GPM/DPR

L3 Product Format Documentation (Experimental product)

Version 1.0

June 2020

Japan Aerospace Exploration Agency

Revision history

revision	date	section	content, reason
Version 1.0	June. 1st 2020	ALL	New

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”,

(4) NOAA NESDIS CENTER FOR SATELLITE APPLICATIONS AND RESEARCH GLOBAL 4KM MULTISENSOR AUTOMATED SNOW/ICE MAP (GMASI) ALGORITHM THEORETICAL BASIS DOCUMENT

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1. Level 3 Data Format Structure (Monthly)

1.1. Data Format Structure

3DPR,"DPR Monthly Product" compute 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).

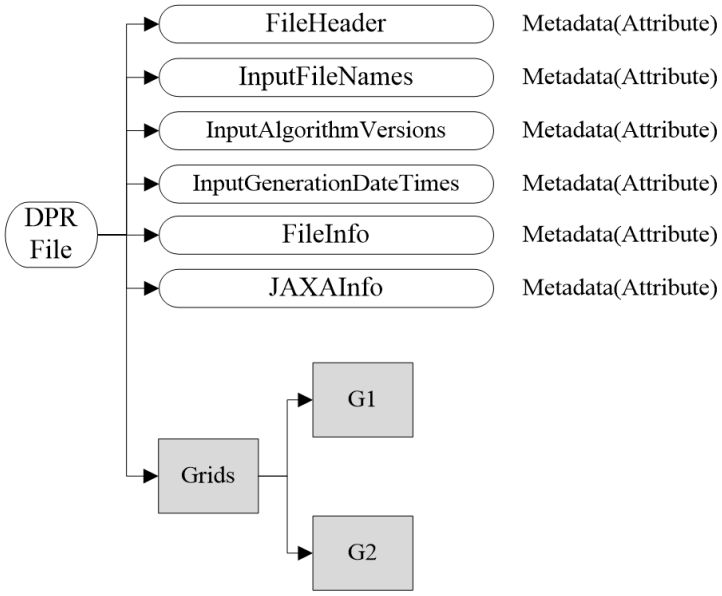


Figure 1.1-1 Data Format Structure for 3DPR

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
  - 7 Number of channels: KuFS(49), KaMS(25), KaHS(24), DPRMS(25), KuMS(25), KaFS(49), DPRFS(49).
- DPRchn
  - 4 Number of DPR channels: DPRKuMS(25), DPRKaMS(25),
- 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 different variables. See the introduction to this algorithm.

1.2. Metadata

Metadata has seven elements. Figure 1.2-1 shows metadata structure.

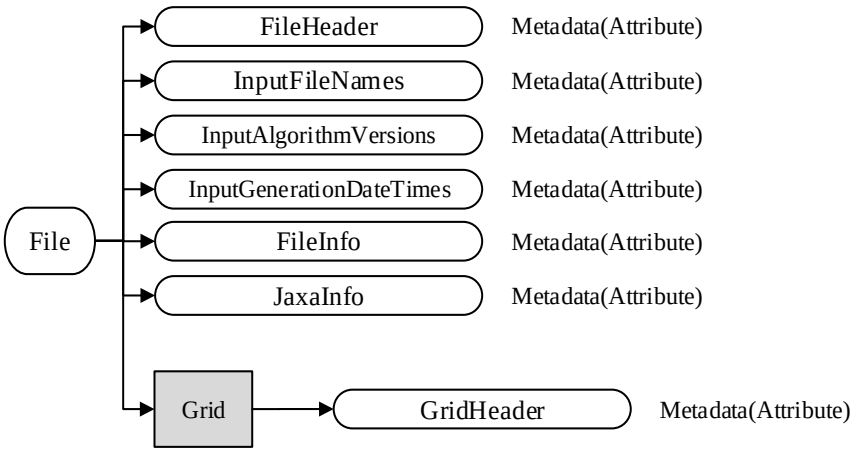


Figure 1.2-1 L3 Metadata

1.2.1. FileHeader

FileHeader contains metadata of general interest. This group appears in all data products. Details are shown in Table 1.2-1 FileHeader Elements.

Table 1.2-1 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

1.2 Metadata

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

1.2.2. 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.

1.2.3. 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 times averaged products.

1.2.4. 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 times averaged products.

1.2.5. 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 Table 1.2-2 FileInfo Elements.

Table 1.2-2 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

No	Element	Description	Data size (bytes)
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

1.2.6. JAXAInfo

JAXAInfo contains metadata requested by JAXA. Used by DPR algorithms and GSMaP. This group appears in L2 Metadata. Table 1.2-3 shows TotalQualityCode in JAXAinfo.

Table 1.2-3 TotalQualityCode Elements

No	Element	Description	Data size (bytes)
1	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 and PR L3 product Good: missing pixels ratio >= 50% Fair: missing pixels ration < 50% (b) GPM DPR SLH L3 and PR SLH L3(Gridded orbit) product Good: The total quality of input data (L2) is Good. Fair: The total quality of input data (L2) is Fair. EG (Empty Granule): The total quality of input data (L2) is EG (c) GPM DPR SLH L3 and PR SLH L3 product Good: missing pixels ratio >= 50% Fair: missing pixels ratio < 50%	50

1.2.7. GridHeader

GridHeader contains metadata defining the grids in the grid structure. This group appears in Level 3 products. Table 1.2-4 shows each metadata elements in GridHeader.

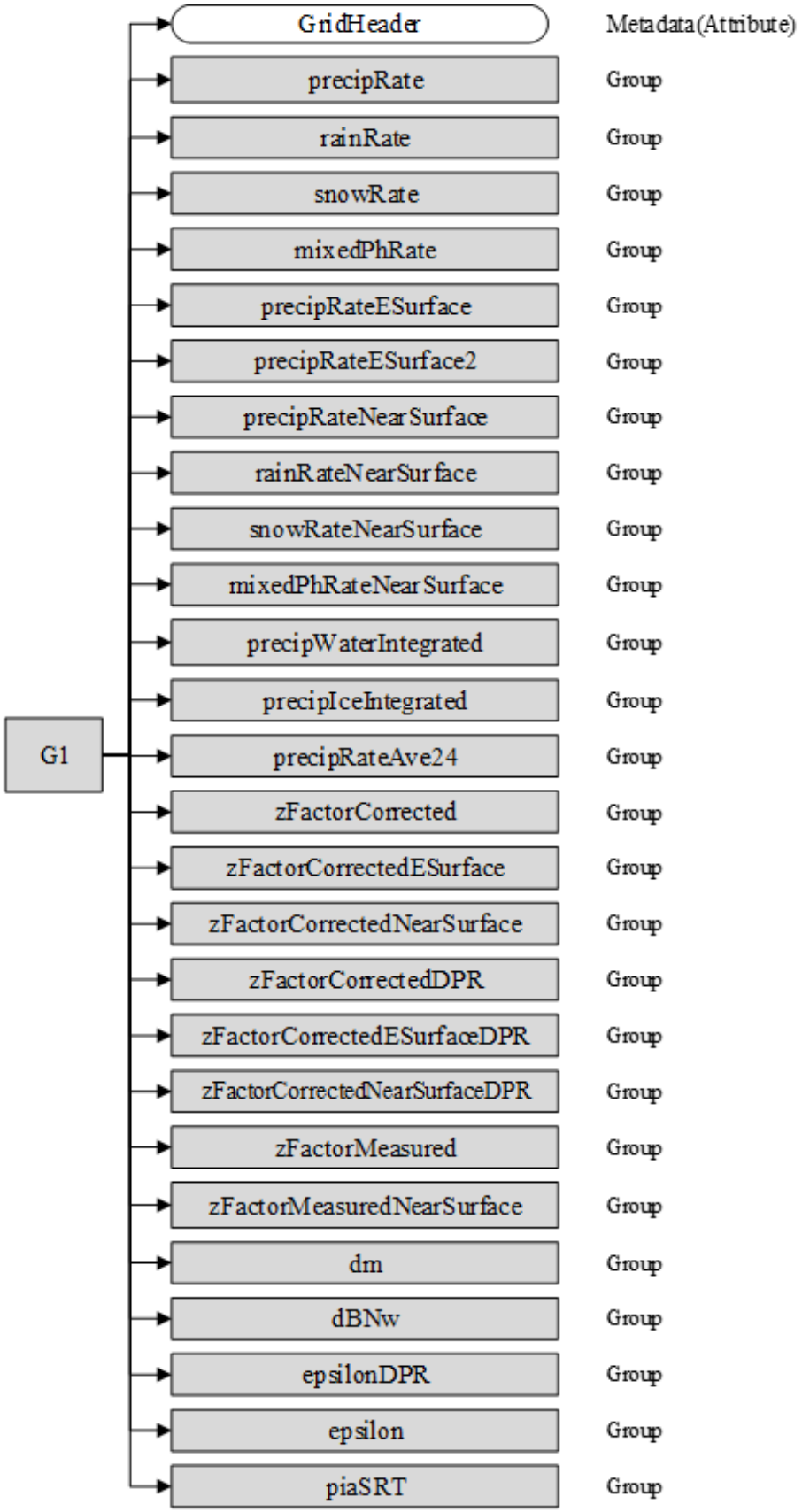
Table 1.2-4 GridHeader Elements

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

No	Element	Description	Data size (bytes)
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
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

1.3. Data Group

Elements of data group are explained in detail in this section. G1 grid and G2 grid have same structure commonly. エラー！参照元が見つかりません。 shows the data group structure.



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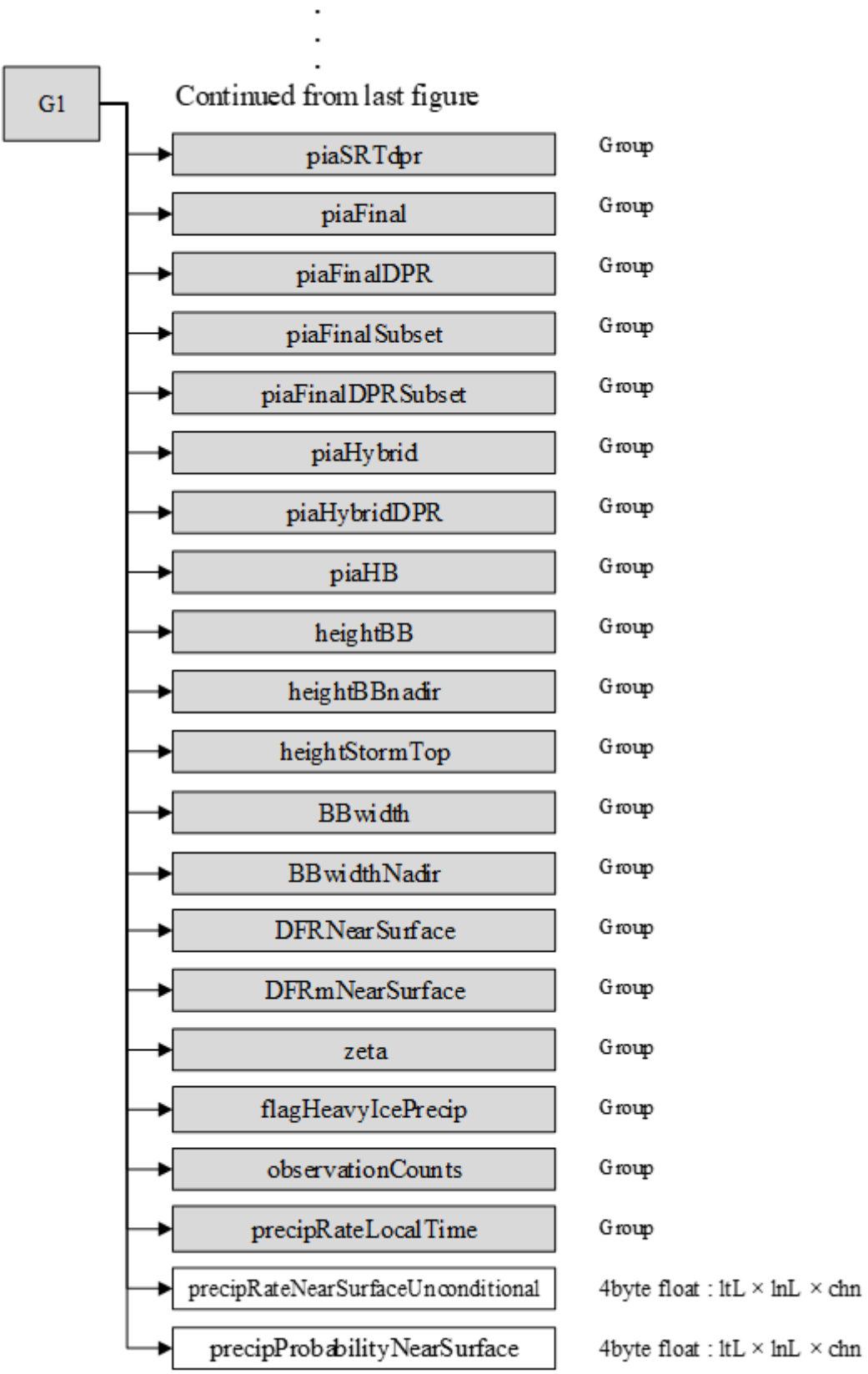


Figure 1.3-1 Data Format Structure for 3DPR

1.3.1. precipRate (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * hgt * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * hgt * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * hgt * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Conditional Precipitation Rate.

1.3.2. rainRate (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * hgt * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * hgt * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * hgt * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Conditional liquid water Rain Rate.

1.3.3. snowRate (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * hgt * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * hgt * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * hgt * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Conditional Snowfall Rate.

1.3.4. mixedPhRate (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * hgt * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * hgt * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * hgt * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Conditional Mixed Phase Precipitation Rate.

1.3.5. precipRateESurface (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Conditional Estimated Surface Precipitation Rate.

1.3.6. precipRateESurface2 (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Alternate Conditional Estimated Surface Precipitation Rate.

1.3.7. precipRateNearSurface (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Conditional Precipitation Rate at Near Surface Level.

1.3.8. rainRateNearSurface (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Unconditional liquid Rain Rate at Near Surface Level.

1.3.9. snowRateNearSurface (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Conditional Snow Rate at Near Surface Level.

1.3.10. mixedPhRateNearSurface (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Conditional Mixed Phase Precipitation Rate at Near Surface Level.

1.3.11. precipWaterIntegrated (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * rt * st	-9999	g/m^2
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Integrated Precipitable Water.

1.3.12. precipIceIntegrated (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * rt	-9999	

	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Integrated Precipitable Ice.

1.3.13. precipRateAve24 (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Average Precipitation Rate in 24hrs.

1.3.14. zFactorCorrected (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * hgt * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * hgt * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * hgt * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Vertical profile of corrected reflectivity factor with attenuation correction.

10 log10(Z) where Z is in mm^6/m^3.

1.3.15. zFactorCorrectedESurface (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * rt * st	-9999	N/A

	mean	4-byte float		-9999.9
	stdev	4-byte float		-9999.9
	hist	4-byte integer	ltL * lnL * chn * rt * st * bin	-9999
G2	count	4-byte integer	ltH * lnH * chn * rt	-9999
	mean	4-byte float		-9999.9
	stdev	4-byte float		-9999.9

Corrected Reflectivity at the Estimated Surface.

1.3.16. zFactorCorrectedNearSurface (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Corrected Reflectivity at the Near Surface Level.

1.3.17. zFactorCorrectedDPR (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * DPRchn * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * DPRchn * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * DPRchn * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Corrected Reflectivity from DPR.

1.3.18. zFactorCorrectedESurfaceDPR (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * DPRchn * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * DPRchn * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * DPRchn * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Corrected Reflectivity from DPR at Estimated Surface.

1.3.19. zFactorCorrectedNearSurfaceDPR (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * DPRchn * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * DPRchn * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * DPRchn * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Corrected Reflectivity from DPR at the Near Surface Level.

1.3.20. zFactorMeasured (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	tL * lnL * chn * hgt * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * hgt * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * hgt * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

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

10log10(Z) where Z is in mm^6/m^3.

1.3.21. zFactorMeasuredNearSurface (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

zFactorMeasured near surface.

1.3.22. dm (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * hgt * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * hgt * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * hgt * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

1.3.23. dBNw (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * hgt * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * hgt * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * hgt * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

1.3.24. epsilon (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

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

1.3.25. epsilonDPR (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * DPRchn * hgt * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * DPRchn * hgt * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * DPRchn * hgt * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Epsilon of DPR.

1.3.26. piaSRT (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * ang * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * ang * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * ang * rt	-9999	

	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Path Integrated Attenuation from SRT.

1.3.27. piaSRTdpr (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * DPRchn * ang * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * DPRchn * ang * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * DPRchn * ang * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Path Integrated Attenuation from SRT DPR.

1.3.28. piaFinal (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * ang * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * ang * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * ang * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

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

1.3.29. piaFinalDPR (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * DPRchn * ang * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	

	stdev	4-byte float		-9999.9
	hist	4-byte integer	ltL * lnL * DPRchn * ang * rt * st * bin	-9999
G2	count	4-byte integer	ltH * lnH * DPRchn * ang * rt	-9999
	mean	4-byte float		-9999.9
	stdev	4-byte float		-9999.9

Final Path Integrated Attenuation from DPR.

1.3.30. piaFinalSubset (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * ang * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * ang * rt * st * bin	-9999	

Final Path Integrated Attenuation Subset. G1 only.

1.3.31. piaFinalDPRsubset (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * DPRchn * ang * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * DPRchn * ang * rt * st * bin	-9999	

Final Path Integrated Attenuation from DPR Subset. G1 only.

1.3.32. piaHybrid (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * ang * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

	hist	4-byte integer	ltL * lnL * chn * ang * rt * st * bin	-9999
G2	count	4-byte integer	ltH * lnH * chn * ang * rt	-9999
	mean	4-byte float		-9999.9
	stdev	4-byte float		-9999.9

Weighted Hybrid PIA between the HB solution and the SRT PIA.

1.3.33. piaHybridDPR (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * DPRchn * ang * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * DPRchn * ang * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * DPRchn * ang * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Weighted Hybrid PIA between the HB solution and the SRT PIA for DPR.

1.3.34. piaHB (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * ang * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * ang * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * ang * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

The 2-way attenuation of Hitchfield-Bordan Path Integrated Attenuation for the slant range path.

1.3.35. heightBB (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * rt * st	-9999	N/A

	mean	4-byte float		-9999.9
	stdev	4-byte float		-9999.9
	hist	4-byte integer	ltL * lnL * chn * rt * st * bin	-9999
G2	count	4-byte integer	ltH * lnH * chn * rt	-9999
	mean	4-byte float		-9999.9
	stdev	4-byte float		-9999.9

Height of bright band.

1.3.36. heightBBnadir (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL *chn * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL *chn * rt * st * bin	-9999	

Height of Bright Band from Nadir. G1 only.

1.3.37. heightStormTop (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Height of storm top.

1.3.38. BBwidth (Group)

Grid	DataName	Type	Array	Missing Value	Unit

G1	count	4-byte integer	ltL * lnL * chn * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

The width of bright band.

1.3.39. BBwidthNadir (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL *chn * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL *chn * rt * st * bin	-9999	

BBwidth at nadir. G1 only.

1.3.40. DFRNearSurface (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

DFR at the Near Surface level.

1.3.41. DFRmNearSurface (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

DFRm at the Near Surface level.

1.3.42. zeta (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * ang * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * ang * rt * st * bin	-9999	
G2	count	4-byte integer	ltH * lnH * chn * ang * rt	-9999	
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Integral of 0.2*ln(10)*alpha*Zm^{beta} over the slant range path where alpha and Zm are functions of range.

1.3.43. flagHeavyIcePrecip (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL * chn * rt * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	
	hist	4-byte integer	ltL * lnL * chn * rt * st * bin	-9999	

G2	count	4-byte integer	ltH * lnH * chn * rt	-9999
	mean	4-byte float		-9999.9
	stdev	4-byte float		-9999.9

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. Counts of the occurrence of flagHeavyIcePrecip. Mean and std. dev. are set to missing. The histogram contains counts of the integer flag values, with bins from 1 to 30.

1.3.44. observationCounts (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	total	4-byte integer	ltL * lnL * chn * st	-9999	N/A
	localTime	4-byte integer	ltL * lnL *chn * tim* st		
	pia	4-byte integer	ltL * lnL *chn * ang * st		
	shallowRain	4-byte integer	ltL * lnL *chn * st		
G2	total	4-byte integer	ltH * lnH * chn		
	pia	4-byte integer	ltH * lnH * chn * ang		
	shallowRain	4-byte integer	ltH * lnH * chn		

Observation Counts of each data.

1.3.45. precipRateLocalTime (Group)

Grid	DataName	Type	Array	Missing Value	Unit
G1	count	4-byte integer	ltL * lnL *chn * tim * st	-9999	N/A
	mean	4-byte float		-9999.9	
	stdev	4-byte float		-9999.9	

Precipitation Rate by Local Time. G1 only.

1.3.46. precipRateNearSurfaceUnconditional

Grid	Type	Array	Missing Value	Unit
G1	4-byte float	ltL * lnL *chn	-9999.9	
G2	4-byte float	ltH * lnH * chn	-9999.9	

Rain, not conditioned on rain.

1.3.47. precipProbabilityNearSurface

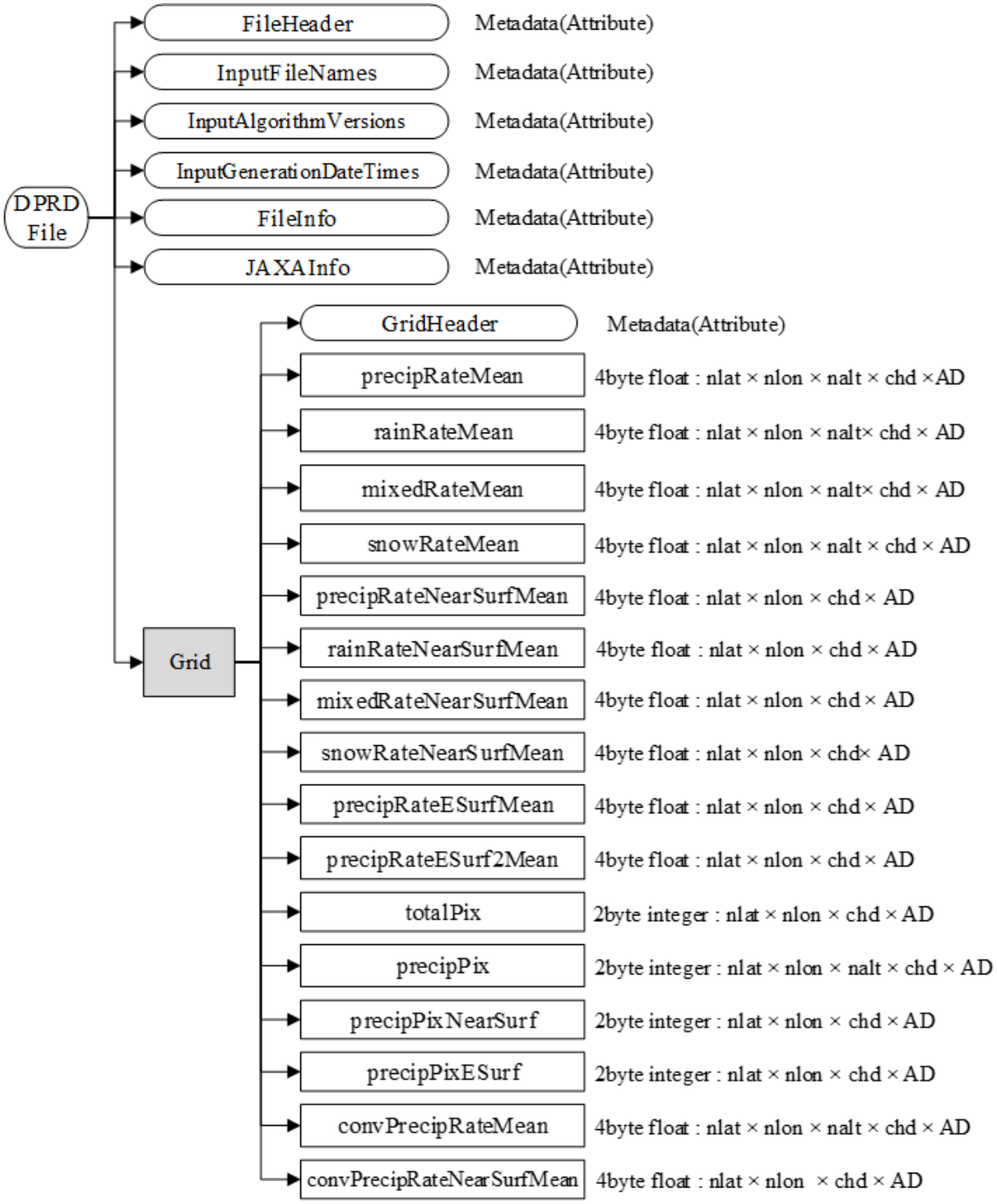
Grid	Type	Array	Missing Value	Unit
G1	4-byte float	ltL * lnL *chn	-9999.9	
G2	4-byte float	ltH * lnH * chn	-9999.9	

Probability of Rain.

2. Level 3 Data Format Structure (Daily)

2.1. Data Format Structure

3DPRD, “DPR Daily Product”, compute daily statistics of the DPR measurements at a high horizontal resolution (0.25° x 0.25° latitude/longitude). Details of the data format structure are shown in Figure 2.1-1. This product can be downloaded from JAXA and NASA download site. An additional product, which is not a GPM standard product, is published by NASA download site. It separates ascending (ASC) and descending (DES) products for L3 daily. The data format structure is identical that of 3DPR, DPR Monthly Product (See 1.1).



Continued on next figure

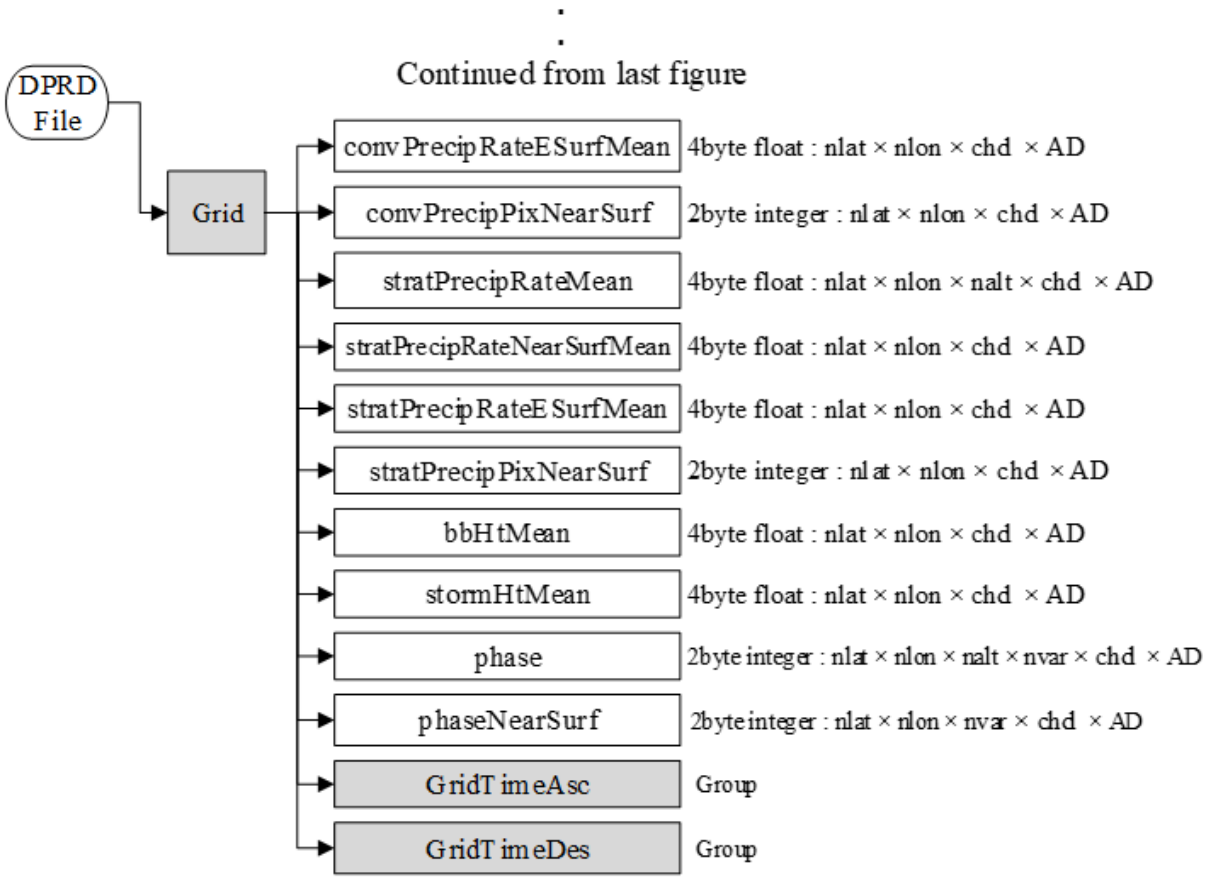


Figure 2.1-1 Data Format Structure for 3DPRD

Dimension definitions:

- 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: KuNS, DPRMS.
- AD
  - 2 Ascending or descending half of the orbit.

2.1. Metadata

See Figure 1.2-1.

2.2. Data Group

2.2.1. 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

2.2.2. 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

2.2.3. 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

2.2.4. 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

2.2.5. 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

2.2.6. 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

2.2.7. 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

2.2.8. 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

2.2.9. 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

2.2.10. 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

2.2.11. 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

2.2.12. 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

2.2.13. 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

2.2.14. 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

2.2.15. 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

2.2.16. 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

2.2.17. 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

2.2.18. 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

2.2.19. 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

2.2.20. 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

2.2.21. 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

2.2.22. 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

2.2.23. 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

2.2.24. 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

2.2.25. phase

(1) phase

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

Type	Array	Unit
	* nvar * chd * AD	

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

Missing Value:

-9999.9

2.2.26. 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

2.2.27. 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

2.2.28. 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

3. Level 3 (Text) Data Format

3.1. 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.

Table 3.1-1 Record structure of level 3 (Text) data

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

3.2. Header Structure for Level 3 (Text) data

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

Table 3.2-1 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

3.3. Data Structure for Level 3 (Text) data

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

Table 3.3-1 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

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