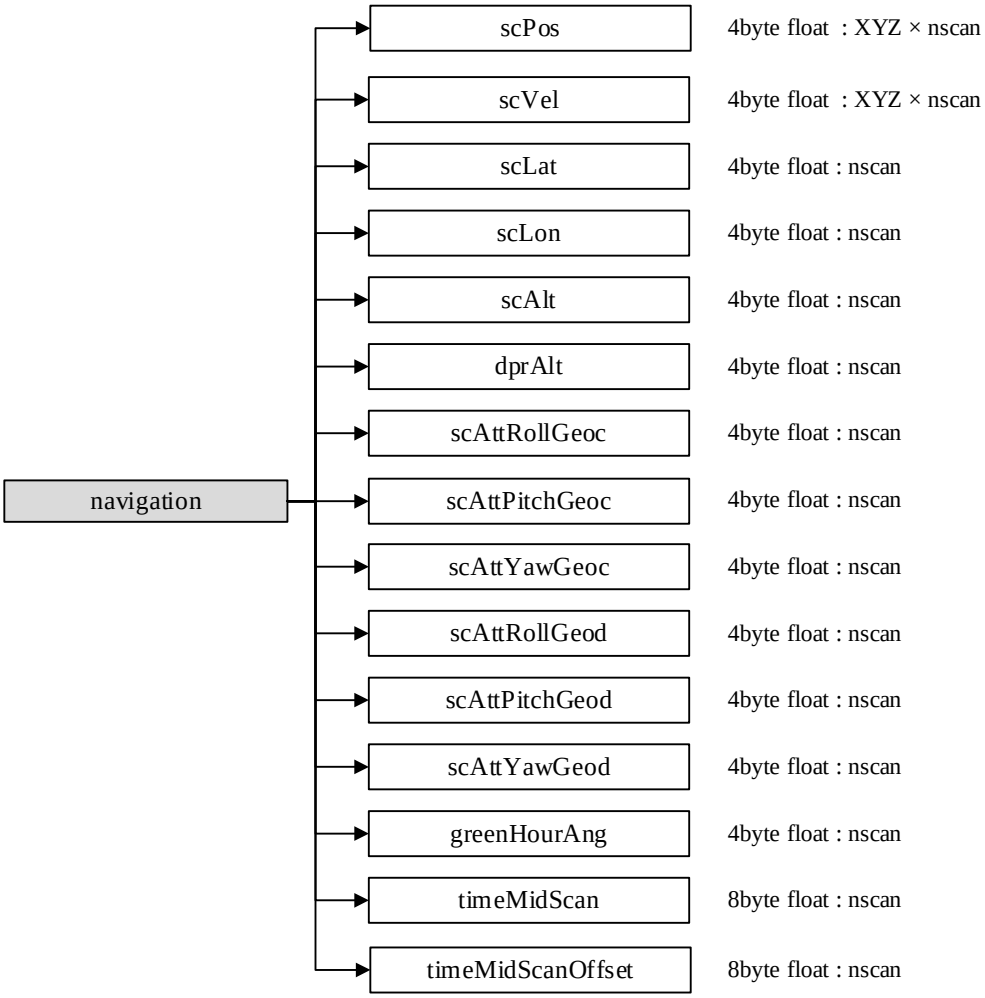


Figure 1.5-3 Data Format Structure for navigation Group

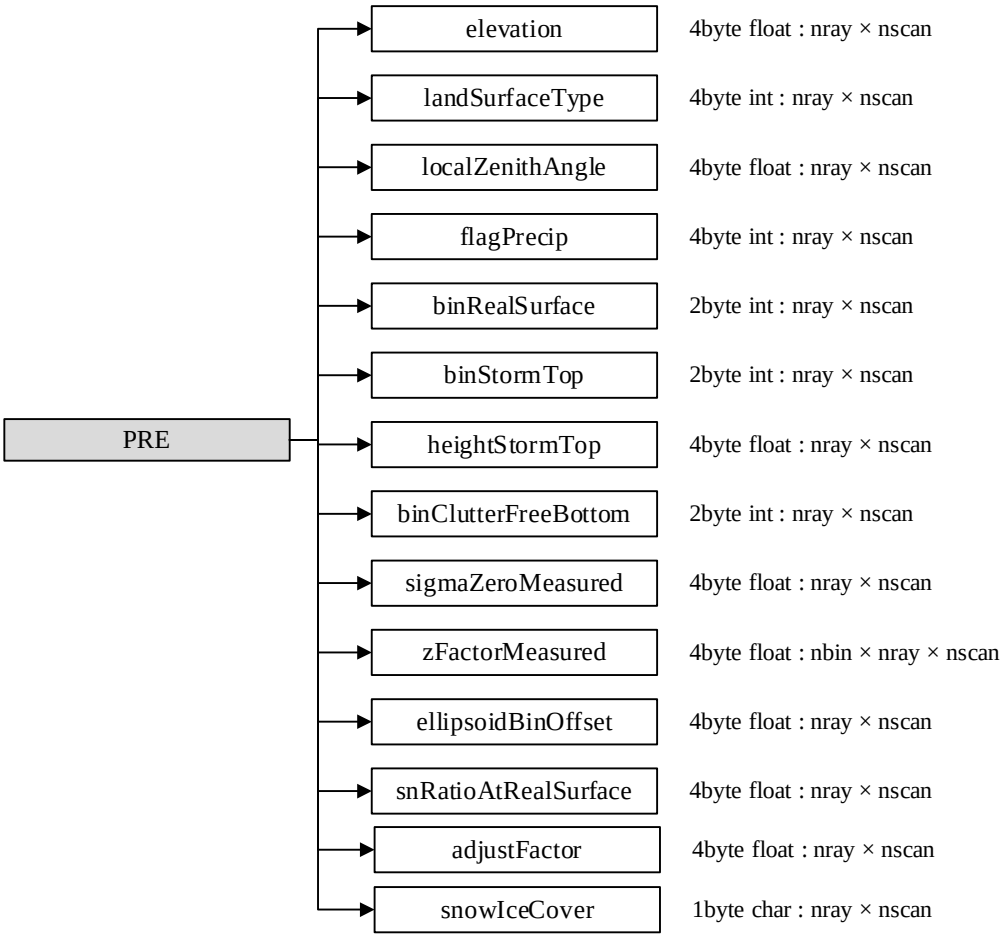


Figure 1.5-4 Data Format Structure for PRE Group

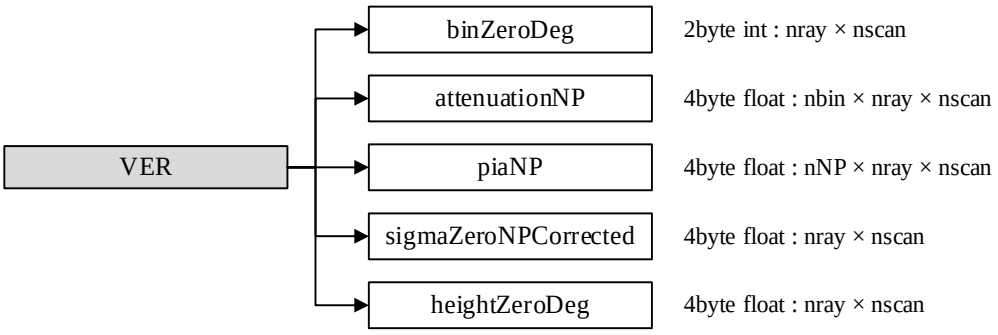


Figure 1.5-5 Data Format Structure for VER Group

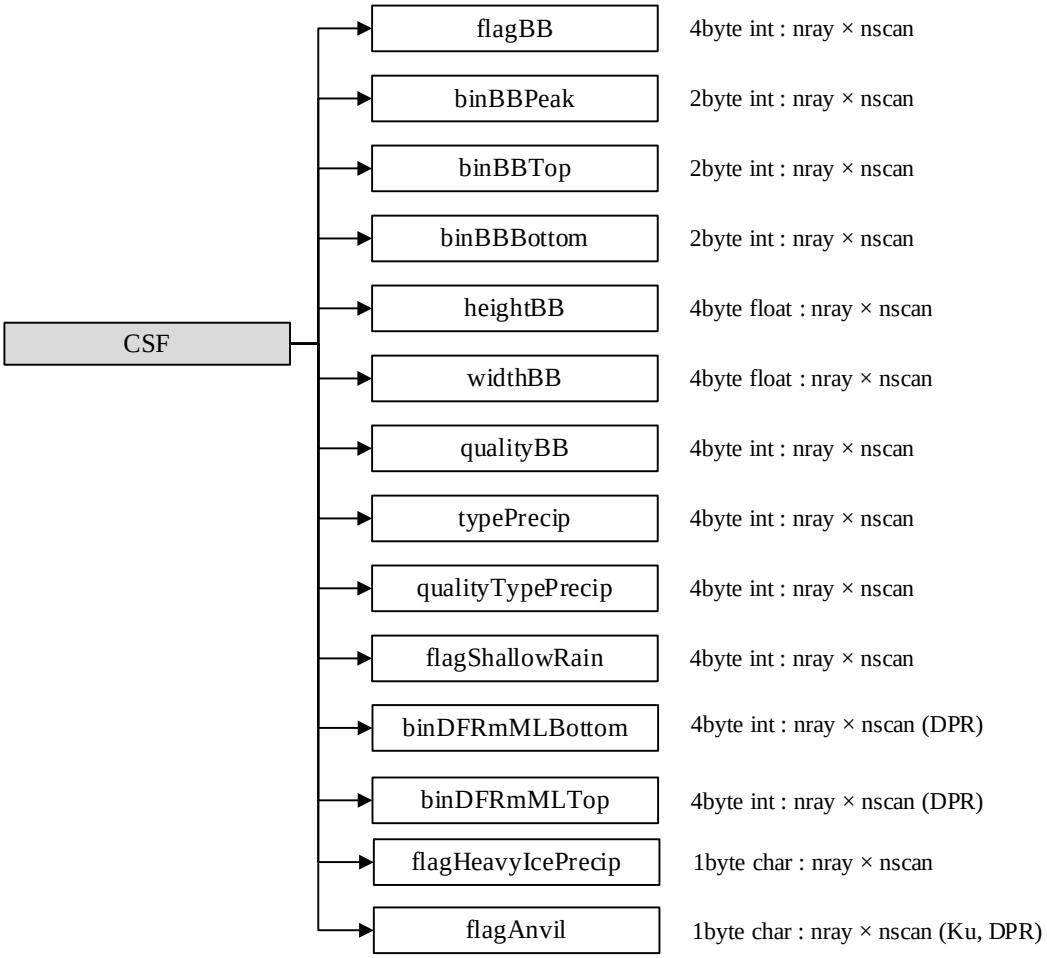


Figure 1.5-6 Data Format Structure for CSF Group

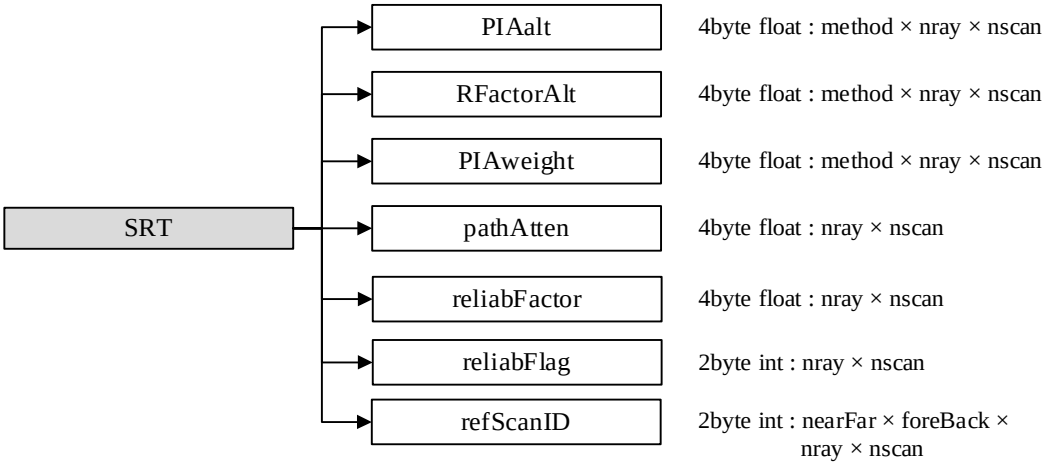


Figure 1.5-7 Data Format Structure for rayPointing Group

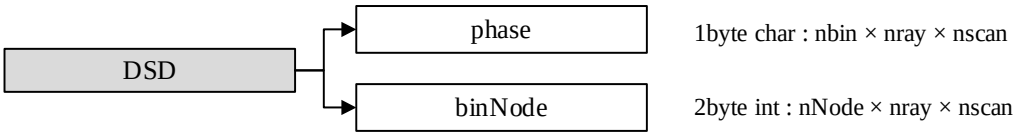


Figure 1.5-8 Data Format Structure for DSD Group

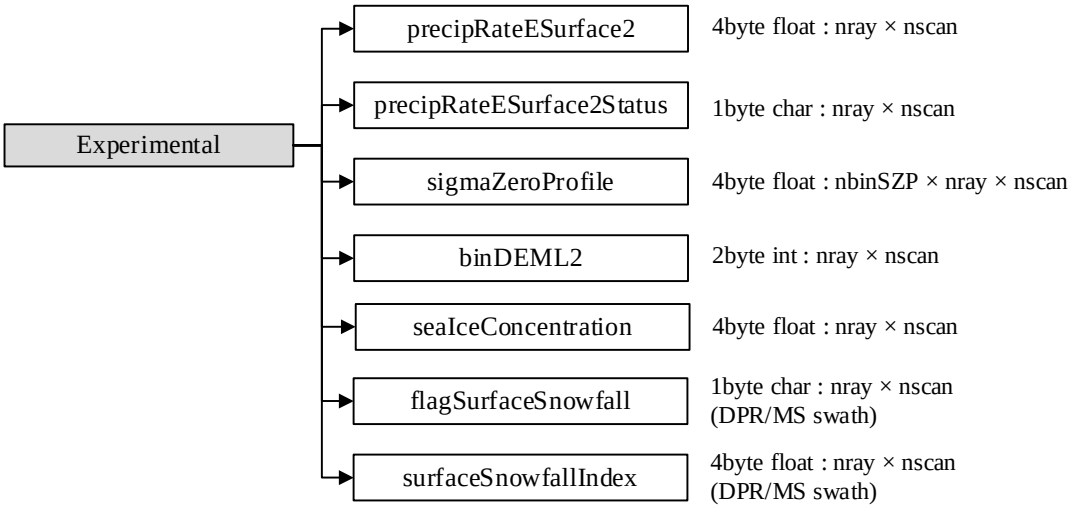


Figure 1.5-9 Data Format Structure for Experimental Group

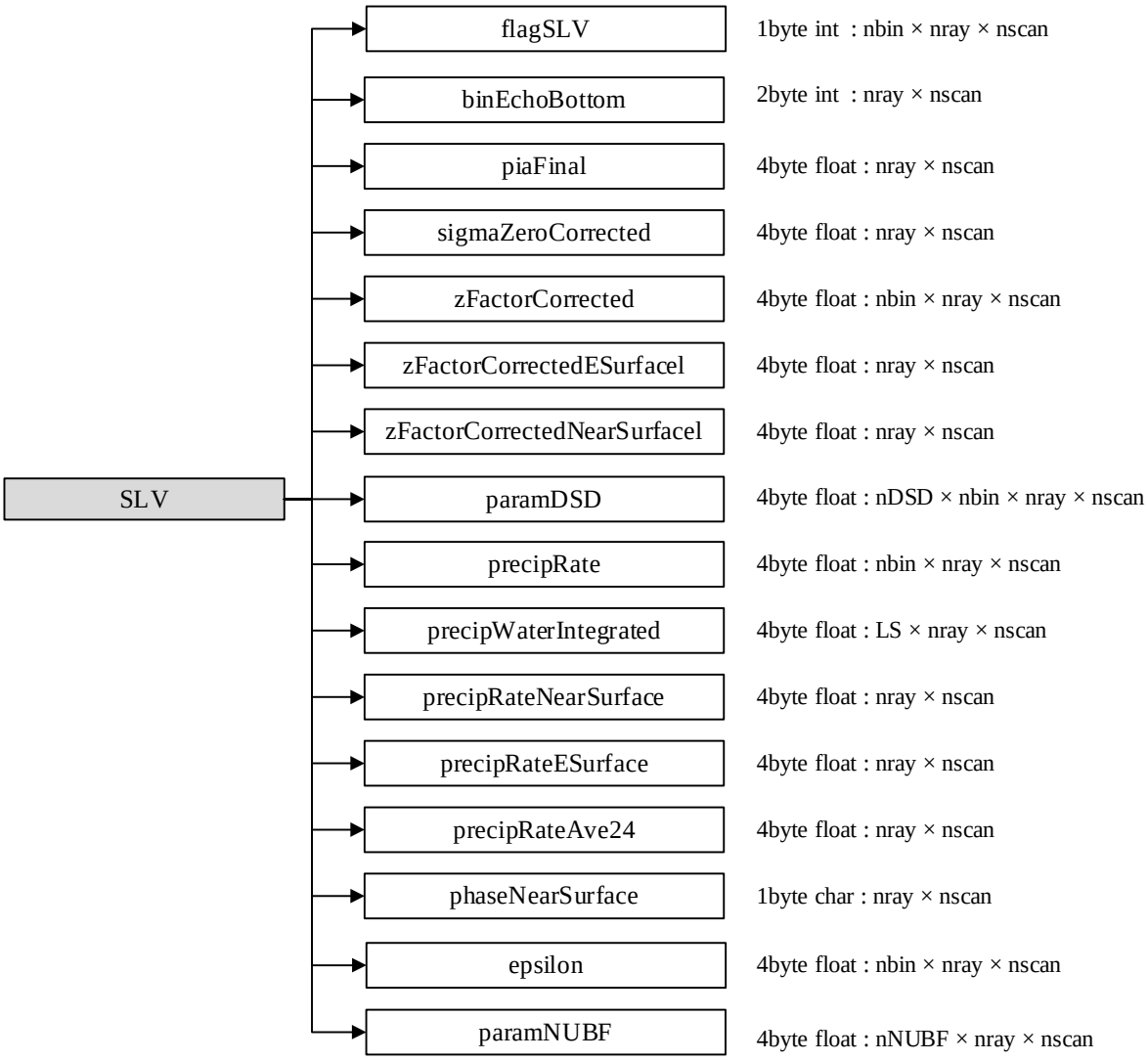


Figure 1.5-10 Data Format Structure for SLV Group

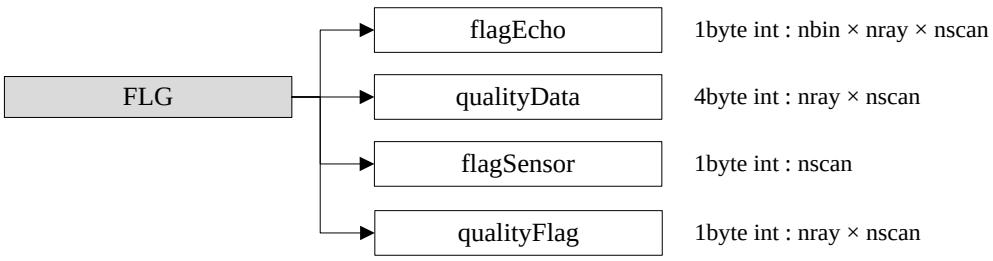


Figure 1.5-11 Data Format Structure for FLG Group

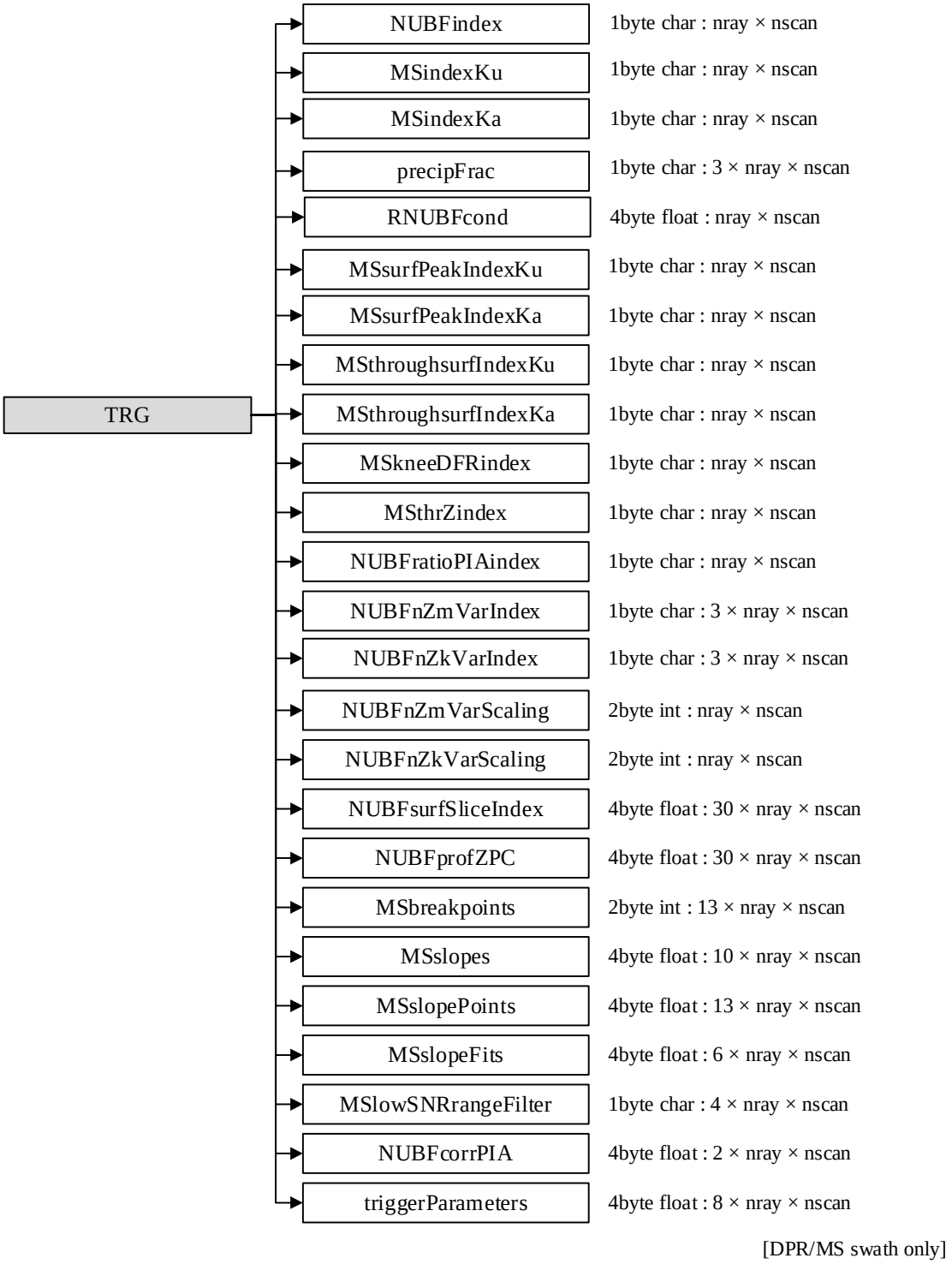


Figure 1.5-12 Data Format Structure for TRG Group

2. Level 2 Contents of Objects in each Group

2.1. Metadata

Metadata has seven elements. Figure 2.1-1 shows metadata structure.

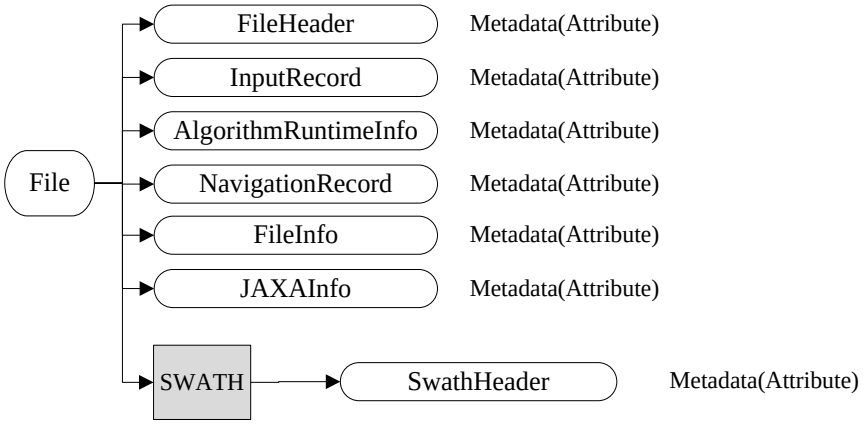


Figure 2.1-1 L2 Metadata

2.1.1. FileHeader

FileHeader contains metadata of general interest. This group appears in all data products. Table 2.1.1-1 shows each metadata elements in FileHeader.

Table 2.1.1-1 FileHeader Elements

No	Element	Description	Data size (bytes)
1	DOI	Digital Object Identifier. *Value is blank currently.	256
2	DOIauthority	Digital Object Identifier Authority.	256
3	DOIshortName	Digital Object Identifier Short Name. *Value is blank currently.	256
4	AlgorithmID	The algorithm that generated this product, e.g., 2A12.	50
5	AlgorithmVersion	The version of the algorithm that generated this product.	50
6	FileName	The file name of this granule.	50

No	Element	Description	Data size (bytes)
7	SatelliteName	Values are: TRMM GPM MULTI F10 ... F18 AQUA GCOMW1 CORIOLIS MT1 NOAA15 ... NOAA19 METOPA NPP. More values will be added as they are known.	10
8	InstrumentName	Values are: PR TMI VIRS PRTMI KU KA DPR GMI DPRGMI MERGED SSMI SSMIS AMSRE AMSR2 WINDSAT MADRAS AMSUA AMSUB SAPHIR MHS ATMS. More values will be added as they are known.	10
9	GenerationDateTime	The date and time this granule was generated. The format is YYYY-MM-DDTHH:MM:SS.sssZ, where YYYY is 4-digit year, MM is month number, DD is day of month, T is "T", HH is hour, MM is minute, SS is second, sss is millisecond, and Z is "Z". All fields are zero-filled. The missing value is constructed by replacing all digits with 9, i.e., 9999-99-99T99:99:99.999Z.	50
10	StartGranuleDateTime	The start time defining this granule. The format is the same as GenerationDateTime. DETAILS: An orbital granule starts when the satellite is at the position defined by GranuleStart. Thus the start time is not the first scan time. Some algorithms have overlap scans in the file before the start time as defined in SwathHeader. A monthly granule starts on the first ms of the month, for example March 1998 would be 1998-03-01T00:00:00.000Z.	50
11	StopGranuleDateTime	The stop time defining this granule. The format is the same as GenerationDateTime. DETAILS: An orbital granule stops when the satellite is at the position defined by GranuleStart. Thus the stop time is not the last scan time. Some algorithms have overlap scans in the file after the stop time as defined in SwathHeader. A monthly granule stops on the last ms of the month, for example March 1998 would be 1998-03-31T23:59:59.999Z.	50
12	GranuleNumber	The number of this granule, which starts as in GranuleStart. If the GranuleStart is identical to the orbit start, then the GranuleNumber will be the same as the orbit number. The GranuleNumber will have 6 digits, including leading zeroes, for example 001234.	50
13	NumberOfSwaths	The number of swaths in this granule.	50
14	NumberOfGrids	The number of grid structures in this granule.	50
15	GranuleStart	The starting place in the orbit of this granule. Currently defined values are ”SOUTHERNMOST LATITUDE” and ”NORTHBOUND EQUATOR CROSSING”.	50
16	TimeInterval	The time interval covered by this granule. Values are ”ORBIT”, ”HALF ORBIT”, ”HALF HOUR”, ”HOUR”, ”3 HOUR”, ”DAY”, ”DAY ASC”, DAY DES”, ”MONTH”, ”CONTACT”.	50
17	ProcessingSystem	The name of the processing system, e.g.,”PPS”, ”JAXA”.	50
18	ProductVersion	The data version assigned by the processing system.	50
19	EmptyGranule	Whether a granule is empty. Values are "EMPTY" or "NOT EMPTY".	50
20	MissingData	The number of missing scans.	50

2.1.2. InputRecord

InputRecord contains a record of input files for this granule. This group appears in Level1, Level 2, and Level 3 orbital data products. Level 3 time averaged products have the same information separated into 3 groups since they have many inputs. Table 2.1.2-1 shows each metadata elements in InputRecord.

Table 2.1.2-1 InputRecord Elements

No	Element	Description	Data size (bytes)
1	InputFileNames	A list of input file names for this granule.	1000
2	InputAlgorithmVersions	A list of algorithm versions of the input files for this granule.	1000
3	InputGenerationDateTimes	A list of generation date times of the input files for this granule. The format is the same as GenerationDateTime.	1000

2.1.3. AlgorithmRuntimeInfo

AlgorithmRuntimeInfo contains text runtime information written by the algorithm. This group is a ”Long Metadata Group”, which has no elements. This group appears in products if the algorithm developer asks for it.

2.1.4. NavigationRecord

NavigationRecord contains navigation metadata for this granule. This group appears in Level 1, Level 2, and Level 3 orbital data products. Table 2.1.4-1 shows each metadata elements in NavigationRecord.

Table 2.1.4-1 NavigationRecord Elements

No	Element	Description	Data size (bytes)
1	LongitudeOnEquator	The longitude where the satellite crosses the equator going from south to north.	50
2	UTCDateTimeOnEquator	The UTC time when the satellite crosses the equator going from south to north. The format is the same as GenerationDate Time.	50
3	MeanSolarBetaAngle	The average solar beta angle in this granule.	50
4	EphemerisFileName	Name of the ephemeris file input for processing.	50
5	AttitudeFileName	Name of the attitude file input for processing.	50
6	GeoControlFileName	Name of the GeoTK Control Parameters File input for processing.	50
7	EphemerisSource	Values are ”0 CONSTANT INPUT TEST VALUE”, ”1 GROUND ESTIMATED STATE (GES)”, ”2 GPS FILTERED SOLUTION (GEONS)”, ”3 GPS POINT SOLUTION (PVT)”, ”4 ON BOARD PROPAGATED (OBP)”, ”5 OEM GROUND EPHEMERIS FILE”, ”6 GEONS WITH FALLBACK AS FLAGGED”, ”7 PVT WITH FALLBACK AS FLAGGED”, ”8 OBP WITH FALLBACK AS FLAGGED”, ”9 GES WITH FALLBACK AS FLAGGED”.	50
8	AttitudeSource	values are ”0 CONSTANT INPUTS FOR TESTING”, ”1 ON BOARD CALCULATED PITCH ROLL YAW”	50
9	GeoToolkitVersion	Version of the GeoToolkit.	50
10	SensorAlignmentFirstRotationAngle	Alignment angle, first rotation, in degrees. Rotation adjustment from sensor coordinates to the Attitude Control System Flight Coordinates.	50
11	SensorAlignmentSecondRotationAngle	Alignment angle, second rotation, in degrees.	50
12	SensorAlignmentThirdRotationAngle	Alignment angle, third rotation, in degrees.	50
13	SensorAlignmentFirstRotationAxis	Euler rotation sequence, first rotation axis. Values are "1","2", "3" (representing X, Y, Z).	50
14	SensorAlignmentSecondRotationAxis	Euler rotation sequence, second rotation axis. Values are "1","2", "3" (representing X, Y, Z).	50
15	SensorAlignmentThirdRotationAxis	Euler rotation sequence, third rotation axis. Values are "1","2", "3" (representing X, Y, Z).	50

2.1.5. FileInfo

FileInfo contains metadata used by the PPS I/O Toolkit. This group appears in all data products. Table 2.1.5-1 shows each metadata elements in FileInfo.

Table 2.1.5-1 FileInfo Elements

No	Element	Description	Data size (bytes)
1	DataFormatVersion	The version of the data format used to write this file. This version is separate for each AlgorithmID. The order is: "a" "b" ... "z" "aa" "ab" ... "az" "ba" "bb".	50
2	TKCodeBuildVersion	Usually TK CodeBuildVersion is "1". If the I/O routines built by TKIO change even though the DataFormatVersion is unchanged, then TK CodeBuildVersion increments to "2", "3", ...If subsequently DataFormatVersion changes, TKCodeBuildVersion becomes "1" again.	50
3	MetadataVersion	The version of metadata used to write this file. This version is separate for each AlgorithmID. The order is: "a" "b" ... "z" "aa" "ab" ... "az" "ba" "bb" ...	50
4	FormatPackage	The underlying format of this granule. Values are ”HDF4”,”HDF5”, ”NETCDF”, ”TKBINARY”.	50
5	BlueprintFilename	The filename of the primary blueprint file that defined the format used to write this file.	50
6	BlueprintVersion	The BlueprintVersion of the format definition.	50
7	TKIOVersion	The version of TKIO used to create I/O routines to write this file. TKIOVersion does not define the format used to write this file.	50
8	MetadataStyle	The style in which the metadata was written, e.g., "PVL"."PVL" means < parameter >=< value >.	50
9	EndianType	The endian type of the system that wrote this file. Values are "BIG ENDIAN" and "LITTLE ENDIAN".	50

2.1.6. JAXAInfo

JAXAInfo contains metadata requested by JAXA. Used by DPR algorithms and GSMaP. Table 2.1.5-1 shows each metadata elements in JAXAInfo.

Table 2.1.6-1 JAXAInfo Elements

No	Element	Description	Data size (bytes)
1	GranuleFirstScanUTCDateTime	The date and time of first scan (incl. missing scan). The format is YYYY-MM-DDTHH:MM:SS.sssZ, where YYYY is 4-digit year, MM is month number, DD is day of month, T is "T", HH is hour, MM is minute, SS is second, sss is millisecond, and Z is "Z". All fields are zero-filled. The missing value is constructed by replacing all digits with 9, i.e., 9999-99-99T99:99:99.999Z.	50
2	GranuleLastScanUTCDateTime	Granule Last Scan UTC Date. Date is a 24 character string. The format is YYYY-MM-DDTHH:MM:SS.sssZ, where YYYY is 4-digit year, MM is month number, DD is day of month, T is ”T”, HH is hour, MM is minute, SS is second, sss is millisecond, and Z is ”Z”. All fields are zero-filled.	50
3	TotalQualityCode	The total quality of product is defined based on the quality of input data. Quality meaning are (a) GPM KuPR/KaPR L2 product Good: The total quality of input data (Ku/Ka L1B) is Good. Fair: The GPM KuPR/KaPR L2 is not JMA's global weather forecast (FCST) or JMA's Global ANALsis model data (GANAL) but weather DB file. EG (Empty Granule): The total quality of input data (Ku/Ka L1B) is EG (b) GPM DPR L2 product Good: The total quality of both Ku L2 and Ka L2 is Good. Fair: (i)The total quality of either Ku L2 or Ka L2 is EG (ii)The input data used in GPM DPR L2 is not JMA's global weather forecast (FCST) or JMA's Global ANALysis model data (GANAL) but weather DB file. EG (Empty Granule): The total quality of both Ku L2 and Ka L2 is EG. (c) GPM DPR SLH L2 product Good: The total quality of input data (DPR L2) is Good Fair: The total quality of input data is Fair. EG (Empty Granule): The total quality of input data (DPR L2) is EG.	50
4	FirstScanLat	Latitude of orbit first scan.	50
5	FirstScanLon	Longitude of orbit first scan.	50
6	LastScanLat	Latitude of orbit last scan.	50
7	LastScanLon	Longitude of orbit last scan.	50
8	NumberOfRainPixelsNS	Number of rain pixels in the NS swath, judged at DPR L2 algorithm. At DPR L1, value is "-9999".	50

No	Element	Description	Data size (bytes)
9	NumberOfRainPixelsMS	Number of rain pixels in the MS swath, judged at DPR L2algorithm. At DPR L1, value is "-9999".	50
10	NumberOfRainPixelsHS	Number of rain pixels in the HS swath, judged at DPR L2algorithm. At DPR L1, value is "-9999".	50
11	ProcessingSubSystem	The name of the processing sub-system, e.g., "ALGORITHM","PCS".	50
12	ProcessingMode	The name of the processing mode, e.g., "STD","NRT".	50
13	lightspeed	Constant value of light speed.	50
14	dielectricConstantKu	The parameter of dielectric for Ku.	50
15	dielectricConstantKa	The parameter of dielectric for Ka.	50

2.1.7. SwathHeader

SwathHeader contains metadata for swaths. This group appears in Level 1 and Level 2 data products. Table 2.1.7-1 shows each metadata elements in SwathHeader.

Table 2.1.7-1 SwathHeader Elements

No	Element	Description	Data size (bytes)
1	NumberScansInSet	The scans read by TKreadScan are a ”set”. For single swath data, one scan is read so NumberScansInSet=1. For multiple swath data, one TKreadScan may read more than one scan. For example, for SSM/I data one TKreadScan reads one low frequency scan and two high frequency scans. Therefore NumberScansInSet=1 for the low frequency swath and Number-ScansInSet=2 for the high frequency swath.	50
2	MaximumNumberScansTotal	The maximum allowed number of total scans in this swath. Total scans = overlap scans before granule + scans in granule + overlap scans after granule.	50
3	NumberScansBeforeGranule	The number of overlap scans before the first scan of the granule in this swath.	50
4	NumberScansGranule	The number of scans in the granule in this swath.	50

No	Element	Description	Data size (bytes)
5	NumberScansAfterGranule	The number of overlap scans after the last scan of the granule in this swath.	50
6	NumberPixels	The number of IFOV in each scan in this swath.	50
7	ScanType	The type of scan in this swath. Values are: "CROSSTRACK" and "CONICAL".	50

2.2. Data Group

Elements of data group are explained in detail in this section. Each swath has 11 data group (12 data group for MS swath of 2ADPR) and 2 data (Latitude and Longitude) commonly. Figure 2.2-1 shows data group structure.

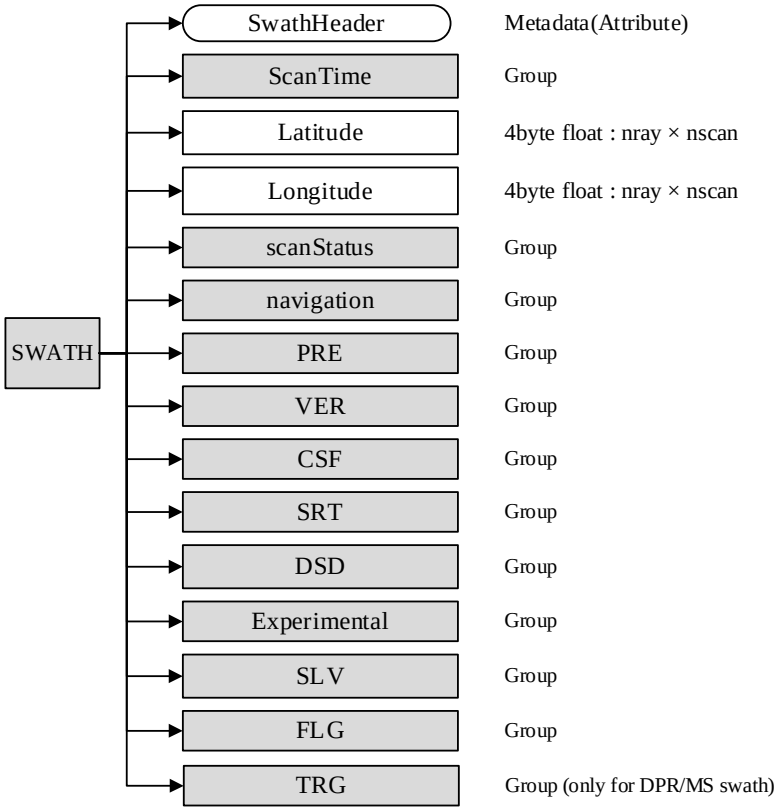


Figure 2.2-1 Data Format Structure for Data Group

2.2.1. ScanTime (Group)

(1) Year

Type	Array	Unit
2-byte integer	nscan	year

4-digit year, e.g., 1998. Values range from 1950 to 2100 years:

Missing Value:

-9999

(2) Month

Type	Array	Unit
1-byte integer	nscan	month

Month of the year. Values range from 1 to 12 months.

Missing Value:

-99

(3) DayOfMonth

Type	Array	Unit
1-byte integer	nscan	day

Day of the month. Values range from 1 to 31 days.

Missing Value:

-99

(4) Hour

Type	Array	Unit
1-byte integer	nscan	hour

UTC hour of the day. Values range from 0 to 23 hours.

Missing Value:

-99

(5) Minute

Type	Array	Unit
1-byte integer	nscan	minute

Minute of the hour. Values range from 0 to 59 minutes.

Missing Value:

-99

(6) Second

Type	Array	Unit
1-byte integer	nscan	s

Second of the minute. Values range from 0 to 60 s.

Missing Value:

-99

(7) MilliSecond

Type	Array	Unit
2-byte integer	nscan	ms

Thousandths of the second. Values range from 0 to 999 ms.

Missing Value:

-9999

(8) DayOfYear

Type	Array	Unit
2-byte integer	nscan	day

Day of the year. Values range from 1 to 366 days.

Missing Value:

-9999

(9) SecondOfDay

Type	Array	Unit
8-byte float	nscan	s

A time associated with the scan. It is expressed as the UTC seconds of the day.

Values range from 0 to 86400 s.

Missing Value:

-9999.9

(10) Latitude

Type	Array	Unit
4-byte float	nray * nscan	degrees

The earth latitude of the center of the IFOV at the altitude of the earth ellipsoid. Latitude is positive north, negative south.

Values range from -90 to 90 degrees.

Missing Value:

-9999.9

(11) Longitude

Type	Array	Unit
4-byte float	nray * nscan	degrees

The earth longitude of the center of the IFOV at the altitude of the earth ellipsoid. Longitude is positive east, negative west. A point on the 180th meridian has the value -180 degrees.

Values range from -180 to 180 degrees.
Missing Value:

-9999.9

2.2.2. scanStatus (Group)

(1) dataQuality

Type	Array	Unit
1-byte integer	nscan	N/A

A summary of data quality in the scan. Unless this is 0 (normal), the scan data is meaningless to higher precipitation processing. Bit 0 is the least significant bit (i.e., if bit i = 1 and other bits = 0, the unsigned integer value is 2**i).

Bit meaning

0 : missing

5 : geoError is not zero

6 : modeStatus is not zero

(2) dataWarning

Type	Array	Unit
1-byte integer	nscan	N/A

Flag of data warning for each scan. Bit Meaning is below.

Bit Meaning

0 : Beam Matching is abnormal

1 : VPRF table is abnormal

2 : surface Table is abnormal

3 : geoWarning is not Zero

4 : operational mode is not observation mode

5 : GPS status is abnormal

(3) missing

Type	Array	Unit
1-byte integer	nscan	N/A

Indicates whether information is contained in the scan data. The values are :

Bit Meaning
0 : Scan is missing
1 : Science telemetry packet missing
2 : Science telemetry segment withing packet missing
3 : Science telemetry other missing
4 : Housekeeping (HK) telemetry packet missing
5 : Spare (always 0)
6 : Spare (always 0)
7 : Spare (always 0)

(4) modeStatus

Type	Array	Unit
1-byte integer	nscan	N/A

A summary of status modes. If all status modes are routine, all bits in modeStatus = 0. Routine means that scan data has been measured in the normal operational situation as far as the status modes are concerned. modeStatus does not assess geolocation quality. modeStatus is broken into 8 bit flags. Each bit = 0 if the status is routine but the bit = 1 if the status is not routine. Bit 0 is the least significant bit (i.e., if bit i = 1 and other bits = 0, the unsigned integer value is 2**i).

The non-routine situations follow :

Bit Meaning
0 : Spare (always 0)
1 : SCorientation not 0 or 180
2 : pointingStatus not 0
3 : Non-routine limitErrorFlag
4 : Non-routine operationalMode (not 1 or 11)
5 : Spare (always 0)
6 : Spare (always 0)
7 : Spare (always 0)

(5) geoError

Type	Array	Unit
2-byte integer	nscan	N/A

A summary of geolocation errors in the scan. geoError is used to set a bit in dataQuality. A zero integer value of geoError indicates 'good' geolocation. A non-zero value broken down into the bit flags below indicates the specified reason, where bit 0 is the least significant bit (i.e., if bit i = 1 and other bits = 0 the unsigned integer value is 2**i). Bits 0, 4, 5, 8 and 9 are per pixel error flags. If the number of bad pixels (for any of the reasons specified by these flags) is greater than the threshold then bit 7 = 1 and each of these flags is set to 1 if any pixel is bad for that reason. At launch this threshold is zero, so data is flagged if any pixel is bad. If the number of bad pixels is less than or equal to the threshold then bit 7 = 0 and all of these flags are also 0.

Bit Meaning

0 : Latitude limit exceeded for viewed pixel locations

1 : Negative scan time, invalid input

2 : Error getting spacecraft attitude at scan mid-time

3 : Error getting spacecraft ephemeris at scan mid-time

4 : Invalid input non-unit ray vector for any pixel

5 : Ray misses Earth for any pixel with normal pointing

6 : Nadir calculation error for subsatellite position

7 : Pixel count with geolocation error over threshold

8 : Error in getting spacecraft attitude for any pixel

9 : Error in getting spacecraft ephemeris for any pixel

10 : Spare (always 0)

11 : Spare (always 0)

12 : Spare (always 0)

13 : Spare (always 0)

14 : Spare (always 0)

15 : Spare (always 0)

(6) geoWarning

Type	Array	Unit
2-byte integer	nscan	N/A

A summary of geolocation warnings in the scan. geoWarning does not set a bit in dataQuality. Warnings indicate unusual conditions. These conditions do not indicate bad geolocation but are flagged as a warning that further review of the data may be useful. A zero integer value indicates usual geolocation. A non-zero value broken down into the following bit flags indicates the following, where bit 0 is the least

significant bit (i.e., if bit i = 1 and other bits = 0 the unsigned integer value is 2**i):

Bit Meaning
0 : Ephemeris Gap Interpolated *
1 : Attitude Gap Interpolated *
2 : Attitude jump/discontinuity *
3 : Attitude out of range *
4 : Anomalous Time Step *
5 : GHA not calculated due to error
6 : SunData (Group) not calculated due to error
7 : Failure to calculate Sun in inertial coordinates
8 : Fallback to GES ephemeris *
9 : Fallback to GEONS ephemeris *
10 : Fallback to PVT ephemeris *
11 : Fallback to OBP ephemeris *
12 : Spare (always 0)
13 : Spare (always 0)
14 : Spare (always 0)
15 : Spare (always 0)

(7) SCorientation

Type	Array	Unit
2-byte integer	nscan	N/A

The positive angle of the spacecraft vector (v) from the satellite forward direction of motion, measured clockwise facing down. We define v in the same direction as the spacecraft axis +X, which is also the center of the GMI scan. If SCorientation is not 0 or 180, a bit is set to 1 in modeStatus.

Value Meaning
0 : +X forward (yaw 0)
180 : -X forward (yaw 180)
-8000 : Non-nominal pointing
-9999 : Missing

(8) pointingStatus

Type	Array	Unit
2-byte integer	nscan	N/A

It is provided by the GeoTK. A value of zero means the pointing is good. Non-zero values indicate non-nominal pointing. If pointingStatus is non-zero, a bit in modeStatus is set to 1.

Value Meaning

0 : Nominal pointing in Mission Science Mode

1 : GPS point solution stale and PVT ephemeris used

2 : GEONS solution stale and GEONS ephemeris used

-8000 : Non-nominal mission science orientation

-9999 : Missing

(9) acsModeMidScan

Type	Array	Unit
1-byte integer	nscan	N/A

It is provided by the GeoTK as taken from Attitude Control System telemetry and is provided in this format for information only.

Value Meaning

0 : LAUNCH

1 : RATENULL

2 : SUNPOINT

3 : GSPM (Gyro-less Sun Point)

4 : MSM (Mission Science Mode)

5 : SLEW

6 : DELTAH

7 : DELTAV

-99 : UNKNOWN -- ACS mode unavailable

(10) targetSelectionMidScan

Type	Array	Unit
1-byte integer	nscan	N/A

It is provided by the GeoTK as taken from Attitude Control System telemetry and is provided in this format for information only.

Value Meaning
0 : S/C Z axis nadir, +X in flight direction
1 : Flight Z axis nadir, +X in flight direction
2 : S/C Z axis nadir, -X in flight direction
3 : Flight Z axis nadir, -X in flight direction
4 : +90 yaw for DPR antenna pattern calibration
5 : -90 yaw for DPR antenna pattern calibration
-99 : Missing
Other standard target orientations TBD

(11) operationalMode

Type	Array	Unit
1-byte integer	nscan	N/A

The operational mode of KuPR/KaPR stored in science telemetry basically. However, if science telemetry is not made like as stand-by mode, L1B algorithm decides it using HK telemetry.

The values range is 1 to 20 and meaning is shown below.

Value Meaning
1 : Ku/Ka Observation
2 : Ku/Ka External Calibration
3 : Ku/Ka Internal Calibration
4 : Ku/Ka SSPA Analysis
5 : Ku/Ka LNA Analysis
6 : Ku/Ka Health-Check
7 : Ku/Ka Standby VPRF Table OUT
8 : Ku/Ka Standby Phase Out
9 : Ku/Ka Standby Dump Out
10 : Ku/Ka Standby (No Science Data)
11 : Ku/Ka Independent Observation
12 : Ku/Ka Independent External Calibration
13 : Ku/Ka Independent Internal Calibration
14 : Ku/Ka Independent SSPA Analysis
15 : Ku/Ka Independent LNA Analysis
16 : Ku/Ka Independent Health-Check
17 : Ku/Ka Independent Standby VPRF Table OUT
18 : Ku/Ka Independent Standby Phase Out

19 : Ku/Ka Independent Standby Dump Out
20 : Ku/Ka Independent Standby (No Science Data)

(12) limitErrorFlag

Type	Array	Unit
1-byte integer	nscan	N/A

It has 2 error information. One is as for noise power limit, another one is as for binEllipsoid limit. The former is defined that if there are more than 2 overlimitted rays in a swath, limitErrorFlag(at 0bit) is adapted. On the other hand, the later is defined that if there is even an overlimitted ray, limitErrorFlag(at 1bit) is adapted. Then, LimitErrorFlag is used in modeStatus, dataQuality in scanStatus Group picks it up consequently.

The values are

Bit Meaning
0 : noise power limit error
1 : binEllipsoid is missing
2 : Spare (always 0)
3 : Spare (always 0)
4 : Spare (always 0)
5 : Spare (always 0)
6 : Spare (always 0)
7 : Spare (always 0)

(13) FractionalGranuleNumber

Type	Array	Unit
8-byte float	nscan	Number

The floating point granule number. The granule begins at the Southern-most point of the spacecraft's trajectory. For example, FractionalGranuleNumber = 10.5 means the spacecraft is halfway through granule 10 and starting the descending half of the granule. Values range from 0 to 100000. 準In Near Real Time (NRT) process, granule number is stored only '0', so Fractional Granule Number less than 1.0.

Missing Value:

-9999.9

2.2.3. navigation (Group)

(1) scPos

Type	Array	Unit
4-byte float	XYZ * nscan	m

The position vector(m) of the spacecraft in Earth-Centered Earth Fixed (ECEF) Coordinates at the Scan mid-Time (i.e., time at the middle pixel/IFOV of the active scan period).

Values range from -10000000 to 10000000 m.

Missing Value:

-9999.9

(2) scVel

Type	Array	Unit
4-byte float	XYZ * nscan	m/s

The velocity vector (m/s) of the spacecraft in ECEF Coordinates at the Scan mid-Time.

Values range from -10000000 to 10000000 m/s.

Missing Value:

-9999.9

(3) scLat

Type	Array	Unit
4-byte float	nscan	degrees

The geodedic latitude (decimal degrees) of the spacecraft at the Scan mid-Time.

Values range from -70 to 70 degrees.

Missing Value:

-9999.9

(4) scLon

Type	Array	Unit
4-byte float	nscan	degrees

The geodedic longitude (decimal degrees) of the spacecraft at the Scan mid-Time.

Values range from -180 to 180 degrees.

Missing Value:

-9999.9

(5) scAlt

Type	Array	Unit
4-byte float	scan	m

The altitude (m) of the spacecraft above the Earth Ellipsiod at the Scan mid-Time. It is computed by GeoTK.

Values range from 350000 to 500000 m.

Missing Value:

-9999.9

(6) dprAlt

Type	Array	Unit
4-byte float	nscan	m

The altitude (m) of the spacecraft above the Earth Ellipsiod at the Scan mid-Time from DPR science telemetry. This is empty in non-DPR products. It is stored 'GPS Altitude Data' with LSB equal to 10m in DPR science telemetry.

Values range from 350000 to 500000 m.

Missing Value:

-9999.9

(7) scAttRollGeoc

Type	Array	Unit
4-byte float	nscan	degrees

The geocentric satellite attitude Euler roll angle (degrees) at the Scan mid-Time. The order of the components in the file is roll, pitch, and yaw. However, the angles are computed using a 3-2-1 Euler rotation sequence representing the rotation order yaw, pitch, and roll for the rotation from Orbital Coordinates to the spacecraft body coordinates. Orbital Coordinates represent an orthogonal triad in Geocentric Inertial Coordinates where the Z-axis is toward the geocentric nadir, the Y-axis is perpendicular to the spacecraft velocity opposite the orbit normal direction, and the X-axis is approximately in the velocity direction for a near circular orbit. Note this is geocentric, not geodetic, referenced, so that pitch and roll will have twice orbital frequency components due to the onboard control system following the oblate geodetic Earth horizon. Note also that the yaw value will show an orbital frequency component relative to the Earth fixed ground track due to the Earth rotation relative to inertial coordinates.

Values range from -180 to 180 degrees.

Missing Value:

-9999.9

(8) scAttPitchGeoc

Type	Array	Unit
4-byte float	nscan	degrees

The geocentric satellite attitude Euler pitch angle (degrees) at the Scan mid-Time.

Values range from -180 to 180 degrees.

Missing Value:

-9999.9

(9) scAttYawGeoc

Type	Array	Unit
4-byte float	nscan	degrees

The geocentric satellite attitude Euler yaw angle (degrees) at the Scan mid-Time.

Values range from -135 to 225 degrees.

Missing Value:

-9999.9

(10) scAttRollGeod

Type	Array	Unit
4-byte float	nscan	degrees

The geodetic satellite attitude Euler roll angle (degrees) at the Scan mid-Time. The order of the components in the file is roll, pitch, and yaw. However, the angles are computed using a 3-2-1 Euler rotation sequence representing the rotation order yaw, pitch, and roll for the rotation from Geodetic Coordinates to the spacecraft body coordinates. Geodetic Coordinates represent an orthogonal triad in Geocentric Inertial Coordinates where the Z-axis is toward the geodetic nadir, the Y-axis is perpendicular to the spacecraft velocity opposite the orbit normal direction, and the X-axis is approximately in the velocity direction for a near circular orbit.

Values range from -180 to 180 degrees.

Missing Value:

-9999.9

(11) scAttPitchGeod

Type	Array	Unit
4-byte float	nscan	degrees

The geodedic satellite attitude Euler pitch angle (degrees) at the Scan mid-Time.

Values range from -180 to 180 degrees.

Missing Value:

-9999.9

(12) scAttYawGeod

Type	Array	Unit
4-byte float	nscan	degrees

The geodedic satellite attitude Euler yaw angle (degrees) at the Scan mid-Time.

Values range from -135 to 225 degrees.

Missing Value:

-9999.9

(13) greenHourAng

Type	Array	Unit
4-byte float	nscan	degrees

The rotation angle (degrees) from Geocentric Inertial Coordinates to Earth Fixed Coordinates.

Values range from 0 to 390 degrees.

Missing Value:

-9999.9

(14) timeMidScan

Type	Array	Unit
8-byte float	nscan	s

The Scan mid-Time in GPS Atomic time, namely the seconds since 0000 UTC, 6 Jan 1980. timeMidScan is used as the reference time for the scPos and scVel values.

Values range from 0 to 10000000000 s.

Missing Value:

-9999.9

(15) timeMidScanOffset

Type	Array	Unit
8-byte float	nscan	s

Offset from the secondary header packet time to the timeMidScan.

Values range from 0 to 100 s.

Missing Value:

-9999.9

2.2.4. PRE (Group)

(1) elevation

Type	Array	Unit
4-byte float	nray * nscan	m

Elevation of the measurement point. It is a copy of DEMHmean of level 1B product.

Missing Value:

-9999.9

(2) landSurfaceType

Type	Array	Unit
4-byte integer	nray * nscan	N/A

Land surface type.

The values are

Bit Meaning
0-99 : Ocean
100 - 199 : Land
200 - 299 : Coast
300 - 399 : Inland water
-9999 : Missing

(3) localZenithAngle

Type	Array	Unit
4-byte float	nray * nscan	degrees

Local zenith angle of each ray. It is a copy of scLocalZenith of level 1B product.

Missing Value:

-9999.9

(4) flagPrecip

Type	Array	Unit
4-byte integer	nray * nscan	N/A

The values are

Bit Meaning
0 : No precipitation
1 : Precipitation

-9999 : Missing

(5) binRealSurface

Type	Array	Unit
2-byte integer	nray * nscan	range bin

Range bin number for real surface.

Missing Value:

-9999

(6) binStormTop

Type	Array	Unit
2-byte integer	nray * nscan	range bin

Range bin number for the storm top.

Missing Value:

-9999

(7) heightStormTop

Type	Array	Unit
4-byte float	nray * nscan	m

Height of storm top.

Missing Value:

-9999.9

(8) binClutterFreeBottom

Type	Array	Unit
2-byte integer	nray * nscan	range bin

Range bin number for clutter free bottom.

Missing Value:

-9999

(9) sigmaZeroMeasured

Type	Array	Unit
4-byte float	nray * nscan	dB

Surface backscattering cross section without attenuation correction (as measured).

Missing Value:

-9999.9

(10) zFactorMeasured

Type	Array	Unit
4-byte float	nbin *nray * nscan	dBZ

Vertical profile of reflectivity factor without attenuation correction (as measured).

Missing Value:

-9999.9

(11) ellipsoidBinOffset

Type	Array	Unit
4-byte float	nray * nscan	m

Distance between the ellipsoid and a center range bin of binEllipsoid defined by level 1B algorithm.

ellipsoidBinOffset =scRangeEllipsoid – (startBinRange + (binEllipsoid-1) x rangeBinSize)

scRangeEllipsoid : Distance between a sensor and the ellipsoid [m]

startBinRange : Distance between a sensor and a center of the highest observed range bin [m]

binEllipsoid : Range bin number of the Ellipsoid (1 - 260)

rangeBinSize : Range bin size [m]

Missing Value:

-9999

(12) snRatioAtRealSurface

Type	Array	Unit
4-byte float	nray * nscan	N/A

Signal/Noise ratio at real surface range bin.

snRatioAtRealSurface= 10.*log10(echoPowertrueV[mW]/noisePowertrueV[mW])

Missing Value:

-9999

(13) adjustFactor

Type	Array	Unit
4-byte float	nray * nscan	dB

Adjustment factor (dB) for zFactorMeasured (dBZm') and sigmaZeroMeasured (dBs0m'). dBZm' and dBs0m' are used and stored as follows:

dBZm' = dBZm – adjustFactor

dBs0m' = dBs0m – adjustFactor

The adjustment factor is the sum of 3 components:

base adjustment for instrument dependency,

angle-bin adjustment for angle-bin dependency, and

temporal adjustment for orbit number dependency.

Missing Value:

-9999.9

(14) snowIceCover

Type	Array	Unit
1-byte character	nray * nscan	dB

Snow and ice cover information. It refers to the multisensor snow/ice cover maps provided by NOAA.

The values are

Value Meaning
0 : Ice free water
1 : Snow free water
2 : Snow
1 : Ice
-99 : Missing

2.2.5. VER (Group)

(1) binZeroDeg

Type	Array	Unit
2-byte integer	nray * nscan	range bin

Range bin number with 0 degrees C level.

Missing Value:

-9999

(2) attenuationNP

Type	Array	Unit
4-byte float	nbin *nray * nscan	dB/km

Vertical profile of attenuation by non-precipitation particles (cloud liquid water, cloud ice water, water vapor, and oxygen molecules).

Missing Value:

-9999.9

(3) piaNP

Type	Array	Unit
4-byte float	nNP * nray * nscan	dB

Path integrated attenuation caused by non-precipitation particles (cloud liquid water, cloud ice water, water vapor, and oxygen molecules).

Missing Value:

-9999.9

(4) sigmaZeroNPCorrected

Type	Array	Unit
4-byte float	nray * nscan	dB

Surface backscattering cross section with attenuation correction only for non-precipitation particles.

Missing Value:

-9999.9

(5) heightZeroDeg

Type	Array	Unit
4-byte float	nray * nscan	m

Height of freezing level (0 degrees C level) Values are in m.

Missing Value:

-9999.9

2.2.6. CSF (Group)

(1) flagBB

Type	Array	Unit
4-byte integer	nray * nscan	N/A

Bright band (BB) exists or not.

The values are

Value Meaning
0 : BB not detected
1 : BB detected
-1111 : No rain value
-9999 : Missing

(2) binBBPeak

Type	Array	Unit
2-byte integer	nray * nscan	range bin

Range bin number for the peak of bright band.

Missing Value:

-9999

(3) binBBTop

Type	Array	Unit
2-byte integer	nray * nscan	range bin

Range bin number for the top of bright band。

Missing Value:

-9999

(4) binBBBottom

Type	Array	Unit
2-byte integer	nray * nscan	range bin

Range bin number for the bottom of bright band.

Missing Value:

-9999

(5) heightBB

Type	Array	Unit
4-byte float	nray * nscan	m

Height of bright band.

Missing Value:

-9999.9

(6) widthBB

Type	Array	Unit
4-byte float	nray * nscan	m

The width of bright band.

Missing Value:

-9999.9

(7) qualityBB

Type	Array	Unit
4-byte integer	nray * nscan	N/A

Quality of the bright band.

The values are

Value Meaning
1 : Good
0 : BB not detected in the case of rain
-1111 : No rain value
-9999 : Missing

(8) typePrecip

Type	Array	Unit
4-byte integer	nray * nscan	N/A

Precipitation type is expressed by an 8-digit number. The three major rain categories, stratiform, convective, and other, can be obtained as follows:

When typePrecip is greater than zero,
Major rain type = typePrecip/10000000
1 : stratiform
2 : convective
3 : other
-1111 : No rain value
-9999 : Missing value

In the DPR product, rain type by the CSU's DFRm (measured dual frequency ratio) method is also included in typePrecip and can be obtained as follows:

DFRm rain type = (typePrecip%10000000)/1000000 in C

DFRm rain type = (MOD(typePrecip,10000000)/1000000 in FORTRAN

DFRm rain type

1 : stratiform

2 : convective

4 : transition

5 : Decided winter precipitation as convective by extended DFRm method.

8 : DFRm method cannot be applicable at Part B (in this case

the conventional method determines the major rain type)

9 : DFRm method cannot be applicable at Part A (in this case

the conventional method determines the major rain type)

-1111 : No rain value

-9999 : Missing value

(9) qualityTypePrecip

Type	Array	Unit
4-byte integer	nray * nscan	N/A

Quality of the precipitation type.

The values are

Value Meaning

1 : Good

-1111 : No rain value

-9999 : Missing

(10) flagShallowRain

Type	Array	Unit
4-byte integer	nray * nscan	N/A

Type of shallow rain.

The values are

Value Meaning

0 : No shallow rain

10 : Shallow isolated (maybe)

11 : Shallow isolated (certain)

20 : Shallow non-isolated (maybe)

21 : Shallow non-isolated (certain)

-1111 : No rain value

-9999 : Missing

(11) binDFRmMLBottom (MS, HS)

Type	Array	Unit
4-byte integer	nray * nscan	range bin

The DFRm method detects melting layer (ML) the meaning of which is wider than that of BB. Since ML and BB are different, new output item binDFRmMLBottom and binDFRmMLTop are added to MS and HS data.

Range bin number for ML bottom detected by the DFRm method.

The values are

Value: Meaning

> 0 : Range bin number when ML bottom is detected

0 : ML bottom is not detected

-1111 : Value for no rain in MS (HS) mode at Ka band

-9999 : Missing value

(12) binDFRmMLTop(MS, HS)

Type	Array	Unit
4-byte integer	nray * nscan	N/A

The DFRm method detects melting layer (ML) the meaning of which is wider than that of BB. Since ML and BB are different, new output item binDFRmMLBottom and binDFRmMLTop are added to MS and HS data.

Range bin number for ML top detected by the DFRm method.

The values are

Value: Meaning

> 0 : Range bin number when ML top is detected

0 : ML top is not detected

-1111 : Value for no rain in MS (HS) mode at Ka band

-9999 : Missing value

(13) flagHeavyIcePrecip

Type	Array	Unit
1-byte character	nray * nscan	N/A

This flag denotes detection of solid ice hydrometeors which cause severely strong Z factor or huge DFRm in the sky less than -10 degree C temperature.

Value Meaning

(A) The case of Ka band MS:

1 (=0x01): 35dBZ >= Zm(Ka) > 30dBZ

2 (=0x02): 40dBZ >= Zm(Ka) > 35dBZ

3 (=0x03): Zm(Ka) > 40dBZ

(B) The case of Ku band NS:

4 (=0x04): 35dBZ >= Zm(Ka) > 30dBZ

8 (=0x08): 40dBZ >= Zm(Ka) > 35dBZ

12 (=0x0c): Zm(Ka) > 40dBZ

(C) The case of DPR NS:

Oter swaths are same as (B).

Inner swaths are addition of (A) and (B). If Zm(Ku) > 27dBZ and DFRm > 7dB in inner swaths, the following value is added in addition to (A) and (B).

16(=0x10)

0 : Missing value

(14) flagHeavyIcePrecip (Ku NS, DPR NS)

Type	Array	Unit
1-byte character	nray * nscan	N/A

flagAnvil is positive values when anvil precipitation is detected by the Ku-band radar. 0 when anvil precipitation is not detected.

The values are

Value Meaning

1 : Type 1 (without rain downward)

2 : Type 2 (with rain downward) 0 : Missing

2.2.7. SRT (Group)

(1) PIAalt

Type	Array	Unit
4-byte float	method * nray * nscan	dB

Missing Value:

-9999.9

(2) RFactorAlt

Type	Array	Unit
4-byte float	method * nray * nscan	N/A

Missing Value:

-9999.9

(3) PIAweight

Type	Array	Unit
4-byte float	method * nray * nscan	N/A

Missing Value:

-9999.9

(4) pathAtten

Type	Array	Unit
4-byte float	nray * nscan	dB

Missing Value:

-9999.9

(5) reliabFactor

Type	Array	Unit
4-byte float	nray * nscan	N/A

Missing Value:

-9999.9

(6) reliabFlag

Type	Array	Unit
2-byte integer	nray * nscan	N/A

Missing Value:

-9999.9

(7) refScanID

Type	Array	Unit
2-byte integer	nearFar * foreBack * nray * nscan	Number

The number of scan lines between the current scan and the beginning (or end) of the along-track reference data at each angle bin. The values are computed by the equation:

Current Scan Number - Reference Scan Number

The values are positive for the Forward estimates and negative for the Backward estimates.

The values are

Bit Meaning
1,1 : Forward - Near reference
2,1 : Forward - Far reference
1,2 : Backward - Near reference
2,2 : Backward - Far reference
9999 : Missing

2.2.8. DSD (Group)

(1) phase

Type	Array	Unit
1-byte char	nbin * nray * nscan	N/A

Missing Value:

225

(2) binNode

Type	Array	Unit
2-byte integer	nNode * nray * nscan	N/A

Missing Value:

-9999

2.2.9. Experimental (Group)

(1) precipRateESurface2

Type	Array	Unit
4-byte float	nray * nscan	mm/hr

Estimates Surface Precipitation using alternate method.

Missing Value:

-9999.9

(2) precipRateESurface2Status

Type	Array	Unit
1-byte char	nray * nscan	N/A

Status of the estimated surface precipitation using alternate method.

Missing Value:

225

(3) sigmaZeroProfile

Type	Array	Unit
4-byte float	nbinSZP * nray * nscan	dB

Surface backscattering cross section profile around the current IFOV.

Missing Value:

-9999.9

(4) binDEML2

Type	Array	Unit
2-byte integer	nray * nscan	range bin

Range bin number of the digital elevation model surface estimate.

Missing Value:

-9999

(5) seaIceConcentration

Type	Array	Unit
4-byte float	nray * nscan	%

Sea ice concentration (30.0 – 100.0%) estimated by Ku.

Missing Value:

-9999.9

(6) flagSurfaceSnowfall

Type	Array	Unit
1-byte character	nray * nscan	N/A

Flag indicating snowfall on the surface, not aloft. 1 for snow on the ground, 0 for not snow.

Missing Value:

0

(7) surfaceSnowfallIndex

Type	Array	Unit
4-byte float	nray * nscan	%

flagSurfaceSnowfall is 1 when this index exceed the defined threshold.

Missing Value:

-9999.9

2.2.10. SLV (Group)

(1) flagSLV

Type	Array	Unit
1-byte integer	nbin * nray * nscan	N/A

Missing Value:

-99

(2) binEchoBottom

Type	Array	Unit
2-byte integer	nray * nscan	N/A

Missing Value:

-9999

(3) piaFinal

Type	Array	Unit
4-byte float	nray * nscan	dB

The final estimates of path integrated attenuation caused by precipitation particles.

Missing Value:

-9999.9

(4) sigmaZeroCorrected

Type	Array	Unit
4-byte float	nray * nscan	dB

Surface backscatter cross section with attenuation correction.

Missing Value:

-9999.9

(5) zFactorCorrected

Type	Array	Unit
4-byte float	nbin * nray * nscan	dBZ

Vertical profile of reflectivity factor with attenuation correction.

Missing Value:

-9999.9

(6) zFactorCorrectedESurface

Type	Array	Unit
4-byte float	nray * nscan	dBZ

Reflectivity factor with attenuation correction at estimated surface.

Missing Value:

-9999.9

(7) zFactorCorrectedNearSurface

Type	Array	Unit
4-byte float	nray * nscan	dBZ

Reflectivity factor with attenuation correction at near surface.

Missing Value:

-9999.9

(8) paramDSD

Type	Array	Unit
4-byte float	nDSD * nbin * nray * nscan	N/A

Parameters of DSD functions such as N0 and D0.

Missing Value:

-9999.9

(9) precipRate

Type	Array	Unit
4-byte float	nbin * nray * nscan	mm/hr

Precipitation rate.

Missing Value:

-9999.9

(10) precipWaterIntegrated

Type	Array	Unit
4-byte float	LS * nray * nscan	g/m^2

Precipitation water vertically integrated.

Missing Value:

-9999.9

(11) precipRateNearSurface

Type	Array	Unit
4-byte float	nray * nscan	mm/hr

Precipitation rate for the near surface.

Missing Value:

-9999.9

(12) precipRateESurface

Type	Array	Unit
4-byte float	nray * nscan	mm/hr

Precipitation rate for the estimated surface.

Missing Value:

-9999.9

(13) precipRateAve24

Type	Array	Unit
4-byte float	nray * nscan	mm/hr

Average of precipitation rate for 2 to 4km height.

Missing Value:

-9999.9

(14) phaseNearSurface

Type	Array	Unit
1-byte char	nray * nscan	N/A

Phase state of the precipitation near the surface.

Missing Value:

255

(15) epsilon

Type	Array	Unit
4-byte float	nbin * nray * nscan	N/A

Epsilon is the indication of the adjustment away from the initial drop size distribution, epsilon = 1 is no adjustment.

Missing Value:

-9999.9

(16) paramNUBF

Type	Array	Unit
4-byte float	nNUBF * nray * nscan	N/A

The parameter to adjustment of None Uniform Beam Filling (NUBF).

paramNUBF(1) is square of coefficient of precipitation rate's variation in FOV or sigma_v.

paramNUBF(2) is square of coefficient of precipitation rate's variation in rainfall area only or rainvar.

paramNUBF(3) is p_area or a ratio of rainfall area in FOV.

Missing Value:

-9999.9

2.2.11. FLG (Group)

(1) flagEcho

Type	Array	Unit
1-byte integer	nbin * nray * nscan	N/A

The values are

Bit Meaning

0 : For L2 Ku: Precipitation judged by L2 Ku algorithm (copy of bit 2)

0 : For L2 Ka: Precipitation judged by L2 Ka algorithm (copy of bit 3)

0 : For L2 DPR: Precipitation judged by L2 DPR algorithm (copy of bit 1)

1 : Precipitation judged by L2 DPR algorithm

2 : Precipitation judged by L2 Ku algorithm

3 : Precipitation judged by L2 Ka algorithm

4 : Main lobe clutter judged by L2 Ku algorithm

5 : Main lobe clutter judged by L2 Ka algorithm

6 : Side lobe clutter judged by L2 Ku algorithm

7 : Side lobe clutter judged by L2 Ka algorithm

(2) qualityData

Type	Array	Unit
4-byte integer	nray * nscan	N/A

Normal data gives ”0”. Non-zero values mean the kinds of errors

The values are

The 2 bit flag for each module has values:

[higher bit lower bit]

[0 0] : Good

[0 1] : Warning but usable

[1 0] : NG or error

The bits of qualityData are assigned as follows:

0 - 7 : Copy of dataQuality in level 1B product

8 - 9 : Flag by input module

10 - 11 : Flag by preparation module

12 - 13 : Flag by vertical module

14 - 15 : Flag by classification module

16 - 17 : Flag by SRT module

18 - 19 : Flag by DSD module

20 - 21 : Flag by solver module

22 - 23 : Flag by output module

24 - 31 : Spare

-9999 : Missing

(3) flagSensor

Type	Array	Unit
1-byte integer	nscan	N/A

Flag of input Ku/Ka data condition

The values are

1 : Valid

-99 : Invalid (judged by dataQuality)

(4) qualityFlag

Type	Array	Unit
1-byte integer	nray*nscan	N/A

qualityFlag is a sample flag gererated by qualityData

The values are

0: High quality. No issues.

1 : Low quality. (DPR modules had warnings but still made a retrieval)

2: Bad. (DPR modules had errors or dataQuality is bad and retrieval is missing)

-99: Missing value

2.2.12. TRG (Group)

(1) NUBFindex

Type	Array	Unit
1-byte character	nray * nscan	N/A

The value is 0.

(2) MSindexKu

Type	Array	Unit
1-byte character	nray * nscan	N/A

The value is 0.

(3) MSindexKa

Type	Array	Unit
1-byte character	nray * nscan	N/A

The value is 0.

(4) precipFrac

Type	Array	Unit
1-byte character	3*nray * nscan	N/A

The value is 0.

(5) RNUBFcond

Type	Array	Unit
4-byte float	nray * nscan	N/A

The value is 0.

(6) MSsurfPeakIndexKu

Type	Array	Unit
1-byte character	nray * nscan	N/A

The value is 0.

(7) MSsurfPeakIndexKa

Type	Array	Unit
1-byte character	nray * nscan	N/A

The value is 0.

(8) MSthroughsurfIndexKu

Type	Array	Unit
1-byte character	nray * nscan	N/A

The value is 0.

(9) MSthroughsurfIndexKa

Type	Array	Unit
1-byte character	nray * nscan	N/A

The value is 0.

(10) MSkneeDFRindex

Type	Array	Unit
1-byte character	nray * nscan	N/A

The value is 0.

(11) MSthrZindex

Type	Array	Unit
1-byte character	nray * nscan	N/A

The value is 0.

(12) NUBFratioPIAindex

Type	Array	Unit
1-byte character	nray * nscan	N/A

The value is 0.

(13) NUBFnZmVarIndex

Type	Array	Unit
1-byte character	3 * nray * nscan	N/A

The value is 0.

(14) NUBFnZkVarIndex

Type	Array	Unit
1-byte character	3 * nray * nscan	N/A

The value is 0.

(15) NUBFnZmVarScaling

Type	Array	Unit
2-byte integer	nray * nscan	N/A

The value is 0.

(16) NUBFnZkVarScaling

Type	Array	Unit
2-byte integer	nray * nscan	N/A

The value is 0.

(17) NUBFsurfSliceIndex

Type	Array	Unit
4-byte float	30 * nray * nscan	N/A

The value is 0.

-9999.9

(18) NUBFprofZPC

Type	Array	Unit
4-byte float	30 * nray * nscan	N/A

The value is 0.

(19) MSbreakpoints

Type	Array	Unit
2-byte integer	13 * nray * nscan	N/A

The value is 0.

(20) MSslopes

Type	Array	Unit
4-byte float	10 * nray * nscan	N/A

The value is 0.

(21) MSslopePoints

Type	Array	Unit
4-byte float	13 * nray * nscan	N/A

The value is 0.

(22) MSslopeFits

Type	Array	Unit
4-byte float	6 * nray * nscan	N/A

The value is 0.

(23) MSlowSNRrangeFilter

Type	Array	Unit
1-byte char	4 * nray * nscan	N/A

The value is 0.

(24) NUBFcorrPIA

Type	Array	Unit
4-byte float	2 * nray * nscan	N/A

The value is 0.

(25) triggerParameters

Type	Array	Unit
4-byte float	8 * nray * nscan	N/A

The value is 0.

3. Level 2 (2HSLH) Data Format Structure

3.1. Dimesion definition

Dimension definitions:

- nscan
  - var Number of scans in the granule.
- nray
  - 49 Number of angle bins in each scan
- nlayer
  - 19 Number of layers at the fixed height of 0.0-0.5km, 0.5-1.0km,

3.2. Data Format Structure for 2HSLH, Spectral Latent Heating

The Level 2 product, 2HSLH, is defined as a swath structure, which is called "Swath".

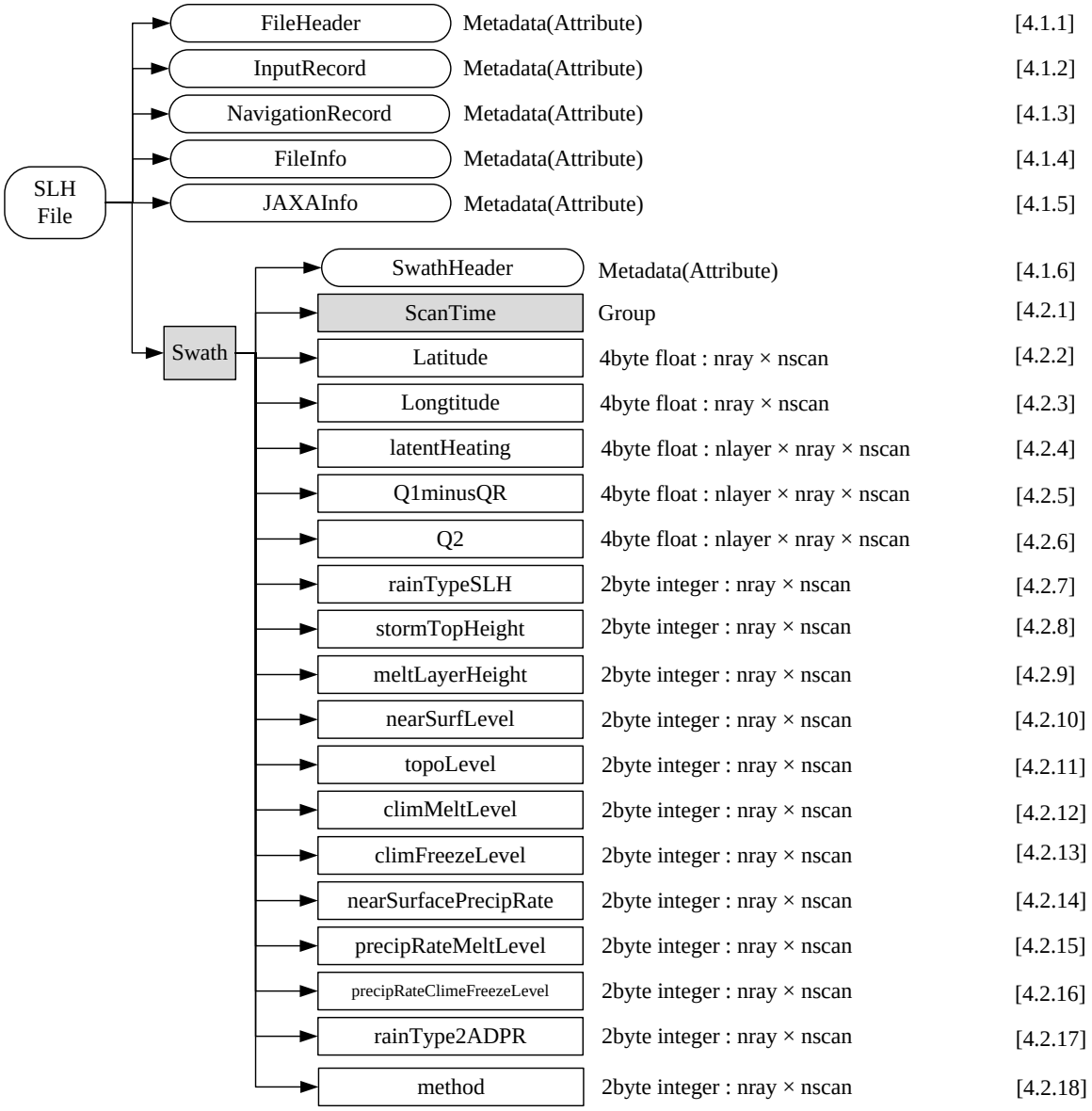


Figure 3.2-1 Data Format Structure for 2HSLH

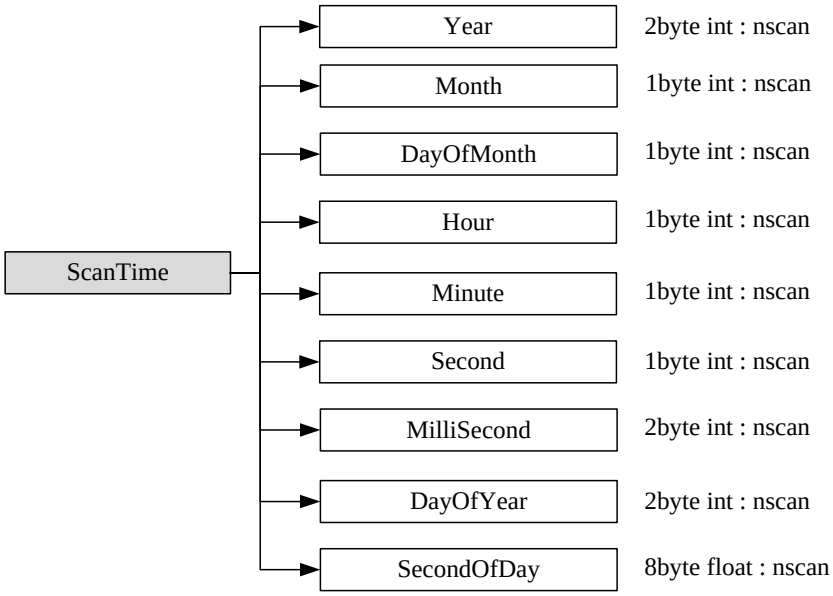


Figure 3.2-2 Data Format Structure for Scan Time Group of 2HSLH

4. Level 2(2HSLH) Contents of Objects in each Group

4.1. Metadata

Metadata has six elements. Figure 4.1-1 shows metadata structure. The explanations of each metadata refer to 2.1.

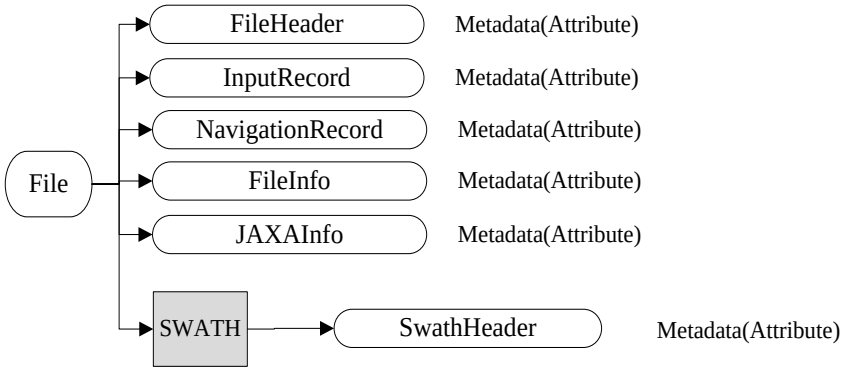


Figure 4.1-1 The structure of L2 (2HSLH) Metadata

4.2. Data Group

Elements of data group and array are explained in detail in this section. Each swath has 1 data group, 17 array and 2 data (Latitude and Longitude) commonly. Figure 4.2-1 shows “Swath” of Spectral Latent Heating and Figure 4.2-2 shows “Scan Time” data group structures.

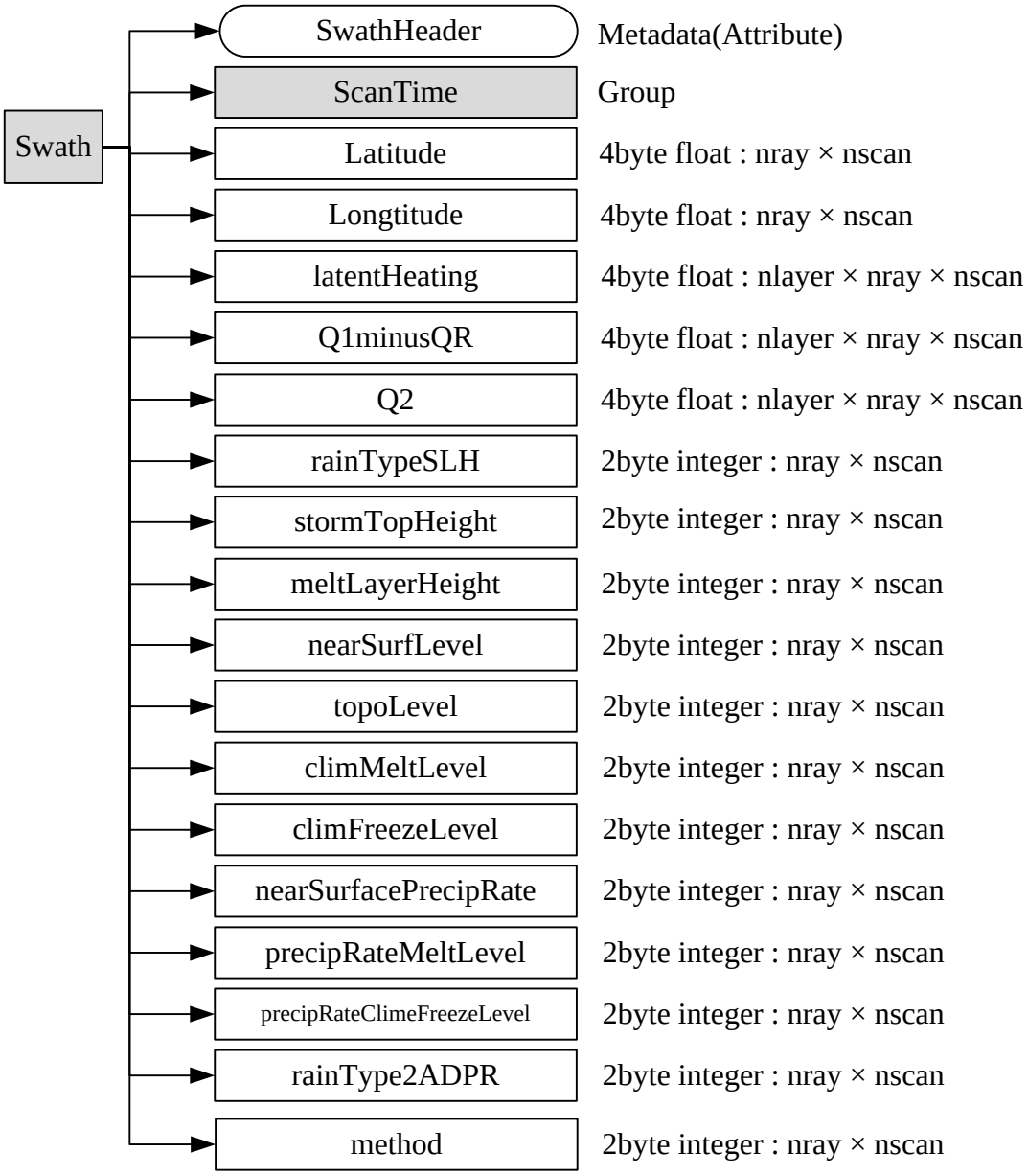


Figure 4.2-1 Data Format Structure for 2HSLH, Spectral Latent Heating

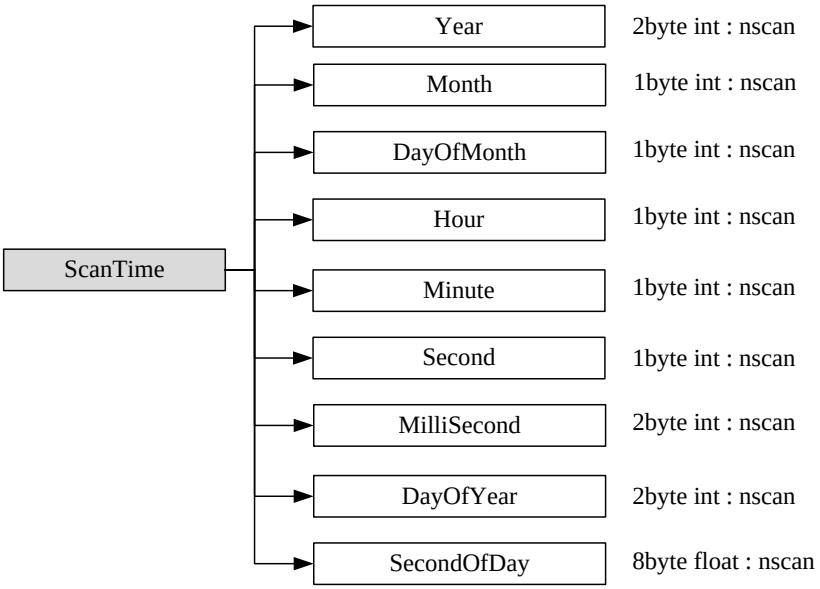


Figure 4.2-2 L2 (2HSLH) Data Format Structure for 2HSLH, Scantime

4.2.1. ScanTime (Group)

(1) Year

Type	Array	Unit
2-byte integer	nscan	year

4-digit year, e.g., 1998. Value range from 1950 to 2100 years.

Missing Value:

-9999

(2) Month

Type	Array	Unit
1-byte integer	nscan	month

Month of the year. Value range from 1 to 12 months.

Missing Value:

-99

(3) DayOfMonth

Type	Array	Unit
1-byte integer	nscan	day

Day of the month. Values range from 1 to 31 days.

Missing Value:

-99

(4) Hour

Type	Array	Unit
1-byte integer	nscan	hour

UTC hour of the day. Values range from 0 to 23 hours.

Missing Value:

-99

(5) Minuite

Type	Array	Unit
1-byte integer	nscan	minute

Minute of the hour. Values range from 0 to 59 minutes.

Missing Value:

-99

(6) Second

Type	Array	Unit
1-byte integer	nscan	s

Second of the minute. Values range from 0 to 60 minuites.

Missing Value:

-99

(7) Millisecond

Type	Array	Unit
2-byte integer	nscan	ms

Thousandths of the second. Value range from 0 to 999 ms.

Missing Value:

-9999

(8) DayOfYear

Type	Array	Unit
2-byte integer	nscan	day

Day of the year. Values range from 1 to 366 days.

Missing Value:

-9999

(9) SecondOfDay

Type	Array	Unit
8-byte float	nscan	s

A time associated with the scan. It is expressed as the UTC seconds of the day. Value range from 0 to 86400 s.

Missing Value:

-9999.9

4.2.2. Latitude

(1) Latitude

Type	Array	Unit
4-byte float	nray*nscan	degrees

The earth latitude of the center of the IFOV at the altitude of the earth ellipsoid. Latitude ispositive north, negative south.

Missing Value:

-9999.9

4.2.3. Longitude

(1) Longitude

Type	Array	Unit
4-byte float	nray*nscan	Degrees

The earth longitude of the center of the IFOV at altitude of the earth ellipsoid. Longitude is positive east, negative west. A point on the 180th meridian has the value -180 degrees.

Missing Value:

-9999.9

4.2.4. latentHeating

(1) latenHeating

Type	Array	Unit
4-byte float	nlayer*nray*nscan	K/hr

Latent heating. Value trange from -400 to 400 K/hr.

Missing Value:

-9999.9

4.2.5. Q1minusQR

(1) Q1minusQR

Type	Array	Unit
4-byte float	nlayer*nray*nscan	K/hr

Q1-QR. Value range from -400 to 400 K/hr.

Missing Value:

-9999.9

4.2.6. Q2

(1) Q2

Type	Array	Unit
4-byte float	nlayer*nray*nscan	K/hr

Apparent humidity absorption. Value range from -400 to 400 K/hr。

Missing Value:

-9999.9

4.2.7. rainTypeSLH

(1) rainTypeSLH

Type	Array	Unit
2-byte integer	nray*nscan	-

The rain type that was estimated in SLH 。

Missing Value:

-9999

4.2.8. stormTopHeight

(1) stormTopHeight

Type	Array	Unit
2-byte integer	nray*nscan	m

Storm Height。Value range from 0 to 32000 [m].

Missing Value:

-9999

4.2.9. meltLayerHeight

(1) meltLayerHeight

Type	Array	Unit
2-byte integer	nray*nscan	m

Melt layer Height. Value range from 0 to 32000 [m].

Missing Value:

-9999

4.2.10. nearSurfLevel

(1) nearSurfLevel

Type	Array	Unit
2-byte integer	nray*nscan	m

The Height of rain near surface. Value range from 0 to 32000 [m].

Missing Value:

-9999

4.2.11. topLevel

(1) topLevel

Type	Array	Unit
2-byte integer	nray*nscan	m

Altitude of the earth surface. Value range from 0 to 32000 [m].

Missing Value:

-9999

4.2.12. climMeltLevel

(1) climMeltLevel

Type	Array	Unit
2-byte integer	nray*nscan	m

Melt Level in Climatology. Value range from 0 to 32000 [m].

Missing Value:

-9999

4.2.13. climFreezLevel

(1) climFreezLevel

Type	Array	Unit
2-byte integer	nray*nscan	m

Freezing altitude in Climatology. Value range from 0 to32000 [m].

Missing Value:

-9999

4.2.14. nearSurfacePrecipRate

(1) nearSurfacePrecipRate

Type	Array	Unit
4-byte float	nray*nscan	mm/hr

Precipitation rate at near surface. Value range from 0 to 500 [mm/hr].

Missing Value:

-9999.9

4.2.15. precipRateMeltLevel

(1) precipRateMeltLevel

Type	Array	Unit
4-byte float	nray*nscan	mm/hr

Precipitation rate at Melting level. Value range from 0 to 500 [mm/hr].

Missing Value:

-9999.9

4.2.16. precipRateClimFreezLevel

(1) precipRateClimFreezLevel

Type	Array	Unit
4-byte integer	nray*nscan	mm/hr

Precipitation rate at Freezing level. Value range from 0 to 500 [mm/hr].

Missing Value:

-9999.9

4.2.17. rainType2ADPR

(1) rainType2ADPR

Type	Array	Unit
2-byte integer	nray*nscan	-

Rain type by 2ADPR

Missing Value:

-9999

4.2.18. method

(1) method

Type	Array	Unit
2-byte integer	nray*nscan	-

Method by 2ADPR

Missing Value:

-9999

5. Level 3(HDF) Data Format Structure

5.1. Dimension definition

Dimension definitions:

- ltL
  - 28 Number of low resolution 5° grid intervals of latitude from 70°S to 70°N.
- lnL
  - 72 Number of low resolution 5° grid intervals of longitude from 180°W to 180°E.
- ltH
  - 536 Number of high resolution 0.25° grid intervals of latitude from 67°S to 67°N.
- lnH
  - 1440 Number of high resolution 0.25° grid intervals of longitude from 180°W to 180°E.
- chn
  - 5 Number of channels: KuNS, KaMS, KaHS, DPRMS, KuMS.
- inst
  - 4 Number of instruments: KuNS, KaMS, KaHS, KuMS.
- hgt
  - 5 Number of heights above the earth ellipsoid: 2, 4, 6, 10, and 15 km.
- tim
  - 24 Number of hours (local time).
- ang
  - 7 Number of angles. The meaning of ang is different for each channel.
    For Ku channel all indeces are used with the meaning 0, 1, 2,...,6 = angle bins 24, (20,28), (16,32), (12,36), (8,40), (3,44), and (0,48).
    For Ka channel 4 indeces are used with the meaning 0, 1, 2, 3 = angle bins 12, (8,16), (4,20), and (0,24). For KaHS channel 4 indeces are used with the meaning 0, 1, 2, 3 = angle bins (11,2), (7,16), (3,20), and (0,23).
- rt
  - 3 Number of rain types: stratiform, convective, all
- st
  - 3 Number of surface types: ocean, land, all.
- bin
  - 30 Number of bins in histogram. The thresholds are different for dif different variables. See the introduction to this algorithm.
- nlat
  - 536 Number of high resolution 0.25° grid intervals of latitude from 67°S to 67°N.
- nlon
  - 1440 Number of high resolution 0.25° grid intervals of longitude from 180°W to 180°E.

- nalt
  - 5 Number of heights above the earth ellipsoid: 2km, 4km, 6km, 10km, and 15km.
- nvar
  - 3 Number of phase bins. Bins are counts of phase less than 100, counts of phase greater than or equal to 100 and less than 200, counts of phase greater than or equal to 200.
- chd
  - 2 Number of channels for 3DPRD.
- AD
  - 2 Ascending or descending half of the orbit.

5.2. Data Format Structure of 3DPR

3DPR,"DPR Full Product", computes statistics of the DPR measurements at both a low horizontal resolution (G1, 5° x 5° latitude/longitude) and a high horizontal resolution (G2, 0.25° x 0.25° latitude/longitude).

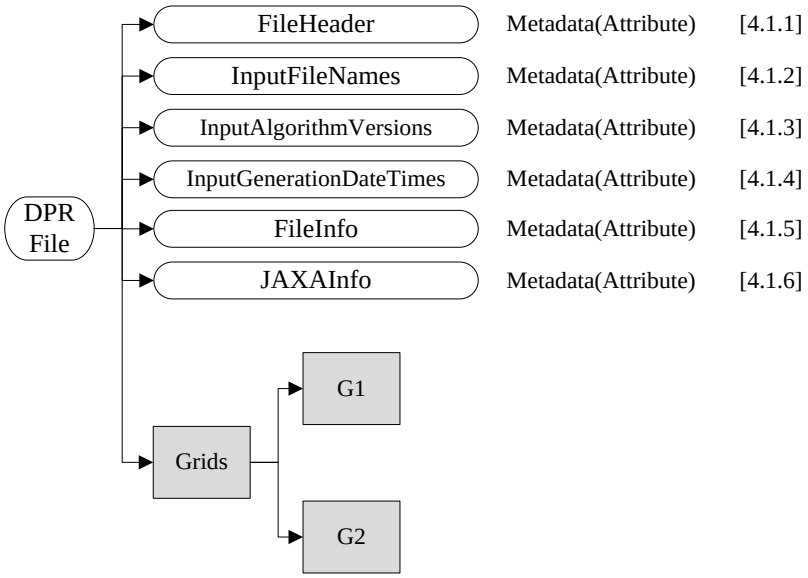


Figure 5.2-1 Data Format Structure for 3DPR

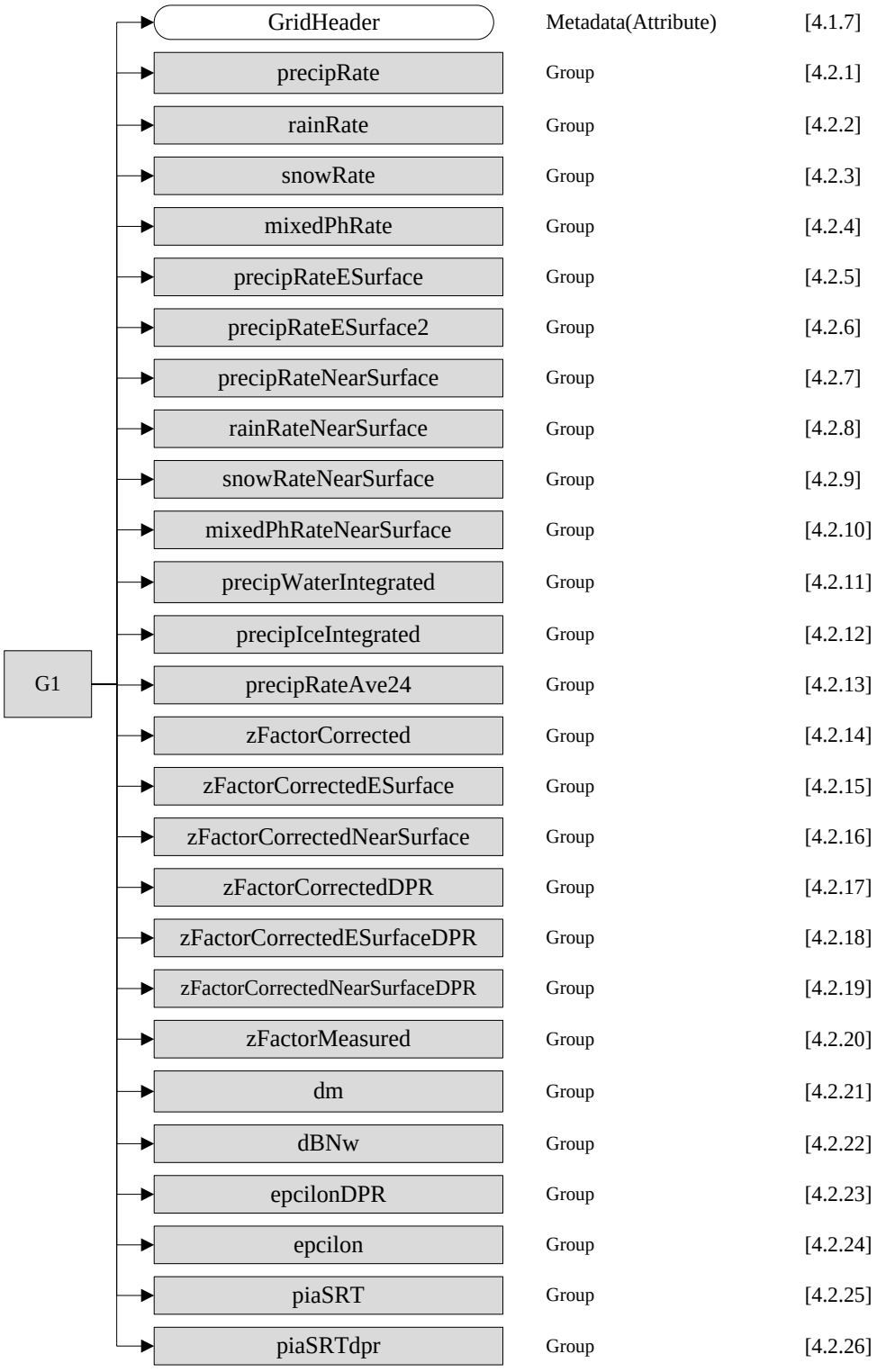


Figure 5.2-2 Data Format Structure for 3DPR

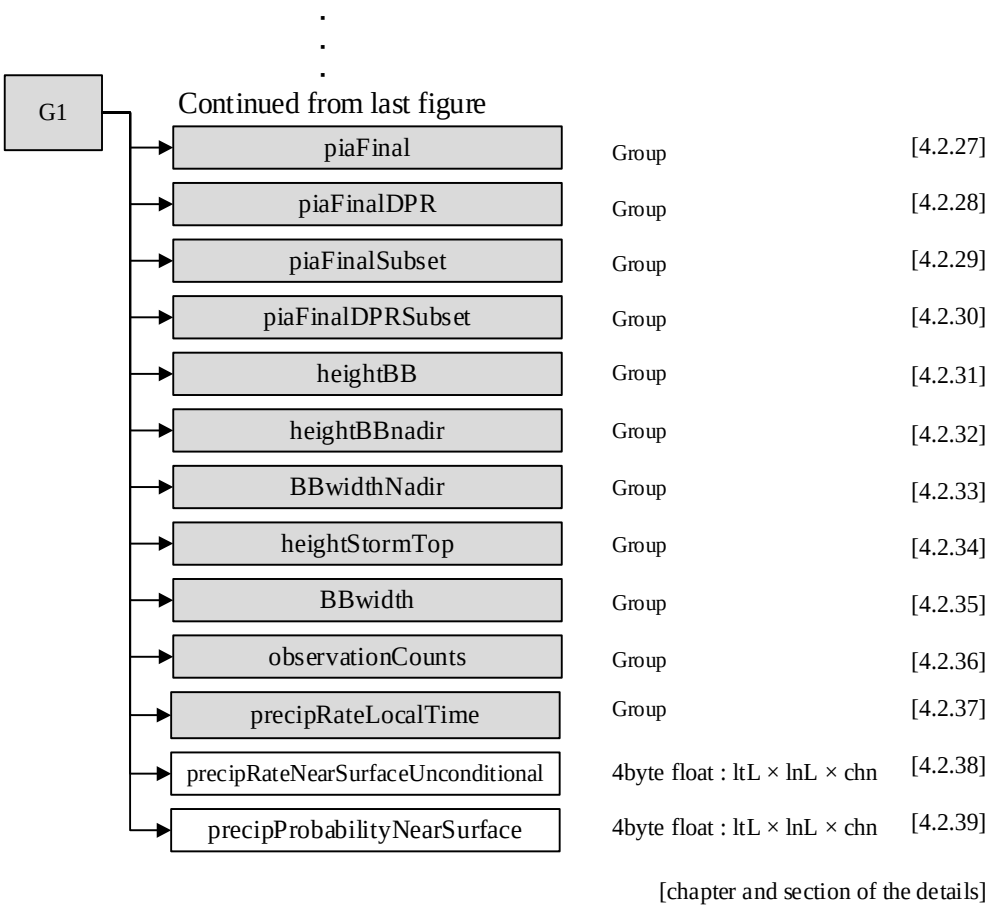


Figure 5.2-3 Data Format Structure for 3DPR

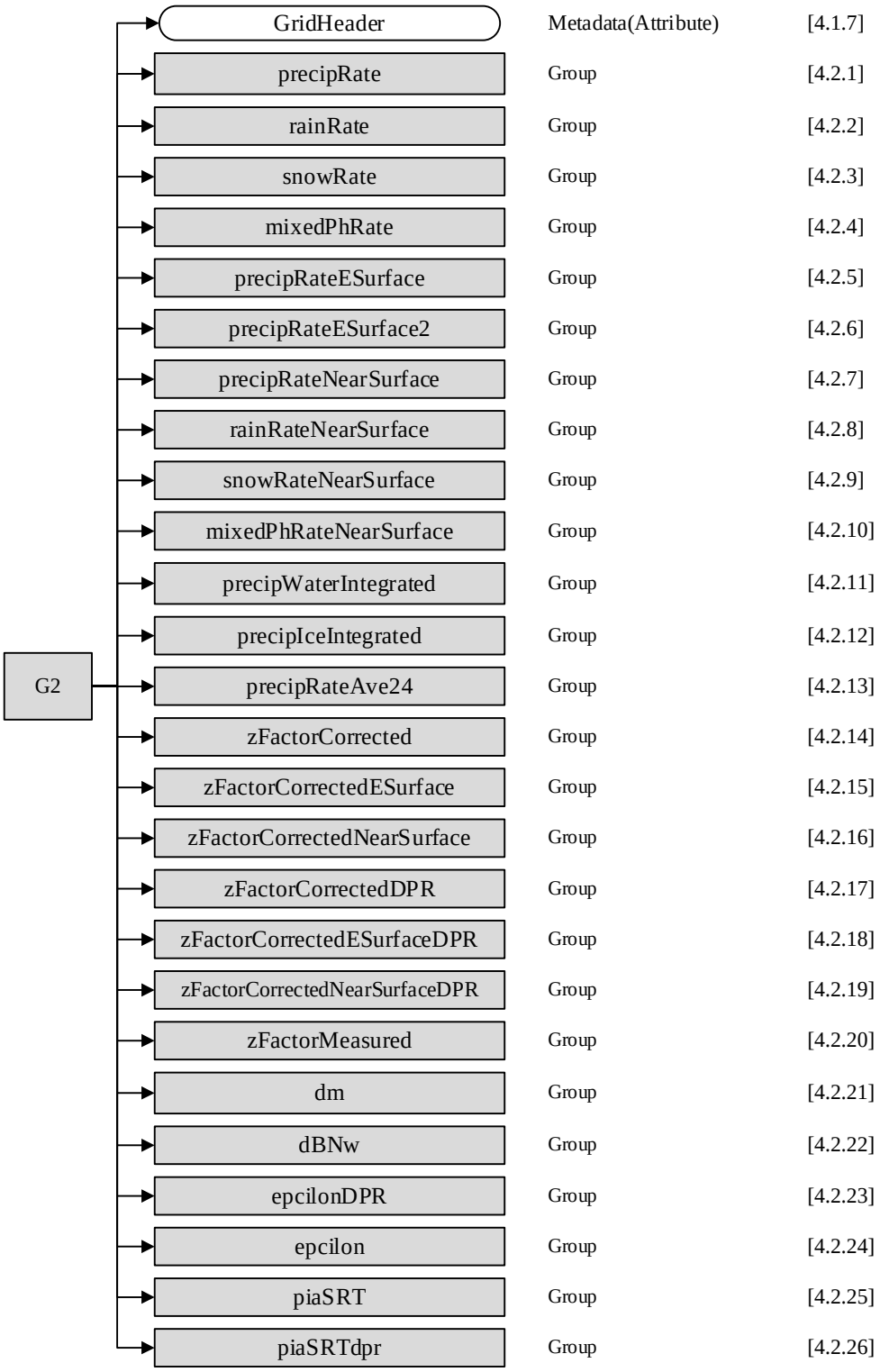


Figure 5.2-4 Data Format Structure for 3DPR

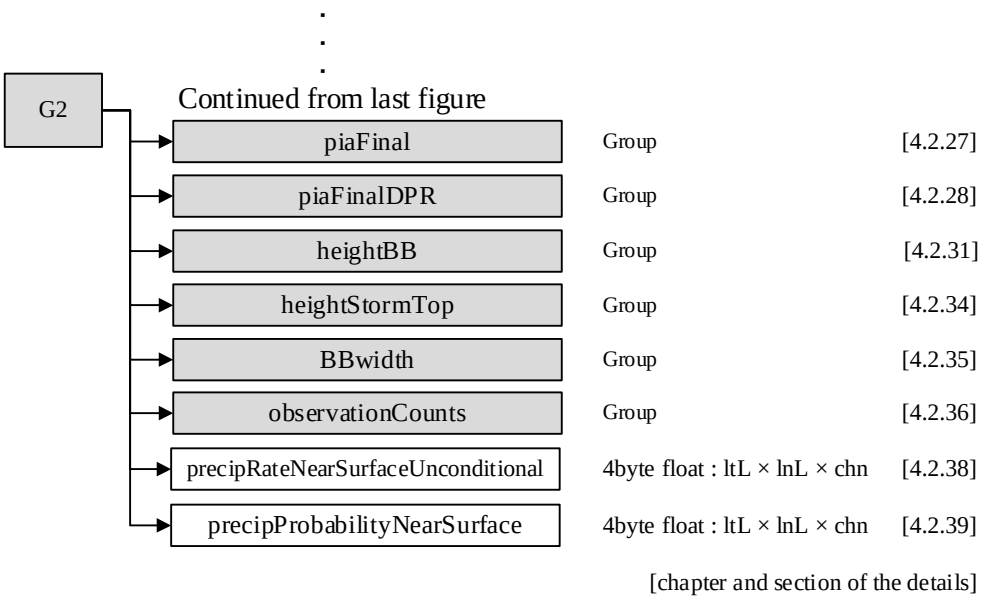


Figure 5.2-5 Data Format Structure for 3DPR

5.3. Data Format Structure for 3DPRD

3DPRD, ”DPR Daily Product”, computes daily statistics of the DPR measurements at a high horizontal resolution (0.25° x 0.25° latitude/longitude).

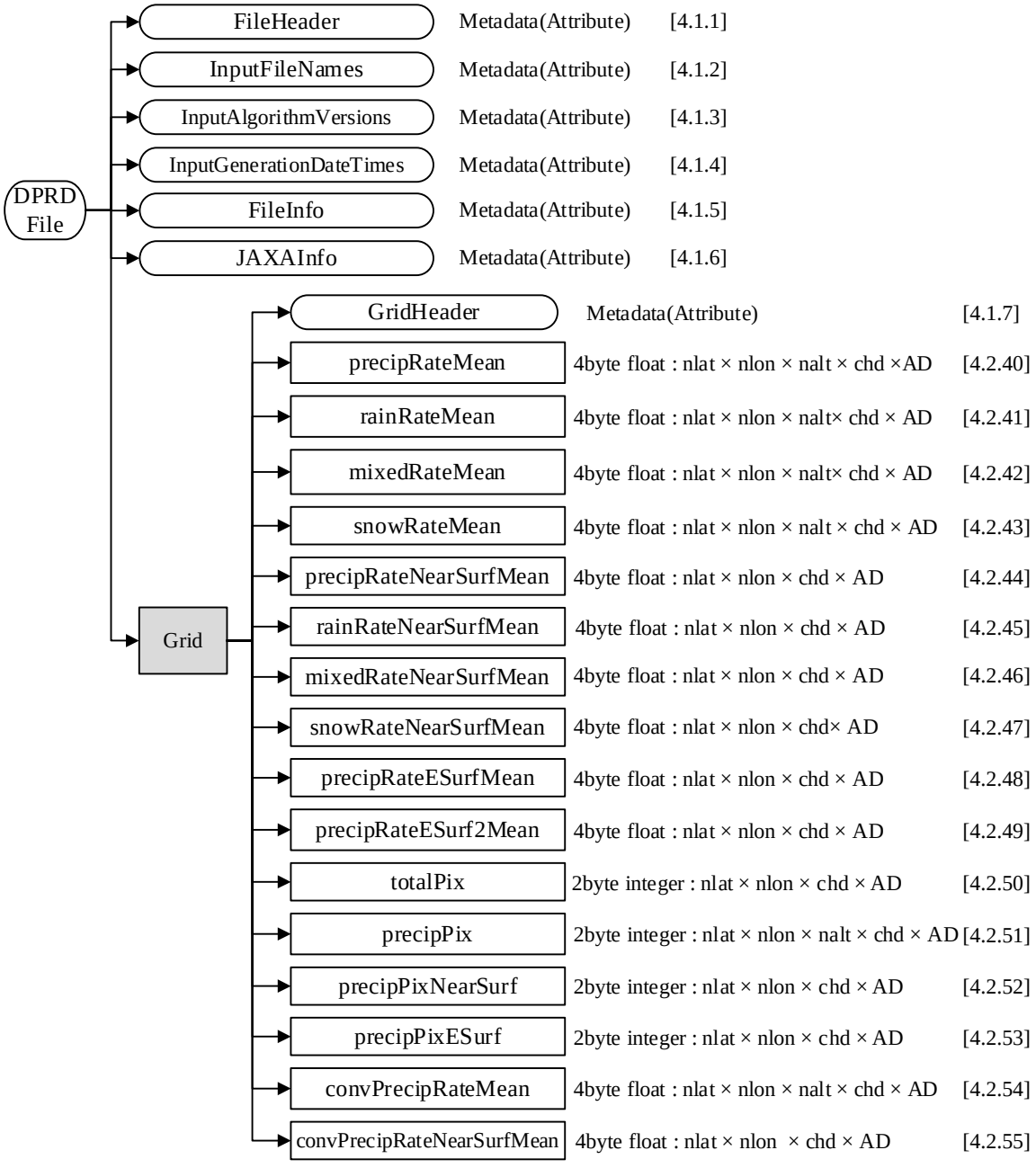


Figure 5.3-1 Data Format Structure for 3DPRD

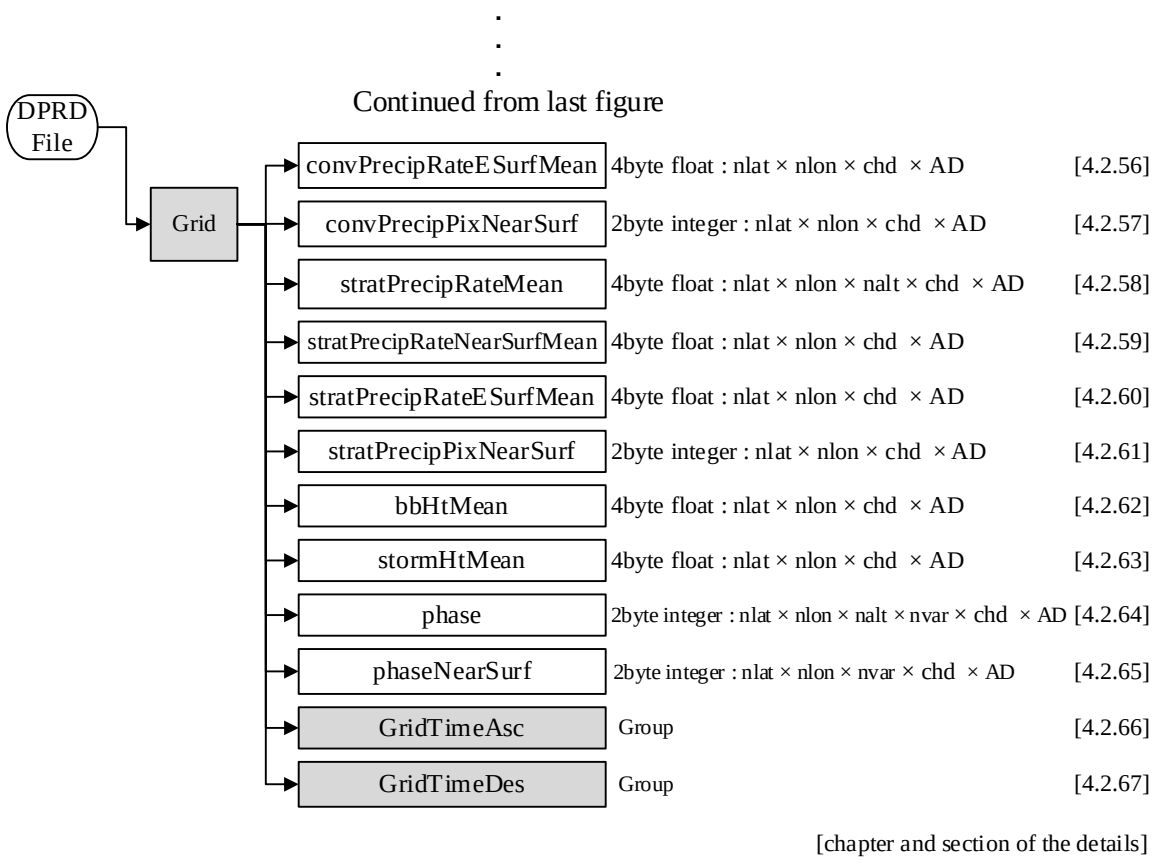


Figure 5.3-2 Data Format Structure for 3DPRD

5.4. Data Format Structure for each Group

Each group's structure is shown in this section.

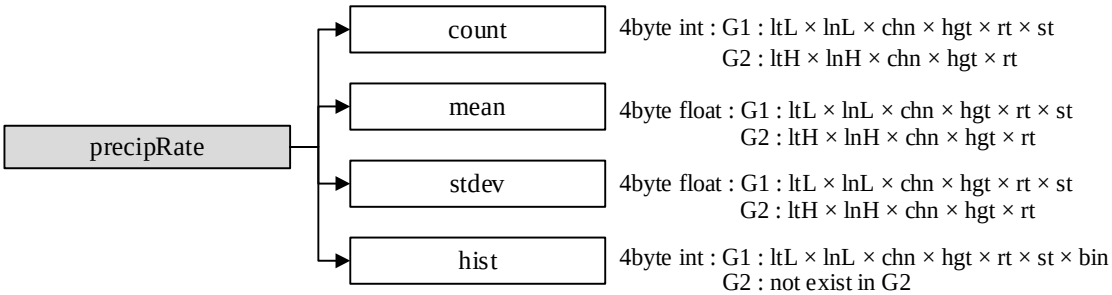


Figure 5.4-1 Data Format Structure for precipRate Group

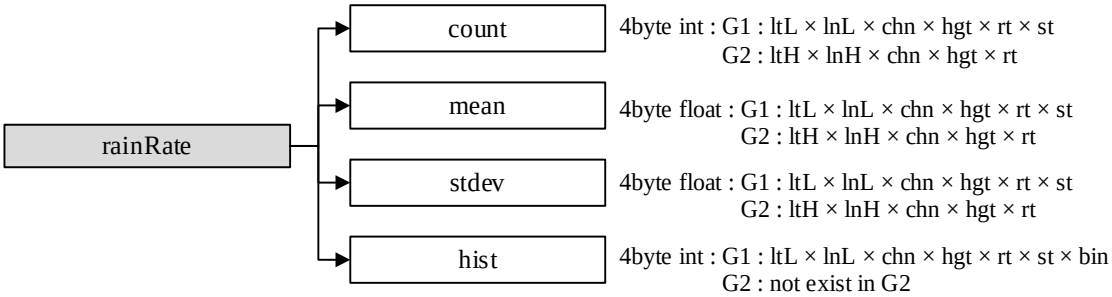


Figure 5.4-2 Data Format Structure for rainRate Group

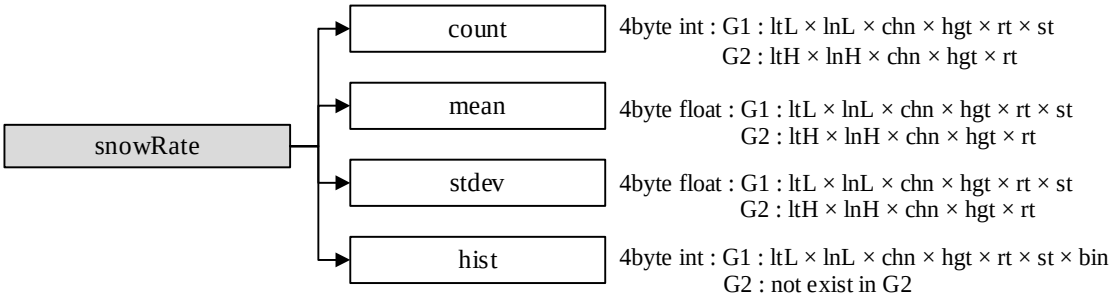


Figure 5.4-3 Data Format Structure for snowRate Group

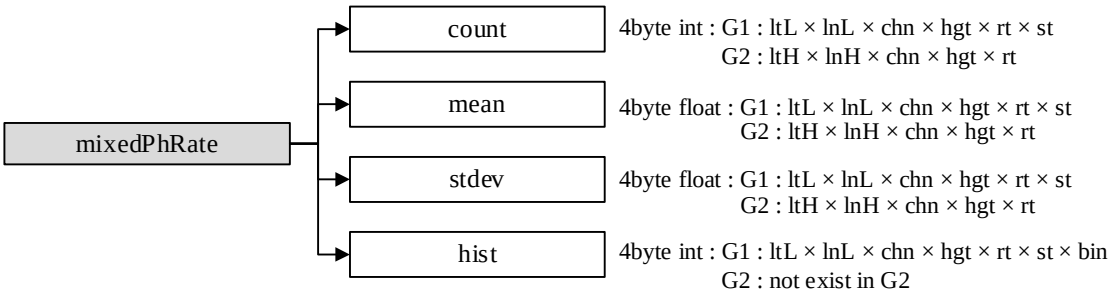


Figure 5.4-4 Data Format Structure for mixedPhRate Group

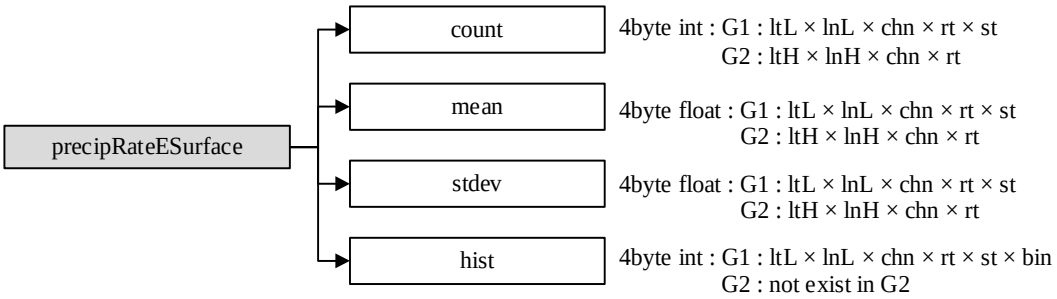


Figure 5.4-5 Data Format Structure for precipRateESurface Group

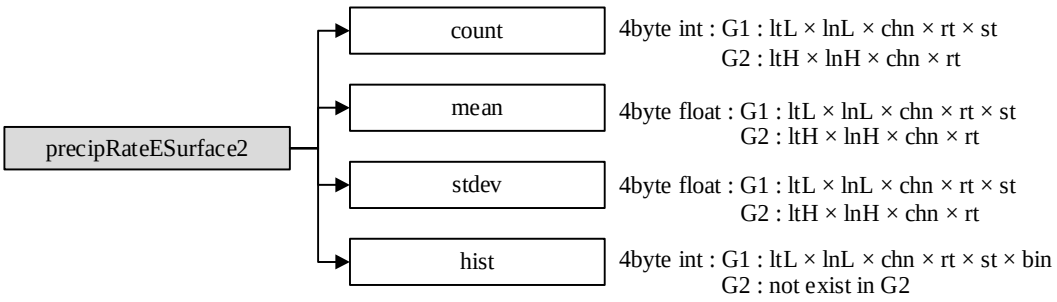


Figure 5.4-6 Data Format Structure for precipRateESurface2 Group

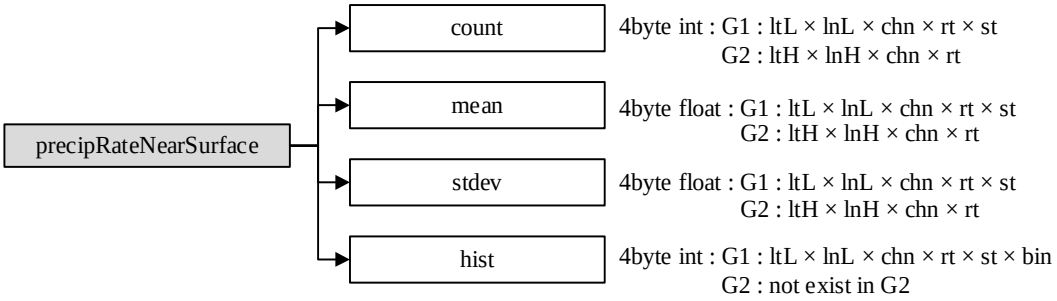


Figure 5.4-7 Data Format Structure for precipRateNearSurface Group

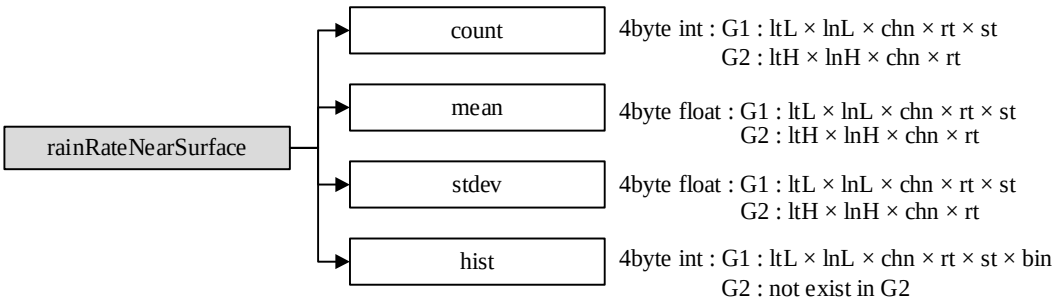


Figure 5.4-8 Data Format Structure for rainRateNearSurface Group

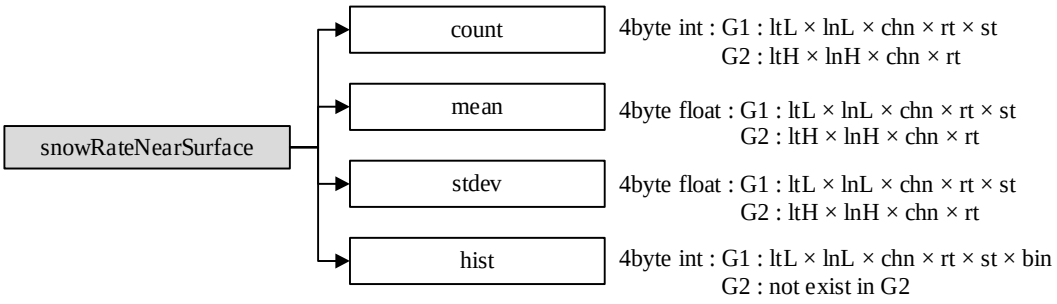


Figure 5.4-9 Data Format Structure for snowRateNearSurface Group

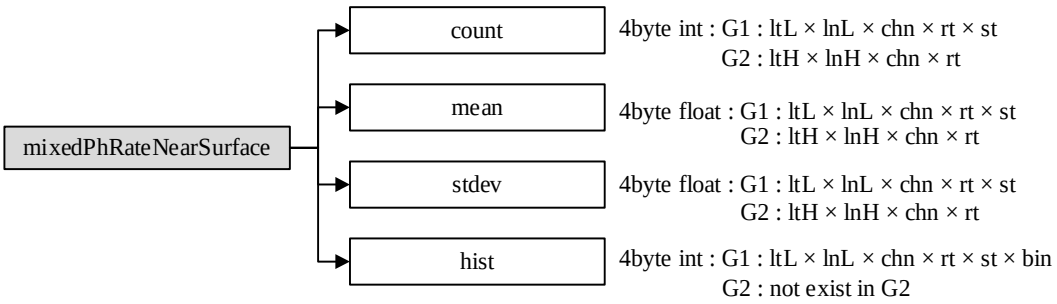


Figure 5.4-10 Data Format Structure for mixedPhRateNearSurface Group

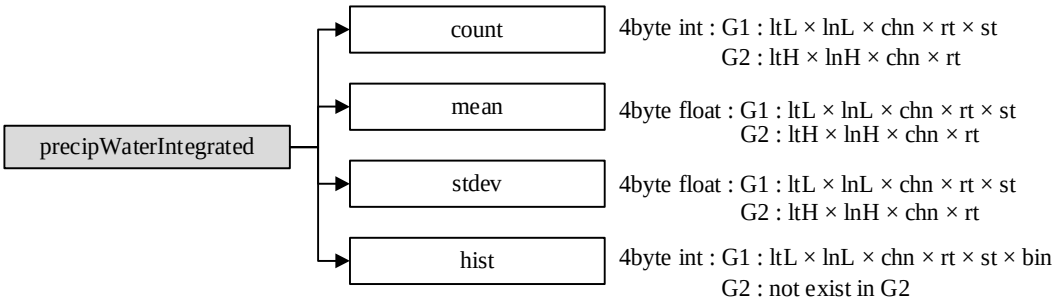


Figure 5.4-11 Data Format Structure for precipWaterIntehgrated Group

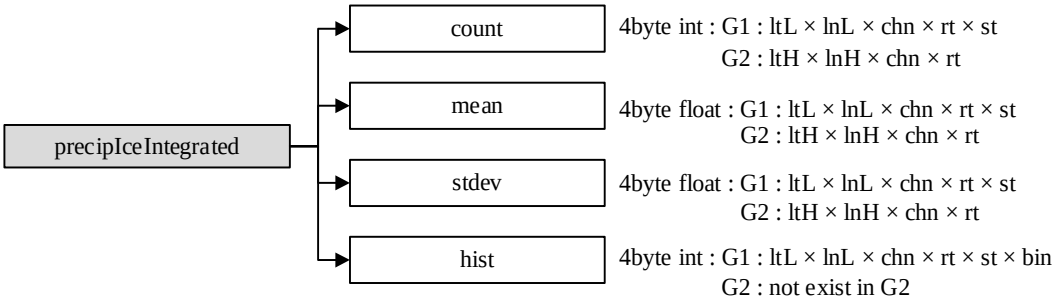


Figure 5.4-12 Data Format Structure for precipIceIntegrated Group

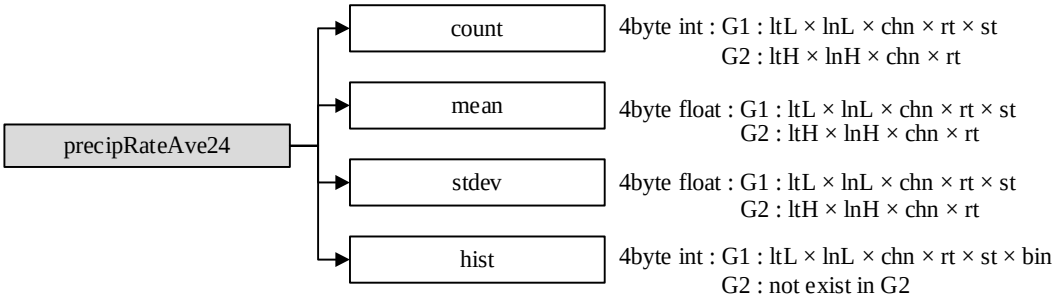


Figure 5.4-13 Data Format Structure for precipRateAve24 Group

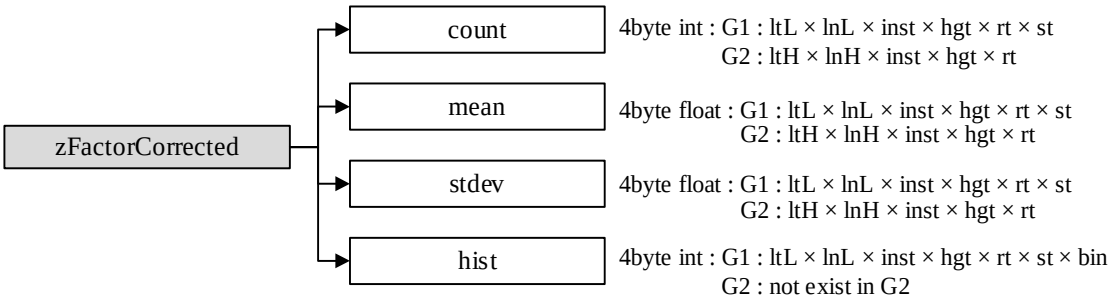


Figure 5.4-14 Data Format Structure for zFactorCorrected Group

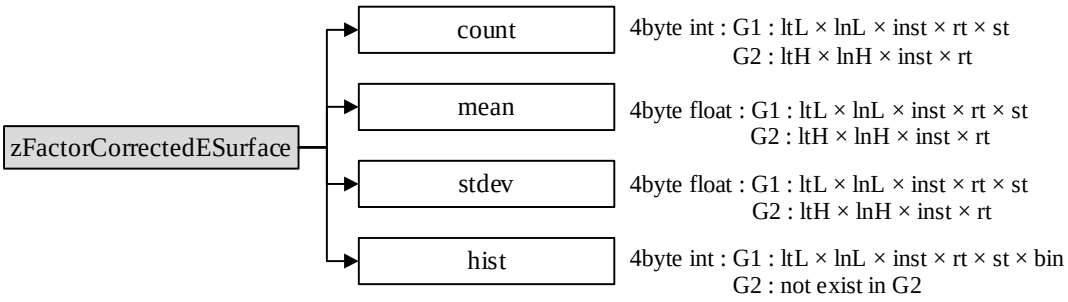


Figure 5.4-15 Data Format Structure for zFactorCorrectedESurface Group

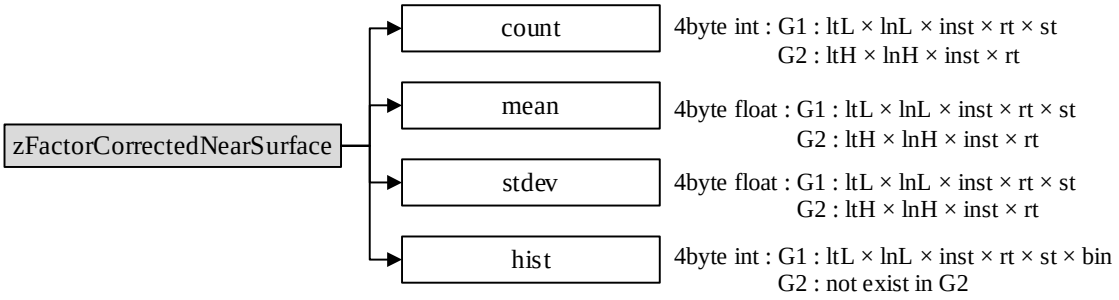


Figure 5.4-16 Data Format Structure for zFactorCorrectedNearSurface Group

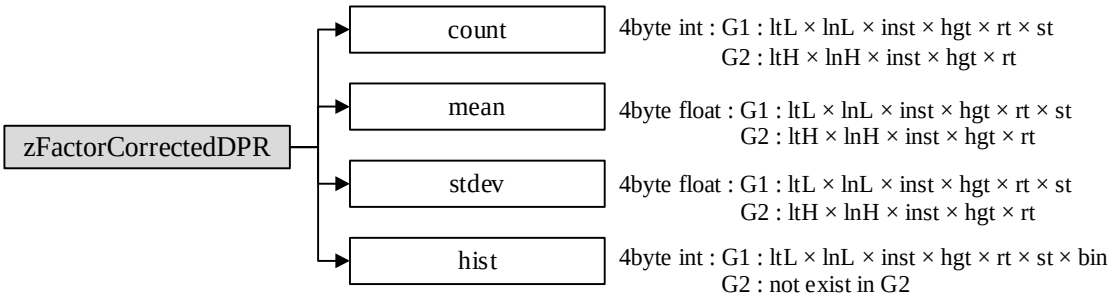


Figure 5.4-17 Data Format Structure for zFactorCorrectedDPR Group

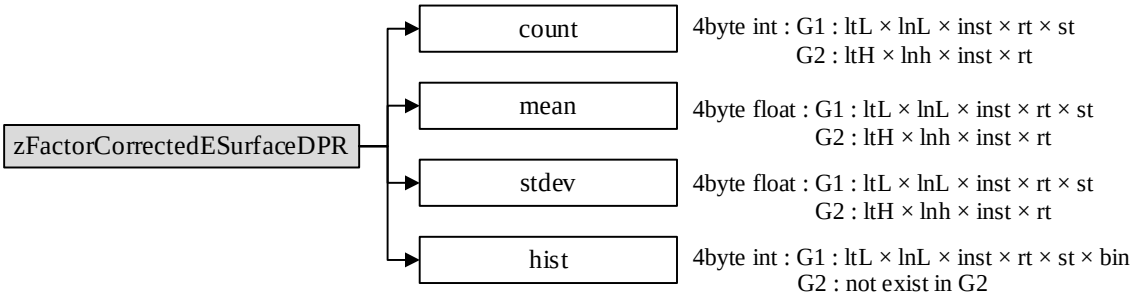


Figure 5.4-18 Data Format Structure for zFactorCorrectedESurfaceDPR Group

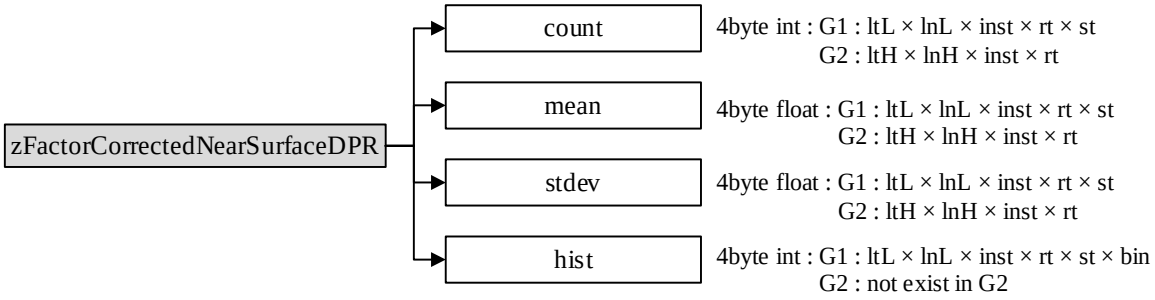


Figure 5.4-19 Data Format Structure for zFactorCorrectedNearSurfaceDPR Group

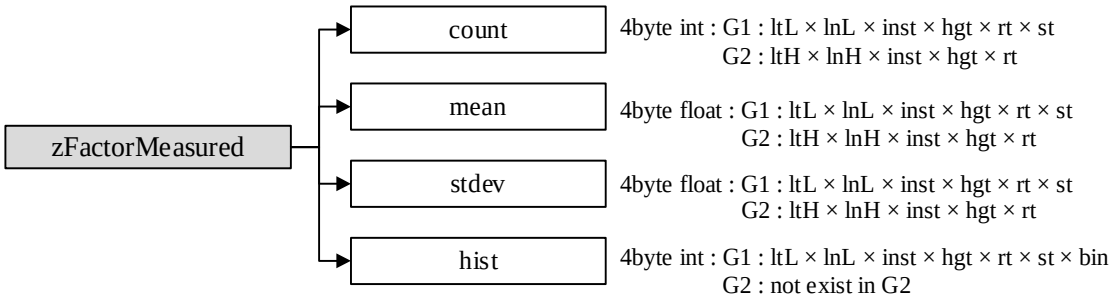


Figure 5.4-20 Data Format Structure for zFactorMeasured Group

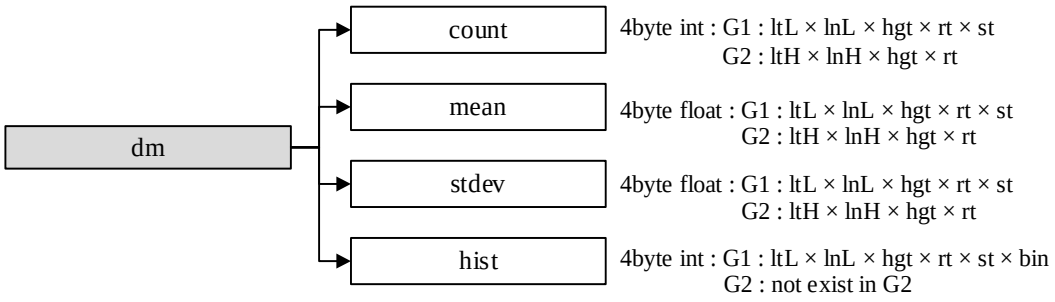


Figure 5.4-21 Data Format Structure for dm Group

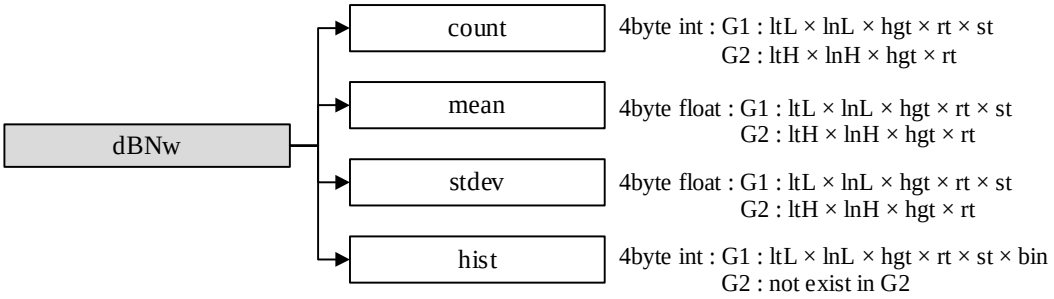


Figure 5.4-22 Data Format Structure for dBNw Group

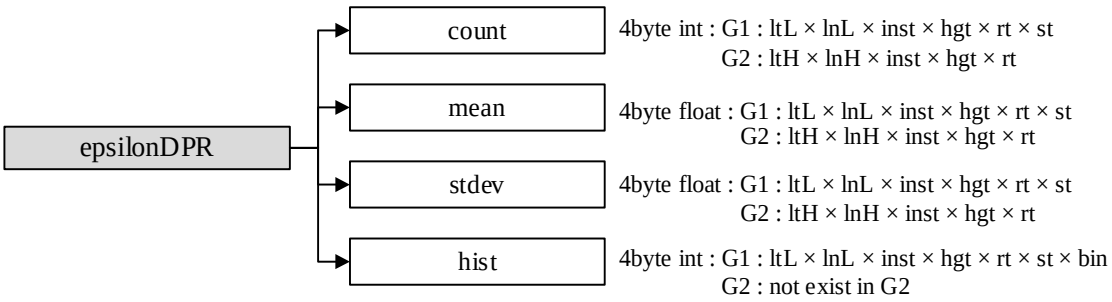


Figure 5.4-23 Data Format Structure for epsilonDPR Group

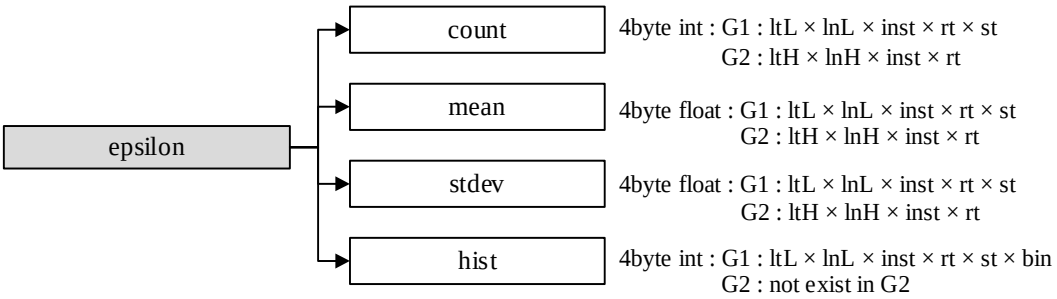


Figure 5.4-24 Data Format Structure for epsilon Group

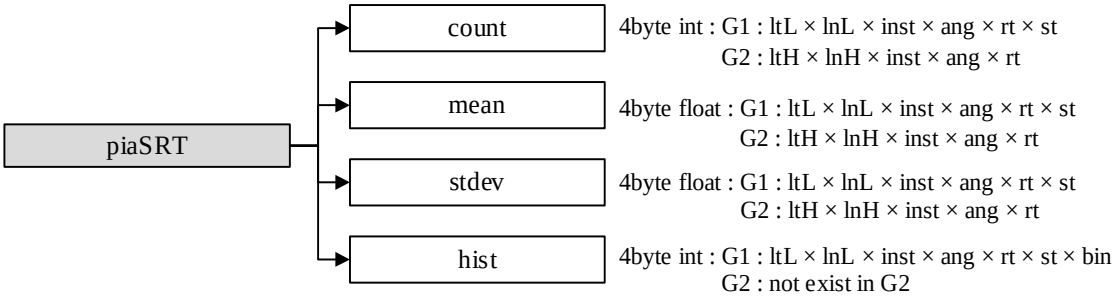


Figure 5.4-25 Data Format Structure for piaSRT Group

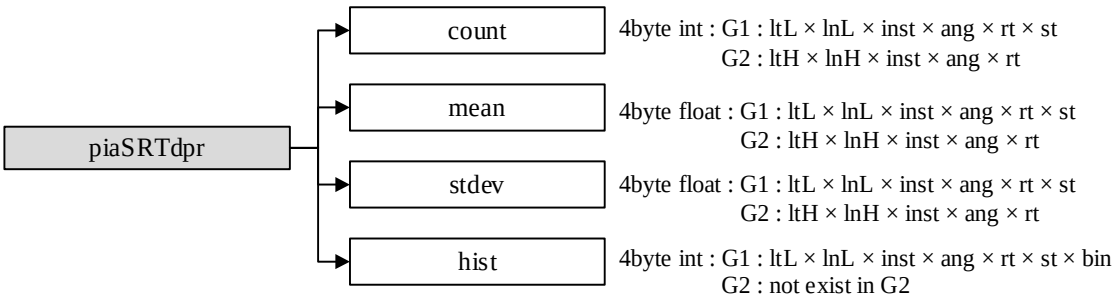


Figure 5.4-26 Data Format Structure for piaSRTdpr Group

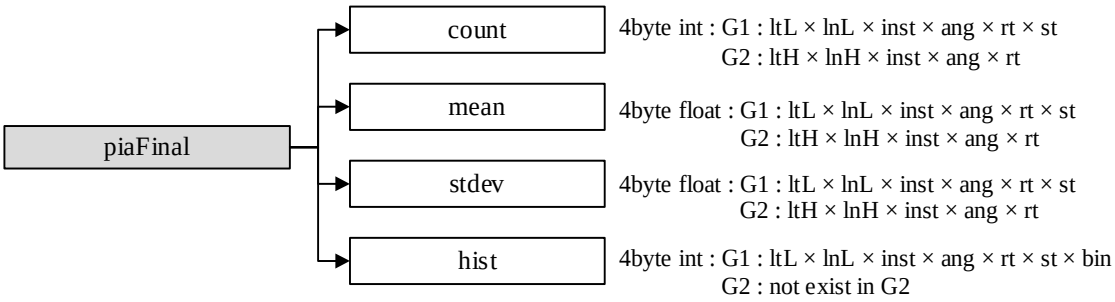


Figure 5.4-27 Data Format Structure for piaFinal Group

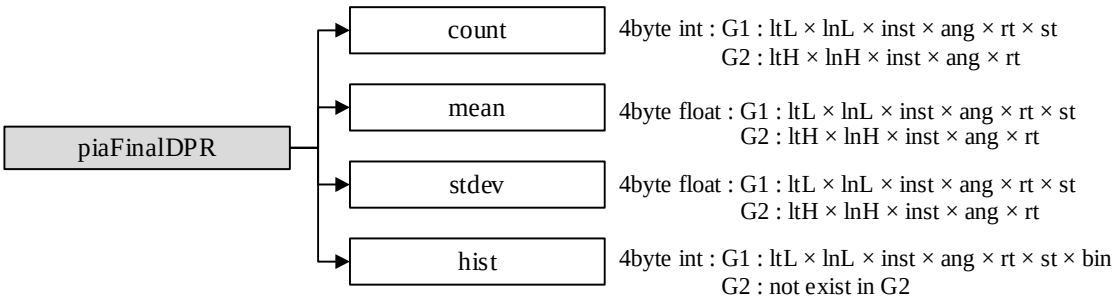


Figure 5.4-28 Data Format Structure for piaFinalDPR Group

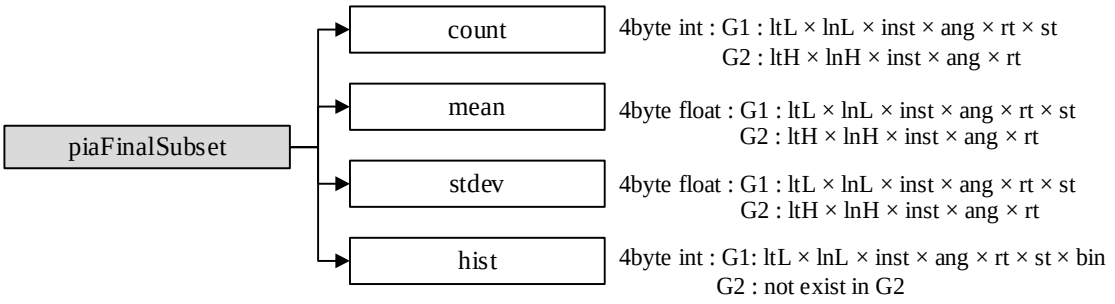


Figure 5.4-29 Data Format Structure for piaFinalSubset Group

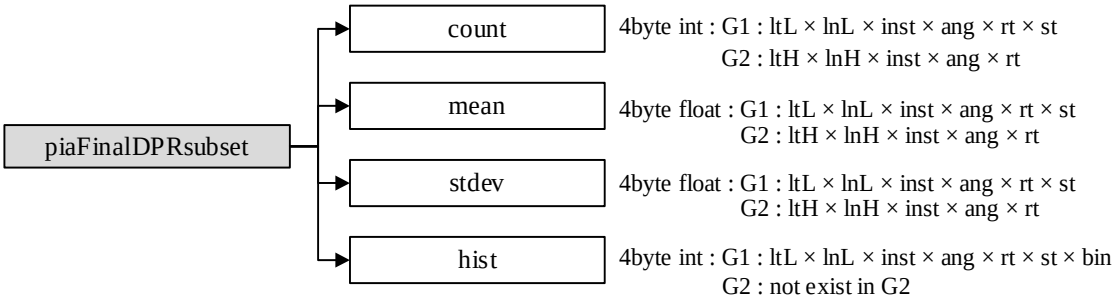


Figure 5.4-30 Data Format Structure for piaFinalDPRsubset Group

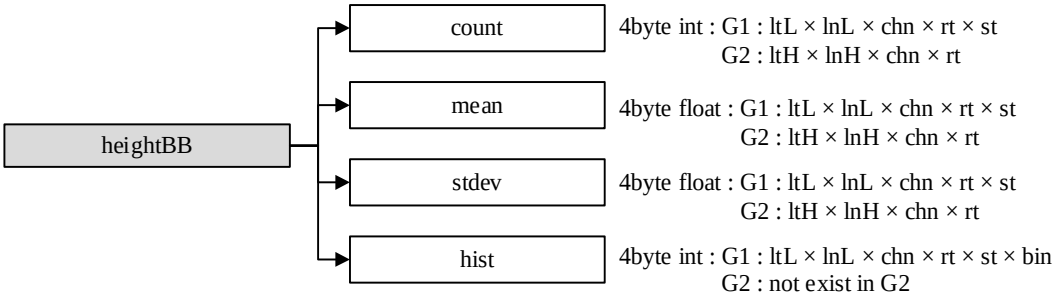


Figure 5.4-31 Data Format Structure for heightBB Group

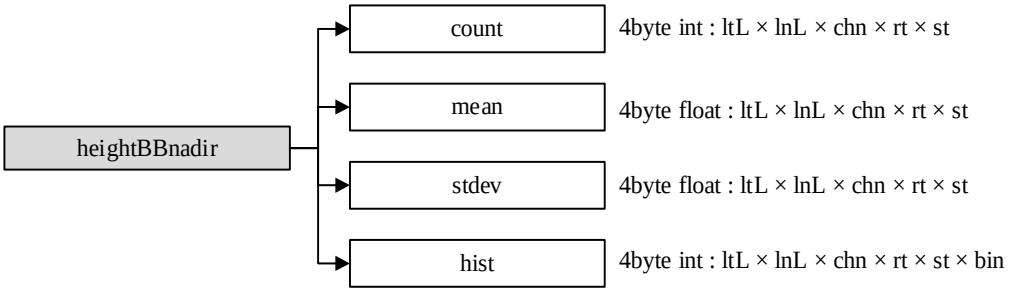


Figure 5.4-32 Data Format Structure for heightBBnadir Group

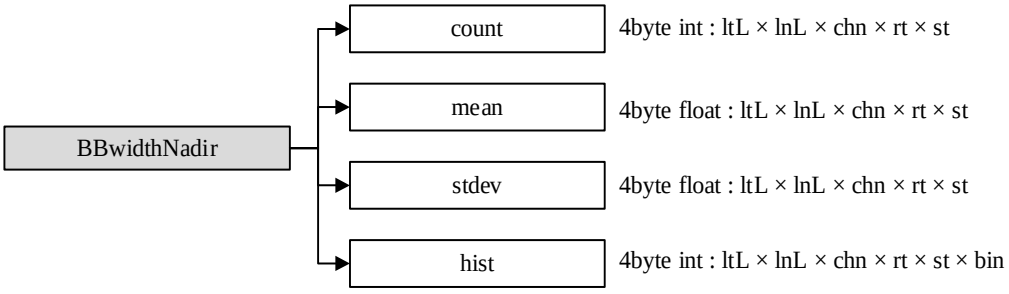


Figure 5.4-33 Data Format Structure for BBwidthNadir Group

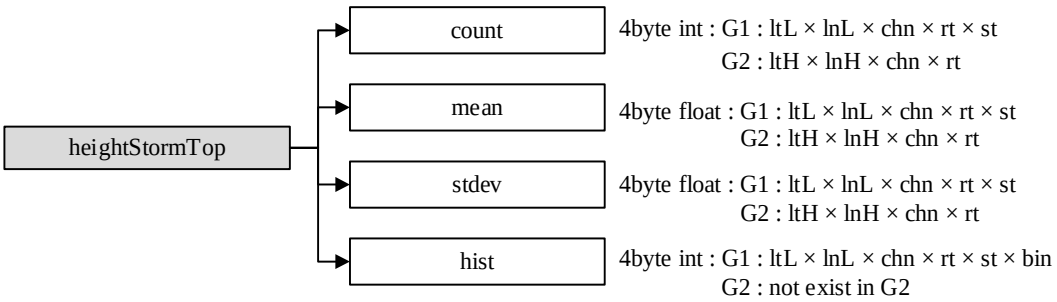


Figure 5.4-34 Data Format Structure for heightStormTop Group

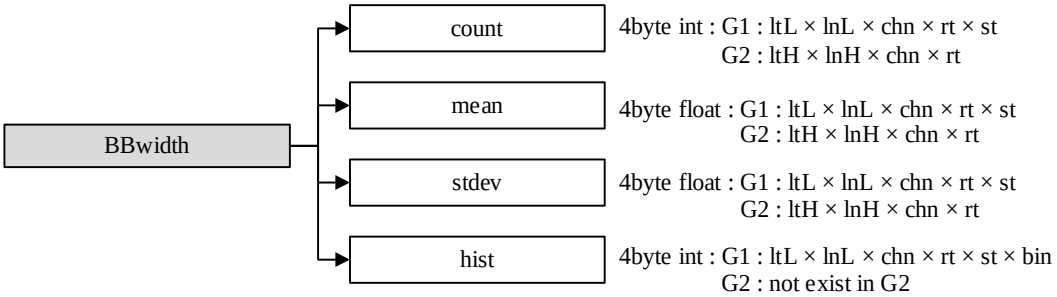


Figure 5.4-35 Data Format Structure for BBwidth Group

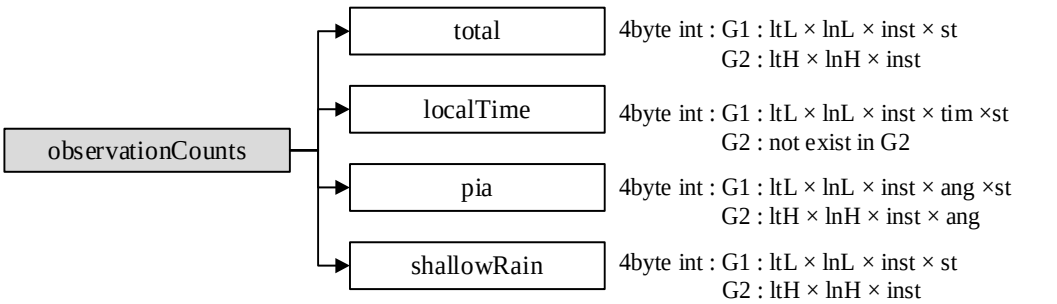


Figure 5.4-36 Data Format Structure for observationCounts Group

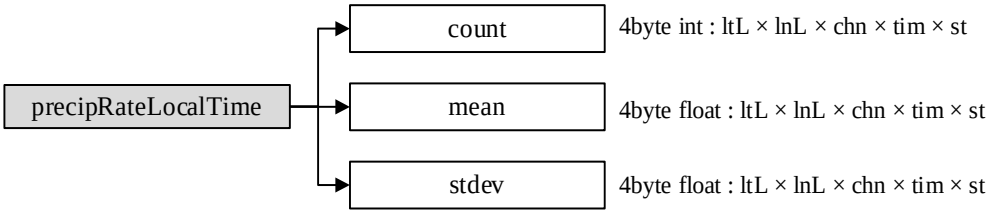


Figure 5.4-37 Data Format Structure for precipRateLocalTime Group

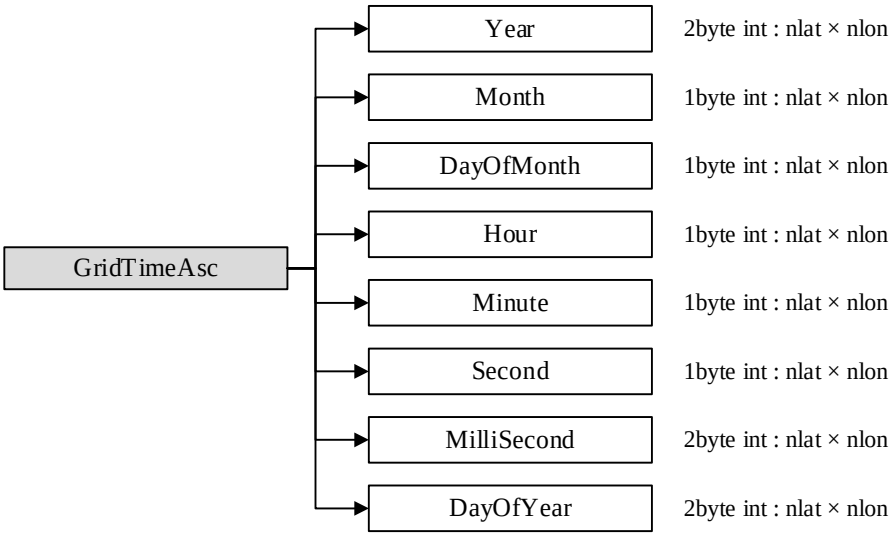


Figure 5.4-38 Data Format Structure for GridTimeAsc Group

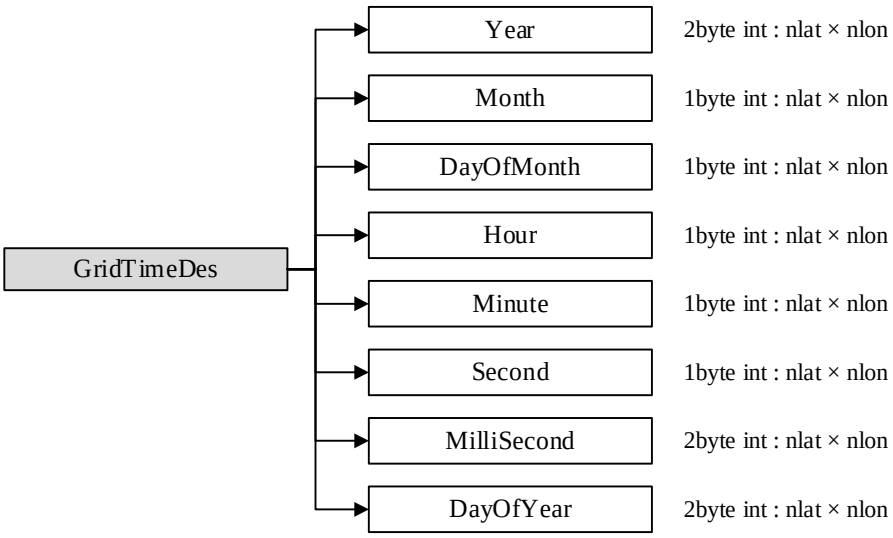


Figure 5.4-39 Data Format Structure for GridTimeDes Group

6. Level 3(HDF) Contents of Objects in each Group

6.1 Metadata

Metadata has seven elements. Figure 4.1-1 shows metadata structure.

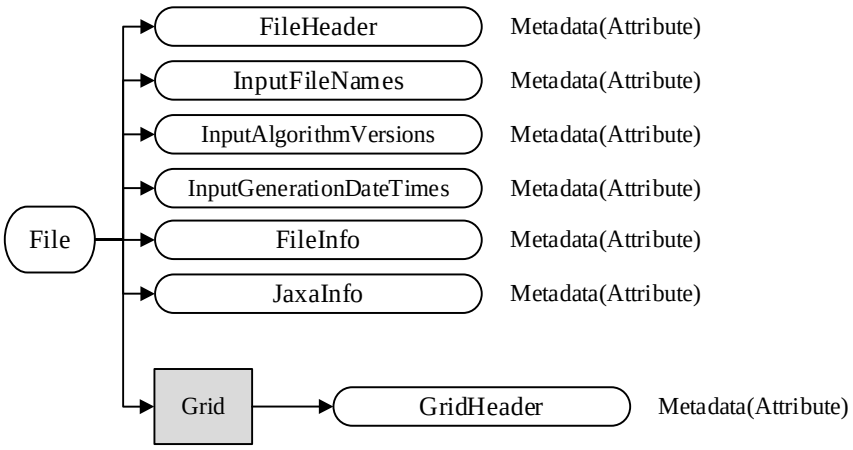


Figure 6.1-1 L3 Metadata

6.1.1. FileHeader

FileHeader contains metadata of general interest. This group appears in all data products. Please see “2.1.1-1 FileHeader Elements”.

6.1.2. InputFileNames

InputFileNames contains a list of input file names for this granule. Since some algorithms may have 2000 input files, this group is a ”Long Metadata Group”, which has no elements. This group appears in Level 3 time averaged products.

6.1.3. InputAlgorithmVersions

InputAlgorithmVersions contains a list of input algorithm versions for this granule. Since some algorithms may have 2000 input files, this group is a ”Long Metadata Group”, which has no elements. This group appears in Level 3 time averaged products.

6.1.4. InputGenarationDateTimes

InputGenerationDateTimes contains a list of input generation datetimes for this granule. Since some algorithms may have 2000 input files, this group is a ”Long Metadata Group”,which has no elements. This group appears in Level 3 time averaged products.

6.1.5. FileInfo

FileInfo contains metadata used by the PPS I/O Toolkit. This group appears in all data products.This group appears in L2 Metadata. Please see “2.1.5-1 FileInfo Elements”.

6.1.6. JAXAInfo

JAXAInfo contains metadata requested by JAXA. Used by DPR algorithms and GSMaP. This group appears in L2 Metadata. Please see “2.1.6-1 JAXAInfo Elements” except TotalQualityCode. Table 6.1.6-1 shows TotalQualityCode in JAXAinfo.

Table 6.1.6-1 TotalQualityCode Elements

No	Element	Description	Data size (bytes)
3	TotalQualityCode	The total quality of product is defined based on the quality of input data or missing pixels ratio. Quality meaning are (a) GPM DPR L3 product Good: missing pixels ratio >= 50% Fair: missing pixels ration < 50% (b) GPM DPR SLH L3 (Gridded orbit) product Good: The total quality of input data (DPR L2) is Good. Fair: The total quality of input data (DPR L2) is Fair. EG (Empty Granule): The total quality of input data (DPR L2) is EG (c) GPM DPR SLH L3 product Good: missing pixels ratio >= 50% Fair: missing pixels ratio < 50%	50

6.1.7. GridHeader

GridHeader contains metadata defining the grids in the grid structure. This group appears in Level 3 products. Table 6.1.7-1 shows each metadata elements in GridHeader.

Table 6.1.7-1 GridHeader Elements

No	Element	Description	Data size (bytes)
1	BinMethod	Method used to obtain the value in each grid box. The only defined value is ”ARITHMEAN”.	50
2	Registration	Representative location within the grid box. The only defined value is ”CENTER”.	50
3	LatitudeResolution	North-south size of a bin (degrees latitude).	50
4	LongitudeResolution	East-west size of a bin (degrees longitude).	50
5	NorthBoundingCoordinate	Northern-most latitude (degrees) covered by the grid.	50
6	SouthBoundingCoordinate	Southern-most latitude (degrees) covered by the grid.	50

No	Element	Description	Data size (bytes)
7	EastBoundingCoordinate	Eastern-most longitude (degrees) covered by the grid.	50
8	WestBoundingCoordinate	Western-most longitude (degrees) covered by the grid.	50
9	Origin	Origin of the grid indices, e.g., ”SOUTHWEST”.	50

6.2. Data Group

Elements of data group are explained in detail in this section。

Two-Grids exist in 3DPR Data Format Structure. Grid G1 has 37 data group and 2 data. Grid G2 has 32 data group and 2 data. Please see Figure 5.2-2 - Figure 5.2-5.

One-Grid exists in 3DPRD Data Format Structure. The grid has 26 data and 2 data groups. Please see Figure 5.3-1 - Figure 5.3-2.

6.2.1. precipRate (Group)

(1) count

Type	Array		Unit
4-byte integer	G1	ltL * lnL * chn * hgt * rt * st	N/A
	G2	ltH * lnH * chn * hgt * rt	

Count

Missing Value:

-9999

(2) mean

Type	Array		Unit
4-byte float	G1	ltL * lnL * chn * hgt * rt * st	N/A
	G2	ltH * lnH * chn * hgt * rt	

mean

Missing Value:

-9999.9

(3) stdev

Type	Array		Unit
4-byte float	G1	ltL * lnL * chn * hgt * rt * st	N/A
	G2	ltH * lnH * chn * hgt * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * chn * hgt * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.2. rainRate (Group)

(1) count

Type	Array		Unit
4-byte integer	G1	ltL * lnL * chn * hgt * rt * st	N/A
	G2	ltH * lnH * chn * hgt * rt	

Count

Missing Value:

-9999

(2) mean

Type	Array		Unit
4-byte float	G1	ltL * lnL * chn * hgt * rt * st	N/A
	G2	ltH * lnH * chn * hgt * rt	

mean

Missing Value:

-9999.9

(3) stdev

Type	Array		Unit
4-byte float	G1	ltL * lnL * chn * hgt * rt * st	N/A
	G2	ltH * lnH * chn * hgt * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * chn * hgt * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.3. snowRate (Group)

(1) count

Type		Array	Unit
4-byte integer	G1	ltL * lnL * chn * hgt * rt * st	N/A
	G2	ltH * lnH * chn * hgt * rt	

Count

Missing Value:

-9999

(2) mean

Type		Array	Unit
4-byte float	G1	ltL * lnL * chn * hgt * rt * st	N/A
	G2	ltH * lnH * chn * hgt * rt	

mean

Missing Value:

-9999.9

(3) stdev

Type		Array	Unit
4-byte float	G1	ltL * lnL * chn * hgt * rt * st	N/A
	G2	ltH * lnH * chn * hgt * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * chn * hgt * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.4. mixedPhRate (Group)

(1) count

Type		Array	Unit
4-byte integer	G1	ltL * lnL * chn * hgt * rt * st	N/A
	G2	ltH * lnH * chn * hgt * rt	

Count

Missing Value:

-9999

(2) mean

Type		Array	Unit
4-byte float	G1	ltL * lnL * chn * hgt * rt * st	N/A
	G2	ltH * lnH * chn * hgt * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type		Array	Unit
4-byte float	G1	ltL * lnL * chn * hgt * rt * st	N/A
	G2	ltH * lnH * chn * hgt * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * chn * hgt * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.5. precipRateESurface (Group)

(1) count

Type	Array		Unit
4-byte integer	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Count

Missing Value:

-9999

(2) mean

Type	Array		Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type	Array		Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * chn * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.6. precipRateESurface2 (Group)

(1) count

Type		Array	Unit
4-byte integer	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Count

Missing Value:

-9999

(2) mean

Type		Array	Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type		Array	Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * chn * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.7. precipRateNearSurface (Group)

(1) count

Type		Array	Unit
4-byte integer	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Count

Missing Value:

-9999

(2) mean

Type		Array	Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type		Array	Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * chn * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.8. rainRateNearSurface (Group)

(1) count

Type		Array	Unit
4-byte integer	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Count

Missing Value:

-9999

(2) mean

Type		Array	Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type		Array	Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * chn * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.9. snowRateNearSurface (Group)

(1) count

Type		Array	Unit
4-byte integer	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Count

Missing Value:

-9999

(2) mean

Type		Array	Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type		Array	Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * chn * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.10. mixedPhRateNearSurface (Group)

(1) count

Type	Array		Unit
4-byte integer	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Count

Missing Value:

-9999

(2) mean

Type	Array		Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type	Array		Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * chn * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.11. precipWaterIntegrated (Group)

(1) count

Type		Array	Unit
4-byte integer	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Count

Missing Value:

-9999

(2) mean

Type		Array	Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type		Array	Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * chn * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.12. precipIceIntegrated (Group)

(1) count

Type	Array		Unit
4-byte integer	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Count

Missing Value:

-9999

(2) mean

Type	Array		Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type	Array		Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * chn * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.13. precipRateAve24 (Group)

(1) count

Type		Array	Unit
4-byte integer	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Count

Missing Value:

-9999

(2) mean

Type		Array	Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type		Array	Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * chn * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.14. zFactorCorrected (Group)

(1) count

Type	Array		Unit
4-byte integer	G1	ltL * lnL * inst * hgt * rt * st	N/A
	G2	ltH * lnH * inst * hgt * rt	

Count

Missing Value:

-9999

(2) mean

Type	Array		Unit
4-byte float	G1	ltL * lnL * inst * hgt * rt * st	N/A
	G2	ltH * lnH * inst * hgt * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type	Array		Unit
4-byte float	G1	ltL * lnL * inst * hgt * rt * st	N/A
	G2	ltH * lnH * inst * hgt * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * inst * hgt * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.15. zFactorCorrectedESurface (Group)

(1) count

Type		Array	Unit
4-byte integer	G1	ltL * lnL * inst * rt * st	N/A
	G2	ltH * lnH * inst * rt	

Count

Missing Value:

-9999

(2) mean

Type		Array	Unit
4-byte float	G1	ltL * lnL * inst * rt * st	N/A
	G2	ltH * lnH * inst * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type		Array	Unit
4-byte float	G1	ltL * lnL * inst * rt * st	N/A
	G2	ltH * lnH * inst * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * inst * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.16. zFactorCorrectedNearSurface (Group)

(1) count

Type		Array	Unit
4-byte integer	G1	ltL * lnL * inst * rt * st	N/A
	G2	ltH * lnH * inst * rt	

Count

Missing Value:

-9999

(2) mean

Type		Array	Unit
4-byte float	G1	ltL * lnL * inst * rt * st	N/A
	G2	ltH * lnH * inst * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type		Array	Unit
4-byte float	G1	ltL * lnL * inst * rt * st	N/A
	G2	ltH * lnH * inst * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * inst * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.17. zFactorCorrectedDPR (Group)

(1) count

Type	Array		Unit
4-byte integer	G1	ltL * lnL * inst * hgt * rt * st	N/A
	G2	ltH * lnH * inst * hgt * rt	

Count

Missing Value:

-9999

(2) mean

Type	Array		Unit
4-byte float	G1	ltL * lnL * inst * hgt * rt * st	N/A
	G2	ltH * lnH * inst * hgt * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type	Array		Unit
4-byte float	G1	ltL * lnL * inst * hgt * rt * st	N/A
	G2	ltH * lnH * inst * hgt * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * inst * hgt * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.18. zFactorCorrectedESurfaceDPR (Group)

(1) count

Type	Array		Unit
4-byte integer	G1	ltL * lnL * inst * rt * st	N/A
	G2	ltH * lnH * inst * rt	

Count

Missing Value:

-9999

(2) mean

Type	Array		Unit
4-byte float	G1	ltL * lnL * inst * rt * st	N/A
	G2	ltH * lnH * inst * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type	Array		Unit
4-byte float	G1	ltL * lnL * inst * rt * st	N/A
	G2	ltH * lnH * inst * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * inst * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.19. zFactorCorrectedNearSurfaceDPR (Group)

(1) count

Type	Array		Unit
4-byte integer	G1	ltL * lnL * inst * rt * st	N/A
	G2	ltH * lnH * inst * rt	

Count

Missing Value:

-9999

(2) mean

Type	Array		Unit
4-byte float	G1	ltL * lnL * inst * rt * st	N/A
	G2	ltH * lnH * inst * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type	Array		Unit
4-byte float	G1	ltL * lnL * inst * rt * st	N/A
	G2	ltH * lnH * inst * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * inst * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.20. zFactorMeasured (Group)

(1) count

Type	Array		Unit
4-byte integer	G1	ltL * lnL * inst * hgt * rt * st	N/A
	G2	ltH * lnH * inst * hgt * rt	

Count

Missing Value:

-9999

(2) mean

Type	Array		Unit
4-byte float	G1	ltL * lnL * inst * hgt * rt * st	N/A
	G2	ltH * lnH * inst * hgt * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type	Array		Unit
4-byte float	G1	ltL * lnL * inst * hgt * rt * st	N/A
	G2	ltH * lnH * inst * hgt * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * inst * hgt * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.21. dm (Group)

(1) count

Type		Array	Unit
4-byte integer	G1	ltL * lnL * hgt * rt * st	N/A
	G2	ltH * lnH * hgt * rt	

Count

Missing Value:

-9999

(2) mean

Type		Array	Unit
4-byte float	G1	ltL * lnL * hgt * rt * st	N/A
	G2	ltH * lnH * hgt * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type		Array	Unit
4-byte float	G1	ltL * lnL * hgt * rt * st	N/A
	G2	ltH * lnH * hgt * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * hgt * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.22. dBNw (Group)

(1) count

Type		Array	Unit
4-byte integer	G1	ltL * lnL * hgt * rt * st	N/A
	G2	ltH * lnH * hgt * rt	

Count

Missing Value:

-9999

(2) mean

Type		Array	Unit
4-byte float	G1	ltL * lnL * hgt * rt * st	N/A
	G2	ltH * lnH * hgt * rt	

mean.

Missing Value:

-9999.9

(3) stdev

Type		Array	Unit
4-byte float	G1	ltL * lnL * hgt * rt * st	N/A
	G2	ltH * lnH * hgt * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * hgt * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.23. epsilonDPR (Group)

(1) count

Type	Array		Unit
4-byte integer	G1	ltL * lnL * inst * hgt * rt * st	N/A
	G2	ltH * lnH * inst * hgt * rt	

Count

Missing Value:

-9999

(2) mean

Type	Array		Unit
4-byte float	G1	ltL * lnL * inst * hgt * rt * st	N/A
	G2	ltH * lnH * inst * hgt * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type	Array		Unit
4-byte float	G1	ltL * lnL * inst * hgt * rt * st	N/A
	G2	ltH * lnH * inst * hgt * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * inst * hgt * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.24. epsilon (Group)

(1) count

Type	Array		Unit
4-byte integer	G1	ltL * lnL * inst * rt * st	N/A
	G2	ltH * lnH * inst * rt	

Count

Missing Value:

-9999

(2) mean

Type	Array		Unit
4-byte float	G1	ltL * lnL * inst * rt * st	N/A
	G2	ltH * lnH * inst * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type	Array		Unit
4-byte float	G1	ltL * lnL * inst * rt * st	N/A
	G2	ltH * lnH * inst * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * inst * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.25. piaSRT (Group)

(1) count

Type	Array		Unit
4-byte integer	G1	ltL * lnL * inst * ang * rt * st	N/A
	G2	ltH * lnH * inst * ang * rt	

Count

Missing Value:

-9999

(2) mean

Type	Array		Unit
4-byte float	G1	ltL * lnL * inst * ang * rt * st	N/A
	G2	ltH * lnH * inst * ang * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type	Array		Unit
4-byte float	G1	ltL * lnL * inst * ang * rt * st	N/A
	G2	ltH * lnH * inst * ang * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * inst * ang * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.26. piaSRTdpr (Group)

(1) count

Type		Array	Unit
4-byte integer	G1	ltL * lnL * inst * ang * rt * st	N/A
	G2	ltH * lnH * inst * ang * rt	

Count

Missing Value:

-9999

(2) mean

Type		Array	Unit
4-byte float	G1	ltL * lnL * inst * ang * rt * st	N/A
	G2	ltH * lnH * inst * ang * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type		Array	Unit
4-byte float	G1	ltL * lnL * inst * ang * rt * st	N/A
	G2	ltH * lnH * inst * ang * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * inst * ang * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.27. piaFinal (Group)

(1) count

Type	Array		Unit
4-byte integer	G1	ltL * lnL * inst * ang * rt * st	N/A
	G2	ltH * lnH * inst * ang * rt	

Count

Missing Value:

-9999

(2) mean

Type	Array		Unit
4-byte float	G1	ltL * lnL * inst * ang * rt * st	N/A
	G2	ltH * lnH * inst * ang * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type	Array		Unit
4-byte float	G1	ltL * lnL * inst * ang * rt * st	N/A
	G2	ltH * lnH * inst * ang * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * inst * ang * rt * st * bin	N/A

Histogram. This element does not exist in G2

Missing Value:

-9999

6.2.28. piaFinalDPR (Group)

(1) count

Type		Array	Unit
4-byte integer	G1	ltL * lnL * inst * ang * rt * st	N/A
	G2	ltH * lnH * inst * ang * rt	

Count

Missing Value:

-9999

(2) mean

Type		Array	Unit
4-byte float	G1	ltL * lnL * inst * ang * rt * st	N/A
	G2	ltH * lnH * inst * ang * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type		Array	Unit
4-byte float	G1	ltL * lnL * inst * ang * rt * st	N/A
	G2	ltH * lnH * inst * ang * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * inst * ang * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.29. piaFinalSubset (Group)

(1) count

Type	Array	Unit
4-byte integer	ltL * lnL * inst * ang * rt * st	N/A

Count

Missing Value:

-9999

(2) mean

Type	Array	Unit
4-byte float	ltL * lnL * inst * ang * rt * st	N/A

Mean

Missing Value:

-9999.9

(3) stdev

Type	Array	Unit
4-byte float	ltL * lnL * inst * ang * rt * st	N/A

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * inst * ang * rt * st * bin	N/A

Histogram

Missing Value:

-9999

6.2.30. piaFinalDPRSubset (Group)

(1) count

Type	Array	Unit
4-byte integer	ltL * lnL * inst * ang * rt * st	N/A

Count

Missing Value:

-9999

(2) mean

Type	Array	Unit
4-byte float	ltL * lnL * inst * ang * rt * st	N/A

Mean

Missing Value:

-9999.9

(3) stdev

Type	Array	Unit
4-byte float	ltL * lnL * inst * ang * rt * st	N/A

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL * inst * ang * rt * st * bin	N/A

Histogram

Missing Value:

-9999

6.2.31. heightBB (Group)

(1) count

Type		Array	Unit
4-byte integer	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Count

Missing Value:

-9999

(2) mean

Type		Array	Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type		Array	Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL *chn * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.32. heightBBnadir (Group)

(1) count

Type	Array	Unit
4-byte integer	ltL * lnL *chn * rt * st	N/A

Count

Missing Value:

-9999

(2) mean

Type	Array	Unit
4-byte float	ltL * lnL *chn * rt * st	N/A

Mean

Missing Value:

-9999.9

(3) stdev

Type	Array	Unit
4-byte float	ltL * lnL *chn * rt * st	N/A

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL *chn * rt * st * bin	N/A

Histogram

Missing Value:

-9999

6.2.33. BBwidthNadir (Group)

(1) count

Type	Array	Unit
4-byte integer	ltL * lnL *chn * rt * st	N/A

Count

Missing Value:

-9999

(2) mean

Type	Array	Unit
4-byte float	ltL * lnL *chn * rt * st	N/A

Mean

Missing Value:

-9999.9

(3) stdev

Type	Array	Unit
4-byte float	ltL * lnL *chn * rt * st	N/A

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL *chn * rt * st * bin	N/A

Histogram

Missing Value:

-9999

6.2.34. heightStormTop (Group)

(1) count

Type	Array		Unit
4-byte integer	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Count

Missing Value:

-9999

(2) mean

Type	Array		Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type	Array		Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL *chn * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.35. BBwidth (Group)

(1) count

Type	Array		Unit
4-byte integer	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Count

Missing Value:

-9999

(2) mean

Type	Array		Unit
4-byte flaot	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Mean

Missing Value:

-9999.9

(3) stdev

Type	Array		Unit
4-byte float	G1	ltL * lnL * chn * rt * st	N/A
	G2	ltH * lnH * chn * rt	

Standard Deviation

Missing Value:

-9999.9

(4) hist

Type	Array	Unit
4-byte integer	ltL * lnL *chn * rt * st * bin	N/A

Histogram. This element does not exist in G2.

Missing Value:

-9999

6.2.36. observationCounts (Group)

(1) total

Type	Array		Unit
4-byte integer	G1	ltL * lnL * inst * st	N/A
	G2	ltH * lnH * inst	

Total Count

Missing Value:

-9999

(2) localTime

Type	Array	Unit
4-byte integer	ltL * lnL *inst * tim* st	N/A

Observation Time. This element does not exist in G2.

Missing Value:

-9999.9

(3) pia

Type	Array		Unit
4-byte integer	G1	ltL * lnL *inst * ang * st	N/A
	G2	ltH * lnH * inst * ang	

Observe PIA。

Missing Value:

-9999.9

(4) shallowRain

Type	Array		Unit
4-byte integer	G1	ltL * lnL *inst * st	N/A
	G2	ltH * lnH * inst	

obs time

Missing Value:

-9999

6.2.37. precipRateLocalTime (Group)

(1) count

Type	Array	Unit
4-byte integer	ltL * lnL *chn * tim * st	N/A

Count

Missing Value:

-9999

(2) mean

Type	Array	Unit
4-byte float	ltL * lnL *chn * tim * st	N/A

Mean

Missing Value:

-9999.9

(3) stdev

Type	Array	Unit
4-byte float	ltL * lnL *chn * tim * st	N/A

Standard Deviation

Missing Value:

-9999.9

6.2.38. precipRateNearSurfaceUnconditional

(1) precipRateNearSurfaceUnconditional

Type	Array		Unit
4-byte	G1	ltL * lnL *chn	N/A
float	G2	ltH * lnH * chn	

Rain, not conditioned on rain

Missing Value:

-9999.9

6.2.39. precipProbabilityNearSurface

(1) precipProbabilityNearSurface

Type	Array		Unit
4-byte	G1	ltL * lnL * chn	N/A
float	G2	ltH * lnH * chn	

Probability

Missing Value:

-9999.9

6.2.40. precipRateMean

(1) precipRateMean

Type	Array	Unit
4-byte float	nlat * nlon * nalt * chd * AD	mm/hr

Mean Precipitation rate, includes both liquid and solid phases at various height levels.

First index is Ascending node, second index is Descending.

Missing Value:

-9999.9

6.2.41. rainRateMean

(1) rainRateMean

Type	Array	Unit
4-byte float	nlat * nlon * nalt * chd * AD	mm/hr

Mean rainfall rate, excludes solid precipitation at various height levels.

First index is Ascending node, second index is Descending.

Missing Value:

-9999.9

6.2.42. mixedRateMean

(1) mixedRateMean

Type	Array	Unit
4-byte float	nlat * nlon * nalt * chd * AD	mm/hr

Mean rainfall rate of the mixed phase precipitation at various height levels. First index is Ascending node, second index is Descending.

Missing Value:

-9999.9

6.2.43. snowRateMean

(1) snowRateMean

Type	Array	Unit
4-byte float	nlat * nlon * nalt * chd * AD	mm/hr

Mean rainfall rate of solid precipitation at various height levels. First index is Ascending node, second index is Descending.

Missing Value:

-9999.9

6.2.44. precipRateNearSurfMean

(1) precipRateNearSurfMean

Type	Array	Unit
4-byte float	nlat * nlon * chd * AD	mm/hr

Mean precipitation rate in a grid box using only the Near Surface location along the slant path for each radar ray. First index is Ascending node, second index is Descending.

Missing Value:

-9999.9

6.2.45. rainRateNearSurfMean

(1) rainRateNearSurfMean

Type	Array	Unit
4-byte float	nlat * nlon * chd * AD	mm/hr

Mean rainfall rate of liquid precipitation in a grid box using only the Near Surface location along the slant path for each radar ray. First index is Ascending node, second index is Descending.

Missing Value:

-9999.9

6.2.46. mixedRateNearSurfMean

(1) mixedRateNearSurfMean

Type	Array	Unit
4-byte float	nlat * nlon * chd * AD	mm/hr

Mean rainfall rate of mixed phase precipitation in a grid box using only the Near Surface location along the slant path for each radar ray. First index is Ascending node, second index is Descending.

Missing Value:

-9999.9

6.2.47. snowRateNearSurfMean

(1) snowRateNearSurfMean

Type	Array	Unit
4-byte float	nlat * nlon * chd * AD	mm/hr

Mean rainfall rate of solid precipitation in a grid box using only the Near Surface location along the slant path for each radar ray. First index is Ascending node, second index is Descending.

Missing Value:

-9999.9

6.2.48. precipRateESurfMean

(1) precipRateESurfMean

Type	Array	Unit
4-byte float	nlat * nlon * chd * AD	mm/hr

Mean precipitation rate in a grid box using only the Estimated Surface location along the slant path for each radar ray. First index is Ascending node, second index is Descending.

Missing Value:

-9999.9

6.2.49. precipRateESurf2Mean

(1) precipRateESurf2Mean

Type	Array	Unit
4-byte float	nlat * nlon * chd * AD	mm/hr

Mean precipitation rate in a grid box using only the Estimated Surface 2 location along the slant path for each radar ray.

First index is Ascending node, second index is Descending.

Missing Value:

-9999.9

6.2.50. totalPix

(1) totalPix

Type	Array	Unit
2-byte integer	nlat * nlon * chd * AD	N/A

The total number of measurements in each grid box. First index is Ascending node, second index is Descending.

Missing Value:

-9999

6.2.51. precipPix

(1) precipPix

Type	Array	Unit
2-byte integer	nlat * nlon * nalt * chd * AD	N/A

The number of measurements in each grid box that included detectable precipitation at various height levels. First index is Ascending node, second index is Descending.

Missing Value:

-9999

6.2.52. precipPixNearSurf

(1) precipPixNearSurf

Type	Array	Unit
2-byte integer	nlat * nlon * chd * AD	N/A

The number of measurements in a grid box that included detectable precipitation at the Near Surface level. First index is Ascending node, second index is Descending.

Missing Value:

-9999

6.2.53. precipPixESurf

(1) precipPixESurf

Type	Array	Unit
2-byte integer	nlat * nlon * chd * AD	N/A

The number of measurements in a grid box that included detectable precipitation at the Estimated Surface level. First index is Ascending node, second index is Descending.

Missing Value:

-9999

6.2.54. convPrecipRateMean

(1) convPrecipRateMean

Type	Array	Unit
4-byte float	nlat * nlon * nalt * chd * AD	mm/hr

The mean precipitation rate of convective type at various height levels. First index is Ascending node, second index is Descending.

Missing Value:

-9999.9

6.2.55. convPrecipRateNearSurfMean

(1) convPrecipRateNearSurfMean

Type	Array	Unit
4-byte float	nlat * nlon * chd * AD	mm/hr

The mean precipitation rate of convective type at the Near Surface level along the radar ray. First index is Ascending node, second index is Descending.

Missing Value:

-9999.9

6.2.56. convPrecipRateESurfMean

(1) convPrecipRateESurfMean

Type	Array	Unit
4-byte float	nlat * nlon * chd * AD	mm/hr

The mean precipitation rate of convective type at the Estimated Surface level along the radar ray. First index is Ascending node, second index is Descending.

Missing Value:

-9999.9

6.2.57. convPrecipPixNearSurf

(1) convPrecipPixNearSurf

Type	Array	Unit
2-byte integer	nlat * nlon * chd * AD	N/A

The number of convective precipitation measurements in a grid box at the Near Surface level. First index is Ascending node, second index is Descending.

Missing Value:

-9999

6.2.58. stratPrecipRateMean

(1) stratPrecipRateMean

Type	Array	Unit
4-byte float	nlat * nlon * chd * nalt * AD	mm/hr

The mean precipitation rate of stratiform type at various height levels. First index is Ascending node, second index is Descending.

Missing Value:

-9999.9

6.2.59. stratPrecipRateNearSurfMean

(1) stratPrecipRateNearSurfMean

Type	Array	Unit
4-byte float	nlat * nlon * chd * AD	mm/hr

The mean precipitation rate of stratiform type at the Near Surface level along the radar ray. First index is Ascending node, second index is Descending.

Missing Value:

-9999.9

6.2.60. stratPrecipRateESurfMean

(1) stratPrecipRateESurfMean

Type	Array	Unit
4-byte float	nlat * nlon * chd * AD	mm/hr

The mean precipitation rate of stratiform type at the Estimated Surface level along the radar ray. First index is Ascending node, second index is Descending.

Missing Value:

-9999.9

6.2.61. stratPrecipPixNearSurf

(1) stratPrecipPixNearSurf

Type	Array	Unit
2-byte integer	nlat * nlon * chd * AD	N/A

The number of stratiform precipitation measurements in a grid box at the Near Surface level. First index is Ascending node, second index is Descending.

Missing Value:

-9999

6.2.62. bbHtMean

(1) bbHtMean

Type	Array	Unit
4-byte float	nlat * nlon * chd * AD	m

The mean bright band height in a grid box. First index is Ascending node, second index is Descending.

Missing Value:

-9999.9

6.2.63. stormHtMean

(1) stormHtMean

Type	Array	Unit
4-byte float	nlat * nlon * chd * AD	m

The mean storm height in a grid box. First index is Ascending node, second index is Descending.

Missing Value:

-9999.9

6.2.64. phase

(1) phase

Type	Array	Unit
2-byte integer	nlat * nlon * nalt * nvar * chd * AD	N/A

The precipitation phase type in a grid box a various heights. First index is Ascending node, second index is Descending.

Missing Value:

-9999.9

6.2.65. phaseNearSurf

(1) phaseNearSurf

Type	Array	Unit
2-byte integer	nlat * nlon * nvar * chd * AD	N/A

The precipitation phase type in a grid box. First index is Ascending node, second index is Descending.

Missing Value:

-9999

6.2.66. GridTimeAsc (Group)

(1) Year

Type	Array	Unit
2-byte integer	nlat * nlon	year

4-digit year, e.g., 1998. Values range from 1950 to 2100 years.

Missing Value:

-9999

(2) Month

Type	Array	Unit
1-byte integer	nlat * nlon	month

Month of the year. Values range from 1 to 12 months.

Missing Value:

-99

(3) DayOfMonth

Type	Array	Unit
1-byte integer	nlat * nlon	day

Day of the month. Values range from 1 to 31 days.

Missing Value:

-99

(4) Hour

Type	Array	Unit
1-byte integer	nlat * nlon	hour

UTC hour of the day. Values range from 0 to 23 hours.

Missing Value:

-99

(5) Minute

Type	Array	Unit
1-byte integer	nlat * nlon	minute

Minute of the hour. Values range from 0 to 59 minutes.

Missing Value:

-99

(6) Second

Type	Array	Unit
1-byte integer	nlat * nlon	s

Second of the minute. Values range from 0 to 60 s.

Missing Value:

-99

(7) MilliSecond

Type	Array	Unit
2-byte integer	nlat * nlon	ms

Thousandths of the second. Values range from 0 to 999 ms.

Missing Value:

-9999

(8) DayOfYear

Type	Array	Unit
2-byte integer	nlat * nlon	day

Day of the year. Values range from 1 to 366 days.

Missing Value:

-9999

6.2.67. GridTimeDes (Group)

(1) Year

Type	Array	Unit
2-byte integer	nlat * nlon	year

4-digit year, e.g., 1998. Values range from 1950 to 2100 years.

Missing Value:

-9999

(2) Month

Type	Array	Unit
1-byte integer	nlat * nlon	Month

Month of the year. Values range from 1 to 12 months.

Missing Value:

-99

(3) DayOfMonth

Type	Array	Unit
1-byte integer	nlat * nlon	day

Day of the month. Values range from 1 to 31 days.

Missing Value:

-99

(4) Hour

Type	Array	Unit
1-byte integer	nlat * nlon	hour

UTC hour of the day. Values range from 0 to 23 hours.

Missing Value:

-99

(5) Minute

Type	Array	Unit
1-byte integer	nlat * nlon	minute

Minute of the hour. Values range from 0 to 59 minutes.

Missing Value:

-99

(6) Second

Type	Array	Unit
1-byte integer	nlat * nlon	s

Second of the minute. Values range from 0 to 60 s.

Missing Value:

-99

(7) MilliSecond

Type	Array	Unit
2-byte integer	nlat * nlon	ms

Thousandths of the second. Values range from 0 to 999 ms.

Missing Value:

-9999

(8) DayOfYear

Type	Array	Unit
2-byte integer	nlat * nlon	day

Day of the year. Values range from 1 to 366 days.

Missing Value:

-9999

7. Level 3 (Text) Data Format

7.1. Record Structure for Level 3 (Text) data

The level 3(Text) data are stored away with the record structure such as the table below by a text file.

Table7.1-1 Record structure of level 3 (Text) data

Header (1 line)	Record 1
Data (N lines)	Record 1
	Record 2
	…
	…
	Record N

7.2. Header Structure for Level 3 (Text) data

The header strucuture for level 3 (Text) contains like the table below in one line.

Table7.2-1 Header Structure of level 3 (Text) data

No.	Item	Contents
1	Longitude	“Lon” Fixed string
2	Separator	", "(one comma + single-byte spaces). Applies to all separators below.
3	Latitude	“Lat” Fixed string
4	Separator	
5	Precipitation intensity of surface	“precip” Fixed string
6	Separator	
7	Hour	“H” Fixed string
8	Separator	
9	Minute	“M” Fixed string
10	Separator	
11	A/D flag	“A_or_D” Fixed string
12	Line break	0x0A

7.3. Data Strucure for Level 3 (Text) data

The data strucuture for level 3 (Text) contains like the table below in N line.

Table7.3-1 Data structure of level 3 (Text) data

No.	Item	Contents
1	Longitude	NNN.NN Arbitrary real number of 2 decimal places Unit：degree
2	Separator	","(one comma). Applies to all separators below.
3	Latitude	(-)NN.NN Arbitrary real number of 2 decimal places Unit：degree
4	Separator	
5	Precipitation intensity of surface	NNN.NN Arbitrary real number of 2 decimal places Unit：mm/hr
6	Separator	
7	Hour	HH Arbitrary integer(00-23) Unit：Hour(UTC)
8	Separator	
9	Minute	MM Arbitrary integer(00-59) Unit：Minute(UTC)
10	Separator	
13	A/D flag	X “A” or “D” (A=Ascending D=Descending)
14	Line break	0x0A

8. Level 3 (3GSLH) Data Format Structure

8.1. Dimension definition

Dimension definition:

- nlat
  - 536 Number of high resolution 0.5° grid intervals of latitude from 67°S to 67°N.
- nlon
  - 1440 Number of high resolution 0.5° grid intervals of longitude from 180°W to 180°E.
- nlayer
  - 19 Number of layers at the fixed heights of 0.0-0.5km, 0.5-1km, 1-2km, …, 17-18km

8.2. Data Format Structure for 3GSLH

The Level 3 Gridded SLH products, 3GSLH, is defined as a Spectral Latent Heating of gridded orbit, "Grid".

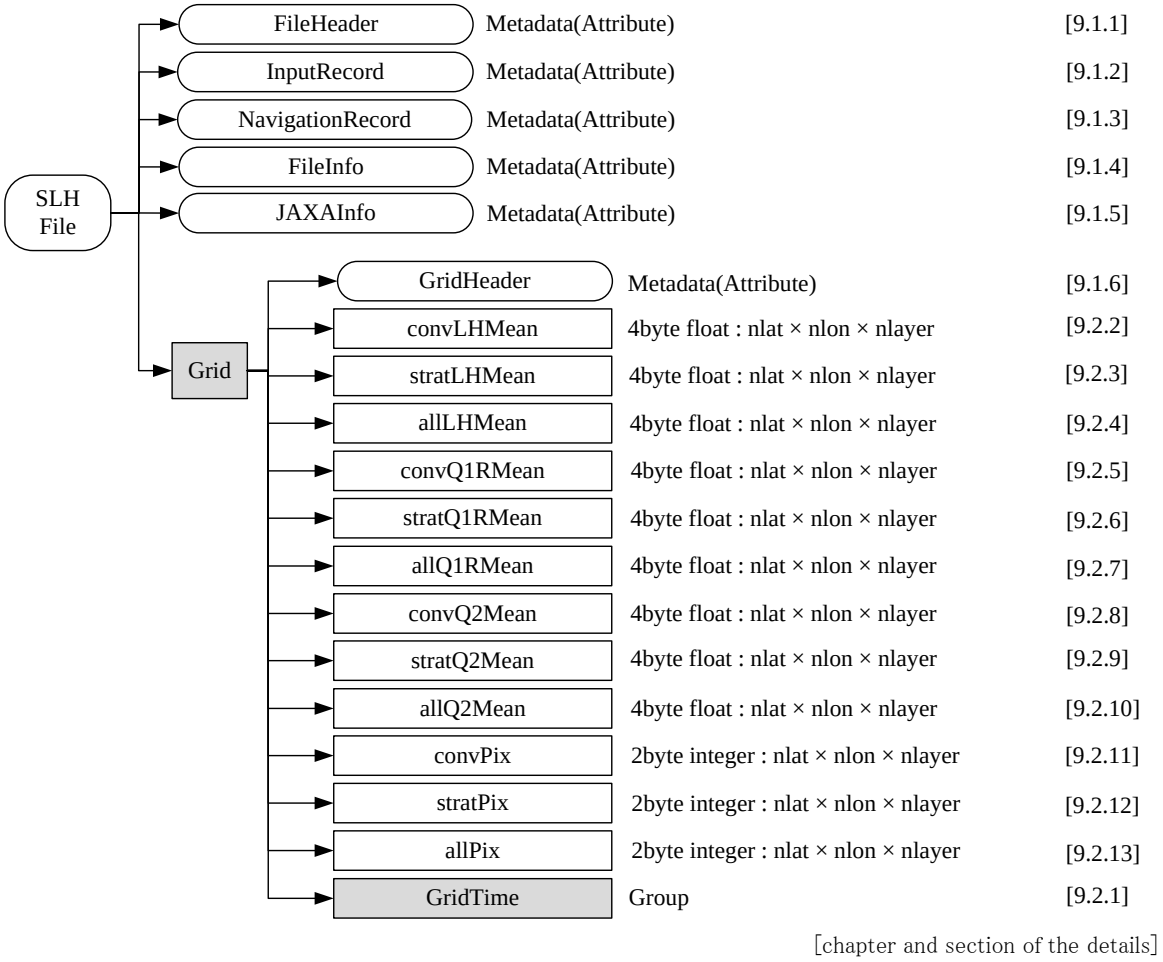


Figure 8.2-1 Data Format Structure for 3GSLH

8.3. Data Format Structure for GridTime

GridTime group's structure is shown in this section.

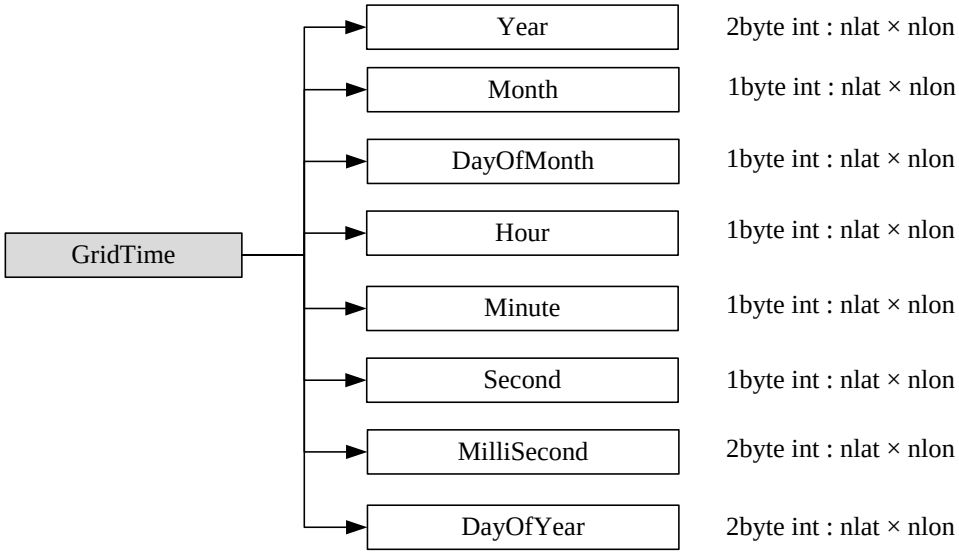


Figure 8.3-1 Data Format Structure for GridTime (3GSLH)

9. Level 3(3GSLH) Contents of Objects in each Group

9.1. Metadata

Metadata has six elements. Figure9.1-1 shows metadata structure. About the 4 elements, FileHeader, FileInfo, JAXAInfo and GridHeader, see the section 6.1. And about other 2 elements, InputRecord and NavigationRecord, see the section 2.1.

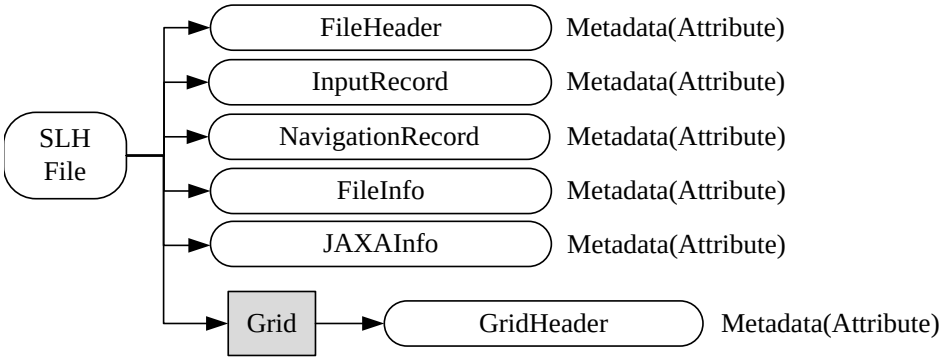


Figure9.1-1 L3GSLH Metadata

9.2. Data Group

9.2.1. convLHMean

(1) convLHMean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Latent Heating: convective conditional mean value.

Value range from - 400 to 400 [K/h].

Missing Value:

-9999.9

9.2.2. stratLHMean

(1) stratLHMean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Latent Heating: Deep stratiform and shallow stratiform of conditional mean value

Value range from – 400 to 400 [K/h].

Missing Value:

-9999.9

9.2.3. allLHMean

(1) allLHMean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Latent heating: all pixel average

Value range from - 400 to 400 [K/h].

Missing Value:

-9999.9

9.2.4. convQ1RMean

(1) convQ1RMean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Q1-QR: convective conditional mean value.

Value range from – 400 to 400 [K/h].

Missing Value:

-9999

9.2.5. stratQ1RMean

(1) stratQ1RMean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Q1-QR: Deep stratiform and shallow stratiform of conditional mean value.

Value range from – 400 to 400 [K/h].

Missing Value:

-9999.9

9.2.6. allQ1RMean

(1) allQ1RMean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Q1-QR: all pixel average.

Value range from - 400 to 400 [K/h].

Missing Value:

-9999.9

9.2.7. convQ2Mean

(1) convQ2Mean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Q2: convective conditional mean value.

Value range from – 400 to 400 [K/h].

Missing Value:

-9999.9

9.2.8. stratQ2Mean

(1) stratQ2Mean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Q2: Deep stratiform and shallow stratiform of conditional mean value.

Value range from – 400 to 400 [K/h].

Missing Value:

-9999.9

9.2.9. allQ2Mean

(1) allQ2Mean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Q2: all pixel average

Value range from - 400 to 400 [K/h]

Missing Value:

-9999.9

9.2.10. convPix

(1) convPix

Type	Array	Unit
2-byte integer	nlat*nlon*nlayer	-

The number of convective pixel in 0.25 degree grid.

Value range from 0 to 500000.

Missing Value:

-9999

9.2.11. stratPix

(1) stratPix

Type	Array	Unit
2-byte integer	nlat*nlon*nlayer	-

The number of pixel of condition for Deep stratiform and shallow stratiform in 0.25 degree grid.

Value range from 0 to 500000.

Missing Value:

-9999

9.2.12. allPix

(1) allPix

Type	Array	Unit
2-byte integer	nlat*nlon*nlayer	-

The number of all pixel in 0.25 degree gird.

Value range from 0 to 500000.

Missing Value:

-9999

9.2.13. GridTime (Group)

(1) Year

Type	Array	Unit
2-byte integer	nlat * nlon	year

4-digit year, e.g., 1998. Value range from 1950 to 2100 years.

Missing Value:

-9999

(2) Month

Type	Array	Unit
1-byte integer	nlat * nlon	Month

Month of the year. Value range from 1 to 12 months.

Missing Value:

-99

(3) DayOfMonth

Type	Array	Unit
1-byte integer	nlat * nlon	day

Day of the month. Values range from 1 to 31 days.

Missing Value:

-99

(4) Hour

Type	Array	Unit
1-byte integer	nlat * nlon	hour

UTC hour of the day. Values range from 0 to 23 hours.

Missing Value:

-99

(5) Minute

Type	Array	Unit
1-byte integer	nlat * nlon	minute

Minute of the hour. Values range from 0 to 59 minutes.

Missing Value:

-99

(6) Second

Type	Array	Unit
1-byte integer	nlat * nlon	s

Second of the minute. Values range from 0 to 60 minuites.

Missing Value:

-99

(7) MilliSecond

Type	Array	Unit
2-byte integer	nlat * nlon	ms

Thousandths of the second. Value range from 0 to 999 ms.

Missing Value:

-9999

(8) DayOfYear

Type	Array	Unit
2-byte integer	nlat * nlon	day

Day of the yaer. Values range from 1 to 366 days.

Missing Value:

-9999

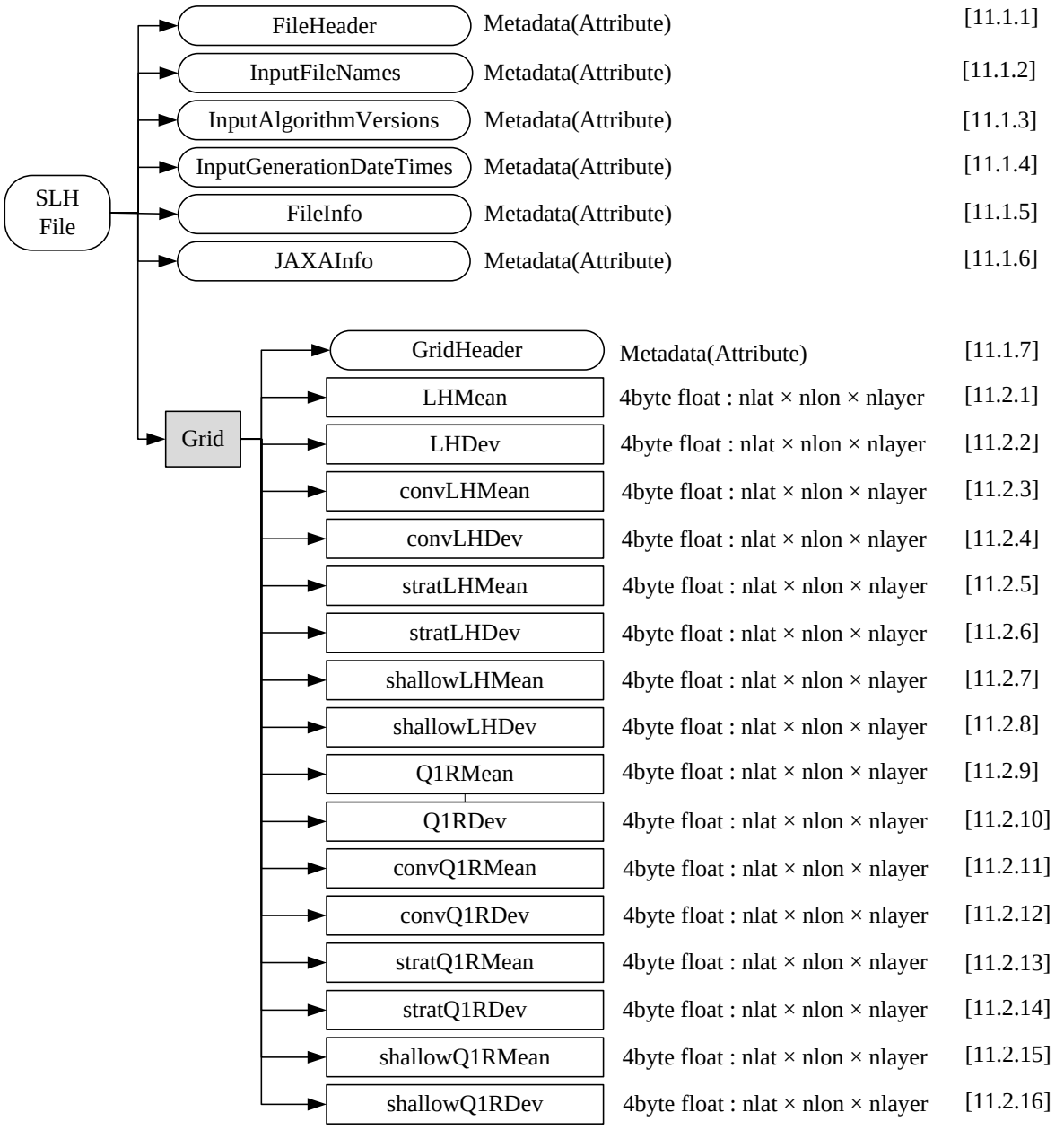
10. Level 3 (3HSLH) Data Format Structure

10.1. Dimension definition

Dimension definitions

- nlat
  - 536 Number of high resolution 0.5° grid intervals of latitude from 67°S to 67°N.
- nlon
  - 1440 Number of high resolution 0.5° grid intervals of longitude from 180°W to 180°E.
- nlayer
  - 19 number of layers at the fixed heights of 0.0-0.5km, 0.5-1km, 1-2km, …, 17-18km

10.2. Data Format Structure for 3HSLH



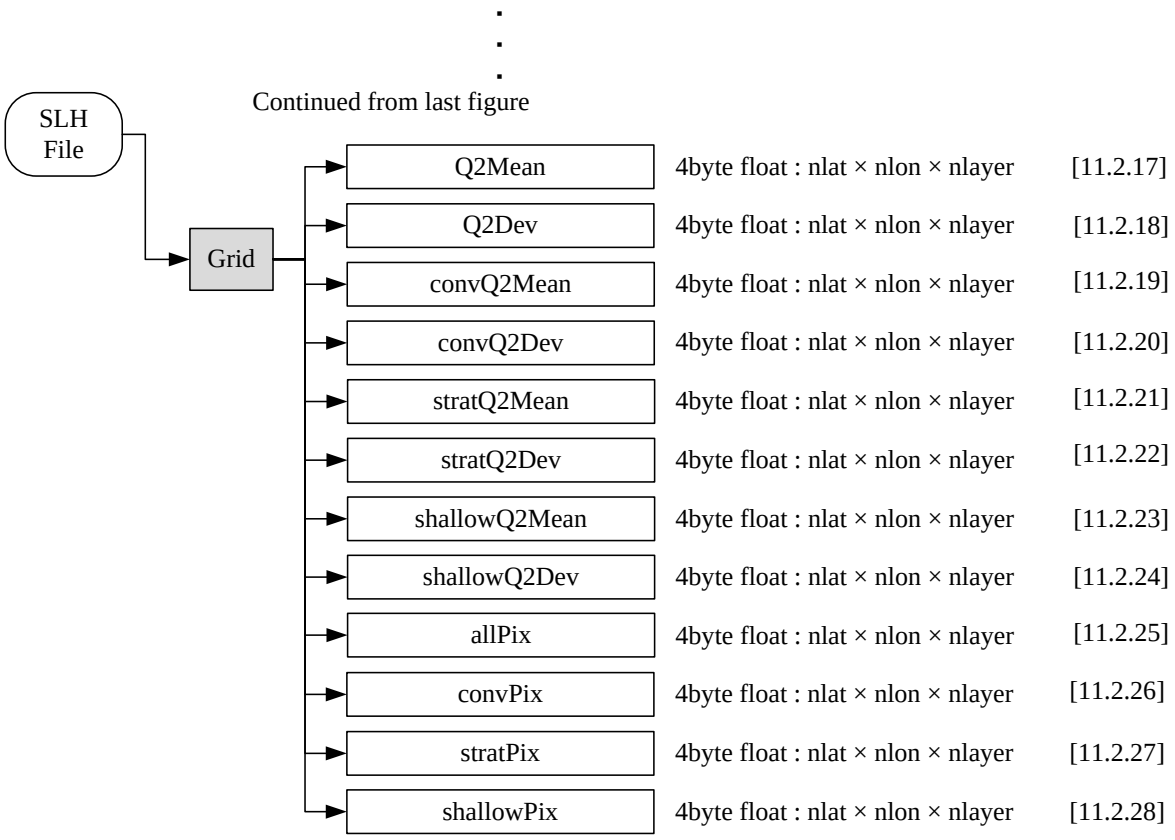


Figure 10.2-1 Data Format Structure for 3HSLH

11. Level 3(3HSLH) Contents of Objects in each Group

11.1. Metadata

Metadata has six elements. Figure11.1-1 shows metadata structure. See Section 6.1 for detail.

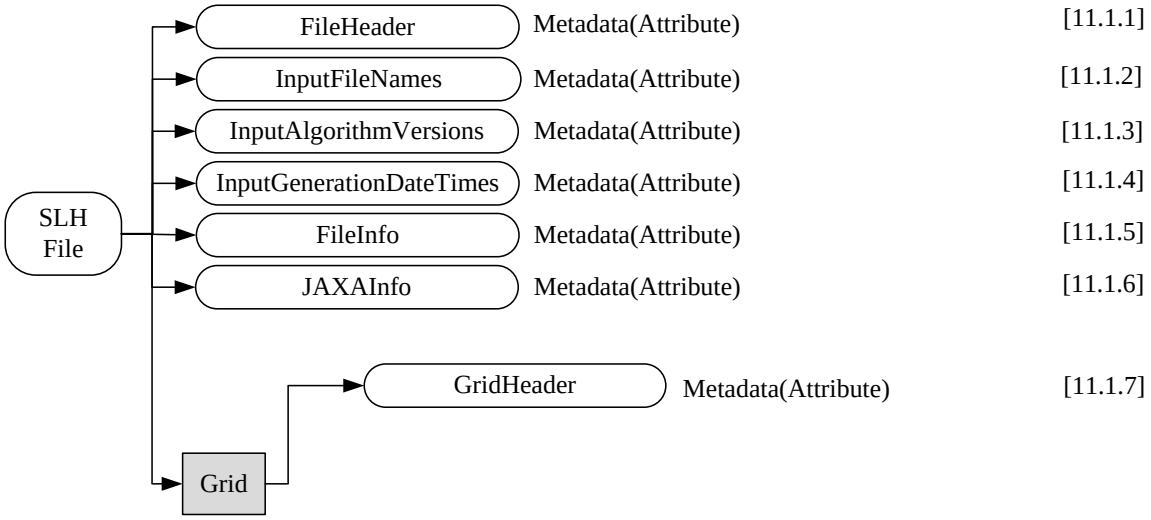


Figure11.1-1　L3 Metadata構成Figure

11.2. Data Group

11.2.1. LHMean

(1) LHMean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional mean value of latent heating

Value range from -50 to 100 [K/hr]

Missing Value:

-9999.9

11.2.2. LHDev

(1) LHDev

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Standard Deviation of latent heating.

Value range from -50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.3. convLHMean

(1) convLHMean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Mean value of convective latent heating

Value range from -50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.4. convLHDev

(1) convLHDev

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Standard Deviation of convective latent heating

Value range from -50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.5. stratLHMean

(1) stratLHMean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Mean Value of deep stratiform latent heating.

Value range from -50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.6. stratLHDev

(1) stratLHDev

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Standard Deviation of deep stratiform latent heating.

Value range from -50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.7. shallowLHMean

(1) shallowLHMean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Mean value of shallow stratiform latent heating.

Value range from -50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.8. shallowLHDev

(1) shallowLHDev

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional standard deviation of shallow stratiform latent heating

Value range from -50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.9. Q1RMean

(1) Q1RMean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Mean value of Q1-QR.

Value range from -50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.10. Q1RDev

(1) Q1RDev

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Standard Deviation of Q1-QR

Value range from -50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.11. convQ1RMean

(1) convQ1RMean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Mean value of convective Q1-QR

Value range from - 50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.12. convQ1RDev

(1) convQ1RDev

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Standard Deviation of convective Q1-QR

Value range from - 50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.13. stratQ1RMean

(1) stratQ1RMean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Mean value of deep stratiform Q1-QR

Value range from – 50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.14. stratQ1RDev

(1) stratQ1RDev

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Standard Deviation of deep stratiform Q1-QR

Value range from – 50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.15. shallowQ1RMean

(1) shallowQ1RMean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Mean value of shallow stratiform Q1-QR

Value range from – 50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.16. shallowQ1RDev

(1) shallowQ1RDev

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Standard Deviation of shallow stratiform Q1-QR

Value range from – 50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.17. Q2Mean

(1) Q2Mean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Mean value of Q2

Value range from – 50 to 100 [K/hr].

Missing Value:

-9999

11.2.18. Q2Dev

(1) Q2Dev

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Standard Deviation of Q2

Value range from – 50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.19. convQ2Mean

(1) convQ2Mean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Mean value of convective Q2

Value range from – 50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.20. convQ2Dev

(1) convQ2Dev

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Standard Deviation of convective Q2

Value range from – 50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.21. stratQ2Mean

(1) stratQ2Mean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Mean value of deep convective Q2

Value range from – 50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.22. stratQ2Dev

(1) stratQ2Dev

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Standard Deviation of deep stratiform Q2

Value range from –50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.23. shallowQ2Mean

(1) shallowQ2Mean

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Mean Value of shallow stratiform Q2

Value range from –50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.24. shallowQ2Dev

(1) shallowQ2Dev

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

Conditional Standard Deviation of shallow stratiform Q2

Value range from – 50 to 100 [K/hr].

Missing Value:

-9999.9

11.2.25. allPix

(1) allPix

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

The number of All pixel

Value range from 0 to 2000000000

Missing Value:

-9999.9

11.2.26. convPix

(1) convPix

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

The number of convective pixel

Value range from 0 to 2000000000.

Missing Value:

-9999.9

11.2.27. stratPix

(1) stratPix

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

The number of Deep Stratiform pixel

Value range from 0 to 2000000000.

Missing Value:

-9999.9

11.2.28. shallowPix

(1) shallowPix

Type	Array	Unit
4-byte float	nlat*nlon*nlayer	-

The number of shallow stratiform pixel

Value range from 0 to 2000000000

Missing Value:

-9999.9

12. The List of Data Group Element

12.1. Data Group Element (2AKu(DU2), NS)

Table 12.1-1 2AKu(DU2) Data Group Element (NS)

Group	Element [Array]	Missing Value (_fillValue)	min	max	Unit	Type
ScanTime	Year [nscan]	-9999	1950	2100	[years]	2-byte integer
	Month [nscan]	-99	1	12	[months]	1-byte integer
	DayOfMonth [nscan]	-99	1	31	[days]	1-byte integer
	Hour [nscan]	-99	0	23	[hours]	1-byte integer
	Minute [nscan]	-99	0	59	[minutes]	1-byte integer
	Second [nscan]	-99	0	60	[s]	1-byte integer
	MilliSecond [nscan]	-9999	0	999	[ms]	2-byte integer
	DayOfYear [nscan]	-9999	1	366	[days]	2-byte integer
	SecondOfDay [nscan]	-9999.9	0	86400	[s]	8-byte float
(N/A)	Latitude [49][nscan]	-9999.9	-90	90	[degrees]	4-byte float
(N/A)	Longitude [49][nscan]	-9999.9	-180	180	[degrees]	4-byte float
scanStatus	dataQuality [nscan]		0x00	0xff		8-bit
	dataWarning [nscan]					1-byte integer

Group	Element [Array]	Missing Value (_fillValue)	min	max	Unit	Type
	Missing [nscan]		0x00	0xff		8-bit
	modeStatus [nscan]		0x00	0xff		8-bit
	geoError [nscan]		0x0000	0xffff		16-bit
	geoWarning [nscan]		0x0000	0xffff		16-bit
	SCorientation [nscan]	-9999				2-byte integer
	pointingStatus [nscan]	-9999				2-byte integer
	acsModeMidScan [nscan]	-99				1-byte integer
	targetSelectionMidScan [nscan]	-99	0	5		1-byte integer
	operationalMode [nscan]		1	20		1-byte integer
	limitErrorFlag [nscan]					1-byte integer
	FractionalGranuleNumber [nscan]	-9999.9	0	100000		8-byte float
navigation	scPos [3][nscan]	-9999.9	-10000000	10000000	[m]	4-byte float
	scVel [3][nscan]	-9999.9	-10000000	10000000	[m/s]	4-byte float
	scLat [nscan]	-9999.9	-70	70	[degrees]	4-byte float
	scLon [nscan]	-9999.9	-180	180	[degrees]	4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	max	Unit	Type
	scAlt [nscan]	-9999.9	350000	500000	[m]	4-byte float
	dprAlt [nscan]	-9999.9	350000	500000	[m]	4-byte float
	scAttRollGeoc [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttPitchGeoc [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttYawGeoc [nscan]	-9999.9	-135	225	[degrees]	4-byte float
	scAttRollGeod [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttPitchGeod [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttYawGeod [nscan]	-9999.9	-135	225	[degrees]	4-byte float
	greenHourAng [nscan]	-9999.9	0	390	[degrees]	4-byte float
	timeMidScan [nscan]	-9999.9	0	10000000000	[s]	8-byte float
	timeMidScanOffset [nscan]	-9999.9	0	100	[s]	8-byte float
PRE	Elevation [49][nscan]	-9999.9			[m]	4-byte float
	landSurfaceType [49][nscan]	-9999	0	399		4-byte integer
	localZenithAngle [49][nscan]	-9999.9			[degrees]	4-byte float
	flagPrecip [49][nscan]	-9999				4-byte integer

Group	Element [Array]	Missing Value (_fillValue)	min	max	Unit	Type
	binRealSurface [49][nscan]	-9999			[range bin number]	2-byte integer
	binStormTop [49][nscan]	-9999			[range bin number]	2-byte integer
	heightStormTop [49][nscan]	-9999.9			[m]	4-byte float
	binClutterFreeBottom [49][nscan]	-9999			[range bin number]	2-byte integer
	sigmaZeroMeasured [49][nscan]	-9999.9			[dB]	4-byte float
	zFactorMeasured [176][49][nscan]	-9999.9			[dBZ]	4-byte float
	ellipsoidBinOffset [49][nscan]	-9999			[m]	4-byte float
	snRatioAtRealSurface [49][nscan]	-9999				4-byte float
	adjustFactor [49][nscan]	-9999.9			[dB]	4-byte float
	snowIceCover [49][nscan]	-99				1-byte integer
VER	binZeroDeg [49][nscan]	-9999			[range bin number]	2-byte integer
	attenuationNP [176][49][nscan]	-9999.9			[dB/km]	4-byte float
	piaNP [4][49][nscan]	-9999.9			[dB]	4-byte float
	sigmaZeroNPCorrected [49][nscan]	-9999.9			[dB]	4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	max	Unit	Type
	heightZeroDeg [49][nscan]	-9999.9			[m]	4-byte float
CSF	flagBB [49][nscan]	-9999				4-byte integer
	binBBPeak [49][nscan]	-9999			[range bin number]	2-byte integer
	binBBTop [49][nscan]	-9999			[range bin number]	2-byte integer
	binBBBottom [49][nscan]	-9999			[range bin number]	2-byte integer
	heightBB [49][nscan]	-9999.9			[m]	4-byte float
	widthBB [49][nscan]	-9999.9			[m]	4-byte float
	qualityBB [49][nscan]	-9999				4-byte integer
	typePrecip [49][nscan]	-9999				4-byte integer
	qualityTypePrecip [49][nscan]	-9999				4-byte integer
	flagShallowRain [49][nscan]	-9999				4-byte integer
	flagHeavyIcePrecip [49][nscan]	-99				1-byte integer
	flagAnvil [49][nscan]	-99				1-byte integer
SRT	PIAalt [6][49][nscan]	-9999.9			[dB]	4-byte float
	RFactorAlt [6][49][nscan]	-9999.9				4-byte float
	PIAweight	-9999.9				4-byte

Group	Element [Array]	Missing Value (_fillValue)	min	max	Unit	Type
	[6][49][nscan]					float
	pathAtten [49][nscan]	-9999.9			[dB]	4-byte float
	reliabFactor [49][nscan]	-9999.9				4-byte float
	reliabFlag [49][nscan]	-9999				2-byte integer
	refScanID [2][2][49][nscan]	-9999			[Number]	2-byte integer
DSD	Phase [176][49][nscan]	255				1-byte char
	binNode [5][49][nscan]	-9999				2-byte integer
Experimental	precipRateESurface2 [49][nscan]	-9999.9			[mm/hr]	4-byte float
	precipRateESurface2 Status [49][nscan]	255				1-byte char
	sigmaZeroProfile [7][49][nscan]	-9999.9			[dB]	4-byte float
	binDEML2 [49][nscan]	-9999			[range bin number]	2-byte integer
SLV	flagSLV [176][49][nscan]	-99				1-byte integer
	binEchoBottom [49][nscan]	-9999				2-byte integer
	piaFinal [49][nscan]	-9999.9			[dB]	4-byte float
	sigmaZeroCorrected [49][nscan]	-9999.9			[dB]	4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	max	Unit	Type
	zFactorCorrected [176][49][nscan]	-9999.9			[dBZ]	4-byte float
	zFactorCorrectedESurface [49][nscan]	-9999.9			[dBZ]	4-byte float
	zFactorCorrectedNearSurface [49][nscan]	-9999.9			[dBZ]	4-byte float
	paramDSD [2][176][49][nscan]	-9999.9				4-byte float
	precipRate [176][49][nscan]	-9999.9			[mm/hr]	4-byte float
	precipWaterIntegrated [2][49][nscan]	-9999.9			[kg/m^2]	4-byte float
	precipRateNearSurface [49][nscan]	-9999.9			[mm/hr]	4-byte float
	precipRateESurface [49][nscan]	-9999.9			[mm/hr]	4-byte float
	precipRateAve24 [49][nscan]	-9999.9			[mm/hr]	4-byte float
	phaseNearSurface [49][nscan]	255				1-byte char
	Epsilon [176][49][nscan]	-9999.9				4-byte float
FLG	flagEcho [176][49][nscan]		0x00	0xff		8-bit
	qualityData [49][nscan]	-9999				4-byte integer
	qualityFlag [49][nscan]					1-byte char

Group	Element [Array]	Missing Value (_fillValue)	min	max	Unit	Type
	flagSensor [nscan]					1-byte integer

12.2. Data Group Element (2AKa(DA2), MS)

Table 12.2-1 2AKa(DA2) Data Group Element (MS)

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
ScanTime	Year [nscan]	-9999	1950	2100	[years]	2-byte integer
	Month [nscan]	-99	1	12	[months]	1-byte integer
	DayOfMonth [nscan]	-99	1	31	[days]	1-byte integer
	Hour [nscan]	-99	0	23	[hours]	1-byte integer
	Minute [nscan]	-99	0	59	[minutes]	1-byte integer
	Second [nscan]	-99	0	60	[s]	1-byte integer
	MilliSecond [nscan]	-9999	0	999	[ms]	2-byte integer
	DayOfYear [nscan]	-9999	1	366	[days]	2-byte integer
	SecondOfDay [nscan]	-9999.9	0	86400	[s]	8-byte float
(N/A)	Latitude [25][nscan]	-9999.9	-90	90	[degrees]	4-byte float
(N/A)	Longitude [25][nscan]	-9999.9	-180	180	[degrees]	4-byte float
scanStatus	dataQuality [nscan]		0x00	0xff		8-bit
	dataWarning [nscan]					1-byte integer

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	Missing [nscan]		0x00	0xff		8-bit
	modeStatus [nscan]		0x00	0xff		8-bit
	geoError [nscan]		0x0000	0xffff		16-bit
	geoWarning [nscan]		0x0000	0xffff		16-bit
	SCorientation [nscan]	-9999				2-byte integer
	pointingStatus [nscan]	-9999				2-byte integer
	acsModeMidScan [nscan]					1-byte integer
	targetSelectionMidScan [nscan]	-99				1-byte integer
	operationalMode [nscan]		1	20		1-byte integer
	limitErrorFlag [nscan]					1-byte integer
	FractionalGranuleNumber [nscan]	-9999.9	0	100000		8-byte float
navigation	scPos [3][nscan]	-9999.9	-1E+07	10000000	[m]	4-byte float
	scVel [3][nscan]	-9999.9	-1E+07	10000000	[m/s]	4-byte float
	scLat [nscan]	-9999.9	-70	70	[degrees]	4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	scLon [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAlt [nscan]	-9999.9	350000	500000	[m]	4-byte float
	dprAlt [nscan]	-9999.9	350000	500000	[m]	4-byte float
	scAttRollGeoc [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttPitchGeoc [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttYawGeoc [nscan]	-9999.9	-135	225	[degrees]	4-byte float
	scAttRollGeod [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttPitchGeod [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttYawGeod [nscan]	-9999.9	-135	225	[degrees]	4-byte float
	greenHourAng [nscan]	-9999.9	0	390	[degrees]	4-byte float
	timeMidScan [nscan]	-9999.9	0	1E+10	[s]	8-byte float
	timeMidScanOffset [nscan]	-9999.9	0	100	[s]	8-byte float
PRE	elevation [25][nscan]	-9999.9			[m]	4-byte float
	landSurfaceType [25][nscan]	-9999	0	399		4-byte integer
	localZenithAngle [25][nscan]	-9999.9			[degrees]	4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	flagPrecip [25][nscan]	-9999				4-byte integer
	binRealSurface [25][nscan]	-9999			[range bin number]	2-byte integer
	binStormTop [25][nscan]	-9999			[range bin number]	2-byte integer
	heightStormTop [25][nscan]	-9999.9			[m]	4-byte float
	binClutterFreeBottom [25][nscan]	-9999			[range bin number]	2-byte integer
	sigmaZeroMeasured [25][nscan]	-9999.9			[dB]	4-byte float
	flagSigmaZeroSaturation [25][nscan]	99				1-byte integer
	zFactorMeasured [176][25][nscan]	-9999.9			[dBZ]	4-byte float
	ellipsoidBinOffset [25][nscan]	-9999			[m]	4-byte float
	snRatioAtRealSurface [25][nscan]	-9999				4-byte float
	adjustFactor [25][nscan]	-9999.9			[dB]	4-byte float
	snowIceCover [25][nscan]	-99				1-byte integer
VER	binZeroDeg [25][nscan]	-9999			[range bin number]	2-byte integer
	attenuationNP [176][25][nscan]	-9999.9			[dB/km]	4-byte float
	piaNP	-9999.9			[dB]	4-byte

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	[4][25][nscan]					float
	sigmaZeroNPCorrected [25][nscan]	-9999.9			[dB]	4-byte float
	heightZeroDeg [25][nscan]	-9999.9			[m]	4-byte float
CSF	flagBB [25][nscan]	-9999				4-byte integer
	binBBPeak [25][nscan]	-9999			[range bin number]	2-byte integer
	binBBTop [25][nscan]	-9999			[range bin number]	2-byte integer
	binBBBottom [25][nscan]	-9999			[range bin number]	2-byte integer
	heightBB [25][nscan]	-9999.9			[m]	4-byte float
	widthBB [25][nscan]	-9999.9			[m]	4-byte float
	qualityBB [25][nscan]	-9999				4-byte integer
	typePrecip [25][nscan]	-9999				4-byte integer
	qualityTypePrecip [25][nscan]	-9999				4-byte integer
	flagShallowRain [25][nscan]	-9999				4-byte integer
	flagHeavyIcePrecip [25][nscan]	-99				1-byte integer
SRT	PIAalt [6][25][nscan]	-9999.9			[dB]	4-byte float
	RFactorAlt	-9999.9				4-byte

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	[6][25][nscan]					float
	PIAweight [6][25][nscan]	-9999.9				4-byte float
	pathAtten [25][nscan]	-9999.9			[dB]	4-byte float
	reliabFactor [25][nscan]	-9999.9				4-byte float
	reliabFlag [25][nscan]	-9999				2-byte integer
	refScanID [2][2][25][nscan]	-9999			[Number]	2-byte integer
DSD	Phase [176][25][nscan]	255				1-byte char
	binNode [5][25][nscan]	-9999				2-byte integer
Experimental	precipRateESurface2 [25][nscan]	-9999.9			[mm/hr]	4-byte float
	precipRateESurface2 Status [25][nscan]	255				1-byte char
	sigmaZeroProfile [7][25][nscan]	-9999.9			[dB]	4-byte float
	seaIceConcentration [25][nscan]	-9999.9			[%]	4-byte float
	binDEML2 [25][nscan]	-9999			[rangebin number]	2-byte integer
SLV	flagSLV [176][25][nscan]	-99				1-byte integer
	binEchoBottom [25][nscan]	-9999				2-byte integer
	piaFinal	-9999.9			[dB]	4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	[25][nscan]					
	sigmaZeroCorrected [25][nscan]	-9999.9			[dB]	4-byte float
	zFactorCorrected [176][25][nscan]	-9999.9			[dBZ]	4-byte float
	zFactorCorrectedESurface [25][nscan]	-9999.9			[dBZ]	4-byte float
	zFactorCorrectedNearSurface [25][nscan]	-9999.9			[dBZ]	4-byte float
	paramDSD [2][176][25][nscan]	-9999.9				4-byte float
	precipRate [176][25][nscan]	-9999.9			[mm/hr]	4-byte float
	precipWaterIntegrated [2][25][nscan]	-9999.9			[kg/m^2]	4-byte float
	precipRateNearSurface [25][nscan]	-9999.9			[mm/hr]	4-byte float
	paramNUBF [25][nscan]	-9999.9				4-byte float
	precipRateESurface [25][nscan]	-9999.9			[mm/hr]	4-byte float
	qualitySLV [25][nscan]	-9999				4-byte integer
	precipRateAve24 [25][nscan]	-9999.9			[mm/hr]	4-byte float
	phaseNearSurface [25][nscan]	255				1-byte char
	epsilon	-9999.9				4-byte

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	[176][25][nscan]					float
FLG	flagEcho [176][25][nscan]		0x00	0xff		8-bit
	qualityData [25][nscan]	-9999				4-byte integer
	qualityFlag [25][nscan]	-99				1-byte integer
	flagSensor [nscan]					1-byte integer

12.3. Data Group Element (2AKa(DA2), HS)

Table 12.3-1 Data Group Element (2AKa(DA2), HS)

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
ScanTime	Year [nscan]	-9999	1950	2100	[years]	2-byte integer
	Month [nscan]	-99	1	12	[months]	1-byte integer
	DayOfMonth [nscan]	-99	1	31	[days]	1-byte integer
	Hour [nscan]	-99	0	23	[hours]	1-byte integer
	Minute [nscan]	-99	0	59	[minutes]	1-byte integer
	Second [nscan]	-99	0	60	[s]	1-byte integer
	MilliSecond [nscan]	-9999	0	999	[ms]	2-byte integer
	DayOfYear [nscan]	-9999	1	366	[days]	2-byte integer
	SecondOfDay [nscan]	-9999.9	0	86400	[s]	8-byte float
(N/A)	Latitude [24][nscan]	-9999.9	-90	90	[degrees]	4-byte float
(N/A)	Longitude [24][nscan]	-9999.9	-180	180	[degrees]	4-byte float
scanStatus	dataQuality [nscan]		0x00	0xff		8-bit
	dataWarning [nscan]					1-byte integer

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	Missing [nscan]		0x00	0xff		8-bit
	modeStatus [nscan]		0x00	0xff		8-bit
	geoError [nscan]		0x0000	0xffff		16-bit
	geoWarning [nscan]		0x0000	0xffff		16-bit
	SCorientation [nscan]	-9999				2-byte integer
	pointingStatus [nscan]	-9999				2-byte integer
	acsModeMidScan [nscan]					1-byte integer
	targetSelectionMidScan [nscan]	-99				1-byte integer
	operationalMode [nscan]		1	20		1-byte integer
	limitErrorFlag [nscan]					1-byte integer
	FractionalGranuleNumber [nscan]	-9999.9	0	100000	[Number]	8-byte float
navigation	scPos [3][nscan]	-9999.9	-1E+07	10000000	[m]	4-byte float
	scVel [3][nscan]	-9999.9	-1E+07	10000000	[m/s]	4-byte float
	scLat [nscan]	-9999.9	-70	70	[degrees]	4-byte float
	scLon [nscan]	-9999.9	-180	180	[degrees]	4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	scAlt [nscan]	-9999.9	350000	500000	[m]	4-byte float
	dprAlt [nscan]	-9999.9	350000	500000	[m]	4-byte float
	scAttRollGeoc [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttPitchGeoc [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttYawGeoc [nscan]	-9999.9	-135	225	[degrees]	4-byte float
	scAttRollGeod [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttPitchGeod [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttYawGeod [nscan]	-9999.9	-135	225	[degrees]	4-byte float
	greenHourAng [nscan]	-9999.9	0	390	[degrees]	4-byte float
	timeMidScan [nscan]	-9999.9	0	1E+10	[s]	8-byte float
	timeMidScanOffset [nscan]	-9999.9	0	100	[s]	8-byte float
PRE	elevation [24][nscan]	-9999.9			[m]	4-byte float
	landSurfaceType [24][nscan]	-9999	0	399		4-byte integer
	localZenithAngle [24][nscan]	-9999.9			[degrees]	4-byte float
	flagPrecip [24][nscan]	-9999				4-byte integer

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	binRealSurface	-9999			[range bin number]	2-byte integer
	binStormTop [24][nscan]	-9999			[range bin	2-byte integer
	heightStormTop [24][nscan]	-9999.9			[m]	4-byte float
	binClutterFreeBottom[24][nscan]	-9999			[range bin]	2-byte integer
	flagSigmaZeroSaturation [24][nscan]	99				1-byte integer
	sigmaZeroMeasured [24][nscan]	-9999.9			[dB]	4-byte float
	zFactorMeasured [88][24][nscan]	-9999.9			[dBZ]	4-byte float
	ellipsoidBinOffset [24][nscan]	-9999			[m]	4-byte float
	snRatioAtRealSurface [24][nscan]	-9999				4-byte float
	adjustFactor [24][nscan]	-9999.9			[dB]	4-byte float
	snowIceCover [24][nscan]	-99				1-byte integer
VER	binZeroDeg [24][nscan]	-9999			[range bin number]	2-byte integer
	attenuationNP [88][24][nscan]	-9999.9			[dB/km]	4-byte float
	piaNP [4][24][nscan]	-9999.9			[dB]	4-byte float
	sigmaZeroNPCorrected [24][nscan]	-9999.9			[dB]	4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	heightZeroDeg [24][nscan]	-9999.9			[m]	4-byte float
CSF	flagBB [24][nscan]	-9999				4-byte integer
	binBBPeak [24][nscan]	-9999			[range bin number]	2-byte integer
	binBBTop [24][nscan]	-9999			[range bin number]	2-byte integer
	binBBBottom [24][nscan]	-9999			[range bin number]	2-byte integer
	heightBB [24][nscan]	-9999.9			[m]	4-byte float
	widthBB [24][nscan]	-9999.9			[m]	4-byte float
	qualityBB [24][nscan]	-9999				4-byte integer
	typePrecip [24][nscan]	-9999				4-byte integer
	qualityTypePrecip [24][nscan]	-9999				4-byte integer
	flagShallowRain [24][nscan]	-9999				4-byte integer
	flagHeavyIcePrecip [24][nscan]	-99				1-byte integer
SRT	PIAalt [6][24][nscan]	-9999.9			[dB]	4-byte float
	RFactorAlt [6][24][nscan]	-9999.9				4-byte float
	PIAweight [6][24][nscan]	-9999.9				4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	pathAtten [24][nscan]	-9999.9			[dB]	4-byte float
	reliabFactor [24][nscan]	-9999.9				4-byte float
	reliabFlag [24][nscan]	-9999				2-byte integer
	refScanID [2][2][24][nscan]	-9999			[Number]	2-byte integer
DSD	Phase [88][24][nscan]	255				1-byte char
	binNode [5][24][nscan]	-9999				2-byte integer
Experimental	precipRateESurface2 [24][nscan]	-9999.9			[mm/hr]	4-byte float
	precipRateESurface2Status [24][nscan]	255				1-byte char
	sigmaZeroProfile [5][24][nscan]	-9999.9			[dB]	4-byte float
	seaIceConcentration [24][nscan]	-9999.9			[%]	4-byte float
	binDEML2 [24][nscan]	-9999			[range bin number]	2-byte integer
SLV	flagSLV [88][24][nscan]	-99				1-byte integer
	binEchoBottom [24][nscan]	-9999				2-byte integer
	piaFinal [24][nscan]	-9999.9			[dB]	4-byte float
	sigmaZeroCorrected [24][nscan]	-9999.9			[dB]	4-byte float
	zFactorCorrected	-9999.9			[dBZ]	4-byte

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	[88][24][nscan]					float
	zFactorCorrectedESurface [24][nscan]	-9999.9			[dBZ]	4-byte float
	zFactorCorrectedNearSurface [24][nscan]	-9999.9			[dBZ]	4-byte float
	paramDSD [2][88][24][nscan]	-9999.9				4-byte float
	precipRate [88][24][nscan]	-9999.9			[mm/hr]	4-byte float
	precipWaterIntegrated [2][24][nscan]	-9999.9			[kg/m^2]	4-byte float
	precipRateNearSurface [24][nscan]	-9999.9			[mm/hr]	4-byte float
	precipRateESurface [24][nscan]	-9999.9			[mm/hr]	4-byte float
	precipRateAve24 [24][nscan]	-9999.9			[mm/hr]	4-byte float
	phaseNearSurface [24][nscan]	255				1-byte char
	paramNUBF [3][24][nscan]	-9999.9				4-byte float
	qualitySLV [24][nscan]	-9999				4-byte integer
	epsilon [88][24][nscan]	-9999.9				4-byte float
FLG	flagEcho [88][24][nscan]		0x00	0xff		8-bit
	qualityData [24][nscan]	-9999				4-byte integer
	qualityFlag	-99				1-byte integer

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	[24][nscan]					
	flagSensor [nscan]					1-byte integer

12.4. Data Group Element (2ADPR(DD2), NS)

Table 12.4-1 Data Group Element (2ADPR(DD2), NS)

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
ScanTime	Year [nscan]	-9999	1950	2100	[years]	2-byte integer
	Month [nscan]	-99	1	12	[months]	1-byte integer
	DayOfMonth [nscan]	-99	1	31	[days]	1-byte integer
	Hour [nscan]	-99	0	23	[hours]	1-byte integer
	Minute [nscan]	-99	0	59	[minutes]	1-byte integer
	Second [nscan]	-99	0	60	[s]	1-byte integer
	MilliSecond [nscan]	-9999	0	999	[ms]	2-byte integer
	DayOfYear [nscan]	-9999	1	366	[days]	2-byte integer
	SecondOfDay [nscan]	-9999.9	0	86400	[s]	8-byte float
(N/A)	Latitude [49][nscan]	-9999.9	-90	90	[degrees]	4-byte float
(N/A)	Longitude [49][nscan]	-9999.9	-180	180	[degrees]	4-byte float
scanStatus	dataQuality [nscan]		0x00	0xff		8-bit
	dataWarning [nscan]					1-byte integer

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	missing [nscan]		0x00	0xff		8-bit
	modeStatus [nscan]		0x00	0xff		8-bit
	geoError [nscan]		0x0000	0xffff		16-bit
	geoWarning [nscan]		0x0000	0xffff		16-bit
	SCorientation [nscan]	-9999				2-byte integer
	pointingStatus [nscan]	-9999				2-byte integer
	acsModeMidScan [nscan]					1-byte integer
	targetSelectionMidScan [nscan]	-99				1-byte integer
	operationalMode [nscan]		1	20		1-byte integer
	limitErrorFlag [nscan]					1-byte integer
	FractionalGranuleNumber [nscan]	-9999.9	0	100000	[Number]	8-byte float
navigation	scPos [3][nscan]	-9999.9	-10000000	10000000	[m]	4-byte float
	scVel [3][nscan]	-9999.9	-10000000	10000000	[m/s]	4-byte float
	scLat [nscan]	-9999.9	-70	70	[degrees]	4-byte float
	scLon [nscan]	-9999.9	-180	180	[degrees]	4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	scAlt [nscan]	-9999.9	350000	500000	[m]	4-byte float
	dprAlt [nscan]	-9999.9	350000	500000	[m]	4-byte float
	scAttRollGeoc [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttPitchGeoc [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttYawGeoc [nscan]	-9999.9	-135	225	[degrees]	4-byte float
	scAttRollGeod [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttPitchGeod [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttYawGeod [nscan]	-9999.9	-135	225	[degrees]	4-byte float
	greenHourAng [nscan]	-9999.9	0	390	[degrees]	4-byte float
	timeMidScan [nscan]	-9999.9	0	10000000000	[s]	8-byte float
	timeMidScanOffset [nscan]	-9999.9	0	100	[s]	8-byte float
PRE	elevation [49][nscan]	-9999.9			[m]	4-byte float
	landSurfaceType [49][nscan]	-9999	0	399		4-byte integer
	localZenithAngle [49][nscan]	-9999.9			[degrees]	4-byte float
	flagPrecip [49][nscan]	-9999				4-byte integer

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	flagSigmaZeroSaturation [49][nscan]	99				1-byte integer
	binRealSurface [49][nscan]	-9999			[range bin number]	2-byte integer
	binStormTop [49][nscan]	-9999			[range bin number]	2-byte integer
	heightStormTop [49][nscan]	-9999.9			[m]	4-byte float
	binClutterFreeBottom [49][nscan]	-9999			[range bin number]	2-byte integer
	sigmaZeroMeasured [49][nscan]	-9999.9			[dB]	4-byte float
	zFactorMeasured [176][49][nscan]	-9999.9			[dBZ]	4-byte float
	ellipsoidBinOffset [49][nscan]	-9999			[m]	4-byte float
	snRatioAtRealSurface [49][nscan]	-9999				4-byte float
	adjustFactor [49][nscan]	-9999.9			[dB]	4-byte float
	snowIceCover [49][nscan]	-99				1-byte integer
VER	binZeroDeg [49][nscan]	-9999			[range bin number]	2-byte integer
	attenuationNP [176][49][nscan]	-9999.9			[dB/km]	4-byte float
	piaNP [4][49][nscan]	-9999.9			[dB]	4-byte float
	sigmaZeroNPCorrected [49][nscan]	-9999.9			[dB]	4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	heightZeroDeg [49][nscan]	-9999.9			[m]	4-byte float
CSF	flagBB [49][nscan]	-9999				4-byte integer
	binBBPeak [49][nscan]	-9999			[range bin number]	2-byte integer
	binBBTop [49][nscan]	-9999			[range bin number]	2-byte integer
	binBBBottom [49][nscan]	-9999			[range bin number]	2-byte integer
	heightBB [49][nscan]	-9999.9			[m]	4-byte float
	widthBB [49][nscan]	-9999.9			[m]	4-byte float
	qualityBB [49][nscan]	-9999				4-byte integer
	typePrecip [49][nscan]	-9999				4-byte integer
	qualityTypePrecip [49][nscan]	-9999				4-byte integer
	flagShallowRain [49][nscan]	-9999				4-byte integer
	flagHeavyIcePrecip [49][nscan]	-99				1-byte integer
	flagAnvil [49][nscan]	-99				1-byte integer
SRT	PIAalt [6][49][nscan]	-9999.9			[dB]	4-byte float
	RFactorAlt [6][49][nscan]	-9999.9				4-byte float
	PIAweight	-9999.9				4-byte

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	[6][49][nscan]					float
	pathAtten [49][nscan]	-9999.9			[dB]	4-byte float
	reliabFactor [49][nscan]	-9999.9				4-byte float
	reliabFlag [49][nscan]	-9999				2-byte integer
	refScanID [2][2][49][nscan]	-9999			[Number]	2-byte integer
DSD	phase [176][49][nscan]	255				1-byte char
	binNode [5][49][nscan]	-9999				2-byte integer
Experimental	precipRateESurface2 [49][nscan]	-9999.9			[mm/hr]	4-byte float
	precipRateESurface2Status [49][nscan]	255				1-byte char
	seaIceConcentration [49][nscan]	-9999.9			[%]	4-byte float
	sigmaZeroProfile [7][49][nscan]	-9999.9			[dB]	4-byte float
	binDEML2 [49][nscan]	-9999			[range bin number]	2-byte integer
SLV	flagSLV [176][49][nscan]	-99				1-byte integer
	binEchoBottom [49][nscan]	-9999				2-byte integer
	piaFinal [49][nscan]	-9999.9			[dB]	4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	sigmaZeroCorrected [49][nscan]	-9999.9			[dB]	4-byte float
	zFactorCorrected [176][49][nscan]	-9999.9			[dBZ]	4-byte float
	zFactorCorrectedESurface [49][nscan]	-9999.9			[dBZ]	4-byte float
	zFactorCorrectedNearSurface [49][nscan]	-9999.9			[dBZ]	4-byte float
	paramNUBF [3][49][nscan]	-9999.9				4-byte float
	paramDSD [2][176] [49][nscan]	-9999.9				4-bytefloat
	precipRate [176][49][nscan]	-9999.9			[mm/hr]	4-byte float
	precipWaterIntegrated [2][49][nscan]	-9999.9			[kg/m^2]	4-bytefloat
	precipRateNearSurface [49][nscan]	-9999.9			[mm/hr]	4-byte float
	precipRateESurface [49][nscan]	-9999.9			[mm/hr]	4-byte float
	precipRateAve24 [49][nscan]	-9999.9			[mm/hr]	4-byte float
	phaseNearSurface [49][nscan]	255				1-byte char
	qualitySLV [49][7900]	-9999				4-byte integer
	epsilon [176][49][nscan]	-9999.9				4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
FLG	flagEcho [176][49][nscan]		0x00	0xff		8-bit
	qualityData [49][nscan]	-9999				4-byte integer
	qualityFlag [49][nscan]	-99				1-byte integer
	flagSensor [nscan]					1-byte integer

12.5. Data Group Element (2ADPR(DD2), MS)

Table 12.5-1 Data Group Element (2ADPR(DD2), MS)

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
ScanTime	Year [nscan]	-9999	1950	2100	[years]	2-byte integer
	Month [nscan]	-99	1	12	[months]	1-byte integer
	DayOfMonth [nscan]	-99	1	31	[days]	1-byte integer
	Hour [nscan]	-99	0	23	[hours]	1-byte integer
	Minute [nscan]	-99	0	59	[minutes]	1-byte integer
	Second [nscan]	-99	0	60	[s]	1-byte integer
	MilliSecond [nscan]	-9999	0	999	[ms]	2-byte integer
	DayOfYear [nscan]	-9999	1	366	[days]	2-byte integer
	SecondOfDay [nscan]	-9999.9	0	86400	[s]	8-byte float
(N/A)	Latitude [25][nscan]	-9999.9	-90	90	[degrees]	4-byte float
(N/A)	Longitude [25][nscan]	-9999.9	-180	180	[degrees]	4-byte float
scanStatus	dataQuality [nscan]		0x00	0xff		8-bit
	dataWarning [nscan]					1-byte integer

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	missing [nscan]		0x00	0xff		8-bit
	modeStatus [nscan]		0x00	0xff		8-bit
	geoError [nscan]		0x0000	0xffff		16-bit
	geoWarning [nscan]		0x0000	0xffff		16-bit
	SCorientation [nscan]	-9999				2-byte integer
	pointingStatus [nscan]	-9999				2-byte integer
	acsModeMidScan [nscan]					1-byte integer
	targetSelectionMidScan [nscan]	-99				1-byte integer
	operationalMode [nscan]		1	20		1-byte integer
	limitErrorFlag [nscan]					1-byte integer
	FractionalGranuleNumber[nscan]	-9999.9	0	100000	[Number]	8-byte float
navigation	scPos [3][nscan]	-9999.9	-10000000	10000000	[m]	4-byte float
	scVel [3][nscan]	-9999.9	-10000000	10000000	[m/s]	4-byte float
	scLat [nscan]	-9999.9	-70	70	[degrees]	4-byte float
	scLon [nscan]	-9999.9	-180	180	[degrees]	4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	scAlt [nscan]	-9999.9	350000	500000	[m]	4-byte float
	prAlt [nscan]	-9999.9	350000	500000	[m]	4-byte float
	scAttRollGeoc [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttPitchGeoc [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttYawGeoc [nscan]	-9999.9	-135	225	[degrees]	4-byte float
	scAttRollGeod [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttPitchGeod [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttYawGeod [nscan]	-9999.9	135	225	[degrees]	4-byte float
	greenHourAng [nscan]	-9999.9	0	390	[degrees]	4-byte float
	timeMidScan [nscan]	-9999.9	0	10000000000	[s]	8-byte float
	timeMidScanOffset [nscan]	-9999.9	0	100	[s]	8-byte float
PRE	elevation [25][nscan]	-9999.9			[m]	4-byte float
	landSurfaceType [25][nscan]	-9999	0	399		4-byte integer
	localZenithAngle [25][nscan]	-9999.9			[degrees]	4-byte float
	flagPrecip [25][nscan]	-9999				4-byte integer

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	flagSigmaZeroSaturation [25][nscan]	99				1-byte integer
	binRealSurface [25][nscan]	-9999			[range bin number]	2-byte integer
	binStormTop [25][nscan]	-9999			[range bin number]	2-byte integer
	heightStormTop [25][nscan]	-9999.9			[m]	4-byte float
	binClutterFreeBottom [25][nscan]	-9999			[range bin number]	2-byte integer
	sigmaZeroMeasured [25][nscan]	-9999.9			[dB]	4-byte float
	zFactorMeasured [176][25][nscan]	-9999.9			[dBZ]	4-byte float
	ellipsoidBinOffset [25][nscan]	-9999			[m]	4-byte float
	snRatioAtRealSurface [25][nscan]	-9999				4-byte float
	adjustFactor [25][nscan]	-9999.9			[dB]	4-byte float
	snowIceCover [25][nscan]	-99				1-byte integer
VER	binZeroDeg [25][nscan]	-9999			[range bin number]	2-byte integer
	attenuationNP [176][25][nscan]	-9999.9			[dB/km]	4-byte float
	piaNP [4][25][nscan]	-9999.9			[dB]	4-byte float
	sigmaZeroNPCorrected [25][nscan]	-9999.9			[dB]	4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	heightZeroDeg [25][nscan]	-9999.9			[m]	4-byte float
CSF	flagBB [25][nscan]	-9999				4-byte integer
	binBBPeak [25][nscan]	-9999			[range bin number]	2-byte integer
	binBBTop [25][nscan]	-9999			[range bin number]	2-byte integer
	binBBBottom [25][nscan]	-9999			[range bin number]	2-byte integer
	binDFRmMLBottom [25][nscan]	-9999				2-byte integer
	binDFRmMLTop [25][nscan]	-9999				2-byte integer
	heightBB [25][nscan]	-9999.9			[m]	4-byte float
	widthBB [25][nscan]	-9999.9			[m]	4-byte float
	qualityBB [25][nscan]	-9999				4-byte integer
	typePrecip [25][nscan]	-9999				4-byte integer
	qualityTypePrecip [25][nscan]	-9999				4-byte integer
	flagShallowRain [25][nscan]	-9999				4-byte integer
	flagHeavyIcePrecip [25][nscan]	-99				1-byte integer
SRT	PIAalt [6][25][nscan]	-9999.9			[dB]	4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	RFactorAlt [6][25][nscan]	-9999.9				4-byte float
	PIAweight [6][25][nscan]	-9999.9				4-byte float
	pathAtten [25][nscan]	-9999.9			[dB]	4-byte float
	reliabFactor [25][nscan]	-9999.9				4-byte float
	reliabFlag [25][nscan]	-9999				2-byte integer
	refScanID [2][2][25][nscan]	-9999			[Number]	2-byte integer
DSD	binNode [5][25][nscan]	-9999				2-byte integer
Experimental	precipRateESurface2 [25][nscan]	-9999.9			[mm/hr]	4-byte float
	precipRateESurface2Status [25][nscan]	255				1-byte char
	seaIceConcentration [25][nscan]	-9999.9				4-byte float
	sigmaZeroProfile [7][25][nscan]	-9999.9			[dB]	4-byte float
	binDEML2 [25][nscan]	-9999			[range bin number]	2-byte integer
	flagSurfaceSnowfall [25][nscan]	255				1-byte char
	surfaceSnowfallIndex [25][nscan]	-9999.9				4-byte float
SLV	binEchoBottom [25][nscan]	-9999				2-byte integer

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	piaFinal [25][nscan]	-9999.9			[dB]	4-byte float
	sigmaZeroCorrected [25][nscan]	-9999.9			[dB]	4-byte float
	zFactorCorrected [176][25][nscan]	-9999.9			[dBZ]	4-byte float
	zFactorCorrectedESurface [25][nscan]	-9999.9			[dBZ]	4-byte float
	zFactorCorrectedNearSurface [25][nscan]	-9999.9			[dBZ]	4-byte float
	precipWaterIntegrated [2][25][nscan]	-9999.9			[kg/m^2]	4-byte float
	precipRateNearSurface [25][nscan]	-9999.9			[mm/hr]	4-byte float
	precipRateESurface [25][nscan]	-9999.9			[mm/hr]	4-byte float
	precipRateAve24 [25][nscan]	-9999.9			[mm/hr]	4-byte float
	phaseNearSurface [25][nscan]	255				1-byte char
	paramNUBF [3][25][nscan]	-9999.9				4-byte float
	epsilon [176][25][nscan]	-9999.9				4-byte float
FLG	flagEcho [176][25][nscan]					1-byte integer
	qualityData [25][nscan]	-9999				4-byte integer
	qualityFlag [25][nscan]					1-byte integer

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	flagSensor [nscan]					1-byte integer
TRG	NUBFindex [25][nscan]	255	0	100		1-byte integer
	MSindexKu [25][nscan]	255	0	100		1-byte integer
	MSindexKa [25][nscan]	255	0	100		1-byte integer
	precipFrac [3][25][nscan]	255				1-byte integer
	RNUBFcond [25][nscan]	-9999.9				4-byte float
	MSsurfPeakIndexKu [25][nscan]	255				1-byte integer
	MSsurfPeakIndexKa [25][nscan]	255				1-byte integer
	MSthroughsurfIndexKu [25][nscan]	255				1-byte integer
	MSthroughsurfIndexKa [25][nscan]	255				1-byte integer
	MSkneeDFRindex [25][nscan]	255				1-byte integer
	MSthrZindex [25][nscan]	255				1-byte integer
	NUBFratioPIAindex [25][nscan]	255				1-byte integer
	NUBFnZmVarIndex [3][25][nscan]	255				1-byte integer
	NUBFnZkVarIndex [3][25][nscan]	255				1-byte integer

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	NUBFnZmVarScaling [25][nscan]	-9999				2-byte integer
	NUBFnZkVarScaling [25][nscan]	-9999				2-byte integer
	NUBFsurfSliceIndex [30][25][nscan]	-9999.9				4-byte float
	NUBFprofZPC [30][25][nscan]	-9999.9				4-byte float
	MSbreakpoints [13][25][nscan]	-9999				2-byte integer
	MSslopes [10][25][nscan]	-9999.9				4-byte float
	MSslopePoints [13][25][nscan]	-9999.9				4-byte float
	MSslopeFits [6][25][nscan]	-9999.9				4-byte float
	MSlowSNRrangeFilter [4][25][nscan]	255				1-byte integer
	NUBFcorrPIA [2][25][nscan]	-9999.9				4-byte float
	triggerParameters [8][25][nscan]	-9999.9				4-byte float

12.6. Data Group Element (2ADPR (DD2), HS)

Table 12.6-1 Data Group Element (2ADPR(DD2), HS)

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
ScanTime	Year [nscan]	-9999	1950	2100	[years]	1-byte integer
	Month [nscan]	-99	1	12	[months]	1-byte integer
	DayOfMonth [nscan]	-99	1	31	[days]	1-byte integer
	Hour [nscan]	-99	0	23	[hours]	1-byte integer
	Minute [nscan]	-99	0	59	[minutes]	1-byte integer
	Second [nscan]	-99	0	60	[s]	1-byte integer
	MilliSecond [nscan]	-9999	0	999	[ms]	2-byte integer
	DayOfYear [nscan]	-9999	1	366	[days]	2-byte integer
	SecondOfDay [nscan]	-9999.9	0	86400	[s]	8-byte float
(N/A)	Latitude [24][nscan]	-9999.9	-90	90	[degrees]	4-byte float
(N/A)	Longitude [24][nscan]	-9999.9	-180	180	[degrees]	4-byte float
scanStatus	dataQuality [nscan]		0x00	0xff		8-bit
	dataWarning [nscan]					1-byte integer

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	missing [nscan]		0x00	0xff		8-bit
	modeStatus [nscan]		0x00	0xff		8-bit
	geoError [nscan]		0x0000	0xffff		16-bit
	geoWarning [nscan]		0x0000	0xffff		16-bit
	SCorientation [nscan]	-9999				2-byte integer
	pointingStatus [nscan]	-9999				2-byte integer
	acsModeMidScan [nscan]					1-byte integer
	targetSelectionMidScan [nscan]	-99				1-byte integer
	operationalMode [nscan]		1	20		1-byte integer
	limitErrorFlag [nscan]					1-byte integer
	FractionalGranuleNumber [nscan]	-9999.9	0	100000	[Number]	8-byte float
navigation	scPos [3][nscan]	-9999.9	-10000000	10000000	[m]	4-byte float
	scVel [3][nscan]	-9999.9	-10000000	10000000	[m/s]	4-byte float
	scLat [nscan]	-9999.9	-70	70	[degrees]	4-byte float
	scLon [nscan]	-9999.9	-180	180	[degrees]	4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	scAlt [nscan]	-9999.9	350000	500000	[m]	4-byte float
	dprAlt [nscan]	-9999.9	350000	500000	[m]	4-byte float
	scAttRollGeoc [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttPitchGeoc [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttYawGeoc [nscan]	-9999.9	-135	225	[degrees]	4-byte float
	scAttRollGeod [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttPitchGeod [nscan]	-9999.9	-180	180	[degrees]	4-byte float
	scAttYawGeod [nscan]	-9999.9	-135	225	[degrees]	4-byte float
	greenHourAng [nscan]	-9999.9	0	390	[degrees]	4-byte float
	timeMidScan [nscan]	-9999.9	0	10000000000	[s]	8-byte float
	timeMidScanOffset [nscan]	-9999.9	0	100	[s]	8-byte float
PRE	elevation [24][nscan]	-9999.9			[m]	4-byte float
	landSurfaceType [24][nscan]	-9999	0	399		4-byte integer
	localZenithAngle [24][nscan]	-9999.9			[degrees]	4-byte float
	flagPrecip [24][nscan]	-9999				4-byte integer

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	binRealSurface [24][nscan]	-9999			[range bin number]	2-byte integer
	binStormTop [24][nscan]	-9999			[range bin number]	2-byte integer
	heightStormTop [24][nscan]	-9999.9			[m]	4-byte float
	binClutterFreeBottom [24][nscan]	-9999			[range bin number]	2-byte integer
	flagSigmaZeroSaturation [24][nscan]	99				1-byte integer
	sigmaZeroMeasured [24][nscan]	-9999.9			[dB]	4-byte float
	zFactorMeasured [88][24][nscan]	-9999.9			[dBZ]	4-byte float
	ellipsoidBinOffset [24][nscan]	-9999			[m]	4-byte float
	snRatioAtRealSurface [24][nscan]	-9999				4-byte float
	adjustFactor [24][nscan]	-9999.9			[dB]	4-byte float
	snowIceCover [24][nscan]	-99				1-byte integer
VER	binZeroDeg [24][nscan]	-9999			[range bin number]	2-byte integer
	attenuationNP [88][24][nscan]	-9999.9			[dB/km]	4-byte float
	piaNP [4][24][nscan]	-9999.9			[dB]	4-byte float
	sigmaZeroNPCorrected [24][nscan]	-9999.9			[dB]	4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	heightZeroDeg [24][nscan]	-9999.9			[m]	4-byte float
CSF	flagBB [24][nscan]	-9999				4-byte integer
	binBBPeak [24][nscan]	-9999			[range bin number]	2-byte integer
	binBBTop [24][nscan]	-9999			[range bin number]	2-byte integer
	binBBBottom [24][nscan]	-9999			[range bin number]	2-byte integer
	binDFRmMLBottom [24][nscan]	-9999				2-byte integer
	binDFRmMLTop [24][nscan]	-9999				2-byte integer
	heightBB [24][nscan]	-9999.9			[m]	4-byte float
	widthBB [24][nscan]	-9999.9			[m]	4-byte float
	qualityBB [24][nscan]	-9999				4-byte integer
	typePrecip [24][nscan]	-9999				4-byte integer
	qualityTypePrecip [24][nscan]	-9999				4-byte integer
	flagShallowRain [24][nscan]	-9999				4-byte integer
	flagHeavyIcePrecip [24][nscan]	-99				1-byte integer
SRT	PIAalt [6][24][nscan]	-9999.9			[dB]	4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	RFactorAlt [6][24][nscan]	-9999.9				4-byte float
	PIAweight [6][24][nscan]	-9999.9				4-byte float
	pathAtten [24][nscan]	-9999.9			[dB]	4-byte float
	reliabFactor [24][nscan]	-9999.9				4-byte float
	reliabFlag [24][nscan]	-9999				2-byte integer
	refScanID [2][2][24][nscan]	-9999			[Number]	2-byte integer
DSD	phase [88][24][nscan]	255				1-byte char
	binNode [5][24][nscan]	-9999				2-byte integer
Experimental	precipRateESurface2 [24][nscan]	-9999.9			[mm/hr]	4-byte float
	precipRateESurface2Status [24][nscan]	255				1-byte char
	seaIceConcentration [24][nscan]	-9999.9				4-byte float
	sigmaZeroProfile [5][24][nscan]	-9999.9			[dB]	4-byte float
	binDEML2 [24][nscan]	-9999			[range bin number]	2-byte integer
SLV	flagSLV [88][24][nscan]	-99				1-byte integer
	binEchoBottom	-9999				2-byte integer

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	[24][nscan]					
	piaFinal [24][nscan]	-9999.9			[dB]	4-byte float
	paramNUBF [3][24][nscan]	-9999.9				4-byte float
	sigmaZeroCorrected [24][nscan]	-9999.9			[dB]	4-byte float
	zFactorCorrected [88][24][nscan]	-9999.9			[dBZ]	4-byte float
	zFactorCorrectedESurface [24][nscan]	-9999.9			[dBZ]	4-bytefloat
	zFactorCorrectedNearSurface [24][nscan]	-9999.9			[dBZ]	4-byte float
	paramDSD [2][88][24][nscan]	-9999.9				4-byte float
	precipRate [88][24][nscan]	-9999.9			[mm/hr]	4-byte float
	precipWaterIntegrated [2][24][nscan]	-9999.9			[kg/m^2]	4-byte float
	precipRateNearSurface [24][nscan]	-9999.9			[mm/hr]	4-byte float
	precipRateESurface [24][nscan]	-9999.9			[mm/hr]	4-byte float
	precipRateAve24 [24][nscan]	-9999.9			[mm/hr]	4-byte float
	phaseNearSurface [24][nscan]	255				1-byte char
	qualitySLV [24][nscan]	-9999				4-byte integer
	epsilon	-9999.9				4-byte float

Group	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	[88][24][nscan]					
FLG	flagEcho [88][24][nscan]		0x00	0xff		8-bit
	qualityData [24][nscan]	-9999				4-byte integer
	qualityFlag [24][nscan]	-99				1-byte integer
	flagSensor [nscan]					1-byte integer

12.7. Data Group Element (3DPR(D3Q))

Table 12.7-1 Data Group Element (3DPR(D3Q))

Group 2	Group3	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
1	precipRate	count [ltL][lnL][chn][hgt][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][chn][hgt][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][chn][hgt][rt][st]	-9999.9				4B float
		hist [ltL][lnL][chn][hgt][rt][st][bin]	-9999				signed 4B int
	rainRate	count [ltL][lnL][chn][hgt][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][chn][hgt][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][chn][hgt][rt][st]	-9999.9				4B float
		hist [ltL][lnL][chn][hgt][rt][st][bin]	-9999				signed 4B int
	snowRate	count [ltL][lnL][chn][hgt][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][chn][hgt][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][chn][hgt][rt][st]	-9999.9				4B float
		hist [ltL][lnL][chn][hgt][rt][st][bin]	-9999				signed 4B int
	mixedPhRate	count [ltL][lnL][chn][hgt][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][chn][hgt][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][chn][hgt][rt][st]	-9999.9				4B float
		hist [ltL][lnL][chn][hgt][rt][st][bin]	-9999				signed 4B int
	precipRateESurface	count [ltL][lnL][chn][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][chn][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][chn][rt][st]	-9999.9				4B float

Group 2	Group3	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
		hist [ltL][lnL][chn][rt][st][bin]	-9999				signed 4B int
	precipRateESurface2	count [ltL][lnL][chn][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][chn][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][chn][rt][st]	-9999.9				4B float
		hist [ltL][lnL][chn][rt][st][bin]	-9999				signed 4B int
	precipRateNearSurface	count [ltL][lnL][chn][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][chn][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][chn][rt][st]	-9999.9				4B float
		hist [ltL][lnL][chn][rt][st][bin]	-9999				signed 4B int
	rainRateNearSurface	count [ltL][lnL][chn][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][chn][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][chn][rt][st]	-9999.9				4B float
		hist [ltL][lnL][chn][rt][st][bin]	-9999				signed 4B int
	snowRateNearSurface	count [ltL][lnL][chn][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][chn][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][chn][rt][st]	-9999.9				4B float
		hist [ltL][lnL][chn][rt][st][bin]	-9999				signed 4B int
	mixedPhRateNearSurface	count [ltL][lnL][chn][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][chn][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][chn][rt][st]	-9999.9				4B float
		hist [ltL][lnL][chn][rt][st][bin]	-9999				signed 4B int

Group 2	Group3	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	precipWaterIntegrated	count [ltL][lnL][chn][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][chn][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][chn][rt][st]	-9999.9				4B float
		hist [ltL][lnL][chn][rt][st][bin]	-9999				signed 4B int
	precipIceIntegrated	count [ltL][lnL][chn][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][chn][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][chn][rt][st]	-9999.9				4B float
		hist [ltL][lnL][chn][rt][st][bin]	-9999				signed 4B int
	precipRateAve24	count [ltL][lnL][chn][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][chn][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][chn][rt][st]	-9999.9				4B float
		hist [ltL][lnL][chn][rt][st][bin]	-9999				signed 4B int
	zFactorCorrected	count [ltL][lnL][inst][hgt][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][inst][hgt][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][inst][hgt][rt][st]	-9999.9				4B float
		hist [ltL][lnL][inst][hgt][rt][st][bin]	-9999				signed 4B int
	zFactorCorrectedESurface	count [ltL][lnL][inst][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][inst][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][inst][rt][st]	-9999.9				4B float
		hist [ltL][lnL][inst][rt][st][bin]	-9999				signed 4B int
	zFactorCorrectedNearSurface	count [ltL][lnL][inst][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][inst][rt][st]	-9999.9				4B float

Group 2	Group3	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
		stdev [ltL][lnL][inst][rt][st]	-9999.9				4B float
		hist [ltL][lnL][inst][rt][st][bin]	-9999				signed 4B int
	zFactorCorrectedDPR	count [ltL][lnL][inst][hgt][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][inst][hgt][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][inst][hgt][rt][st]	-9999.9				4B float
		hist [ltL][lnL][inst][hgt][rt][st][bin]	-9999				signed 4B int
	zFactorCorrectedESurfaceDPR	count [ltL][lnL][inst][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][inst][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][inst][rt][st]	-9999.9				4B float
		hist [ltL][lnL][inst][rt][st][bin]	-9999				signed 4B int
	zFactorCorrectedNearSurfaceDPR	count [ltL][lnL][inst][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][inst][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][inst][rt][st]	-9999.9				4B float
		hist [ltL][lnL][inst][rt][st][bin]	-9999				signed 4B int
	zFactorMeasured	count [ltL][lnL][inst][hgt][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][inst][hgt][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][inst][hgt][rt][st]	-9999.9				4B float
		hist [ltL][lnL][inst][hgt][rt][st][bin]	-9999				signed 4B int
	dm	count [ltL][lnL][hgt][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][hgt][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][hgt][rt][st]	-9999.9				4B float
		hist [ltL][lnL][hgt][rt][st][bin]	-9999				signed 4B int

Group 2	Group3	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	dBNw	count [ltL][lnL][hgt][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][hgt][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][hgt][rt][st]	-9999.9				4B float
		hist [ltL][lnL][hgt][rt][st][bin]	-9999				signed 4B int
	epsilonDPR	count [ltL][lnL][inst][hgt][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][inst][hgt][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][inst][hgt][rt][st]	-9999.9				4B float
		hist [ltL][lnL][inst][hgt][rt][st][bin]	-9999				signed 4B int
	epsilon	count [ltL][lnL][inst][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][inst][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][inst][rt][st]	-9999.9				4B float
		hist [ltL][lnL][inst][rt][st][bin]	-9999				signed 4B int
	piaSRT	count [ltL][lnL][inst][ang][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][inst][ang][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][inst][ang][rt][st]	-9999.9				4B float
		hist [ltL][lnL][inst][ang][rt][st][bin]	-9999				signed 4B int
	piaSRTdpr	count [ltL][lnL][inst][ang][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][inst][ang][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][inst][ang][rt][st]	-9999.9				4B float
		hist [ltL][lnL][inst][ang][rt][st][bin]	-9999				signed 4B int
	piaFinal	count [ltL][lnL][inst][ang][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][inst][ang][rt][st]	-9999.9				4B float

Group 2	Group3	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
		stdev [ltL][lnL][inst][ang][rt][st]	-9999.9				4B float
		hist [ltL][lnL][inst][ang][rt][st][bin]	-9999				signed 4B int
	piaFinalDPR	count [ltL][lnL][inst][ang][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][inst][ang][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][inst][ang][rt][st]	-9999.9				4B float
		hist [ltL][lnL][inst][ang][rt][st][bin]	-9999				signed 4B int
	piaFinalSubset	count [ltL][lnL][inst][ang][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][inst][ang][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][inst][ang][rt][st]	-9999.9				4B float
		hist [ltL][lnL][inst][ang][rt][st][bin]	-9999				signed 4B int
	piaFinalDPRsubset	count [ltL][lnL][inst][ang][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][inst][ang][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][inst][ang][rt][st]	-9999.9				4B float
		hist [ltL][lnL][inst][ang][rt][st][bin]	-9999				signed 4B int
	heightBB	count [ltL][lnL][chn][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][chn][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][chn][rt][st]	-9999.9				4B float
		hist [ltL][lnL][chn][rt][st][bin]	-9999				signed 4B int
	heightBBnadir	count [ltL][lnL][chn][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][chn][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][chn][rt][st]	-9999.9				4B float
		hist [ltL][lnL][chn][rt][st][bin]	-9999				signed 4B int

Group 2	Group3	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
	BBwidthNadir	count [ltL][lnL][chn][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][chn][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][chn][rt][st]	-9999.9				4B float
		hist [ltL][lnL][chn][rt][st][bin]	-9999				signed 4B int
	heightStormTop	count [ltL][lnL][chn][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][chn][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][chn][rt][st]	-9999.9				4B float
		hist [ltL][lnL][chn][rt][st][bin]	-9999				signed 4B int
	BBwidth	count [ltL][lnL][chn][rt][st]	-9999				signed 4B int
		mean [ltL][lnL][chn][rt][st]	-9999.9				4B float
		stdev [ltL][lnL][chn][rt][st]	-9999.9				4B float
		hist [ltL][lnL][chn][rt][st][bin]	-9999				signed 4B int
	observationCounts	total [ltL][lnL][inst][st]	-9999				signed 4B int
		localTime [ltL][lnL][inst][tim][st]	-9999				signed 4B int
		pia [ltL][lnL][inst][ang][st]	-9999				signed 4B int
		shallowRain [ltL][lnL][inst][st]	-9999				signed 4B int
	precipRateLocalTime	count [ltL][lnL][chn][tim][st]	-9999				signed 4B int
		mean [ltL][lnL][chn][tim][st]	-9999.9				4B float
		stdev [ltL][lnL][chn][tim][st]	-9999.9				4B float
	(N/A)	precipRateNearSurfaceUnconditional [ltL][lnL][chn]	-9999.9				4B float

Group 2	Group3	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
		precipProbabilityNearSurface [ltL][lnL][chn]	-9999.9				4B float
2	precipRate	count [ltH][lnH][chn][hgt][rt]	-9999				signed 4B int
		mean [ltH][lnH][chn][hgt][rt]	-9999.9				4B float
		stdev [ltH][lnH][chn][hgt][rt]	-9999.9				4B float
	rainRate	count [ltH][lnH][chn][hgt][rt]	-9999				signed 4B int
		mean [ltH][lnH][chn][hgt][rt]	-9999.9				4B float
		stdev [ltH][lnH][chn][hgt][rt]	-9999.9				4B float
	snowRate	count [ltH][lnH][chn][hgt][rt]	-9999				signed 4B int
		mean [ltH][lnH][chn][hgt][rt]	-9999.9				4B float
		stdev [ltH][lnH][chn][hgt][rt]	-9999.9				4B float
	mixedPhRate	count [ltH][lnH][chn][hgt][rt]	-9999				signed 4B int
		mean [ltH][lnH][chn][hgt][rt]	-9999.9				4B float
		stdev [ltH][lnH][chn][hgt][rt]	-9999.9				4B float
	precipRateESurface	count [ltH][lnH][chn][rt]	-9999				signed 4B int
		mean [ltH][lnH][chn][rt]	-9999.9				4B float
		stdev [ltH][lnH][chn][rt]	-9999.9				4B float
	precipRateESurface2	count [ltH][lnH][chn][rt]	-9999				signed 4B int
		mean [ltH][lnH][chn][rt]	-9999.9				4B float
		stdev [ltH][lnH][chn][rt]	-9999.9				4B float
	precipRateNearSurface	count [ltH][lnH][chn][rt]	-9999				signed 4B int
		mean [ltH][lnH][chn][rt]	-9999.9				4B float
		stdev [ltH][lnH][chn][rt]	-9999.9				4B float
	rainRateNearSurface	count [ltH][lnH][chn][rt]	-9999				signed 4B int

Group 2	Group3	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
		mean [ltH][lnH][chn][rt]	-9999.9				4B float
		stdev [ltH][lnH][chn][rt]	-9999.9				4B float
	snowRateNearSurface	count [ltH][lnH][chn][rt]	-9999				signed 4B int
		mean [ltH][lnH][chn][rt]	-9999.9				4B float
		stdev [ltH][lnH][chn][rt]	-9999.9				4B float
	mixedPhRateNearSurface	count [ltH][lnH][chn][rt]	-9999				signed 4B int
		mean [ltH][lnH][chn][rt]	-9999.9				4B float
		stdev [ltH][lnH][chn][rt]	-9999.9				4B float
	precipWaterIntegrated	count [ltH][lnH][chn][rt]	-9999				signed 4B int
		mean [ltH][lnH][chn][rt]	-9999.9				4B float
		stdev [ltH][lnH][chn][rt]	-9999.9				4B float
	precipIceIntegrated	count [ltH][lnH][chn][rt]	-9999				signed 4B int
		mean [ltH][lnH][chn][rt]	-9999.9				4B float
		stdev [ltH][lnH][chn][rt]	-9999.9				4B float
	precipRateAve24	count [ltH][lnH][chn][rt]	-9999				signed 4B int
		mean [ltH][lnH][chn][rt]	-9999.9				4B float
		stdev [ltH][lnH][chn][rt]	-9999.9				4B float
	zFactorCorrected	count [ltH][lnH][inst][hgt][rt]	-9999				signed 4B int
		mean [ltH][lnH][inst][hgt][rt]	-9999.9				4B float
		stdev [ltH][lnH][inst][hgt][rt]	-9999.9				4B float
	zFactorCorrectedESurface	count [ltH][lnH][inst][rt]	-9999				signed 4B int
		mean [ltH][lnH][inst][rt]	-9999.9				4B float
		stdev [ltH][lnH][inst][rt]	-9999.9				4B float
	zFactorCorrectedNearSurface	count [ltH][lnH][inst][rt]	-9999				signed 4B int

Group 2	Group3	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
		mean [ltH][lnH][inst][rt]	-9999.9				4B float
		stdev [ltH][lnH][inst][rt]	-9999.9				4B float
	zFactorCorrectedDPR	count [ltH][lnH][inst][hgt][rt]	-9999				signed 4B int
		mean [ltH][lnH][inst][hgt][rt]	-9999.9				4B float
		stdev [ltH][lnH][inst][hgt][rt]	-9999.9				4B float
	zFactorCorrectedESurfaceDPR	count [ltH][lnH][inst][rt]	-9999				signed 4B int
		mean [ltH][lnH][inst][rt]	-9999.9				4B float
		stdev [ltH][lnH][inst][rt]	-9999.9				4B float
	zFactorCorrectedNearSurfaceDPR	count [ltH][lnH][inst][rt]	-9999				signed 4B int
		mean [ltH][lnH][inst][rt]	-9999.9				4B float
		stdev [ltH][lnH][inst][rt]	-9999.9				4B float
	zFactorMeasured	count [ltH][lnH][inst][hgt][rt]	-9999				signed 4B int
		mean [ltH][lnH][inst][hgt][rt]	-9999.9				4B float
		stdev [ltH][lnH][inst][hgt][rt]	-9999.9				4B float
	dm	count [ltH][lnH][hgt][rt]	-9999				signed 4B int
		mean [ltH][lnH][hgt][rt]	-9999.9				4B float
		stdev [ltH][lnH][hgt][rt]	-9999.9				4B float
	dBNw	count [ltH][lnH][hgt][rt]	-9999				signed 4B int
		mean [ltH][lnH][hgt][rt]	-9999.9				4B float
		stdev [ltH][lnH][hgt][rt]	-9999.9				4B float
	epsilonDPR	count [ltH][lnH][inst][hgt][rt]	-9999				signed 4B int
		mean [ltH][lnH][inst][hgt][rt]	-9999.9				4B float
		stdev [ltH][lnH][inst][hgt][rt]	-9999.9				4B float
	epsilon	count [ltH][lnH][inst][rt]	-9999				signed 4B int

Group 2	Group3	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
		mean [ltH][lnH][inst][rt]	-9999.9				4B float
		stdev [ltH][lnH][inst][rt]	-9999.9				4B float
	piaSRT	count [ltH][lnH][inst][ang][rt]	-9999				signed 4B int
		mean [ltH][lnH][inst][ang][rt]	-9999.9				4B float
		stdev [ltH][lnH][inst][ang][rt]	-9999.9				4B float
	piaSRTdpr	count [ltH][lnH][inst][ang][rt][st]	-9999				signed 4B int
		mean [ltH][lnH][inst][ang][rt][st]	-9999.9				4B float
		stdev [ltH][lnH][inst][ang][rt][st]	-9999.9				4B float
	piaFinal	count [ltH][lnH][inst][ang][rt][st]	-9999				signed 4B int
		mean [ltH][lnH][inst][ang][rt][st]	-9999.9				4B float
		stdev [ltH][lnH][inst][ang][rt][st]	-9999.9				4B float
	piaFinalDPR	count [ltH][lnH][inst][ang][rt][st]	-9999				signed 4B int
		mean [ltH][lnH][inst][ang][rt][st]	-9999.9				4B float
		stdev [ltH][lnH][inst][ang][rt][st]	-9999.9				4B float
	heightBB	count [ltH][lnH][chn][rt]	-9999				signed 4B int
		mean [ltH][lnH][chn][rt]	-9999.9				4B float
		stdev [ltH][lnH][chn][rt]	-9999.9				4B float
	heightStormTop	count [ltH][lnH][chn][rt][st]	-9999				signed 4B int
		mean [ltH][lnH][chn][rt][st]	-9999.9				4B float
		stdev [ltH][lnH][chn][rt][st]	-9999.9				4B float
	BBwidth	count [ltH][lnH][chn][rt][st]	-9999				signed 4B int
		mean [ltH][lnH][chn][rt][st]	-9999.9				4B float
		stdev [ltH][lnH][chn][rt][st]	-9999.9				4B float
	observationCounts	total [ltH][lnH][inst]	-9999				signed 4B int

Group 2	Group3	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
		pia [ltH][lnH][inst][ang]	-9999				signed 4B int
		shallowRain [ltH][lnH][inst]	-9999				signed 4B int
	(N/A)	precipRateNearSurfaceUnconditional [ltH][lnH][chn]	-9999.9				4B float
		precipProbabilityNearSurface [ltH][lnH][chn]	-9999.9				4B float

12.8. Data Group Element (3DPRD(D3D))

Table 12.8-1 Data Group Element (3DPRD(D3D))

Group 1	Group 2	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
Grid	(N/A)	precipRateMean [nlat][nlon][nalt][chd][AD]	-9999.9			mm/hr	4B float
		rainRateMean [nlat][nlon][nalt][chd][AD]	-9999.9			mm/hr	4B float
		mixedRateMean [nlat][nlon][nalt][chd][AD]	-9999.9			mm/hr	4B float
		snowRateMean [nlat][nlon][nalt][chd][AD]	-9999.9			mm/hr	4B float
		precipRateNearSurfMean [nlat][nlon][chd][AD]	-9999.9			mm/hr	4B float
		rainRateNearSurfMean [nlat][nlon][chd][AD]	-9999.9			mm/hr	4B float
		mixedRateNearSurfMean [nlat][nlon][chd][AD]	-9999.9			mm/hr	4B float
		snowRateNearSurfMean [nlat][nlon][chd][AD]	-9999.9			mm/hr	4B float
		precipRateESurfMean [nlat][nlon][chd][AD]	-9999.9			mm/hr	4B float
		precipRateESurf2Mean [nlat][nlon][chd][AD]	-9999.9			mm/hr	4B float
		totalPix [nlat][nlon][chd][AD]	-9999				signed 2B int
		precipPix [nlat][nlon][nalt][chd][AD]	-9999				signed 2B int
		precipPixNearSurf [nlat][nlon][chd][AD]	-9999				signed 2B int
		precipPixESurf [nlat][nlon][chd][AD]	-9999				signed 2B int
		convPrecipRateMean [nlat][nlon][nalt][chd][AD]	-9999.9			mm/hr	4B float

Group 1	Group 2	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
		convPrecipRateNearSurfMean [nlat][nlon][chd][AD]	-9999.9			mm/hr	4B float
		convPrecipRateESurfMean [nlat][nlon][chd][AD]	-9999.9			mm/hr	4B float
		convPrecipPixNearSurf [nlat][nlon][chd][AD]	-9999				signed 2B int
		stratPrecipRateMean [nlat][nlon][nalt][chd][AD]	-9999.9			mm/hr	4B float
		stratPrecipRateNearSurfMean [nlat][nlon][chd][AD]	-9999.9			mm/hr	4B float
		stratPrecipRateESurfMean [nlat][nlon][chd][AD]	-9999.9			mm/hr	4B float
		stratPrecipPixNearSurf [nlat][nlon][chd][AD]	-9999				signed 2B int
		bbHtMean [nlat][nlon][chd][AD]	-9999.9			m	4B float
		stormHtMean [nlat][nlon][chd][AD]	-9999.9			m	4B float
		phase [nlat][nlon][nalt][nvar][chd][AD]	-9999				signed 2B int
		phaseNearSurf [nlat][nlon][nvar][chd][AD]	-9999				signed 2B int
	GridTimeAsc	Year [nlat][nlon]	-9999	1950	2100		signed 2B int
		Month [nlat][nlon]	-99	1	12		signed 1B int
		DayOfMonth [nlat][nlon]	-99	1	31		signed 1B int
		Hour [nlat][nlon]	-99	0	23		signed 1B int
		Minute [nlat][nlon]	-99	0	59		signed 1B int
		Second [nlat][nlon]	-99	0	60		signed 1B int

Group 1	Group 2	Element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
		MilliSecond [nlat][nlon]	-9999	0	999		signed 2B int
		DayOfYear [nlat][nlon]	-9999	1	366		signed 2B int
	GridTimeDes	Year [nlat][nlon]	-9999	1950	2100		signed 2B int
		Month [nlat][nlon]	-99	1	12		signed 1B int
		DayOfMonth [nlat][nlon]	-99	1	31		signed 1B int
		Hour [nlat][nlon]	-99	0	23		signed 1B int
		Minute [nlat][nlon]	-99	0	59		signed 1B int
		Second [nlat][nlon]	-99	0	60		signed 1B int
		MilliSecond [nlat][nlon]	-9999	0	999		signed 2B int
		DayOfYear [nlat][nlon]	-9999	1	366		signed 2B int

12.9. Data Group Element(2HSLH(SLP))

Table 12.9-1 Data Group Element (2HSLH(SLP))

Group 2	Element [Array]	Missing Value(_fillValue)	min	Max	Unit	Type
Scantime	Year [nscan]	-9999	950	2100	[years]	2-byte integer
	Month [nscan]	-99	1	12	[months]	1-byte integer
	DayOfMonth [nscan]	-99	1	31	[days]	1-byte integer
	Hour [nscan]	-99	0	23	[hours]	1-byte integer
	Minute [nscan]	-99	0	59	[minutes]	1-byte integer
	Second [nscan]	-99	0	60	[s]	1-byte integer
	MilliSecond [nscan]	-9999	0	999	[ms]	2-byte integer
	DayOfYear [nscan]	-9999	1	366	[days]	2-byte integer
	SecondOfDay [nscan]	-9999.9	0	86400	[s]	8-byte float
(N/A)	Latitude [49][nscan]	-9999.9	-90	90	[degrees]	4-byte float
(N/A)	Longitude [49][nscan]	-9999.9	-180	180	[degrees]	4-byte float
	latentHeating [19][49][nscan]	-9999.9	-400	400	[K/hr]	4-byte float
	Q1minusQR [19][49][nscan]	-9999.9	-400	400	[K/hr]	4-byte float

Group 2	Element [Array]	Missing Value(_fillValue)	min	Max	Unit	Type
	Q2 [19][49][nscan]	-9999.9	-400	400	[K/hr]	4-byte float
	rainTypesSLH [49][nscan]	-9999				2-byte integer
	stormTopHeight [49][nscan]	-9999	0	32000	[m]	2-byte integer
	meltLayerHeight [49][nscan]	-9999	0	32000	[m]	2-byte integer
	nearSurfLevel [49][nscan]	-9999	0	32000	[m]	2-byte integer
	topoLevel [49][nscan]	-9999	0	32000	[m]	2-byte integer
	climFreezLevel [49][nscan]	-9999	0	32000	[m]	2-byte integer
	nearSurfacePrecipRate [49][nscan]	-9999.9	0	500	[mm/hr]	4-byte float
	precipRateMeltLevel [49][nscan]	-9999.9	0	500	[mm/hr]	4-byte float
	precipRateClimFreezLevel [49][nscan]	-9999.9	0	500	[mm/hr]	4-byte float
	rainType2ADPR [49][nscan]	-9999				2-byte integer
	Method [49][nscan]	-9999				2-byte integer

12.10. Data Group Elemeny (3GSLH(SLG))

Table 12.10-1 Data Group Element (3GSLH(SLG))

Group 1	Group 2	element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
Grid	(N/A)	convLHMean [19][720][268]	-9999.9	-400	400	[K/hr]	4-byte float
		stratLHMean [19][720][268]	-9999.9	-400	400	[K/hr]	4-byte float
		allLHMean [19][720][268]	-9999.9	-400	400	[K/hr]	4-byte float
		convQ1RMean [19][720][268]	-9999.9	-400	400	[K/hr]	4-byte float
		stratQ1RMean [19][720][268]	-9999.9	-400	400	[K/hr]	4-byte float
		allQ1RMean [19][720][268]	-9999.9	-400	400	[K/hr]	4-byte float
		convQ2Mean [19][720][268]	-9999.9	-400	400	[K/hr]	4-byte float
		stratQ2Mean [19][720][268]	-9999.9	-400	400	[K/hr]	4-byte float
		allQ2Mean [19][720][268]	-9999.9	-400	400	[K/hr]	4-byte float
		convPix [19][720][268]	-9999	0	500000		2-byte integer
		stratPix [19][720][268]	-9999	0	500000		2-byte integer
		allPix [19][720][268]	-9999	0	500000		2-byte integer
	GridTime	Year [720][268]	-9999	1950	2100	[years]	2-byte integer
		Month [720][268]	-99	1	12	[months]	1-byte integer

Group 1	Group 2	element [Array]	Missing Value (_fillValue)	min	Max	Unit	Type
		DayOfMonth [720][268]	-99	1	31	[days]	1-byte integer
		Hour [720][268]	-99	0	23	[hours]	1-byte integer
		Minute [720][268]	-99	0	59	[minutes]	1-byte integer
		Second [720][268]	-99	0	60	[s]	1-byte integer
		MilliSecond [720][268]	-9999	0	999	[ms]	2-byte integer
		DayOfYear [720][268]	-9999	1	366	[days]	2-byte integer

12.11. Data Group Element (3HSLH (SLM))

Table 12.11-1 Data Group Element(3HSLH(SLM))

Group 1	Group2	Element[Array]	Missing Value (_fillValue)	min	Max	Unit	Type
Grid	(N/A)	LHMean [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		LHDev [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		convLHMean [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		convLHDev [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		stratLHMean [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		stratLHDev [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		shallowLHMean [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		shallowLHDev [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		Q1RMean [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		Q1RDev [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		convQ1RMean [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		convQ1RDev [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		stratQ1RMean [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		stratQ1RDev [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float

Group 1	Group2	Element[Array]	Missing Value (_fillValue)	min	Max	Unit	Type
		shallowQ1RMean [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		shallowQ1RDev [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		Q2Mean [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		Q2Dev [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		convQ2Mean [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		convQ2Dev [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		stratQ2Mean [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		stratQ2Dev [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		shallowQ2Mean [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		shallowQ2Dev [19][720][268]	-9999.9	-50	100	[K/hr]	4-byte float
		allPix [19][720][268]	-9999.9	0	2000000000		4-byte float
		convPix [19][720][268]	-9999.9	0	2000000000		4-byte float
		stratPix [19][720][268]	-9999.9	0	2000000000		4-byte float
		shallowPix [19][720][268]	-9999.9	0	2000000000		4-byte float

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