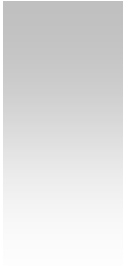


付録-3 GPMプロダクトフォーマット

DPR レベル 1 プロダクトフォーマット説明書

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1. 概要

1.1. 目的

本文書は、GPM/DPRミッション運用系システムの処理固有部DPRレベル1B処理によって作成されるレベル1プロダクトについて記述したものである。

DPRレベル1B処理は、レベル1Aプロダクトを入力し、ラジオメトリック補正、幾何計算を施し、KuPRレーダ、KaPRレーダごとに以下のプロダクトを作成する。

- KuPRレベル1プロダクト
- KaPRレベル1プロダクト

DPRレベル1プロダクトの記述フォーマットはHDF5(Hierarchical Data Format、バージョン5)とする。本プロダクトはHDF5のライブラリ1.8を使用して作成している。

1.2. 関連文書

関連文書を以下に示す。

- (1)「HDF5 Reference Manual(Release 1.8.5)」(TBD)
- (2)「HDF5 User's Guide (Release 1.8.5)」(TBD)
- (3)「全球降水観測計画(GPM)アルゴリズム開発計画書(案)」(NDX-080013)
- (4)「DPRレベル1Bアルゴリズム説明書」(TBD)
- (5)「GPMGeolocationToolkitATBD v2.1」(TBD)
- (6)「GPMデータ利用ハンドブック」(MAS-140012)

1.3. レベル定義

プロダクトレベルの定義を表1.3-1に示す。

表1.3-1 プロダクトレベル定義

名称	定義	運用モード	主な付加情報
KuPRレベル1 KaPRレベル1	受信電力に対し、ラジオメトリック補正、欠損情報に基づく欠損処理、スキャン時刻の補正、各スキャンの各レンジビンでの時刻、緯度、経度、高度情報等の幾何計算を行ったもの。	通常観測モード 外部校正モード SSPA動作解析モード LNA動作解析モード	- 受信電力プロファイル - スキャン、レンジビンの位置情報 - 品質情報 - 校正データ
		内部校正モード	- サイエンステレメトリの受信カウント値 - スキャン、レンジビンの位置情報 - 校正データ
		スタンバイモード ヘルスチェックモード	欠損情報

プロダクトの運用モードは、以下の項目(表1.3-2)を参照することで識別できる。

表 1.3-2 運用モード格納項目

グループ名	項目名
scanStatus	operationalMode

各運用モードについて、以下に概略を記述する。

表 1.3-3 運用モード概要

No.	運用モード	概要
1	通常観測モード	通常の観測モード
2	外部校正モード	地上に設置したレーダ校正装置による降雨レーダの構成を行うモード
3	内部校正モード	FCIFのRF信号折り返しループを用いて受信系の校正を行うモード
4	SSPA動作解析モード	SSPAのそれぞれの素子が正常に信号を増幅していることを確認するモード
5	LNA動作解析モード	LNAのそれぞれの素子が正常に信号を増幅していることを確認するモード
6	ヘルスチェックモード	SCDP内部のヘルスチェックを行うモード

No.	運用モード	概要
7	スタンバイモード	以下のいずれかをサイエンステレメトリに出力するモード ● 可変PRFテーブルダンプ ● 位相コードダンプ ● メモリダンプ

各運用モードの詳細については、地球観測データ利用ハンドブック -GPM編-を参照のこと。
また、それぞれのスキャンのステータスは以下の項目にフラグとして格納される。

表 1.3-4 フラグ情報格納項目

No.	グループ名	項目名	概要
1	scanStatus	dataQuality	L2で欠損とすべきスキャンに立つフラグ
2		dataWarning	固定PRFなど、注意が必要なスキャンに立つ警告フラグ
3		missing	L1Bで欠損として処理したスキャンに立つフラグ
4		geoError	GeoTKでエラーになったスキャンに立つフラグ
5		geoWarning	GeoTKでWarningになったスキャンに立つフラグ
6		limitErrorFlag	noisePower が閾値を超えたスキャンに立つフラグ
7		SCorientation	視線ベクトルに異常がある場合に立つフラグ
8		modeStatus	missing以外のエラーフラグの集約フラグ
9		pointingStatus	GPSに異常があった場合に立つフラグ

観測について、1スキャンでのAngleBinは0-51の52個となるが、実際に電波を出して観測するのは、Angle Bin 1-49の49個である。残りのAngle Bin 0, 50, 51 は「dead Time」に相当し、Angle Bin 50, 51, (次スキャンの)0 が、連続した電波停止時間となる。なお、AngleBinの間隔は0.7sec刻みである。以下に通常観測時における観測概念図を示す。KaPRの観測幅は約120km、KuPRの観測幅は約245kmである。

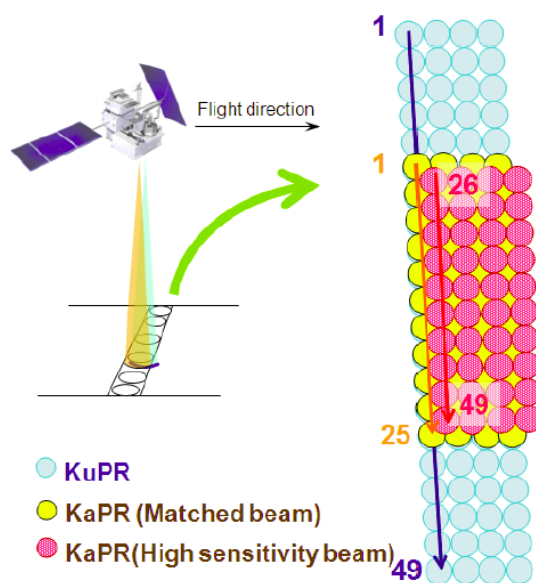
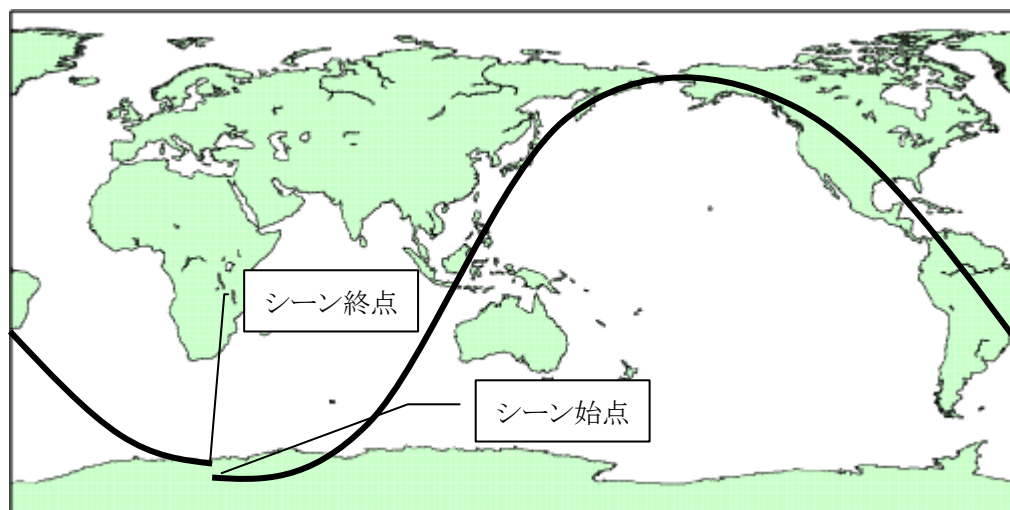


Figure 3.1-1. DPR scan pattern.

図1.3-1 通常観測時におけるKuPR、KaPR の観測概念図

1.4. シーン定義

地球の南端を起点に1周回のデータを1シーンとして定義する。シーン定義のイメージについて「図1.4-1」に示す。



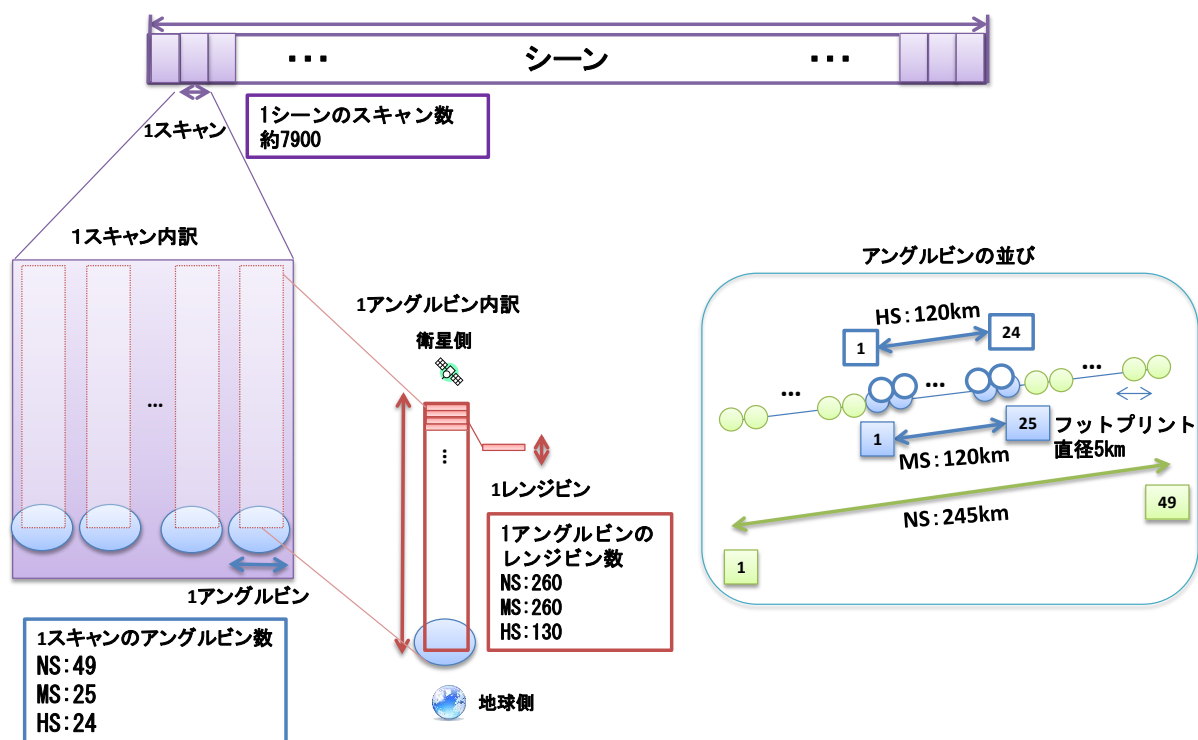


図1.4-1 シーン定義のイメージ

1.5. プロダクト構成

1シーン分のサイエンスデータを格納した1ファイルを、1プロダクトとする。

1.6. ファイルの分割とデータサイズ

1シーンをプロダクトの単位とする。

レベル1プロダクトのデータサイズを「表 1.6-1 プロダクトサイズ」に示す。

表 1.6-1 プロダクトサイズ

No.	名称	データサイズ
1	KuPRレベル1 KuPRレベル1R	約85[MByte/1周回] 約27[MByte]
2	KaPRレベル1 KaPRレベル1R	約62[MByte/1周回] 約20[MByte]

1.7. HDFデータ構造

1.7.1. Kuのファイル構造

Kuのファイル構造を以下の図に示す。

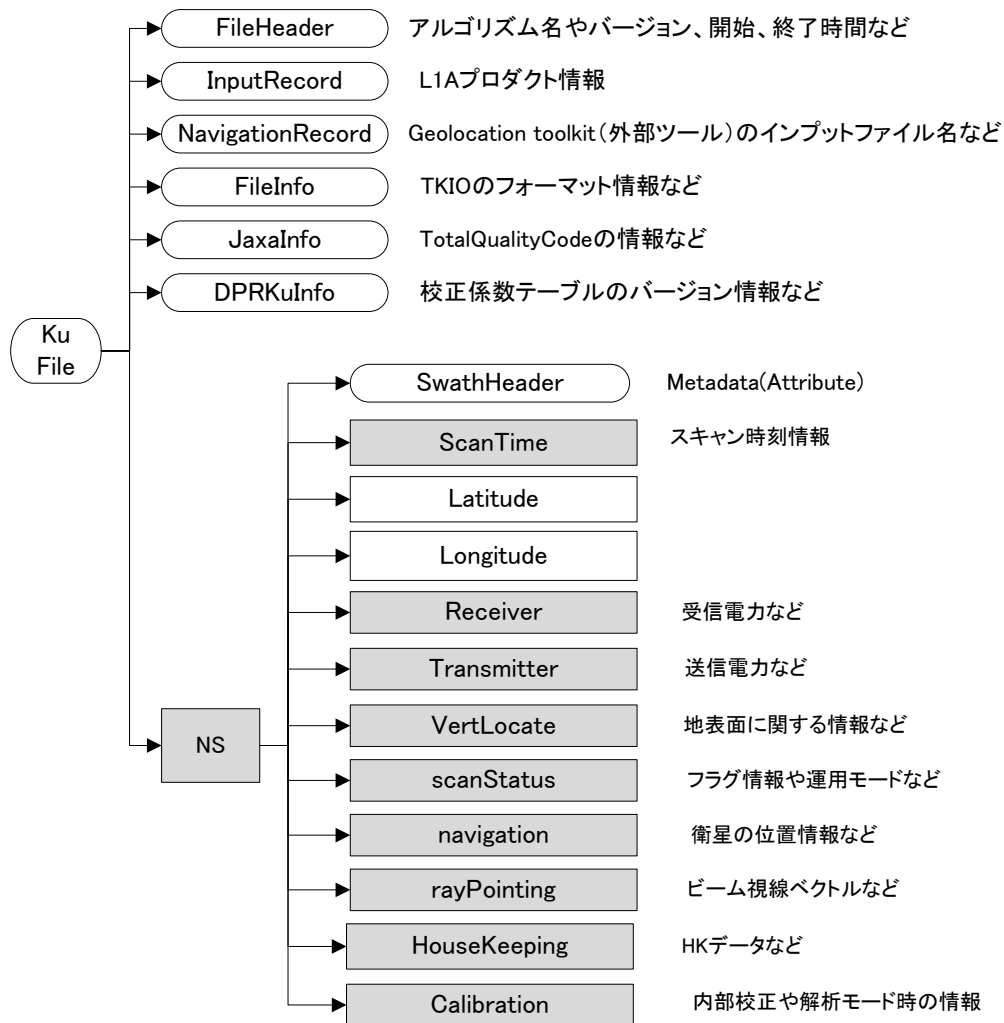


図1.7-1 Kuのファイル構造

- ※ L1Aプロダクトとはレベル1プロダクトの前処理として実行されるプロセスの出力であり、レベル1プロダクトのインプットとして用いられる。
- ※ Geolocation toolkit とは、緯度経度情報などの算出に用いられる外部ツールである。
- ※ TKIOとはプロダクト入出力のための外部ツールである

1.7.2. Kaのファイル構造

また、Kaのファイル構造を以下の図に示す。

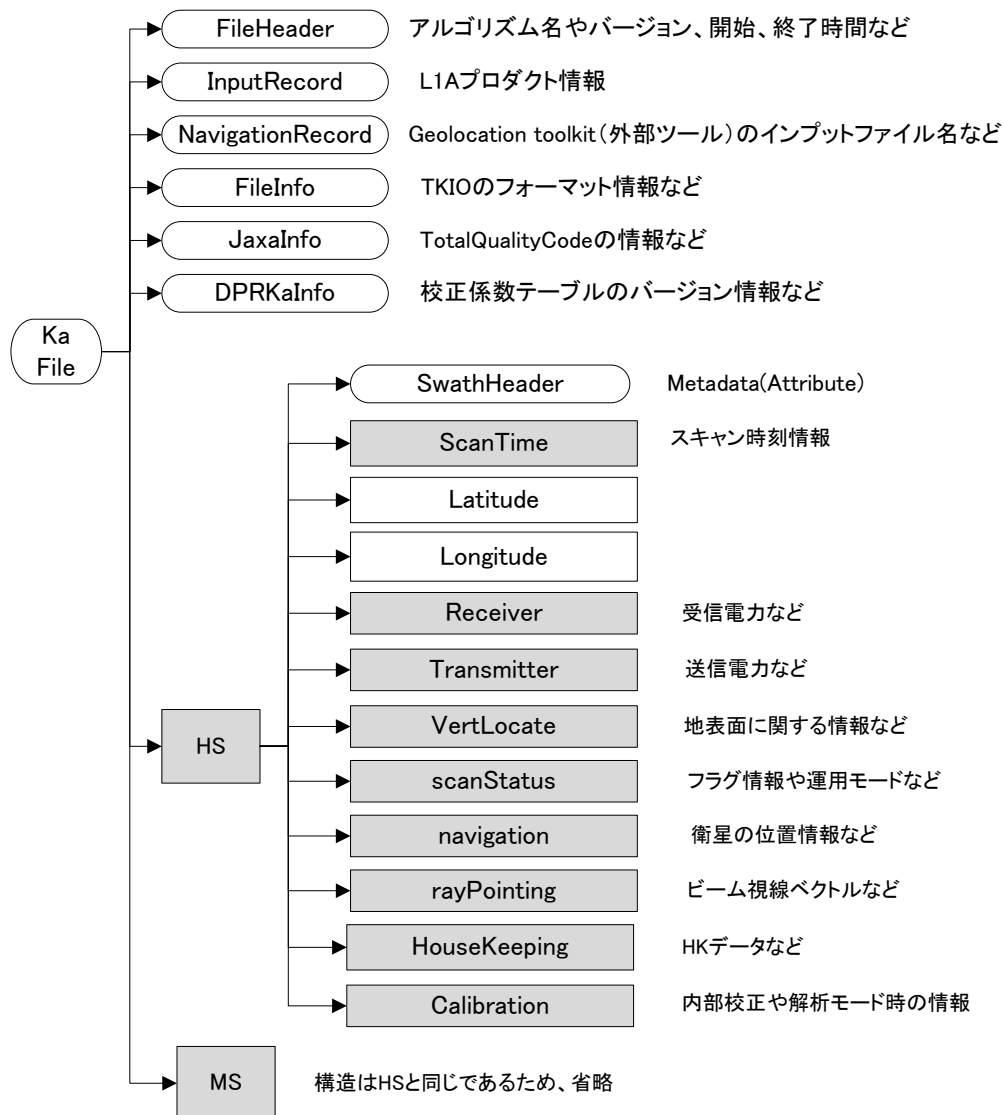


図1.7-2 Kaのファイル構造

1.8. ファイル名規約

レベル1プロダクトのファイル名規約について「標準プロダクト」と「準リアルタイムプロダクト」に分けて以下に示す。

1.8.1. 標準プロダクト

グラニューールIDをファイル名とする。グラニューールIDとは、全球地球観測衛星データを一意に識別することのできるコードのことを称する。

KuPRレベル1プロダクトのファイル名規約を「図 1.8-1 標準プロダクト KuPRレベル1ファイル名」に示す。KaPRレベル1プロダクトのファイル名規約を「図 1.8-2 標準プロダクト KaPRレベル1ファイル名」に示す。

図中の各項目の説明を「表1.8-1 標準プロダクト DPRレベル1 ファイル名の規約」に示す。

図 1.8-1 標準プロダクト KuPRレベル1ファイル名

図 1.8-2 標準プロダクト KaPRレベル1ファイル名

No.	種別	名称	文字数	値
①	シーンID	ミッションID (ミッション名 + 衛星識別)	6	GPMCOR【固定】
②		セパレータ	1	「_」(アンダースコア)【固定】
③		センサID (センサ識別)	3	XXX: KUR:KuPR KAR:KaPR
④		セパレータ	1	「_」(アンダースコア)【固定】
⑤		シーン開始時刻	10	UTC時刻

1 概要

No.	種別	名称	文字数	値
				YY:西暦 MM:月 DD:月ごとの日 hh:時刻 0～23 mm:分 0～59
⑥		セパレータ	1	「_」(アンダースコア)【固定】
⑦		シーン終了時刻	4	UTC時刻 hh:時刻 0～23 mm:分 0～59
⑧		セパレータ	1	「_」(アンダースコア)【固定】
⑨		オービット番号	6	000001～999999(ゼロ詰め6桁)
⑩		セパレータ	1	「_」(アンダースコア)【固定】
⑪	プロダクトID	処理レベル	3	1BS【固定】
⑫		セパレータ	1	「_」(アンダースコア)【固定】
⑬		アルゴリズムID (処理アルゴリズム)	3	アルゴリズム種別と開発チームを特定
⑭		セパレータ	1	「_」(アンダースコア)【固定】
⑮		プロダクトバージョン	3	XX+A: XX: 自然数 01～99 A: 英文字 A～Z 再処理はバージョン番号の数字2桁のみで識別する。 3桁目の英文字はマイナーなバージョン変更を意味する。 アルゴリズムバージョンとソフトウェアバージョンはメタで管理
⑯		ファイル拡張子	3	「.h5」【固定】HDF5形式

1.8.2. 準リアルタイムプロダクト

グラニューールIDをファイル名とする。

KuPRレベル1プロダクトのファイル名規約を「図 1.8-3 準リアルタイムプロダクト KuPRレベル1ファイル名」に示す。KaPRレベル1プロダクトのファイル名規約を「図 1.8-4 準リアルタイムプロダクト KaPRレベル1ファイル名」に示す。

図中の項目の説明を「表1.8-2 準リアルタイムプロダクト DPRレベル1Bファイル名の規約」に示す。

図 1.8-3 準リアルタイムプロダクト KuPRLレベル1ファイル名

図 1.8-4 準リアルタイムプロダクト KaPRレベル1ファイル名

No.	種別	名称	文字数	値
①	シーンID	ミッションID (ミッション名 + 衛星識別)	6	GPMCOR【固定】
②		セパレータ	1	「_」(アンダースコア)【固定】
③		センサID (センサ識別)	3	XXX: KUR:KuPR KAR:KaPR
④		セパレータ	1	「_」(アンダースコア)【固定】
⑤		シーン開始時刻	10	UTC時刻

1 概要

No.	種別	名称	文字数	値
				YY:西暦 MM:月 DD:月ごとの日 hh:時刻 0～23 mm:分 0～59
⑥		セパレータ	1	「_」(アンダースコア)【固定】
⑦		シーン終了時刻	4	UTC時刻 hh:時刻 0～23 mm:分 0～59
⑧		セパレータ	1	「_」(アンダースコア)【固定】
⑨		オービット番号	6	000001～999999(ゼロ詰め6桁)
⑩		セパレータ	1	「_」(アンダースコア)【固定】
⑪	プロダクトID	処理レベル	3	1BR【固定】
⑫		セパレータ	1	「_」(アンダースコア)【固定】
⑬		アルゴリズムID (処理アルゴリズム)	3	アルゴリズム種別と開発チームを特定
⑭		セパレータ	1	「_」(アンダースコア)【固定】
⑮		プロダクトバージョン	3	XX+A: XX: 自然数 01～99 A: 英文字 A～Z 再処理はバージョン番号の数字2桁のみで識別する。 3桁目の英文字はマイナーなバージョン変更を意味する。 アルゴリズムバージョンとソフトウェアバージョンはメタで管理
⑯		ファイル拡張子	3	「.h5」【固定】HDF5形式

2. レベル1プロダクト フォーマット仕様

2.1. 処理概要

レベル1B処理の概要について以下に示す。

2.1.1. 標準処理

DPRレベル1B標準処理では、入力となるレベル1Aプロダクトを読み込み、受信電力プロファイル、観測位置等の幾何情報を含んだプロダクトを出力する。処理内容は、ラジオメトリック補正、欠損情報に基づく欠損処理、スキャン時刻の補正、各スキャンの各レンジビンでの時刻、緯度、経度、高度情報等の幾何計算を行う。

上記の処理をKuPRレーダ、KaPRレーダの入力値に対し行う。処理フローを図2.1-1に示す。

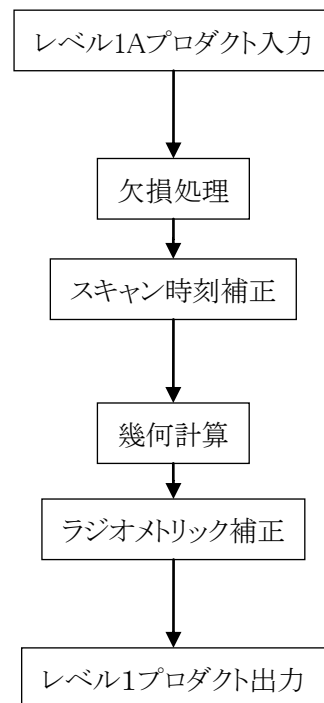


図2.1-1 レベル1B標準処理フロー

2.1.2. 準リアルタイム処理

準リアルタイム処理の概要は、「2.1.1 標準処理」と同様である。

2.2. ファイル入出力関連

レベル1B処理のファイル入出力について表2.2-1に示す。

表2.2-1 DPRレベル1B処理での入出力ファイル一覧

No	入/出	ファイル名	主な格納項目	フォーマット
1	入	レベル1AKuPRプロダクト	・スキャン数 ・サイエンステレメトリ ・HKテレメトリ	HDF5
2	入	レベル1AKaPRプロダクト	・スキャン数 ・サイエンステレメトリ ・HKテレメトリ	HDF5
3	入	L1Bデータベース	・VPRFテーブル ・校正係数 ・走査角度 ・基本システム情報テーブル ・offset DB テーブル	ASCII またはバイナリ
4	入	geolocation toolkit入力ファイル	・軌道、姿勢関連情報	-
5	入	制御情報ファイル	・シーンの開始・終了時刻 ・ファイルパス	XML
5	出	レベル1BKuPRプロダクト	・HKテレメトリ ・スキャン数 ・スキャン時刻、各スキャンの地理情報 ・各スキャンの鉛直情報 ・KuPRセンサでの各周波数でのレーダ受信電力値 ・校正係数	HDF5
6	出	レベル1BKaPRプロダクト	・HKテレメトリ ・スキャン数 ・スキャン時刻、各スキャンの地理情報 ・各スキャンの鉛直情報 ・KaPRセンサでの各周波数でのレーダ受信電力値 ・校正係数	HDF5
7	出	処理結果	・プロダクトの状態 (Good、NG、Poor、EG) ・G-Portalへの情報	XML
8	出	ブラウザ	受信電力の地図へのマッピング画像	JPEG
9	出	サムネイル	ブラウザのサムネイル	JPEG

※ 標準プロダクトと準リアルタイムプロダクトの内容は同一である。

2.3. データ概要

データの内容を表2.3-1に示す。

表2.3-1 DPRレベル1プロダクトの内容

処理レベル	プロダクト	シーン単位	観測領域	ピクセルサイズ	観測モード	備考
レベル1B	KuPRレベル1 プロダクト	1周回	約245km	水平約5km 鉛直125m	通常観測モード 外部校正モード SSPA動作解析モード LAN動作解析モード	-
					内部校正モード	受信電力値にサイエンステレメトリの受信カウント値を入力。100倍スケーリングを行わない
					スタンバイモード ヘルスチェックモード	欠損情報を格納
	KaPRレベル1 プロダクト	1周回	約125km	水平約5km 鉛直125m/250m	通常観測モード 外部校正モード SSPA動作解析モード LAN動作解析モード	-
					内部校正モード	受信電力値にサイエンステレメトリの受信カウント値を入力。100倍スケーリングを行わない
					スタンバイモード ヘルスチェックモード	欠損情報を格納

※ 標準プロダクトと準リアルタイムプロダクトの内容は同一である。

2.3.1. 位置情報

プロダクトに格納される位置情報を表2.3-2に示す。緯度経度などの位置情報は外部ツール (Geolocation toolkit) により算出される。

表2.3-2 プロダクトに格納される位置情報

No.	グループ名	項目名	単位	概要
1	–	Latitude	degrees	各アングルビンでの緯度
2	–	Longitude	degrees	各アングルビンでの経度
3	navigation	greenHourAng	m	Greenwich Hour angle at scan mid
4		scAlt	m	衛星直下の高度
5		scAttPitchGeoc	degrees	S/C geocentric pitch at scan mid time
6		scAttPitchGeod	degrees	S/C geodetic pitch at scan mid time
7		scAttRollGeoc	degrees	S/C geocentric roll at scan mid time
8		scAttRollGeod	degrees	S/C geodetic roll at scan mid time
9		scAttYawGeoc	degrees	S/C geocentric Yaw at scan mid time
10		scAttYawGeod	degrees	S/C geodetic yaw at scan mid time
11		scLat	degrees	衛星直下の緯度
12		scLon	degrees	衛星直下の経度
13		scPos	m	地球固定座標系での衛星の位置

No.	グループ名	項目名	単位	概要
14		scVel	m/s	地球固定座標系での衛星の速度
15	rayPointing	instrumentPitch	degrees	Instrument pitch/pixel time (deg)
16		instrumentRoll	degrees	Instrument roll/pixel time (deg)
17		instrumentYaw	degrees	Instrument yaw/pixel time (deg)
18	VertLocate	scLocalZenith	degrees	レンジビンでの天頂角
19		scRangeEllipsoid	m	エリプソイドまでの距離

回転楕円体としてWGS-84 を使用している。項目の詳細については、GPMGeolocationToolkitATBDv2.1 を参照のこと。

また、位置情報算出時にGeolocation toolkit に与えている視線ベクトルは以下の項目に格納されている。

表2.3-3 視線ベクトル格納項目

No.	グループ名	項目名	単位	概要
1	rayPointing	rayDirectionX	—	DPR機械座標系におけるビーム指向方向X
2		rayDirectionY	—	DPR機械座標系におけるビーム指向方向Y

ビーム視線ベクトルはDPR機械座標系におけるビーム指向方向の単位ベクトルである。算出方法についてはDPRレベル1Bアルゴリズム説明書を参照のこと。

2.3.2. 時刻定義

格納される時刻はスキャンの中心時刻、すなわちKuではAngleBin#25 の開始時刻、MSでは AngleBin #13の開始時刻、HSでは AngleBin#37 の中心時刻となる。サイエンステレトリのSecondary Header には

Kuの Anglebin#0 の開始時刻が格納されるため、Kaは固定遅延時間を考慮して時刻の算出を行う。

Ku、Kaともに遅延がない場合の時刻を以下の図に示す。

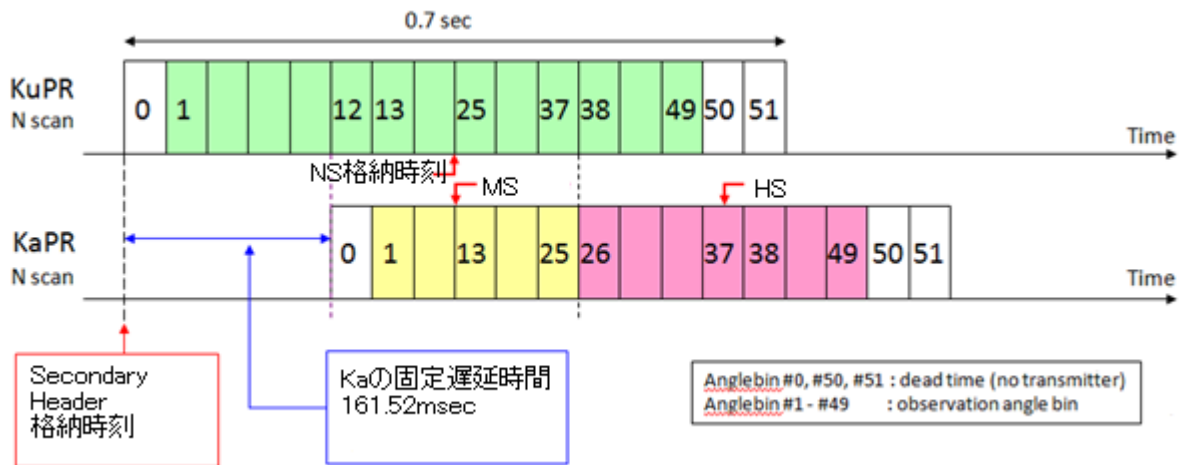


図2.3-1 遅延がない場合の時刻情報

この場合、NSの格納時刻とMSの格納時刻は一致する。

Kaにのみ遅延がある場合の時刻を以下の図に示す。

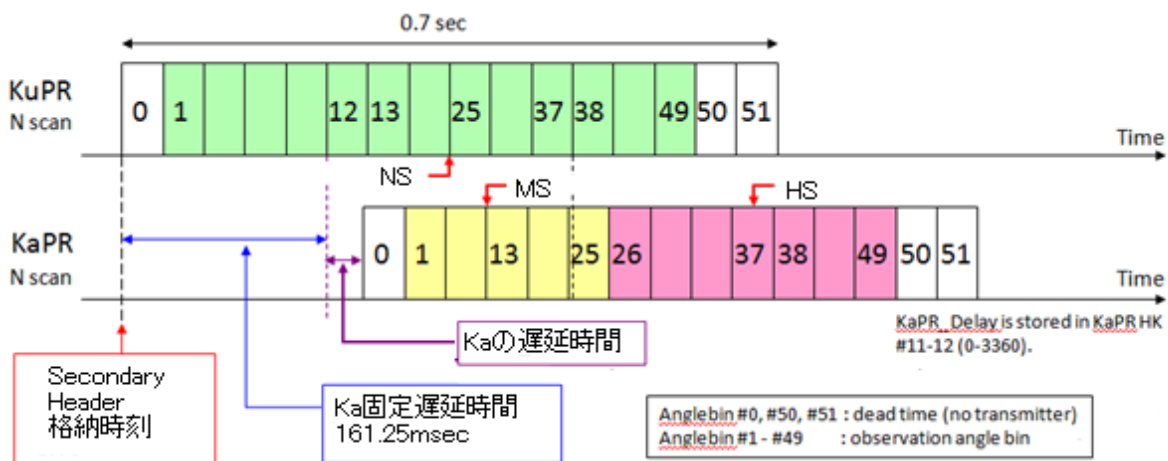


図2.3-2 Kaにのみ遅延がある場合の時刻情報

遅延時間は衛星進行方向のビームミスマッチ補正を行うために設定され、この場合NSとMSの時刻は一致しない。ビームミスマッチとは、KuPRまたはKaPRにおいて、送信ビームと受信ビームの方向が一致しないことである。

Kuにのみ遅延がある場合の時刻を以下の図に示す。

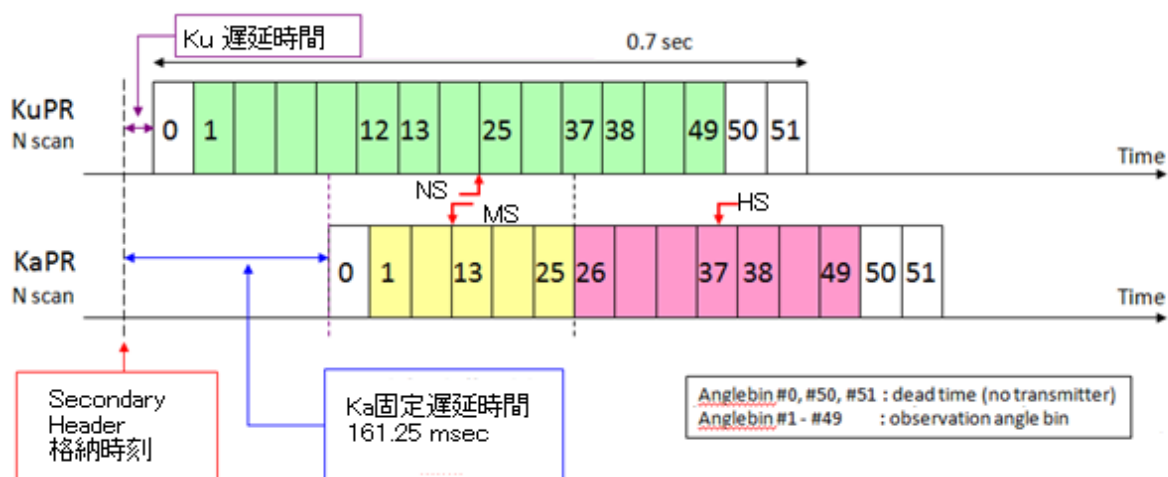


図2.3-3 Kuにのみ遅延がある場合の時刻情報

遅延時間は衛星進行方向のビームスマッチ補正を行うために設定され、この場合NSとMSの時刻は一致しない。

SCDP独立運用の場合の時刻を以下の図に示す。

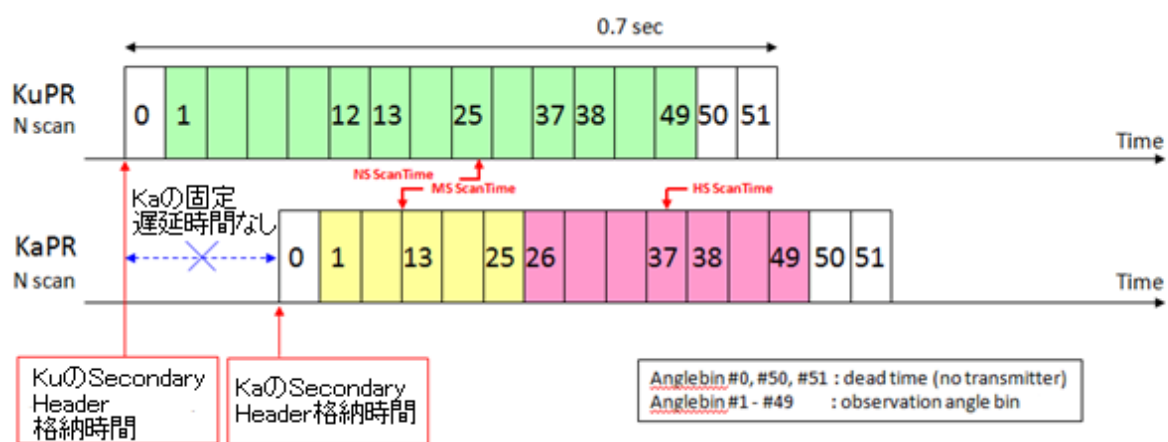


図2.3-4 SCDP独立運用場合の時刻情報

SCDP独立運用とは、KuPRとKaPRのシステム制御・データ処理を独立させて運用することである。この場合、Kaの固定遅延時間は設定されず、Secondary Header にはそれぞれのセンサのAngleBin#0 の開始時刻が格納される。

2.3.3. AngleBin時刻算出方法

それぞれのAngleBinの時刻を算出する場合、以下の項目を使用する。

表2.3-4 AngleBin 時刻算出で使用する項目

No.	グループ名	項目名	説明
1	HouseKeeping	scTime	Secondary Header の格納時刻。1980年1月6日00:00:00からの積算秒で格納
2	rayPointing	rayTiming	Secondary Header の格納時刻を基準としたAngle Bin[n]におけるオフセット時間

rayTiming にはSecondary Header の格納時刻から、各AngleBinの中心時刻までのオフセット時刻が格納されている。scTime に rayPointing を足し合わせることでAngleBin の時刻を求めることができる。なお、rayTiming に格納されている中心時刻は、Angle Bin [n]の時刻とAngle Bin [n+1]の時刻の平均である。

2.3.4. 欠損値

通常観測、外部校正、SSPA動作解析、LNA動作解析モードの場合、データが欠落したスキャンのみ、以下の表に示す項目が欠損値となる。またスタンバイ、ダンプモードの場合、以下の表に示す項目が全て欠損値となる。

表2.3-2 欠損値一覧

No.	グループ名	項目名	欠損値
1	ScanTime	Year	N/A
2		Month	N/A
3		DayOhMonth	N/A
4		Hour	N/A
5		Minute	N/A
6		Second	N/A
7		MilliSecond	N/A
8		DayOfYear	N/A
9		SecondOfDay	N/A
10	-	Latitude	-9999.9
11	-	Longitude	-9999.9
12	Receiver	noiseCount	-9999.9

No.	グループ名	項目名	欠損値
13		echoPower	-29999 -30000
14		noisePower	-30000
15		noiseSampleNumber	-9999
16		rxAntGain	-9999.9
17	Transmitter	radarTransPower	-9999.9
18		transPulseWidth	-9999.9
19		txAntGain	-9999.9
20	VertLocate	DEMHmean	-9999
21		alongTrackBeamWidth	N/A
22		binDEm	-9999
23		binDEMHTop	-9999
24		binDEMHBOTTOM	-9999
25		binEchoPeak	-9999
26		binEllipsoid	-9999
27		crossTrackBeamWidth	N/A
28		echoHighResBinNumber	-9999
29		echoLowResBinNumber	-9999
30		landOceanFlag	-9999
31		mainlobeEdge	-9999
32		rangeBinSize	-9999.9
33		scLocalZenith	-9999.9
34		scRangeDEM	-9999.9
35		scRangeEllipsoid	-9999.9
36		sidelobeEdge	-9999
37		startBinRange	-9999.9
38	scanStatus	FractionalGranuleNumber	N/A
39		SCorientation	-9999
40		acsModeMidScan	N/A
41		dataQuality	N/A
42		dataWarning	N/A
43		geoError	N/A
44		geoWarning	N/A

No.	グループ名	項目名	欠損値
45		limitErrorFlag	N/A
46		missing	N/A
47		modeStatus	N/A
48		operationalMode	-99
49		pointingStatus	-9999
50		targetSelectionMidScan	-99
51	navigation	dprAlt	-9999.9
52		greenHourAng	-9999.9
53		scAttPitchGeoc	-9999.9
54		scAttPitchGeod	-9999.9
55		scAttRollGeoc	-9999.9
56		scAttRollGeod	-9999.9
57		scAttYawGeoc	-9999.9
58		scAttYawGeod	-9999.9
59		scLat	-9999.9
60		scLon	-9999.9
61		scPos	-9999.9
62		scVel	-9999.9
63		timeMidScan	-9999.9
64		timeMidScanOffset	-9999.9
65	rayPointing	instrumentPitch	-9999.9
66		instrumentRoll	-9999.9
67		instrumentYaw	-9999.9
68		rayDirectionX	N/A
69		rayDirectionY	N/A
70		rayTiming	N/A
71		scanAngle	N/A
72	HouseKeeping	binDiffPeakDEM	-9999
73		cathingInt	-99
74		delay	-9999
75		divcomb1Temp	-9999
76		divcomb2Temp	-9999
77		fcifFlag	N/A

No.	グループ名	項目名	欠損値
78		fcifTemp	-9999
79		lnaTemp	-9999
80		logAmpNoiseLevel	-9999
81		rdaTemp	-9999
82		rxAtt	-99
83		rxAttGainOffset	-9999.9
84		scTime	N/A
85		scdpFlag	N/A
86		seqCountL1A	-9999
87		sspaTemp	-9999
88		vprfTableSelect	-99
89		vprfTableVersion	-99
90	Calibration	angleBinSelect	-99
91		fcifInPower	-30000
92		intAttSelect	-99
93		sspaLnaSelect	-99

内部校正モードの場合、以下の表に示す項目が全て欠損値となる。

表2.3-3 内部校正モード時の欠損値一覧

No.	グループ名	項目名	欠損値
1	Receiver	noiseCount	-9999.9
2		noisePower	-30000
3		noiseSampleNumber	-9999
4		rxAntGain	-9999.9
5	Transmitter	radarTransPower	-9999.9
6		transPulseWidth	-9999.9
7		txAntGain	-9999.9
8	VertLocate	startBinRange	-9999.9
9		echoLowResBinNumber	-9999
10		binEllipsoid	-9999
11		binDEm	-9999
12		binDEMHTop	-9999

No.	グループ名	項目名	欠損値
13		binDEMHbottom	-9999
14		binEchoPeak	-9999
15		ellipsoidBinOffset	-9999.9
16		rangeBinSize	-9999.9
17		mainlobeEdge	-9999
18		sidelobeEdge	-9999
19	HouseKeeping	binDiffPeakDEM	-9999
20		vprfTableVersion	-99
21		vprfTableSelect	-99
22		rxAttGainOffset	-9999.9
23		catchingInt	-99

なお、データ欠損の場合のフラグ情報については表1-3.4を参照のこと

2.4. 標準プロダクトフォーマット

2.4.1. KuPRレベル1プロダクト

KuPR レベル 1 プロダクトのフォーマットを「表 2. 5-1 KuPR レベル 1 プロダクト」に示す。

2.4.2. KaPRレベル1プロダクト

KaPR レベル 1 プロダクトのフォーマットを「表 2. 5-2 KaPR レベル 1 プロダクト」に示す。

2.5. 準リアルタイムプロダクト

「2.3.標準プロダクト」と同様。

表 2.5-1 KuPR レベル 1 プロダクトフォーマット

	Group Name 1	Group Name 2	DPR Initial 1BKu Value Name	missing	min	max	unit	type	Data size	type	array	Remark			
1BKu	NS	ScanTime	Year[nscan]	-9999	1950	2100	[years]	signed 2B int	15800	2	nscan	1	1		
			Month[nscan]	-99	1	12	[months]	signed 1B int	7900	1	nscan	1	1		
			DayOfMonth[nscan]	-99	1	31	[days]	signed 1B int	7900	1	nscan	1	1		
			Hour[nscan]	-99	0	23	[hours]	signed 1B int	7900	1	nscan	1	1		
			Minute[nscan]	-99	0	59	[minutes]	signed 1B int	7900	1	nscan	1	1		
			Second[nscan]	-99	0	60	[s]	signed 1B int	7900	1	nscan	1	1		
			MilliSecond[nscan]	-9999	0	999	[ms]	signed 2B int	15800	2	nscan	1	1		
			DayOfYear[nscan]	-9999	1	366	[days]	signed 2B int	15800	2	nscan	1	1		
			SecondOfDay[nscan]	-9999.9	0	86400	[s]	8B double	63200	8	nscan	1	1		
			Latitude[nray][nscan]	-9999.9	-90	90	[degrees]	4B float	1548400	4	49	nscan	1		
			(N/A)												
			(N/A)												
			scanStatus	dataQuality[nscan]						signed 1B int	7900	1	nscan	1	1
		dataWarning[nscan]							signed 1B int	7900	1	nscan	1	1	Flag of data warning for each scan. Detailed information is defined in LIB Product Format edited by JAXA/EORC.
		missing[nscan]							signed 1B int	7900	1	nscan	1	1	Indicates whether information is contained in the scan data. The values are: Bit Meaning if bit = 1 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)
		modeStatus[nscan]							signed 1B int	7900	1	nscan	1	1	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 if bit = 1 0 Spare (always 0) 1 Sorientation 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)
		geoError[nscan]							signed 2B int	15800	2	nscan	1	1	A summary of geolocation errors in the scan. geoError is used to set a bit in dataQuality. 5 18 1BKu - Ku Power 565 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 if bit = 1 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)
		geoWarning[nscan]							signed 2B int	15800	2	nscan	1	1	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 if bit = 1 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)
		Sorientation[nscan]		-9999						15800	2	nscan	1	1	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 Sorientation 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
		pointingStatus[nscan]		-9999					signed 2B int	15800	2	nscan	1	1	pointingStatus is provided by the geo Toolkit. 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
		acsModeMidScan[nscan]							signed 1B int	7900	1	nscan	1	1	acsModeMidScan is provided by the geo Toolkit 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
		targetSelectionMidScan[nscan]		-99					signed 1B int	7900	1	nscan	1	1	targetSelectionMidScan is provided by the geo Toolkit 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
		operationalMode[nscan]			1	20			signed 1B int	7900	1	nscan	1	1	The operational mode of KuPR/KaPR stored in science telemetry. operationalMode is used in modeStatus. The range is 1 to 20. 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)
		limitErrorFlag[nscan]							signed 1B int	7900	1	nscan	1	1	Bit flags for every ray with information about echo power limit checks. limitErrorFlag may be used in modeStatus. Detailed information is defined in LIB Product Format edited by JAXA/EORC.
		navigation	FractionalGranuleNumber[nscan]	-9999.9	0	100000		8B double	63200	8	nscan	1	1	1	The floating point granule number. The granule begins at the Southern-most point of
			scPos[XYZ][nscan]	-9999.9	-10000000	10000000	[m]	4B float	94800	4	3	nscan	1	1	
			scVel[XYZ][nscan]	-9999.9	-10000000	10000000	[m/s]	4B float	94800	4	3	nscan	1	1	
			scLat[nscan]	-9999.9	-70	70	[degrees]	4B float	31600	4	nscan	1	1	1	
			scLon[nscan]	-9999.9	-180	180	[degrees]	4B float	31600	4	nscan	1	1	1	
			scAlt[nscan]	-9999.9	350000	500000	[m]	4B float	31600	4	nscan	1	1	1	
			dprAlt[nscan]	-9999.9	350000	500000	[m]	4B float	31600	4	nscan	1	1	1	
			scAttRollGeoc[nscan]	-9999.9	-180	180	[degrees]	4B float	31600	4	nscan	1	1	1	
			scAttPitchGeoc[nscan]	-9999.9	-180	180	[degrees]	4B float	31600	4	nscan	1	1	1	
			scAttYawGeoc[nscan]	-9999.9	-135	225	[degrees]	4B float	31600	4	nscan	1	1	1	
			scAttRollGeod[nscan]	-9999.9	-180	180	[degrees]	4B float	31600	4	nscan	1	1	1	
			scAttPitchGeod[nscan]	-9999.9	-180	180	[degrees]	4B float	31600	4	nscan	1	1	1	
			scAttYawGeod[nscan]	-9999.9	-135	225	[degrees]	4B float	31600	4	nscan	1	1	1	
			greenHourAng[nscan]	-9999.9	0	390	[degrees]	4B float	31600	4	nscan	1	1	1	
			timeMidScan[nscan]	-9999.9	0	10000000000	[s]	8B double	63200	8	nscan	1	1	1	
		timeMidScanOffset[nscan]	-9999.9	0	100	[s]	8B double	63200	8	nscan	1	1	1		

	Group Name 1	Group Name 2	DPR Initial 18Ku Value Name	missing	min	max	unit	type	Data size	type	array	Remark		
1BKu-Metadata		rayPointing	rayDirectionX[nray][nscan]	-9999.9	-1	1		4B float	1548400	4	49 nscan	1		
			rayDirectionY[nray][nscan]	-9999.9	-1	1		4B float	1548400	4	49 nscan	1		
			instrumentYaw[nray][nscan]	-9999.9	-135	225 [degrees]		4B float	1548400	4	49 nscan	1		
			instrumentPitch[nray][nscan]	-9999.9	-90	90 [degrees]		4B float	1548400	4	49 nscan	1		
			instrumentRoll[nray][nscan]	-9999.9	-180	180 [degrees]		4B float	1548400	4	49 nscan	1		
			rayTiming[nray][nscan]	-9999.9	0	1.6 [s]		4B float	1548400	4	49 nscan	1		
			scanAngle[nray][nscan]	-9999.9	-18	18 [degrees]		4B float	1548400	4	49 nscan	1		
			rxAtt[nscan]	99	0	12 [dB]		signed 1B int	7900	1	nscan	1	1	
			rxAttGainOffset[nscan]	-9999.9	-260	260 [dB]		4B float	31600	4	nscan	1	1	
			binDiffPeakDEM[nray][nscan]	-9999	-260	260		signed 2B int	774200	2	49 nscan	1	1	
		scTime[nscan]	-9999.9				8B float	63200	8	nscan	1	1		
		vrpfTableVersion[nscan]	-99	1	127		signed 1B int	7900	1	nscan	1	1		
		HouseKeeping											the selected number of VPRF table for altitude (h, km) which is used in LIB process. The range is 1 to 25. h LT 396.5 = 1 396.5 LE h LT 397.5 = 2 397.5 LE h LT 398.5 = 3 398.5 LE h LT 399.5 = 4 399.5 LE h LT 400.5 = 5 400.5 LE h LT 401.5 = 6 401.5 LE h LT 402.5 = 7 402.5 LE h LT 403.5 = 8 403.5 LE h LT 404.5 = 9 404.5 LE h LT 405.5 = 10 405.5 LE h LT 406.5 = 11 406.5 LE h LT 407.5 = 12 407.5 LE h LT 408.5 = 13 408.5 LE h LT 409.5 = 14 409.5 LE h LT 410.5 = 15 410.5 LE h LT 411.5 = 16 411.5 LE h LT 412.5 = 17 412.5 LE h LT 413.5 = 18 413.5 LE h LT 414.5 = 19 414.5 LE h LT 415.5 = 20 415.5 LE h LT 416.5 = 21 416.5 LE h LT 417.5 = 22 417.5 LE h LT 418.5 = 23 418.5 LE h LT 419.5 = 24 419.5 LE h = 25 where LT mean less than and LE means less than or equal to	
			vrpfTableSelect[nscan]		1	25		signed 1B int	7900	1	nscan	1	1	
			catchingInt[nscan]	-99	8	12		signed 1B int	7900	1	nscan	1	1	
			scdpFlag[nscan]					signed 1B int	7900	1	nscan	1	1	
			fcirFlag[nscan]					signed 1B int	7900	1	nscan	1	1	
				logAmpNoiseLevel[nscan]	-9999			[dBm]	signed 2B int	15800	2	nscan	1	1
				delay[nscan]	-9999	0	3360		signed 2B int	15800	2	nscan	1	1
				seqCountL1A[nscan]	-9999	0	27000		signed 2B int	15800	2	nscan	1	1
				fcirTemp[2xnscan]	-9999	-5000	5000 [C]		signed 2B int	31600	2	2 X nscan	1	1
				lnaTemp[2xnscan]	-9999	-5000	5000 [C]		signed 2B int	31600	2	2 X nscan	1	1
		rdetTemp[2xnscan]		-9999	-5000	5000 [C]		signed 2B int	31600	2	2 X nscan	1	1	
		divcomb1Temp[2xnscan]		-9999	-5000	5000 [C]		signed 2B int	31600	2	2 X nscan	1	1	
		divcomb2Temp[2xnscan]		-9999	-5000	5000 [C]		signed 2B int	31600	2	2 X nscan	1	1	
		sspaTemp[2xnscan]		-9999	-5000	5000 [C]		signed 2B int	31600	2	2 X nscan	1	1	
		VertLocate	landOceanFlag[nray][nscan]		0	3		signed 2B int	774200	2	49 nscan	1	Land or ocean information. The values of the flag are: 0 = Water 1 = Land 2 = Coast 3 = Inland Water	
			scLocalZenith[nray][nscan]	-9999.9	0	90 [degrees]		4B float	1548400	4	49 nscan	1		
			startBinRange[nray][nscan]	-9999.9	350000	500000 [m]		4B float	1548400	4	49 nscan	1		
			echoHighResBinNumber[nray][nscan]	-9999	1	260		signed 2B int	774200	2	49 nscan	1	Meaning in Normal Mode: 0 = Over sampling range bin OR 1 = Normal sampling range bin 2 = Interpolated range bin -99 = Outrange bin of the observation area Meaning in internal calibration mode: 0 : In internal calibration mode, this value is stored 1~ 42 range bin for each ray. -99: missing value. In internal calibration mode, this value is stored after 43 range bin for each ray as missing.	
			echoLowResBinNumber[nray][nscan]	-9999	0	260		signed 2B int	774200	2	49 nscan	1		
			binEllipsoid[nray][nscan]	-9999	1	260		signed 2B int	774200	2	49 nscan	1		
			scRangeEllipsoid[nray][nscan]	-9999.9	0	500000 [m]		4B float	1548400	4	49 nscan	1		
			binDEM[nray][nscan]	-9999	1	260		signed 2B int	774200	2	49 nscan	1		
			scRangeDEM[nray][nscan]	-9999.9	0	500000 [m]		4B float	1548400	4	49 nscan	1		
			DEMHmean[nray][nscan]	-9999	0	9000 [m]		signed 2B int	774200	2	49 nscan	1		
			binDEMhtop[nray][nscan]	-9999	1	260		signed 2B int	774200	2	49 nscan	1		
			binDEMhbottom[nray][nscan]	-9999	1	260		signed 2B int	774200	2	49 nscan	1		
			binEchoPeak[nray][nscan]	-9999	1	260		signed 2B int	774200	2	49 nscan	1		
			alongTrackBeamWidth[nray][nscan]				[degrees]	4B float	1548400	4	49 nscan	1		
			crossTrackBeamWidth[nray][nscan]				[degrees]	4B float	1548400	4	49 nscan	1		
			mainlobeEdge[nray][nscan]					signed 2B int	774200	2	49 nscan	1		
			sidelobeRange[nray][nscan]					signed 2B int	774200	2	49 nscan	1		
			ellipseOffset[nray][nscan]					4B float	1548400	4	49 nscan	1		
			rangeBinSize[nscan]				[m]	4B float	31600	4	nscan	1		
			ratioLand[nray][nscan]					signed 1B int	387100	1	49 nscan	1		
		ratioOcean[nray][nscan]					signed 1B int	387100	1	49 nscan	1			
		ratioInLand[nray][nscan]					signed 1B int	387100	1	49 nscan	1			
		ratioCoast[nray][nscan]					signed 1B int	387100	1	49 nscan	1			
		Calibration	fcirPower[nscan]	-32734			[dBm]	signed 2B int	15800	2	nscan	1	1	
			intAttSelect[nscan]	-99	1	32 [step]		signed 1B int	7900	1	nscan	1	1	
			sspaLnaSelect[nscan]	-9999	1	128		signed 2B int	15800	2	nscan	1	1	
			angleBinSelect[nscan]	-99	1	49		signed 1B int	7900	1	nscan	1	1	
		Transmitter	radarTransPower[nscan]	-9999.9				4B float	31600	4	nscan	1	1	
			transPulseWidth[nscan]	-9999.9	0.0000015	0.0000017 [s]		4B float	31600	4	nscan	1	1	
			txAntGain[nray][nscan]	-9999.9			[dB]	4B float	1548400	4	49 nscan	1	1	
		Receiver	echoCount[nbin][nray][nscan]					unsigned 1B in	100646000	1	260	49 nscan	The total signal count at the antenna input that includes both echo and noise power. The signal count is stored on both observation mode and calibration mode. It is basically a copy of science telemetry raw data for sampling range bins. 0 is set to both interpolated range bin and outrange bin of the observation area.	
			noiseCount[nbin][nray][nscan]	-9999.9				4B float	402584000	4	260	49 nscan	An average of the received noise count for each angle bins during suspended 4 pulses.	
			echoPower[nbin][nray][nscan]	-30000	-12000	-2000 [dBm]		signed 2B int	201292000	2	260	49 nscan	Special values: "Count value": internal calibration mode. -29999 : Out range bins of the observation area. -30000 : Missing value	
			noisePower[nray][nscan]	-30000	-12000	-2000 [dBm]		signed 2B int	774200	2	49 nscan	1		
			noiseSampleNumber[nray][nscan]	-9999	0	140		signed 2B int	774200	2	49 nscan	1		
			echoSampleNumber[nray][nscan]	-99	0	127 [dB]		signed 1B int	387100	1	49 nscan	1		
			rxAntGain[nray][nscan]	-9999.9				4B float	1548400	4	49 nscan	1		
		FileHeader	(N/A)	DOI						256				
				AlgorithmID						50				
				AlgorithmVersion						50				
				FileName						50				
				SatelliteName						10				
				InstrumentName						10				
				GenerationDateTime						50				
				StartGranuleDateTime						50				
				StopGranuleDateTime						50				
				GranuleNumber						50				
				NumberOfSwaths						50				
				NumberOfGrids						50				
				GranuleStart						50				
				TimeInterval						50				
				ProcessingSystem						50				
		InputRecord	(N/A)	ProductVersion					50					
				EmptyGranule					50					
				MissingData					50					
				InputFileNames					1000					
				InputAlgorithmVersions					1000					
				InputGenerationDateTimes				1000						
		NavigationRecord	(N/A)	LongitudeOnEquator					50					
				UTCDateTimeOnEquator					50					
				MeanSolarBetaAngle					50					
				EphemerisFileName					50					
				AttitudeFileName					50					
				GeoControlFileName					50					
				EphemerisSource					50					
				AttitudeSource					50					
				GeoToolKitVersion					50					
				SensorAlignmentFirstRotationAngle					50					
				SensorAlignmentSecondRotationAngle					50					
				SensorAlignmentThirdRotationAngle					50					
				SensorAlignmentFirstRotationAxis					50					
				SensorAlignmentSecondRotationAxis					50					
				SensorAlignmentThirdRotationAxis					50					
		FileInfo	(N/A)	DataFormatVersion					50					
	TKCodeBuildVersion							50						
	MetadataVersion							50						
	FormatPackage							50						
	BlueprintFilename							50						
	BlueprintVersion							50						
	TKIOVersion							50						
	MetadataStyle							50						
	EndianType							50						
	GranuleFirstScanUTCDateTime							50						
	JAXAInfo	(N/A)	GranuleLastScanUTCDateTime					50						
			TotalQualityCode					50						
			FirstScanLat					50						
			FirstScanLon					50						
			LastScanLat					50						
			LastScanLon					50						
			NumberOfRainPixelsNS					50						
			NumberOfRainPixelsMS					50						
			NumberOfRainPixelsHS					50						
			ProcessingSubSystem					50						

	Group Name 1	Group Name 2	DPR Initial 1BKu Value Name	missing	min	max	unit	type	Data size	type	array	Remark
			ProcessingMode						50			
			LightSpeed						TBD			
			DielectricConstantKa						TBD			
			DielectricConstantKu						TBD			
	DPRKuInfo	(N/A)	scanAngleObsVersion						100			
			scanAngleExtVersion						100			
			transReceiptCoefVersion						100			
			fofHoTableVersion						100			
			eqvWavelength						100			
			logAveOffset						100			
			alignmentAngleBasicEtoA						100			
			alignmentAngleOffsetAtoM						100			
			NumberScansInSet						50			
			MaximumNumberScansTotal						50			
	NS	SwathHeader	NumberScansBeforeGranule						50			
			NumberScansGranule						50			
			NumberScansAfterGranule						50			
			NumberPixels						50			
			ScanType						50			
									746695176			

表 2.5-2 KaPR レベル 1 プロダクトフォーマット

	Group Name 1	Group Name 2	DPR Initial 1BKa Value Name	missing	min	max	unit	type	Data size	type	array	Remark			
		ScanTime	Year[nscan]	-9999	1950	2100	[years]	signed 2B int	15800	2	nscan	1	1		
			Month[nscan]	-99	1	12	[months]	signed 1B int	7900	1	nscan	1	1		
			DayOfMonth[nscan]	-99	1	31	[days]	signed 1B int	7900	1	nscan	1	1		
			Hour[nscan]	-99	0	23	[hours]	signed 1B int	7900	1	nscan	1	1		
			Minute[nscan]	-99	0	59	[minutes]	signed 1B int	7900	1	nscan	1	1		
			Second[nscan]	-99	0	60	[s]	signed 1B int	7900	1	nscan	1	1		
			MilliSecond[nscan]	-9999	0	999	[ms]	signed 2B int	15800	2	nscan	1	1		
			DayOfYear[nscan]	-9999	1	366	[days]	signed 2B int	15800	2	nscan	1	1		
			SecondOfDay[nscan]	-9999.9	0	86400	[s]	8B double	63200	8	nscan	1	1		
		(N/A)	Latitude[nrayMS][nscan]	-9999.9	-90	90	[degrees]	4B float	790000	4	25	nscan	1		
		(N/A)	Longitude[nrayMS][nscan]	-9999.9	-180	180	[degrees]	4B float	790000	4	25	nscan	1		
	scanStatus		dataQuality[nscan]						signed 1B int	7900	1	nscan	1	1	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 if bit = 1 0 missing 5 geoError is not zero 6 modeStatus is not zero
			dataWarning[nscan]						signed 1B int	7900	1	nscan	1	1	Flag of data warning for each scan. Detailed information is defined in LIB Product Format edited by JAXA/EORC.
			missing[nscan]						signed 1B int	7900	1	nscan	1	1	Indicates whether information is contained in the scan data. The values are: Bit Meaning if bit = 1 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)
			modeStatus[nscan]						signed 1B int	7900	1	nscan	1	1	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 if bit = 1 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)
			geoError[nscan]						signed 2B int	15800	2	nscan	1	1	A summary of geolocation errors in the scan. geoError is used to set a bit in dataQuality. 5.18 1BKu - Ku Power 565 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 if bit = 1 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)
			geoWarning[nscan]						signed 2B int	15800	2	nscan	1	1	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 if bit = 1 0 Ephemeris Gap Interpolated * 1 Attitude Gap Interpolated * 2 Attitude jump/discontinuity * 3 Attitude out of range * 4 Anomalous Time Stop * 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)
			SCorientation[nscan]	-9999					signed 2B int	15800	2	nscan	1	1	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
			pointingStatus[nscan]	-9999					signed 2B int	15800	2	nscan	1	1	pointingStatus is provided by the geo Toolkit. 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
			acsModeMidScan[nscan]						signed 1B int	7900	1	nscan	1	1	acsModeMidScan is provided by the geo Toolkit 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 MSW (Mission Science Mode) 5 SLEW 6 DELTAH 7 DELTAV -99 UNKNOWN --- ACS mode unavailable
			targetSelectionMidScan[nscan]	-99					signed 1B int	7900	1	nscan	1	1	targetSelectionMidScan is provided by the geo Toolkit 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
	MS		operationalMode[nscan]			1	20		signed 1B int	7900	1	nscan	1	1	The operational mode of KuPR/KaPR stored in science telemetry. operationalMode is used in modeStatus. The range is 1 to 20. 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)
			limitErrorFlag[nscan]						signed 1B int	7900	1	nscan	1	1	Bit flags for every ray with information about echo power limit checks. limitErrorFlag may be used in modeStatus. Detailed information is defined in LIB Product Format edited by JAXA/EORC.
			FractionalGranuleNumber[nscan]	-9999.9	0	100000			8B double	63200	8	nscan	1	1	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. Special values are defined as: -9999.9 Missing value
		navigation	scPos[XYZ][nscan]	-9999.9	-10000000	10000000	[m]	4B float	94800	4	3	nscan	1	1	
			scVel[3][nscan]	-9999.9	-10000000	10000000	[m/s]	4B float	94800	4	3	nscan	1	1	
			scLat[nscan]	-9999.9	-70	70	[degrees]	4B float	31600	4	nscan	1	1	1	
			scLon[nscan]	-9999.9	-180	180	[degrees]	4B float	31600	4	nscan	1	1	1	
			scAlt[nscan]	-9999.9	350000	500000	[m]	4B float	31600	4	nscan	1	1	1	
			dprAlt[nscan]	-9999.9	350000	500000	[m]	4B float	31600	4	nscan	1	1	1	
			scAttRollGeoc[nscan]	-9999.9	-180	180	[degrees]	4B float	31600	4	nscan	1	1	1	
	scAttPitchGeoc[nscan]		-9999.9	-180	180	[degrees]	4B float	31600	4	nscan	1	1	1		
	scAttYawGeoc[nscan]		-9999.9	-135	225	[degrees]	4B float	31600	4	nscan	1	1	1		
	scAttRollGeod[nscan]		-9999.9	-180	180	[degrees]	4B float	31600	4	nscan	1	1	1		
	scAttPitchGeod[nscan]	-9999.9	-180	180	[degrees]	4B float	31600	4	nscan	1	1	1			
	scAttYawGeod[nscan]	-9999.9	-135	225	[degrees]	4B float	31600	4	nscan	1	1	1			

	Group Name 1	Group Name 2	DPR Initial 1BKa Value Name	missing	min	max	unit	type	Data size	type	array				Remark
1BKa			greenHourAng[nscan]	-9999.9	0	390	[degrees]	4B float	31600	4	nscan	1	1	1	
			timeMidScan[nscan]	-9999.9	0	10000000000	[s]	8B double	63200	8	nscan	1	1	1	
			timeMidScanOffset[nscan]	-9999.9	0	100	[s]	8B double	63200	8	nscan	1	1	1	
		rayPointing	rayDirectionX[nrayMS][nscan]	-9999.9	-1	1		4B float	790000	4	49	nscan	1	1	
			rayDirectionY[nrayMS][nscan]	-9999.9	-1	1		4B float	790000	4	25	nscan	1	1	
			instrumentYaw[nrayMS][nscan]	-9999.9	-135	225	[degrees]	4B float	790000	4	25	nscan	1	1	
			instrumentPitch[nrayMS][nscan]	-9999.9	-90	90	[degrees]	4B float	790000	4	25	nscan	1	1	
			instrumentRoll[nrayMS][nscan]	-9999.9	-180	180	[degrees]	4B float	790000	4	25	nscan	1	1	
			rayTiming[nrayMS][nscan]	-9999.9	0	1.6	[s]	4B float	790000	4	25	nscan	1	1	
			scanAngle[nrayMS][nscan]	-9999.9	-18	18	[degrees]	4B float	790000	4	25	nscan	1	1	
		HouseKeeping	rxAtt[nscan]	-99	0	12	[dB]	signed 1B int	7900	1	nscan	1	1	1	
			rxAttGainOffset[nscan]	-9999.9	-260	260	[dB]	4B float	31600	4	nscan	1	1	1	
			binDiffPeakDEM[nrayMS][nscan]	-9999	-260	260		signed 2B int	395000	2	25	nscan	1	1	
			scTime[nscan]	-9999.9				8B float	63200	8	nscan	1	1	1	
			vprfTableVersion[nscan]	-99	1	127		signed 1B int	7900	1	nscan	1	1	1	
															the selected number of VPRF table for altitude (h, km) which is used in L1B process. The range is 1 to 25. h LT 396.5 = 1 396.5 LE h LT 397.5 = 2 397.5 LE h LT 398.5 = 3 398.5 LE h LT 399.5 = 4 399.5 LE h LT 400.5 = 5 400.5 LE h LT 401.5 = 6 401.5 LE h LT 402.5 = 7 402.5 LE h LT 403.5 = 8 403.5 LE h LT 404.5 = 9 404.5 LE h LT 405.5 = 10 405.5 LE h LT 406.5 = 11 406.5 LE h LT 407.5 = 12 407.5 LE h LT 408.5 = 13 408.5 LE h LT 409.5 = 14 409.5 LE h LT 410.5 = 15 410.5 LE h LT 411.5 = 16 411.5 LE h LT 412.5 = 17 412.5 LE h LT 413.5 = 18 413.5 LE h LT 414.5 = 19 414.5 LE h LT 415.5 = 20 415.5 LE h LT 416.5 = 21 416.5 LE h LT 417.5 = 22 417.5 LE h LT 418.5 = 23 418.5 LE h LT 419.5 = 24 419.5 LE h = 25 where LT mean less than and LE means less than or equal to
			vprfTableSelect[nscan]		1	25		signed 1B int	7900	1	nscan	1	1	1	
			catchingInt[nscan]	-99	8	12		signed 1B int	7900	1	nscan	1	1	1	
															The side of the SCDP system and system table used. Bit Meaning if bit=1 0 B-side is used (if bit=0, then A-side used) 1 Priority is 1 at Basic System Table. Refer to Basic System Table. 2 Priority is 2 at Basic System Table. Refer to HK telemetry. 3 Priority is 2 at Basic System Table. Refer to Basic System Table. 4 (Spare) 5 (Spare) 6 (Spare) 7 (Spare)
			scdpFlag[nscan]					signed 1B int	7900	1	nscan	1	1	1	
															The side of FCIF system and the system table used. Bit Meaning if bit=1 0 B-side is used (if bit=0, then A-side used) 1 Priority is 1 at Basic System Table. Refer to Basic System Table. 2 Priority is 2 at Basic System Table. Refer to HK telemetry 3 Priority is 2 at Basic System Table. Refer to Basic System Table 4 (Spare) 5 (Spare) 6 (Spare) 7 (Spare)
			fcifFlag[nscan]					signed 1B int	7900	1	nscan	1	1	1	
			logAmpNoiseLevel[nscan]	-9999			[dBm]	signed 2B int	15800	2	nscan	1	1	1	
			delay[nscan]	-9999	0	3360		signed 2B int	15800	2	nscan	1	1	1	
			seqCountL1A[nscan]	-9999	0	27000		signed 2B int	15800	2	nscan	1	1	1	
			fcifTemp1[nscan]	-9999	-5000	5000	[C]	signed 2B int	31600	2	2 × nscan	1	1	1	The first dimension is temperature and the other is the number of referenced HK telemetry.
			lhaTemp1[nscan]	-9999	-5000	5000	[C]	signed 2B int	31600	2	2 × nscan	1	1	1	The first dimension is temperature and the other is the number of referenced HK telemetry.
			rdaTemp1[nscan]	-9999	-5000	5000	[C]	signed 2B int	31600	2	2 × nscan	1	1	1	The first dimension is temperature and the other is the number of referenced HK telemetry.
			divcomb1Temp1[nscan]	-9999	-5000	5000	[C]	signed 2B int	31600	2	2 × nscan	1	1	1	The first dimension is temperature and the other is the number of referenced HK telemetry.
			divcomb2Temp1[nscan]	-9999	-5000	5000	[C]	signed 2B int	31600	2	2 × nscan	1	1	1	The first dimension is temperature and the other is the number of referenced HK telemetry.
			sspaTemp1[nscan]	-9999	-5000	5000	[C]	signed 2B int	31600	2	2 × nscan	1	1	1	The first dimension is temperature and the other is the number of referenced HK telemetry.
		VertLocate	landOceanFlag[nrayMS][nscan]		0	3		signed 2B int	395000	2	25	nscan	1	1	Land or ocean information. The values of the flag are: 0 = Water 1 = Land 2 = Coast 3 = Inland Water
			scLocalZenith[nrayMS][nscan]	-9999.9	0	90	[degrees]	4B float	790000	4	25	nscan	1	1	
			startBinRange[nrayMS][nscan]	-9999.9	350000	500000	[m]	4B float	790000	4	25	nscan	1	1	
															Meaning in Normal Mode: 0 = Over sampling range bin OR 1 = Normal sampling range bin 2 = Interpolated range bin -99 = Outrange bin of the observation area Meaning in internal calibration mode: 0: In internal calibration mode, this value is stored 1- 42 range bin for each ray. -99: missing value. In internal calibration mode, this value is stored after 43 range bin for each ray as missing.
			echoHighResBinNumber[nrayMS][nscan]	-9999	1	260		signed 2B int	395000	2	25	nscan	1	1	
			echoLowResBinNumber[nrayMS][nscan]	-9999	0	260		signed 2B int	395000	2	25	nscan	1	1	
			binEllipsoid[nrayMS][nscan]	-9999	1	260		signed 2B int	395000	2	25	nscan	1	1	
			scRangeEllipsoid[nrayMS][nscan]	-9999.9	0	500000	[m]	4B float	790000	4	25	nscan	1	1	
			binDEM[nrayMS][nscan]	-9999	1	260		signed 2B int	395000	2	25	nscan	1	1	
			scRangeDEM[nrayMS][nscan]	-9999.9	0	500000	[m]	4B float	790000	4	25	nscan	1	1	
		Calibration	DEMhmean[nrayMS][nscan]	-9999	0	9000	[m]	signed 2B int	395000	2	25	nscan	1	1	
			binDEMhtop[nrayMS][nscan]	-9999	1	260		signed 2B int	395000	2	25	nscan	1	1	
			binDEMhbottom[nrayMS][nscan]	-9999	1	260		signed 2B int	395000	2	25	nscan	1	1	
			binEchoPeak[nrayMS][nscan]	-9999	1	260		signed 2B int	395000	2	25	nscan	1	1	
			alongTrackBeamWidth[nrayMS][nscan]				[degrees]	4B float	790000	4	25	nscan	1	1	
			crossTrackBeamWidth[nrayMS][nscan]				[degrees]	4B float	790000	4	25	nscan	1	1	
			mainlobeEdge[nrayMS][nscan]					signed 2B int	395000	2	25	nscan	1	1	
			sidelobeRange[nrayMS][nscan]					signed 2B int	395000	2	25	nscan	1	1	
			ellipsoidBinOffset[nrayMS][nscan]					4B float	790000	4	25	nscan	1	1	
			rangeBinSize[nscan]				[m]	4B float	31600	4	nscan	1	1	1	
		Transmitter	ratioLand[nrayMS][nscan]					signed 1B int	197500	1	25	nscan	1	1	
			ratioOcean[nrayMS][nscan]					signed 1B int	197500	1	25	nscan	1	1	
			ratioInLand[nrayMS][nscan]					signed 1B int	197500	1	25	nscan	1	1	
			ratioCoast[nrayMS][nscan]					signed 1B int	197500	1	25	nscan	1	1	
			fcifInPower[nscan]	-32734			[dBm]	signed 2B int	15800	2	nscan	1	1	1	
			intAttSelect[nscan]	-99	1	32	[step]	signed 1B int	7900	1	nscan	1	1	1	
			sspaLnaSelect[nscan]	-9999	1	128		signed 2B int	15800	2	nscan	1	1	1	
			angleBinSelect[nscan]	-99	1	49		signed 1B int	7900	1	nscan	1	1	1	
			radarTransPower[nscan]	-9999.9				4B float	31600	4	nscan	1	1	1	
			transPulseWidth[nscan]	-9999.9	0.0000015	0.0000017	[s]	4B float	31600	4	nscan	1	1	1	
			txAntGain[nrayMS][nscan]	-9999.9			[dB]	4B float	790000	4	25	nscan	1	1	
	Receiver		echoCount[nbinMS][nrayMS][nscan]					unsigned 1B int	51350000	1	260	25	nscan	1	The total signal count at the antenna input that includes both echo and noise power. The signal count is stored on both observation mode and calibration mode. It is basically a copy of science telemetry raw data for sampling range bins. 0 is set to both interpolated range bin and outrange bin of the observation area.
			noiseCount[nbinMS][nrayMS][nscan]	-9999.9				4B float	205400000	4	260	25	nscan	1	An average of the received noise count for each angle bins during suspended 4 pulses. Special values: "Count value": internal calibration mode. -29999 : Out range bins of the observation area. -30000 : Missing value
			echoPower[nbinMS][nrayMS][nscan]	-30000	-12000	-2000	[dBm]	signed 2B int	102700000	2	260	25	nscan	1	
			noisePower[nrayMS][nscan]	-30000	-12000	-2000	[dBm]	signed 2B int	395000	2	25	nscan	1	1	
			noiseSampleNumber[nrayMS][nscan]	-9999	0	140		signed 2B int	395000	2	25	nscan	1	1	
			echoSampleNumber[nrayMS][nscan]	-99	0	127	[dB]	signed 1B int	197500	1	25	nscan	1	1	
			rxAntGain[nrayMS][nscan]	-9999.9				4B float	790000	4	25	nscan	1	1	
			Year[nscan]	-9999	1950	2100	[years]	signed 2B int	15800	2	nscan	1	1	1	
			Month[nscan]	-99	1	12	[months]	signed 1B int	7900	1	nscan	1	1	1	
			DayOfMonth[nscan]	-99	1	31	[days]	signed 1B int	7900	1	nscan	1	1	1	
	ScanTime		Hour[nscan]	-99	0	23	[hours]	signed 1B int	7900	1	nscan	1	1	1	
			Minute[nscan]	-99	0	59	[minutes]	signed 1B int	7900	1	nscan	1	1	1	
			Second[nscan]	-99	0	60	[s]	signed 1B int	7900	1	nscan	1	1	1	
			MilliSecond[nscan]	-9999	0	999	[ms]	signed 2B int	15800	2	nscan	1	1	1	
			DayOfYear[nscan]	-9999	1	366	[days]	signed 2B int	15800	2	nscan	1	1	1	
			SecondOfDay[nscan]	-9999.9	0	86400	[s]	8B double	63200	8	nscan	1	1	1	
			dataQuality[nscan]					signed 1B int	7900	1	nscan	1	1	1	A summary of data quality in the scan. Unless this is 0 (normal), the scan data is 564 5 STANDARD GPM PRODUCTS 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 if bit = 1 0 missing 5 geoError is not zero 6 modeStatus is not zero
			dataWarning[nscan]					signed 1B int	7900	1	nscan	1	1	1	Flag of data warning for each scan. Detailed information is defined in L1B Product Format edited by JAXA/EORC.
			missing[nscan]					signed 1B int	7900	1	nscan	1	1	1	Indicates whether information is contained in the scan data. The values are: Bit Meaning if bit = 1 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)
															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 if bit = 1 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)
			modeStatus[nscan]					signed 1B int	7900	1	nscan	1	1	1	

	Group Name 1	Group Name 2	DPR Initial 1BKa Value Name	missing	min	max	unit	type	Data size	type	array			Remark
HS		scanStatus	geoError[nscan]					signed 2B int	15800	2	nscan	1	1	A summary of geolocation errors in the scan. geoError is used to set a bit in dataQuality. 5. 18 1BKu - Ku Power 565 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 if bit = 1 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)
			geoWarning[nscan]					signed 2B int	15800	2	nscan	1	1	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 if bit = 1 0 Ephemeris Gap Interpolated * 1 Attitude Gap Interpolated * 2 Attitude jump/discontinuity * 3 Attitude out of range * 4 Anomalous Time Step * 5 GMA 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)
			SCorientation[nscan]	-9999				signed 2B int	15800	2	nscan	1	1	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
			pointingStatus[nscan]	-9999				signed 2B int	15800	2	nscan	1	1	pointingStatus is provided by the geo Toolkit. 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
			acsModeMidScan[nscan]					signed 1B int	7900	1	nscan	1	1	acsModeMidScan is provided by the geo Toolkit 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 GSPW (Gyro-less Sun Point) 4 MSM (Mission Science Mode) 5 SLEW 6 DELTAH 7 DELTAV -99 UNKNOWN -- ACS mode unavailable
			targetSelectionMidScan[nscan]	-99				signed 1B int	7900	1	nscan	1	1	targetSelectionMidScan is provided by the geo Toolkit as taken from Attitude Control System telemetry and is provided in this format for information only. Value Meaning 0 S/O Z axis nadir, +X in flight direction 1 Flight Z axis nadir, +X in flight direction 2 S/O 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
			operationalMode[nscan]		1	20		signed 1B int	7900	1	nscan	1	1	The operational mode of KuPR/KaPR stored in science telemetry. operationalMode is used in modeStatus. The range is 1 to 20. 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)
			limitErrorFlag[nscan]					signed 1B int	7900	1	nscan	1	1	Bit flags for every ray with information about echo power limit checks. limitErrorFlag may be used in modeStatus. Detailed information is defined in LIB Product Format edited by JAXA/EORC.
			FractionalGranuleNumber[nscan]	-9999.9	0	100000		8B double	63200	8	nscan	1	1	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. Special values are defined as: -9999.9 Missing value
		navigation	scPos[3][nscan]	-9999.9	-10000000	10000000	[m]	4B float	94800	4	3	nscan	1	
			scVel[3][nscan]	-9999.9	-10000000	10000000	[m/s]	4B float	94800	4	3	nscan	1	
			scLat[nscan]	-9999.9	-70	70	[degrees]	4B float	31600	4	nscan	1	1	
			scLon[nscan]	-9999.9	-180	180	[degrees]	4B float	31600	4	nscan	1	1	
			scAlt[nscan]	-9999.9	350000	500000	[m]	4B float	31600	4	nscan	1	1	
			dprAlt[nscan]	-9999.9	350000	500000	[m]	4B float	31600	4	nscan	1	1	
			scAttRollGeoc[nscan]	-9999.9	-180	180	[degrees]	4B float	31600	4	nscan	1	1	
			scAttPitchGeoc[nscan]	-9999.9	-180	180	[degrees]	4B float	31600	4	nscan	1	1	
			scAttYawGeoc[nscan]	-9999.9	-135	225	[degrees]	4B float	31600	4	nscan	1	1	
			scAttRollGeod[nscan]	-9999.9	-180	180	[degrees]	4B float	31600	4	nscan	1	1	
			scAttPitchGeod[nscan]	-9999.9	-180	180	[degrees]	4B float	31600	4	nscan	1	1	
			scAttYawGeod[nscan]	-9999.9	-135	225	[degrees]	4B float	31600	4	nscan	1	1	
			greenHourAng[nscan]	-9999.9	0	390	[degrees]	4B float	31600	4	nscan	1	1	
		rayPointing	timeMidScan[nscan]	-9999.9	0	10000000000	[s]	8B double	63200	8	nscan	1	1	
			timeMidScanOffset[nscan]	-9999.9	0	100	[s]	8B double	63200	8	nscan	1	1	
			rayDirectionX[nrayHS][nscan]	-9999.9	-1	1		4B float	758400	4	24	nscan	1	
			rayDirectionY[nrayHS][nscan]	-9999.9	-1	1		4B float	758400	4	24	nscan	1	
			instrumentYaw[nrayHS][nscan]	-9999.9	-135	225	[degrees]	4B float	758400	4	24	nscan	1	
			instrumentPitch[nrayHS][nscan]	-9999.9	-90	90	[degrees]	4B float	758400	4	24	nscan	1	
			instrumentRoll[nrayHS][nscan]	-9999.9	-180	180	[degrees]	4B float	758400	4	24	nscan	1	
			rayTiming[nrayHS][nscan]	-9999.9	0	1.6	[s]	4B float	758400	4	24	nscan	1	
			scanAngle[nrayHS][nscan]	-9999.9	-18	18	[degrees]	4B float	758400	4	24	nscan	1	
		HouseKeeping	rxAtt[nscan]	-99	0	12	[dB]	signed 1B int	7900	1	nscan	1	1	
			rxAttGainOffset[nscan]	-9999.9	-260	260	[dB]	4B float	31600	4	nscan	1	1	
			binDiffPeakDEM[nrayHS][nscan]	-9999	-260	260		signed 2B int	379200	2	24	nscan	1	
			scTime[nscan]	-9999.9				8B float	63200	8	nscan	1	1	
			vprfTableVersion[nscan]	-99	1	127		signed 1B int	7900	1	nscan	1	1	
														the selected number of VPRF table for altitude (h, km) which is used in LIB process. The range is 1 to 25. h LT 396.5 = 1 396.5 LE h LT 397.5 = 2 397.5 LE h LT 398.5 = 3 398.5 LE h LT 399.5 = 4 399.5 LE h LT 400.5 = 5 400.5 LE h LT 401.5 = 6 401.5 LE h LT 402.5 = 7 402.5 LE h LT 403.5 = 8 403.5 LE h LT 404.5 = 9 404.5 LE h LT 405.5 = 10 405.5 LE h LT 406.5 = 11 406.5 LE h LT 407.5 = 12 407.5 LE h LT 408.5 = 13 408.5 LE h LT 409.5 = 14 409.5 LE h LT 410.5 = 15 410.5 LE h LT 411.5 = 16 411.5 LE h LT 412.5 = 17 412.5 LE h LT 413.5 = 18 413.5 LE h LT 414.5 = 19 414.5 LE h LT 415.5 = 20 415.5 LE h LT 416.5 = 21 416.5 LE h LT 417.5 = 22 417.5 LE h LT 418.5 = 23 418.5 LE h LT 419.5 = 24 419.5 LE h = 25 where LT mean less than and LE means less than or equal to
			catchingInt[nscan]	-99	8	12		signed 1B int	7900	1	nscan	1	1	

	Group Name 1	Group Name 2	DPR Initial 1BKa Value Name	missing	min	max	unit	type	Data size	type	array			Remark				
			scdpFlag[nscan]					signed 1B int	7900	1	nscan	1	1	The side of the SCDP system and system table used. Bit Meaning if bit=1 0 B-side is used (if bit=0, then A-side used) 1 Priority is 1 at Basic System Table. Refer to Basic System Table. 2 Priority is 2 at Basic System Table. Refer to HK telemetry. 3 Priority is 2 at Basic System Table. Refer to Basic System Table. 4 (Spare) 5 (Spare) 6 (Spare) 7 (Spare)				
			fcifFlag[nscan]					signed 1B int	7900	1	nscan	1	1	The side of FCIF system and the system table used. Bit Meaning if bit=1 0 B-side is used (if bit=0, then A-side used) 1 Priority is 1 at Basic System Table. Refer to Basic System Table. 2 Priority is 2 at Basic System Table. Refer to HK telemetry 3 Priority is 2 at Basic System Table. Refer to Basic System Table 4 (Spare) 5 (Spare) 6 (Spare) 7 (Spare)				
			logAmpNoiseLevel[nscan]	-9999			[dBm]	signed 2B int	15800	2	nscan	1	1					
			delay[nscan]	-9999	0	3360		signed 2B int	15800	2	nscan	1	1					
			secCountL1A[nscan]	-9999	0	27000		signed 2B int	15800	2	nscan	1	1					
			fcifTemp[2][nscan]	-9999	-5000	5000	[C]	signed 2B int	31600	2	2	nscan	1	The first dimension is temperature and the other is the number of referenced HK telemetry.				
			lnaTemp[2][nscan]	-9999	-5000	5000	[C]	signed 2B int	31600	2	2	nscan	1	The first dimension is temperature and the other is the number of referenced HK telemetry.				
			rdaTemp[2][nscan]	-9999	-5000	5000	[C]	signed 2B int	31600	2	2	nscan	1	The first dimension is temperature and the other is the number of referenced HK telemetry.				
			divcomb1Temp[2][nscan]	-9999	-5000	5000	[C]	signed 2B int	31600	2	2	nscan	1	The first dimension is temperature and the other is the number of referenced HK telemetry.				
			divcomb2Temp[2][nscan]	-9999	-5000	5000	[C]	signed 2B int	31600	2	2	nscan	1	The first dimension is temperature and the other is the number of referenced HK telemetry.				
			sspaTemp[2][nscan]	-9999	-5000	5000	[C]	signed 2B int	31600	2	2	nscan	1	The first dimension is temperature and the other is the number of referenced HK telemetry.				
		VertLocate	landOceanFlag[nrayHS][nscan]		0		3		signed 2B int	379200	2	24	nscan	1	Land or ocean information. The values of the flag are: 0 = Water 1 = Land 2 = Coast 3 = Inland Water			
			scLocalZenith[nrayHS][nscan]	-9999.9	0	90	[degrees]	4B float	758400	4	24	nscan	1					
			startBinRange[nrayHS][nscan]	-9999.9	350000	500000	[m]	4B float	758400	4	24	nscan	1					
			echoHighResBinNumber[nrayHS][nscan]	-9999	1	260		signed 2B int	379200	2	24	nscan	1	Meaning in Normal Mode: 0 = Over sampling range bin OR 1 = Normal sampling range bin 2 = Interpolated range bin -99 = Outrange bin of the observation area 1 Meaning in internal calibration mode: 0: In internal calibration mode, this value is stored 1~ 42 range bin for each ray. -99: missing value. In internal calibration mode, this value is stored after 43 range bin for each ray as missing.				
			echoLowResBinNumber[nrayHS][nscan]	-9999	0	260		signed 2B int	379200	2	24	nscan	1					
			binEllipsoid[nrayHS][nscan]	-9999	1	260		signed 2B int	379200	2	24	nscan	1					
			scRangeEllipsoid[nrayHS][nscan]	-9999.9	0	500000	[m]	4B float	758400	4	24	nscan	1					
			binDEM[nrayHS][nscan]	-9999	1	260		signed 2B int	379200	2	24	nscan	1					
			scRangeDEM[nrayHS][nscan]	-9999.9	0	500000	[m]	4B float	758400	4	24	nscan	1					
			DEMhmean[nrayHS][nscan]	-9999	0	9000	[m]	signed 2B int	379200	2	24	nscan	1					
			binDEMhTop[nrayHS][nscan]	-9999	1	260		signed 2B int	379200	2	24	nscan	1					
			binDEMhBottom[nrayHS][nscan]	-9999	1	260		signed 2B int	379200	2	24	nscan	1					
			binEchoPeak[nrayHS][nscan]	-9999	1	260		signed 2B int	379200	2	24	nscan	1					
			alongTrackBeamWidth[nrayHS][nscan]				[degrees]	4B float	758400	4	24	nscan	1					
			crossTrackBeamWidth[nrayHS][nscan]				[degrees]	4B float	758400	4	24	nscan	1					
			mainlobeEdge[nrayHS][nscan]					signed 2B int	379200	2	24	nscan	1					
			sidelobeRange[nrayHS][nscan]					signed 2B int	379200	2	24	nscan	1					
			ellipsoidBinOffset[nrayHS][nscan]					4B float	758400	4	24	nscan	1					
			rangeBinSize[nscan]				[m]	4B float	31600	4	nscan	1	1					
			ratioLand[nrayHS][nscan]					signed 1B int	189600	1	24	nscan	1					
			ratioOcean[nrayHS][nscan]					signed 1B int	189600	1	24	nscan	1					
			ratioInLand[nrayHS][nscan]					signed 1B int	189600	1	24	nscan	1					
			ratioCoast[nrayHS][nscan]					signed 1B int	189600	1	24	nscan	1					
		Caibration	fcifInPower[nscan]	-32734				[dBm]	signed 2B int	15800	2	nscan	1	1				
			intAttSelect[nscan]	-99	1	32	[step]	signed 1B int	7900	1	nscan	1	1					
			sspaLnaSelect[nscan]	-9999	1	128		signed 2B int	15800	2	nscan	1	1					
			angleBinSelect[nscan]	-99	1	49		signed 1B int	7900	1	nscan	1	1					
		Transmitter	radarTransPower[nscan]	-9999.9					4B float	31600	4	nscan	1	1				
			transPulseWidth[nscan]	-9999.9	0.0000015	0.0000017	[s]	4B float	31600	4	nscan	1	1					
			txAntGain[nrayHS][nscan]	-9999.9				[dB]	4B float	758400	4	24	nscan	1				
		Receiver	echoCount[nbinHS][nrayHS][nscan]						unsigned 1B ir	24648000	1	130	24	nscan		The total signal count at the antenna input that includes both echo and noise power. The signal count is stored on both observation mode and calibration mode. It is basically a copy of science telemetry raw data for sampling range bins. 0 is set to both interpolated range bin and outrange bin of the observation area.		
			noiseCount[nbinHS][nrayHS][nscan]	-9999.9					4B float	98592000	4	130	24	nscan		An average of the received noise count for each angle bins during suspended 4 pulses. Special values: "Count value": internal calibration mode. -29999 : Out range bins of the observation area. -30000 : Missing value		
			echoPower[nbinHS][nrayHS][nscan]	-30000	-12000	-2000	[dBm]	signed 2B int	49296000	2	130	24	nscan					
			echoFlag[nbinHS][nrayHS][nscan]	-99	0	2		signed 1B int	24648000	1	130	24	nscan		echoFlag represents the observational state of the range bin. The definition of the values is as follows. Value Meaning 0 = Over sampling range bin 1 = Normal sampling range bin 2 = Interpolated range bin -99 = Out range bin of the observation area (It will be change -88 in future algorithm versions) Special Values 0: In internal calibration mode, this value is stored in 1 ~ 42 range bin for each ray -99: Missing value. In internal calibration mode, this value is stored after 43 range bin for each ray as missing.			
			noisePower[nrayHS][nscan]	-30000	-12000	-2000	[dBm]	signed 2B int	379200	2	24	nscan	1					
			noiseSampleNumber[nrayHS][nscan]	-9999	0	140		signed 2B int	379200	2	24	nscan	1					
			echoSampleNumber[nrayHS][nscan]	-99	0	127	[dB]	signed 1B int	189600	1	24	nscan	1					
			rxAntGain[nrayHS][nscan]	-9999.9				4B float	758400	4	24	nscan	1					
			FileHeader	(N/A)	DOI							256						
					AlgorithmID							50						
					AlgorithmVersion							50						
					FileName							50						
					SatelliteName							10						
					InstrumentName							10						
					GenerationDateTime							50						
					StartGranuleDateTime							50						
					StopGranuleDateTime							50						
					GranuleNumber							50						
					NumberOfSwaths							50						
					NumberOfGrids							50						
					GranuleStart							50						
					TimeInterval							50						
					ProcessingSystem							50						
					ProductVersion							50						
					EmptyGranule							50						
					MissingData							50						
		InputRecord			(N/A)	InputFileNames						1000						
						InputAlgorithmVersions						1000						
						InputGenerationDateTimes						1000						
												50						
		avigationRecord			(N/A)	LongitudeOnEquator						50						
						UTCDateTimeOnEquator						50						
						MeanSolarBetaAngle						50						
			EphemerisFileName							50								
			AttitudeFileName							50								
			GeoControlFileName							50								
			EphemerisSource							50								
			AttitudeSource							50								
			GeoToolkitVersion							50								
			SensorAlignmentFirstRotationAngle							50								
			SensorAlignmentSecondRotationAngle							50								
			SensorAlignmentThirRotationAngle							50								
			SensorAlignmentFirstRotationAxis							50								
			SensorAlignmentSecondRotationAxis							50								
			SensorAlignmentThirRotationAxis							50								
		FileInfo	(N/A)	DataFormatVersion						50								
				TKCodeBuildVersion						50								
				MetadataVersion						50								
				FormatPackage						50								
		JAXAInfo	(N/A)	BlueprintFilename						50								
				BlueprintVersion						50								
				TKIOVersion						50								
				MetadataStyle						50								
		DPRKaInfo	(N/A)	EndianType						50								
				GranuleFirstScanUTCDateTime						50								
				GranuleLastScanUTCDateTime						50								
				TotalQualityCode						50								
				FirstScanLat						50								
				FirstScanLon						50								
				LastScanLat						50								
				LastScanLon						50								
				NumberOfRainPixelsNS						50								
				NumberOfRainPixelsMS						50								
				NumberOfRainPixelsHS						50								
				ProcessingSubSystem						50								
				ProcessingMode						50								
				LightSpeed						TBD								
				DielectricConstantKa						TBD								
				DielectricConstantKu						TBD								
MS	KS_SwathHeader	scanAngleObsVersion						100										
		scanAngleExtVersion						100										
		transReceiptCoefVersion						100										
		fciffoTableVersion						100										
		eqvWavelength						100										
		logAveOffset						100										
		alignmentAngleBasicEtoA						100										
		alignmentAngleOffsetAttoM						100										
		NumberScansInSet						50										
		MaximumNumberScansTotal						50										
		NumberScansBeforeGranule						50										
		NumberScansGranule						50										
		NumberScansAfterGranule						50										
		NumberPixels						50										
		ScanType						50										
		HS	KS_SwathHeader	NumberScansInSet														

略語一覧

A

ATBD :Algorithm Theoretical Basis Document
アルゴリズム記述書

B

C

D

DPR :Dual-frequency Precipitation Radar
二周波降水レーダ

E

F

FCIF :Frequency Converter ・ IF unit
周波数変換・インタフェース部

G

GPM :Global Precipitation Measurement
全球降水観測計画

H

HDF :Hierarchical Data Format
階層型データフォーマット

HK :House Keeping
衛星の状態監視

I

J

K

KaPR :Ka-band Precipitation Radar
Ka帯降水レーダ

KuPR :Ku-band Precipitation Radar
Ku帯降水レーダ

L

LNA :Low Noise Amplifier
低雑音増幅装置

M

N

NASA :National Aeronautics and Space Administration
アメリカ航空宇宙局

O

P

PPS :Precipitation Processing System
NASAの降水データ処理システム

PRF :Pulse Repetition Frequency
パルス繰り返し周波数

Q

R

RF :Radio Frequency
無線

S

SCDP :System Control Data Processing
システム制御・データ処理部

SSPA :Solid State Power Amplifier
固体電力増幅器

T

TK :Toolkit
ツールキット

U

UTC :Universal Time Coordinat
協定世界時

V

VPRF :Variable PRF
可変パルス繰り返し周波数

W

WGS :World Geodetic System
世界測地系

X

Y

Z

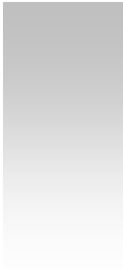
GPM 高次プロダクトフォーマット説明書

GPM高次プロダクトフォーマット説明書

DPR編

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1. 概要

1.1. 目的

本文書は、GPM/DPRミッション運用系システムによって作成されるDPR高次(レベル2およびレベル3)プロダクトフォーマットについて記述したものである。

DPRレベル2処理は、レベル1プロダクトを入力し、以下のプロダクトを作成する。

- ・ KuPRレベル2 標準プロダクトおよび準リアルタイムプロダクト
- ・ KaPRレベル2 標準プロダクトおよび準リアルタイムプロダクト
- ・ DPRレベル2 標準プロダクトおよび準リアルタイムプロダクト

DPRレベル3処理は、レベル2プロダクトを入力し、以下のプロダクトを作成する。

- ・ 二周波降水レーダ レベル3 標準プロダクト
 - daily $0.1^{\circ} \times 0.1^{\circ}$ テキスト形式
 - daily $0.25^{\circ} \times 0.25^{\circ}$ HDF5形式
 - daliy $5^{\circ} \times 5^{\circ}$ HDF5形式
 - monthly $0.25^{\circ} \times 0.25^{\circ}$ HDF5形式
 - monthly $5^{\circ} \times 5^{\circ}$ HDF5形式
- ・

DPRレベル2プロダクトの記述フォーマットはHDF5(Hierarchical Data Format、バージョン5)とし、DPRレベル3プロダクトの記述フォーマットはHDF5とテキストとする。本プロダクトはHDF5のライブラリ1.8を使用して作成している。

1.2. 関連文書

関連文書を以下に示す。

- (1)「ISO19115:2003 Geographic information_Metadata」(First edition 2003-05-01)
- (2)「ISO19115-2:2009 Geographic information_Metadata Part 2:Extensions for imagery and gridded data」(First edition 2009-02-15)
- (3)「HDF5 Reference Manual」(Release 1.8.5)
- (4)「HDF5 User's Guide」(Release 1.8.5)
- (5)「全球降水観測計画(GPM)アルゴリズム開発計画書(案)」(NDX-080013)
- (6)「GPMデータ利用ハンドブック」(MAS-140012)

1.3. レベル定義

プロダクトレベルの定義を表1.3-1に示す。

表1.3-1 プロダクトレベル定義

名称	定義	備考
KuPRレベル2	レベル1プロダクトを入力とし、レベル2アルゴリズムにより降水に関する各	KuPR(Kuバンド降水レーダ)によるL2プロダクト。周波数

名称	定義	備考
KaPRレベル2	種物理量(地表面散乱断面積、降水タイプ、ブライトバンド高度、減衰補正済みレーダ反射因子、降水強度など)を算出したプロダクト	は13.6Ghz。
DPRレベル2		KaPR(Kaバンド降水レーダ)によるL2プロダクト。周波数は35.5Ghz。
二周波降水レーダ レベル3(Daily)	レベル1またはレベル2プロダクトを入力とし、時空間的に統計処理したプロダクト。緯経度 $5^{\circ} \times 5^{\circ}$ や $0.25^{\circ} \times 0.25^{\circ}$ の範囲で算出した平均降雨強度を示す。	平均降雨強度は日単位
二周波降水レーダ レベル3(Monthly)		平均降雨強度は日単位

KuRRレベル2, KaRRレベル2, DPRレベル2プロダクトには標準処理と準リアルタイム処理があるが定義は同じである。

1.4. シーン定義

1.4.1. レベル2のシーン定義

標準プロダクトについては、KuPR レベル2、KaPR レベル2、DPRレベル2、全てについて各周回の南端から南端までを1シーンとして定義する。シーン定義のイメージについて、「図1.4-1 シーン定義」に示す。

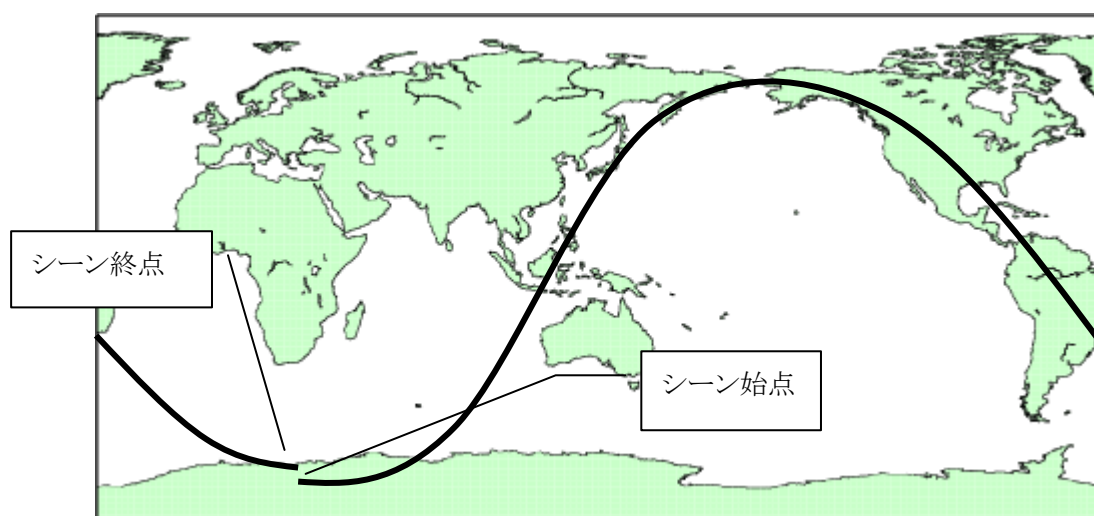


図1.4-1 シーン定義のイメージ

1 概要

準リアルタイムの場合は、KuPR レベル2、KaPR レベル2、DPRレベル2、全てについて1ダウンリンクを1シーンとする

1.4.2. レベル3のシーン定義

二周波降水レーダレベル3 プロダクトのシーン定義を以下に示す。

表 1.4-1 レベル3プロダクトのシーン定義

種別	名称	シーン定義
高解像度プロダクト	二周波降水レーダ レベル3 (Daliy) 0.25°×0.25 二周波降水レーダ レベル3 (Monthly) 0.25°×0.25	67° S～67° N、180° W～180° E の範囲で、DPRプロダクトを1日分 もしくは1ヶ月分まとめたもの
低解像度プロダクト	二周波降水レーダ レベル3 (Daliy) 5°×5° 二周波降水レーダ レベル3 (Monthly) 5°×5°	70° S～70° N、180° W～180° E の範囲で、DPRプロダクトを1日分 もしくは1ヶ月分まとめたもの

1.5. プロダクト構成

1シーン分のサイエンスデータを格納した1ファイルを、1プロダクトとする。

1.6. ファイルの分割とデータサイズ

1シーンをプロダクトの単位とする。

レベル2 標準処理のデータサイズを「表1.6-1 プロダクトサイズ(レベル2, 標準処理)」に示す。
 レベル2 準リアルタイム処理のデータサイズを「表1.6-2 プロダクトサイズ(レベル2, 準リアルタイム処理)」に示す。
 レベル3 標準処理のデータサイズを「表1.6-3 プロダクトサイズ(レベル3, 標準処理)」に示す。

表1.6-1 プロダクトサイズ(レベル2, 標準処理)

No.	名称	データサイズ
1	KuPRレベル2	200 [MB/1周回]
2	KaPRレベル2	160 [MB/1周回]
3	DPRレベル2	360 [MB/1周回]

表1.6-2 プロダクトサイズ(レベル2, 準リアルタイム処理)

No.	名称	データサイズ
1	KuPRレベル2R	65 [MB]
2	KaPRレベル2R	55 [MB]
3	DPRレベル2R	120 [MB]

表1.6-3 プロダクトサイズ(レベル3, 標準処理)

No.	名称	データサイズ
1	二周波降水レーダレベル3(日平均、0.1度格子)	1.6 [MB/1日] (0.1° 格子, TEXT形式)
2	二周波降水レーダレベル3(日平均、0.25度格子)	60 [MB/1日] (0.25° 格子, HDF5形式)
3	二周波降水レーダレベル3(月平均)	950 [MB/1ヶ月] (HDF5形式)

1.7. HDFデータ構造

1.7.1. KuPRレベル2のファイル構造

KuPRレベル2のファイル構造を以下に示す。

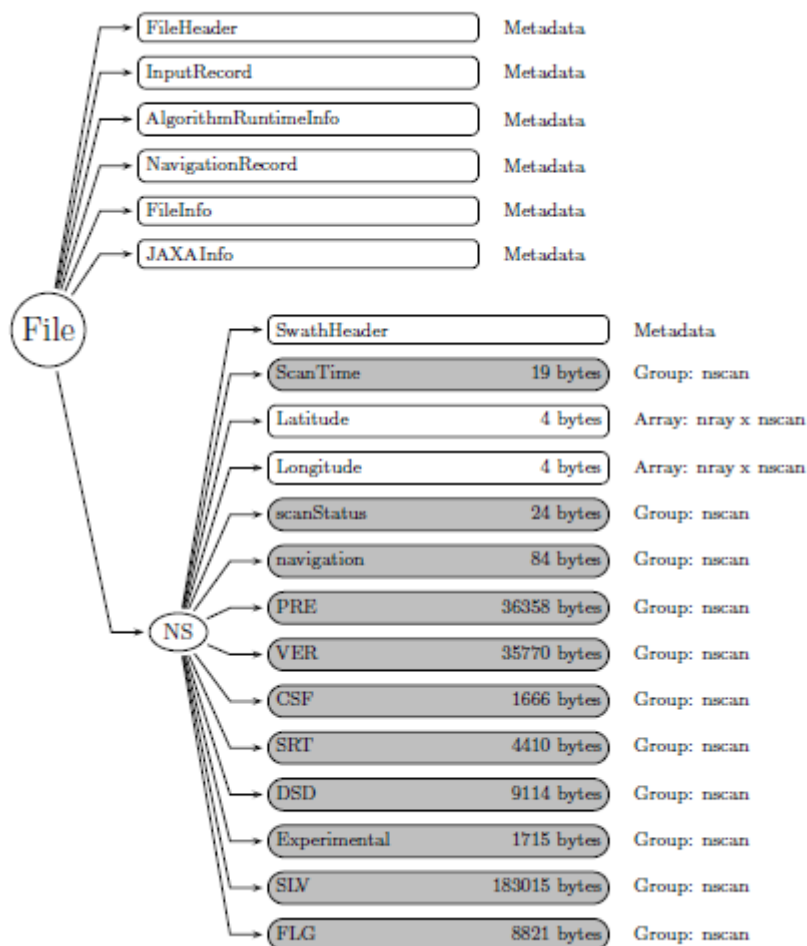


図 1.7-1 KuPRレベル2プロダクトのファイル構造

※nscan = var : グラニュール中のスキャン数

※nray = 49 : 各NSスキャンのアングルビン数

1.7.2. KaPRレベル2のファイル構造

KaPRレベル2のファイル構造を以下に示す。

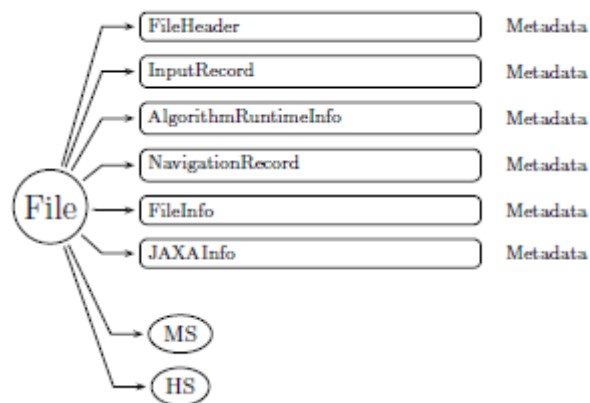


図 1.7-2 KaPRレベル2プロダクトのファイル構造

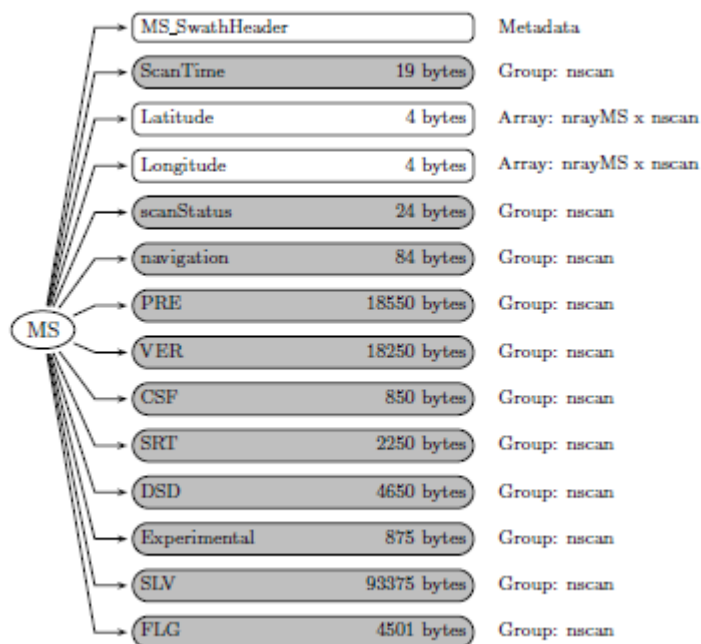


図 1.7-3 KaPRレベル2プロダクトのファイル構造(MS)

※nscan = var : グラニューール中のスキャン数

※nray MS= 25 : 各MSスキャンのアングルビン数

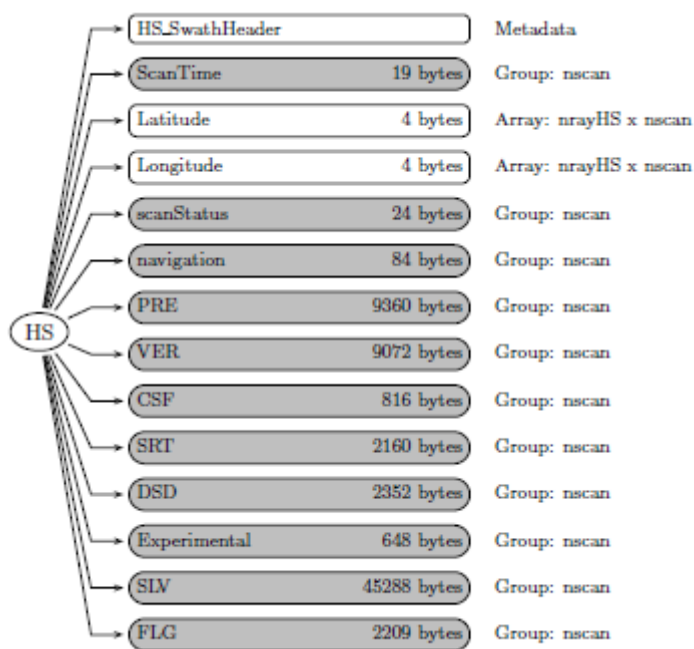


図 1.7-4 KaPRレベル2プロダクトのファイル構造(HS)

※nscan = var : グラニュール中のスキャン数

※nrayHS = 24 : 各HSスキャンのアングルビン数

1.7.3. DPRレベル2のファイル構造

DPRレベル2のファイル構造を以下に示す。

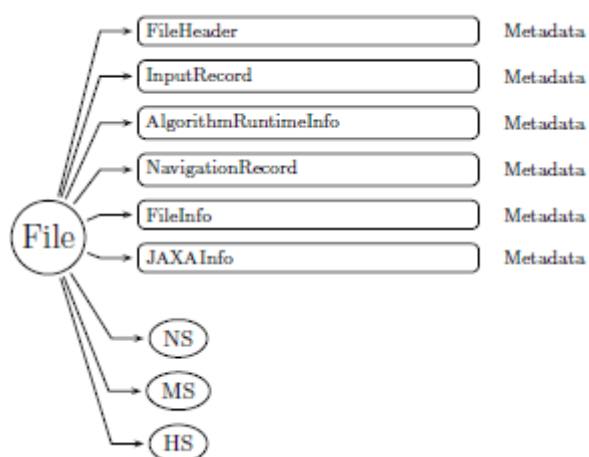


図 1.7-5 DPRレベル2プロダクトのファイル構造

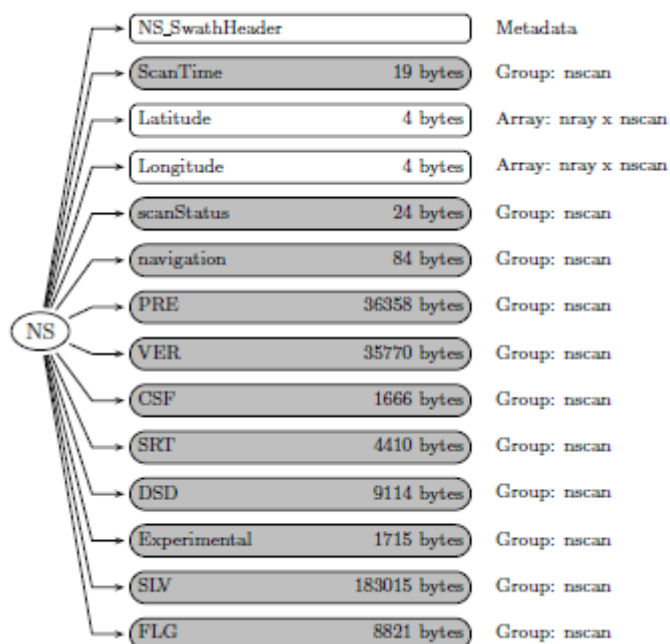


図 1.7-6 DPRレベル2プロダクトのファイル構造(NS)

※nscan = var : グラニューール中のスキャン数

※nray = 49 : 各NSスキャンのアングルビン数

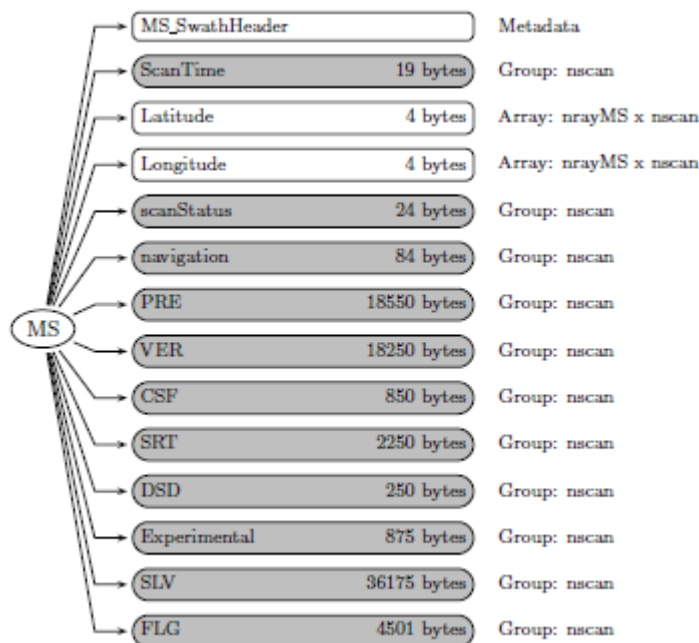


図 1.7-7 DPRレベル2プロダクトのファイル構造(MS)

※nscan = var : グラニューール中のスキャン数

※nrayMS = 25 : 各MSスキャンのアングルビン数

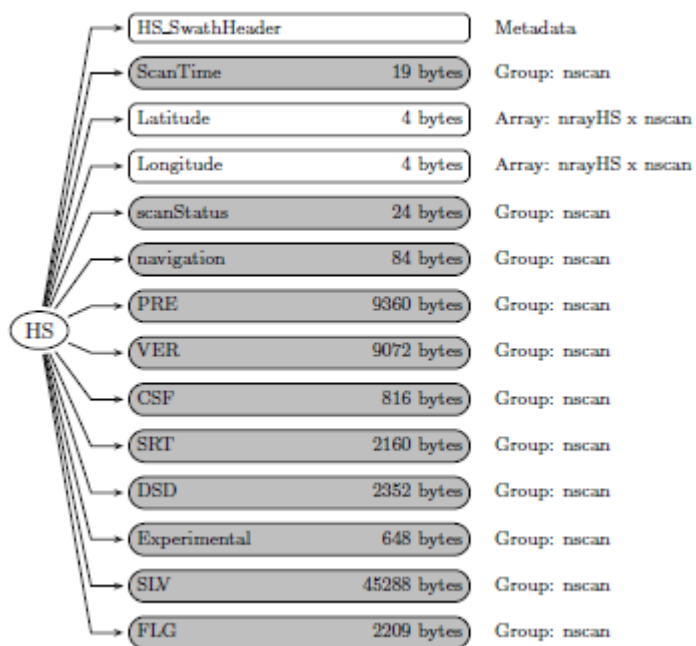


図 1.7-8 DPRレベル2プロダクトのファイル構造(HS)

※nscan = var : グラニューール中のスキャン数

※nrayHS = 24 : 各HSスキャンのアングルビン数

1.7.4. DPRレベル3(Full Product)のファイル構造

DPRレベル3(Full Product)のファイル構造を以下に示す。

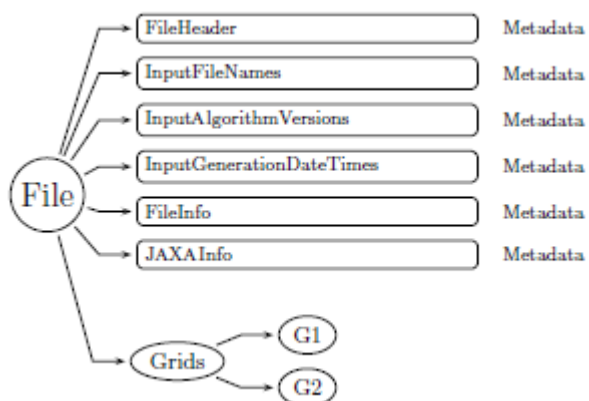


図 1.7-9 DPRレベル3(Full Product)プロダクトのファイル構造

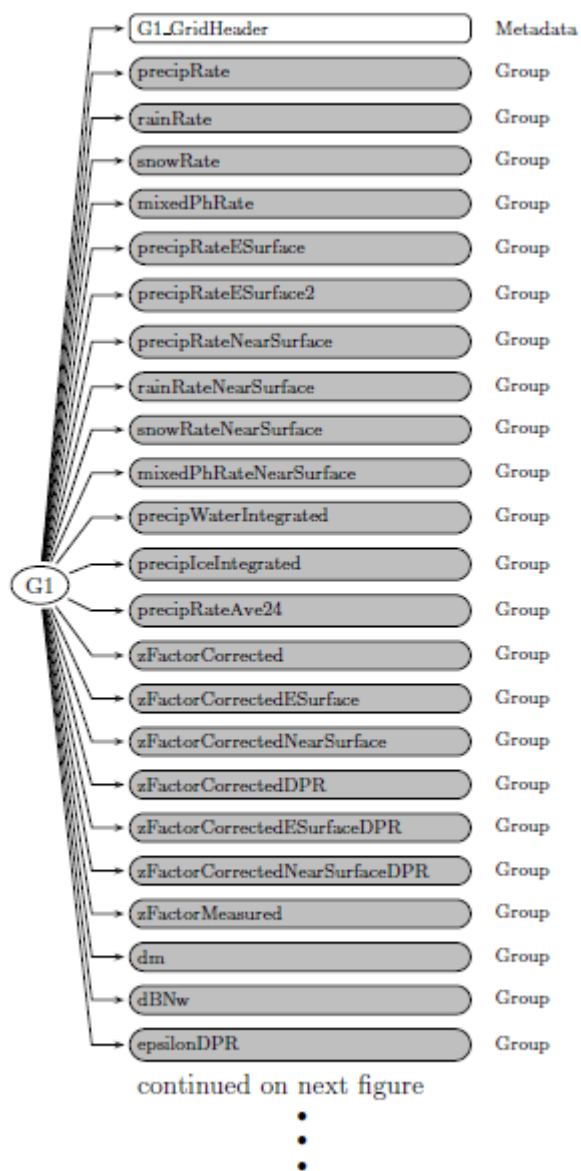


図 1.7-10 DPRレベル3(Full Product)プロダクトのファイル構造(G1)

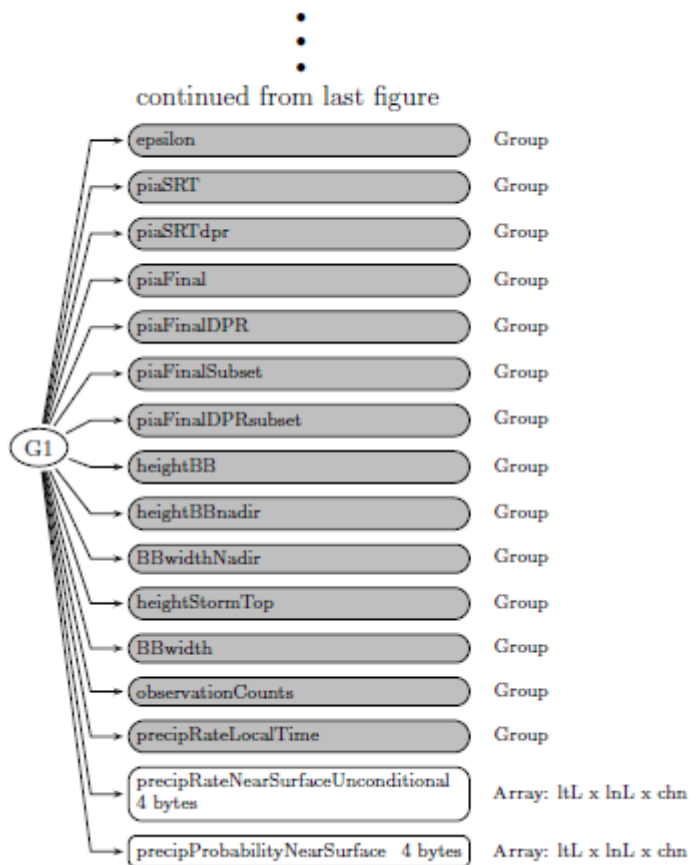


図 1.7-11 DPRレベル3(Full Product)プロダクトのファイル構造(G1)

※ltL = 28 : 低解像度($5^{\circ} \times 5^{\circ}$)の緯度グリッド間隔

※lnL = 72 : 低解像度($5^{\circ} \times 5^{\circ}$)の経度グリッド間隔

※chn = 4 : チャンネル数(Ku、Ka、KaHS、DPR)

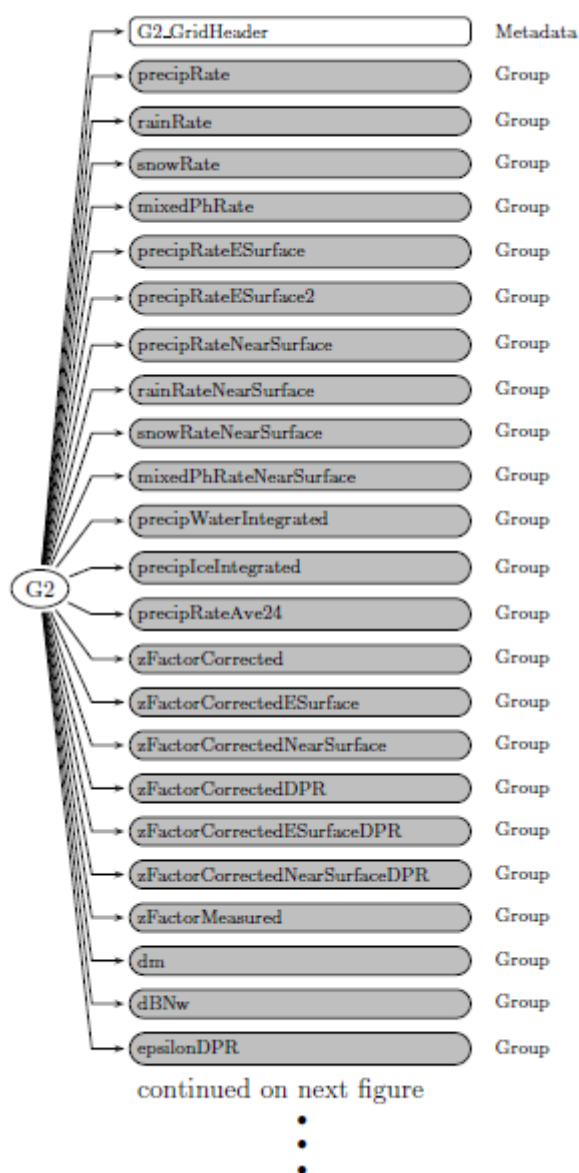


図 1.7-12 DPRレベル3(Full Product)プロダクトのファイル構造(G2)

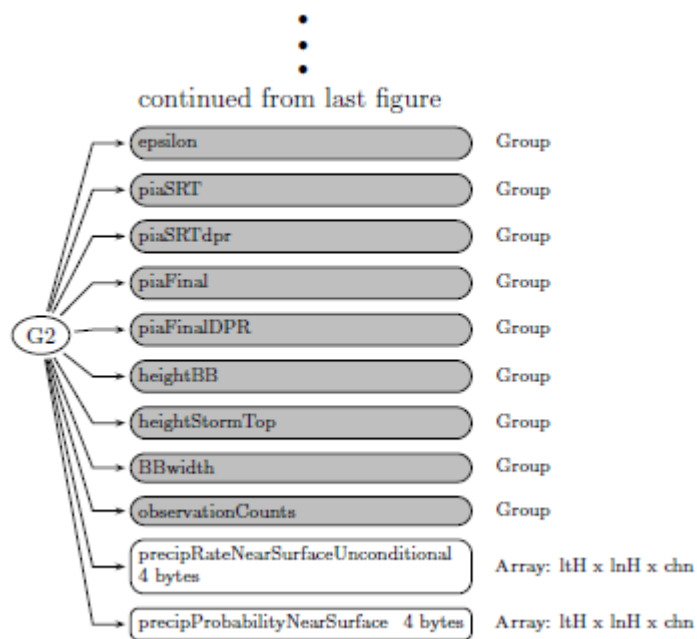


図 1.7-13 DPRレベル3(Full Product)プロダクトのファイル構造(G2)

※ltH = 536 : 低解像度($0.25^{\circ} \times 0.25^{\circ}$)の緯度グリッド間隔

※lnH = 1440 : 高解像度($0.25^{\circ} \times 0.25^{\circ}$)の経度グリッド間隔

※chn = 4 : チャンネル数(Ku、Ka、KaHS、DPR)

1.7.5. DPRレベル3(Daliy)のファイル構造

DPRレベル3(Daliy)のファイル構造を以下に示す。

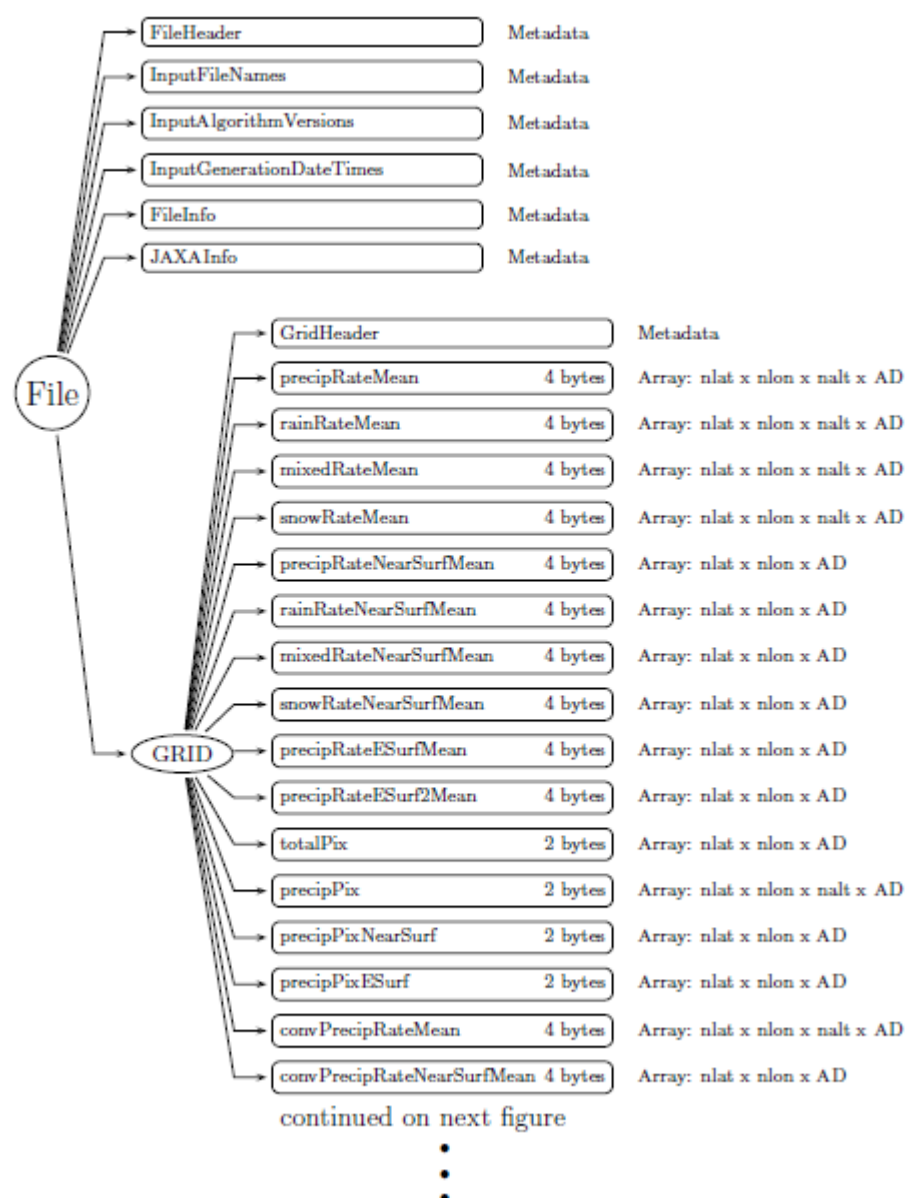


図 1.7-14 DPRレベル3(Daily)プロダクトのファイル構造

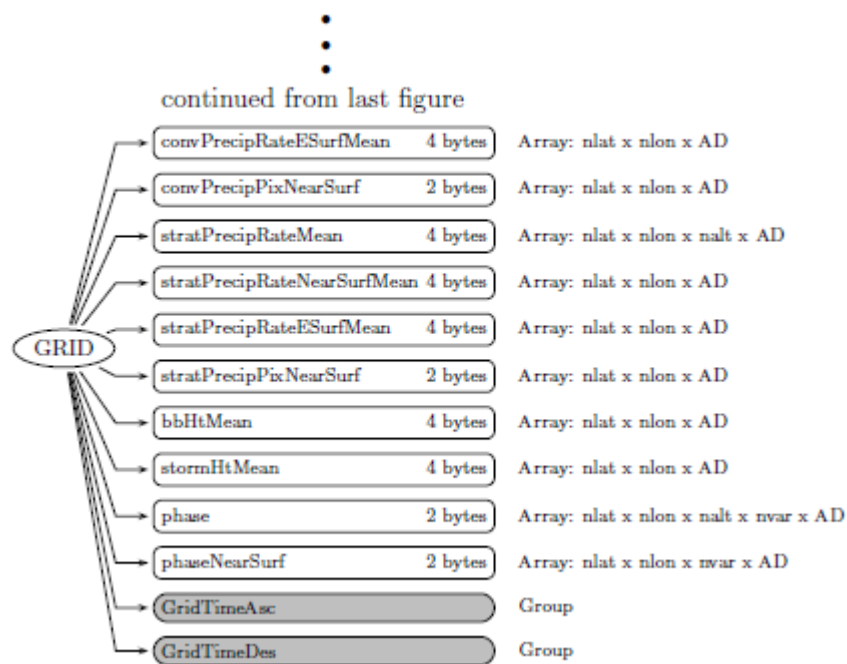


図 1.7-15 DPRレベル3(Daily)プロダクトのファイル構造

※nlat = 536 : 高解像度(0.25°)の緯度グリッド間隔

※nlon = 1440 : 高解像度(0.25°)の経度グリッド間隔

※nalt = 5 : 地上からの高さ(2km、4km、6km、10km、15km)

※nvar = 3 : 位相ビン数(～99、100～199、200～)

※AD = 2 : 上昇軌道または下降軌道

1.8. ファイル名規約

1.8.1. レベル2プロダクトファイル名規約

(1) 標準処理

グラニューールIDをファイル名とする。

レベル2プロダクト(標準処理)のファイル名規約を「図 1.8-1レベル2プロダクト(標準処理)」に示す。レベル2プロダクト (準リアルタイム処理)のファイル名規約を「図 1.8-2レベル2プロダクト(準リアルタイム処理)」に示す。

レベル2プロダクト(標準処理)中の各項目の説明を「表 1.8-1 レベル2プロダクト(標準処理)ファイル名の規約」に示す。レベル2プロダクト(準リアルタイム処理)中の各項目の説明を「表 1.8-2 レベル2プロダクト(準リアルタイム処理)ファイル名の規約」に示す。

1 概要

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
G	P	M	C	O	R		X	X	X		Y	Y	M	M	D	D	h	h	m	m		h	h	m	m		n	n	n	n	n	n		L	2	S		x	x	x		v	v	v	.	h	5
①							②	③		④	⑤											⑥	⑦			⑧	⑨							⑩	⑪			⑫	⑬			⑭	⑮		⑯		

図 1.8-1レベル2プロダクト(標準処理)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
G	P	M	C	O	R		X	X	X		Y	Y	M	M	D	D	h	h	m	m		h	h	m	m		L	2	R		x	x	x		v	v	v	.	h	5
①							②	③		④	⑤											⑥	⑦			⑧	⑪			⑫	⑬			⑭	⑮			⑯		

図 1.8-2レベル2プロダクト(準リアルタイム処理)

1 概要

表 1.8-1 レベル2プロダクト(標準処理)ファイル名の規約

No.	種別	名称	文字数	値
①	シーンID	ミッションID (ミッション名+衛星識別)	6	GPMCOR【固定】
②		セパレータ	1	「_」(アンダースコア)【固定】
③		センサID (センサ識別)	3	XXX: KUR:KuPR KAR:KaPR DPR: DPR
④		セパレータ	1	「_」(アンダースコア)【固定】
⑤		シーン開始時刻	10	UTC時刻 YY:西暦 MM:月 DD:月ごとの日 hh:時刻 0～23 mm:分 0～59
⑥		セパレータ	1	「_」(アンダースコア)【固定】
⑦		シーン終了時刻	4	UTC時刻 hh:時刻 0～23 mm:分 0～59
⑧		セパレータ	1	「_」(アンダースコア)【固定】
⑨		オービット番号	6	000001～999999(ゼロ詰め6桁)
⑩	プロダクトID	セパレータ	1	「_」(アンダースコア)【固定】
⑪		処理レベル	3	L2S【固定】
⑫		セパレータ	1	「_」(アンダースコア)【固定】
⑬		アルゴリズムID (処理アルゴリズム)	3	アルゴリズム種別と開発チームを特定

1 概要

No.	種別	名称	文字数	値
⑭		セパレータ	1	「_」(アンダースコア)【固定】
⑮		プロダクトバージョン	3	XX+A: XX: 自然数 01～99 A: 英文字 A～Z 再処理はバージョン番号の数字 2 桁のみで識別する。 3 桁目の英文字はマイナーなバージョン変更を意味する。 アルゴリズムバージョンとソフトウェアバージョンはメタで管理
⑯		ファイル拡張子	3	「.h5」【固定】 HDF5形式

表 1.8-2 レベル2プロダクト(準リアルタイム処理)ファイル名の規約

No.	種別	名称	文字数	値
①	シーンID	ミッションID (ミッション名+衛星識別)	6	GPMCOR【固定】
②		セパレータ	1	「_」(アンダースコア)【固定】
③		センサID (センサ識別)	3	XXX: KUR:KuPR KAR:KaPR DPR: DPR
④		セパレータ	1	「_」(アンダースコア)【固定】
⑤		シーン開始時刻	10	UTC時刻

1 概要

No.	種別	名称	文字数	値
				YY:西暦 MM:月 DD:月ごとの日 hh:時刻 0～23 mm:分 0～59
⑥		セパレータ	1	「_」(アンダースコア)【固定】
⑦		シーン終了時刻	4	UTC時刻 hh:時刻 0～23 mm:分 0～59
⑧		セパレータ	1	「_」(アンダースコア)【固定】
⑨	プロダクトID	処理レベル	3	L2R【固定】
⑩		セパレータ	1	「_」(アンダースコア)【固定】
⑪		アルゴリズムID (処理アルゴリズム)	3	アルゴリズム種別と開発チームを特定
⑫		セパレータ	1	「_」(アンダースコア)【固定】
⑬		プロダクトバージョン	3	XX+a: XX: 自然数 01～99 a: 英文字 a～z 再処理はバージョン番号の数字 2 桁のみで識別する。 3 桁目の英文字はマイナーなバージョン変更を意味する。 アルゴリズムバージョンとソフトウェアバージョンはメタで管理
⑭		ファイル拡張子	3	「.h5」【固定】 HDF5形式

1.8.2. レベル3プロダクトファイル名規約

二周波降水レーダレベル3標準プロダクトのファイル名規約を「図 1.8-3 二周波降水レーダレベル3プロダクトのファイル名規約」に示す。

図中の各項目の説明を「表 1.8-3 レベル3プロダクトファイル名の規約」に示す。

1 概要

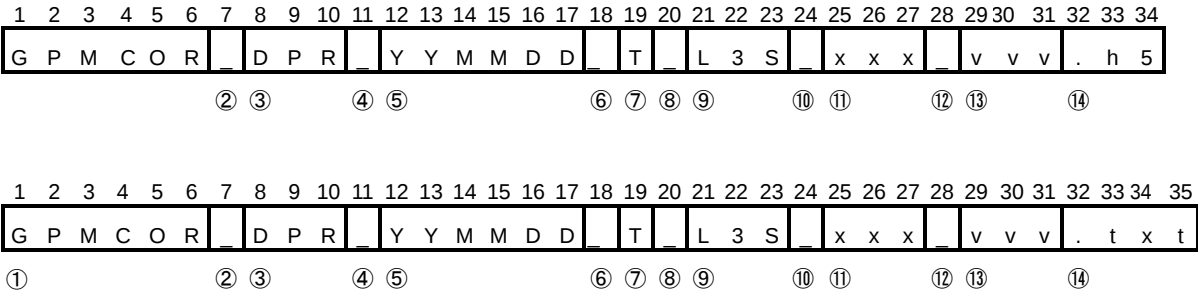


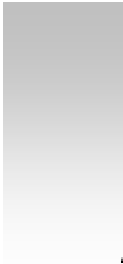
図 1.8-3 二周波降水レーダレベル3プロダクトのファイル名規約

表 1.8-3 レベル3プロダクトファイル名の規約

No.	種別	名称	文字数	値
①	シーンID	ミッションID (ミッション名+衛星識別)	6	GPMCOR【固定】
②		セパレータ	1	「_」(アンダースコア)【固定】
③		センサID (センサ識別)	3	XXX: DPR: 二周波降水レーダ
④		セパレータ	1	「_」(アンダースコア)【固定】
⑤		シーン開始時刻	4,6のいずれか	YYMM:Monthly YYMMDD:Daily

1 概要

No.	種別	名称	文字数	値
				YY:西暦 MM:月 DD:月ごとの日
⑥		セパレータ	1	「_」(アンダースコア)【固定】
⑦		処理単位	1	M: Monthly, D: Daily
⑧		セパレータ	1	「_」(アンダースコア)【固定】
⑨	プロダクトID	処理レベル	3	L3S【固定】
⑩		セパレータ	1	「_」(アンダースコア)【固定】
⑪		アルゴリズムID (処理アルゴリズム)	3	アルゴリズム種別と開発チームを特定
⑫		セパレータ	1	「_」(アンダースコア)【固定】
⑬		プロダクトバージョン	3	XX+A: XX: 自然数 01～99 A: 英文字 A～Z 再処理はバージョン番号の数字 2 桁のみで識別する。 3 桁目の英文字はマイナーなバージョン変更を意味する。 アルゴリズムバージョンとソフトウェアバージョンはメタで管理
⑭		ファイル拡張子	3または4	「.h5」HDF5形式 「.txt」Text形式(TBD)



2. レベル2プロダクトフォーマット仕様

2.1. 処理概要

レベル2 処理については、標準処理と準リアルタイム処理がある。処理概要を以下に示す。

2.1.1. 標準処理

二周波降水レーダのレベル 2 処理アルゴリズムは、KuPR およびKaPR それぞれによって観測された受信電力値プロファイルを相補的に利用し、降水強度プロファイルを推定する機能を持つ。また、降雨タイプ、降雨頂高度、ブライトバンド高度などを推定する機能も持つ。

アルゴリズムのフローを「図 2.1-1 レベル2処理アルゴリズムのフロー」に示す。

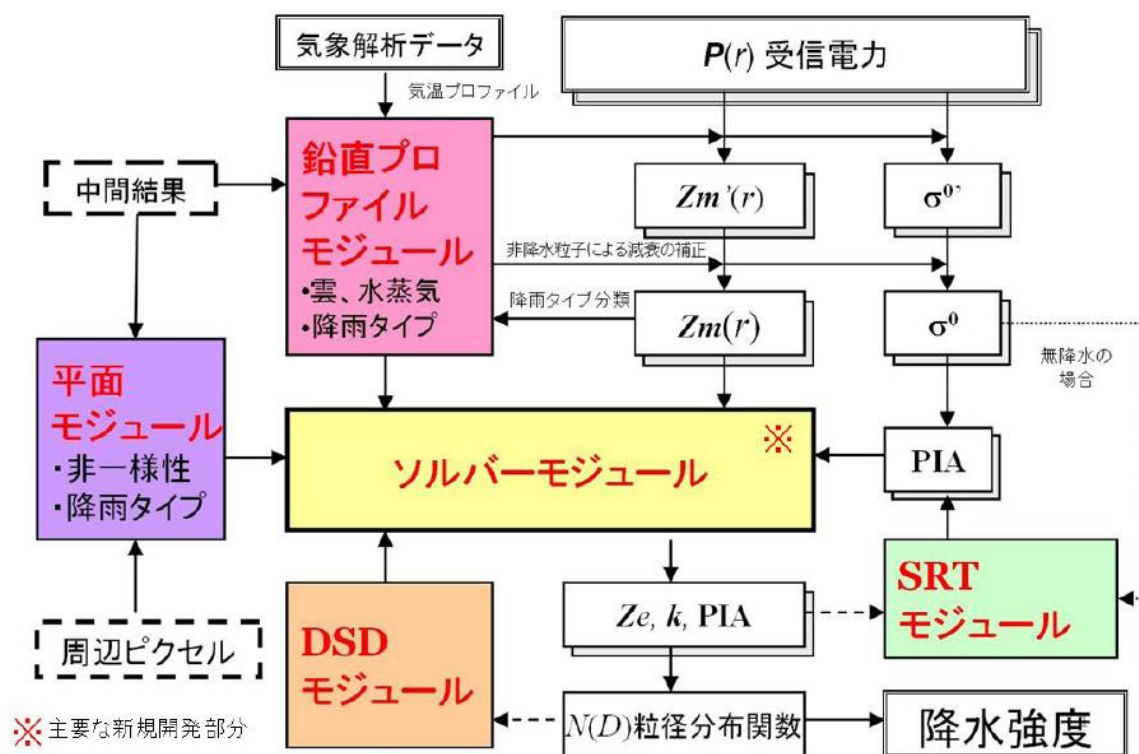


図 2.1-1 レベル2処理アルゴリズムのフロー

(「図 2.1-1 レベル 2 処理アルゴリズムのフロー」 および下記文章は関連文書(5)より引用)

レベル2 アルゴリズムの入力データはレベル1 プロダクト(受信電力値プロファイル等)であり、出力データはレベル2 プロダクト(降水強度プロファイル等)である。

標準アルゴリズムからは、KuPR プロダクト、KaPR プロダクト、二周波降水プロダクトが作成される。このうち、KuPR プロダクトはKuPR による観測のみを利用してwide swath(約245km 幅)に対して処理する。KaPR プロダクトはKaPR による観測のみを利用してnarrow swath(約125km 幅)に対して処理する。二周波降水プロダクトはnarrow swath に対してはKuPR とKaPR の両方の観測を利用して処理し、narrow swath を含まないwide swath に対してはKuPR による観測と、narrow swath におけるKuPR とKaPR の観測から得られた情報を拡張して処理する。

2.1.2. 準リアルタイム処理

レベル2 の準リアルタイムアルゴリズムは、KuPRレベル2R、KaPRレベル2R、DPR レベル2R プロダクトを作成する。処理アルゴリズムは「2.1.1 標準処理」と同様である。

2.2. ファイル入出力

「図 2.2-1 DPRレベル0からレベル3処理全体のフロー」に標準処理におけるレベル0からレベル3までの処理全体のフローを示す。「表2.2-1 レベル2処理の入出力ファイル」にDPR レベル2で使用する入力データ、出力プロダクトを示す。

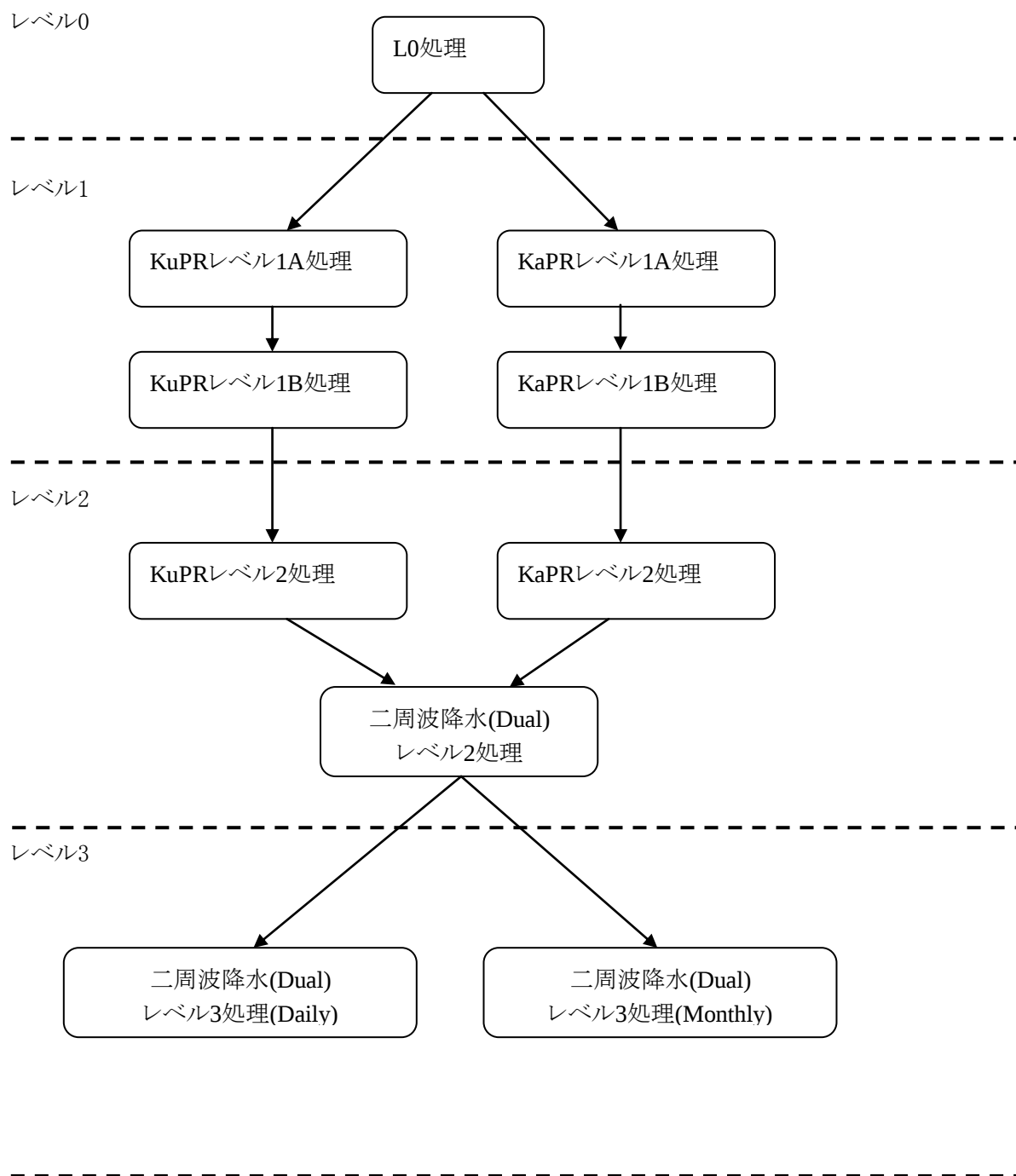


図 2.2-1 DPRレベル0からレベル3処理全体のフロー

表2.2-1 レベル2処理の入出力ファイル

(凡例 I:Input/O:Output)

No.	標準処理	準リアルタイム処理	I/O
1	KuPR レベル 1B	KuPR レベル 1BR	I
2	KaPR レベル 1B	KaPR レベル 1BR	I
3	全球客観解析値(GANAL)・予報値	予報値	I
4	KuPR レベル 2	KuPR レベル 2R	I/O
5	KaPR レベル 2	KaPR レベル 2R	I/O
6	DPR レベル 2	DPR レベル 2R	O

2.3. プロダクトフォーマット

レベル 2 プロダクトフォーマットの説明を以下に示す。

2.3.1. HDFプロダクト

(1) 標準プロダクト

KuPRレベル2プロダクト(標準プロダクト)のフォーマットを「表2.3-1」に示す。

KaPRレベル2プロダクト(標準プロダクト)のフォーマットを「表2.3-2」に示す。

DPRレベル2プロダクト(標準プロダクト)のフォーマットを「表2.3-3」に示す。

(2) 準リアルタイムプロダクト

KuPR, KaPR, DPR レベル2準リアルタイム処理のプロダクトフォーマットは、標準処理のプロダクトフォーマットと同じである。

表 2.3-1 KuPR レベル 2 プロダクトフォーマット(標準プロダクト・準リアルタイムプロダクト)

	Group Name 1	Group Name 2	DPR Initial 1B21 Value Name	missing	min	max	unit	type	Data size	type	array				remark		
2AKu	NS	ScanTime	Year[nscan]	-9999	1950	2100	[years]	2-byte integer	15800	2	nscan	1	1	1			
			Month[nscan]	-99	1	12	[months]	1-byte integer	7900	1	nscan	1	1	1			
			DayOfMonth[nscan]	-99	1	31	[days]	1-byte integer	7900	1	nscan	1	1	1			
			Hour[nscan]	-99	0	23	[hours]	1-byte integer	7900	1	nscan	1	1	1			
			Minute[nscan]	-99	0	59	[minutes]	1-byte integer	7900	1	nscan	1	1	1			
			Second[nscan]	-99	0	60	[s]	1-byte integer	7900	1	nscan	1	1	1			
			MilliSecond[nscan]	-9999	0	999	[ms]	2-byte integer	15800	2	nscan	1	1	1			
			DayOfYear[nscan]	-9999	1	366	[days]	2-byte integer	15800	2	nscan	1	1	1			
			SecondOfDay[nscan]	-9999.9	0	86400	[s]	8-byte float	63200	8	nscan	1	1	1			
		(N/A)	Latitude[nray][nscan]	-9999.9	-90	90	[degrees]	4-byte float	1548400	4	49	nscan	1	1	1		
		(N/A)	Longitude[nray][nscan]	-9999.9	-180	180	[degrees]	4-byte float	1548400	4	49	nscan	1	1	1		
		scanStatus	dataQuality[nscan]		0x00	0xff		8-bit	7900	1	nscan	1	1	1	1	A summary of data quality in the scan. Bit Meaning if bit = 1 0 missing 5 geoError is not zero 6 modeStatus is not zero	
			dataWarning[nscan]					1-byte integer	7900	1	nscan	1	1	1	1	Flag of data warning for each scan. 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	
			missing[nscan]		0x00	0xff		8-bit	7900	1	nscan	1	1	1	1	Indicates whether information is contained in the scan data. Bit Meaning if bit = 1 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)	
			modeStatus[nscan]		0x00	0xff		8-bit	7900	1	nscan	1	1	1	1	A summary of status modes. Bit Meaning if bit = 1 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)	
			geoError[nscan]		0x0000	0xffff		16-bit	15800	2	nscan	1	1	1	1	A summary of geolocation errors in the scan. Bit Meaning if bit = 1 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)	
			geoWarning[nscan]		0x0000	0xffff		16-bit	15800	2	nscan	1	1	1	1	A summary of geolocation warnings in the scan. Bit Meaning if bit = 1 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)	
			SCorientation[nscan]	-9999				2-byte integer	15800	2	nscan	1	1	1	1	Value Meaning 0 +X forward (yaw 0) 180 -X forward (yaw 180) -8000 Non-nominal pointing	
			pointingStatus[nscan]	-9999				2-byte integer	15800	2	nscan	1	1	1	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	
			acsModeMidScan[nscan]	-99				1-byte integer	7900	1	nscan	1	1	1	1	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	
			targetSelectionMidScan[nscan]	-99	0	5		1-byte integer	7900	1	nscan	1	1	1	1	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	
			operationalMode[nscan]		1	20		1-byte integer	7900	1	nscan	1	1	1	1		
			limitErrorFlag[nscan]					1-byte integer	7900	1	nscan	1	1	1	1	Bit flags for every ray with information about echo power limit checks. limitErrorFlag may be used in modeStatus. 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)	
		navigation	FractionalGranuleNumber[nscan]	-9999.9	0	100000		8-byte float	63200	8	nscan	1	1	1	1		
			scPos[XYZ][nscan]	-9999.9	-10000000	10000000	[m]	4-byte float	94800	4	3	nscan	1	1	1		
			scVel[XYZ][nscan]	-9999.9	-10000000	10000000	[m/s]	4-byte float	94800	4	3	nscan	1	1	1		
			scLat[nscan]	-9999.9	-70	70	[degrees]	4-byte float	31600	4	nscan	1	1	1	1		
			scLon[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	1		
			scAlt[nscan]	-9999.9	350000	500000	[m]	4-byte float	31600	4	nscan	1	1	1	1		
			dprAlt[nscan]	-9999.9	350000	500000	[m]	4-byte float	31600	4	nscan	1	1	1	1		
			scAttRollGeoc[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	1		
			scAttPitchGeoc[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	1		
			scAttYawGeoc[nscan]	-9999.9	-135	225	[degrees]	4-byte float	31600	4	nscan	1	1	1	1		
			scAttRollGeod[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	1		
			scAttPitchGeod[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	1		
			scAttYawGeod[nscan]	-9999.9	-135	225	[degrees]	4-byte float	31600	4	nscan	1	1	1	1		
			greenHourAng[nscan]	-9999.9	0	390	[degrees]	4-byte float	31600	4	nscan	1	1	1	1		
			timeMidScan[nscan]	-9999.9	0	10000000000	[s]	8-byte float	63200	8	nscan	1	1	1	1		
			timeMidScanOffset[nscan]	-9999.9	0	100	[s]	8-byte float	63200	8	nscan	1	1	1	1		
			elevation[nray][nscan]	-9999.9			[m]	4-byte float	1548400	4	49	nscan	1	1	1	1	
		PRE	landSurfaceType[nray][nscan]	-9999	0	399		4-byte integer	1548400	4	49	nscan	1	1	1	1	Land surface type. 0 - 99 Ocean 100 - 199 Land 200 - 299 Coast 300 - 399 Inland water
			localZenithAngle[nray][nscan]	-9999.9			[degrees]	4-byte float	1548400	4	49	nscan	1	1	1	1	
			flagPrecip[nray][nscan]	-9999				4-byte integer	1548400	4	49	nscan	1	1	1	1	Precipitation or no precipitation. 1 No precipitation 2 Precipitation
			binRealSurface[nray][nscan]	-9999			[range bin number]	2-byte integer	774200	2	49	nscan	1	1	1	1	
			binStormTop[nray][nscan]	-9999			[range bin number]	2-byte integer	774200	2	49	nscan	1	1	1	1	
			heightStormTop[nray][nscan]	-9999.9			[m]	4-byte float	1548400	4	49	nscan	1	1	1	1	
			binClutterFreeBottom[nray][nscan]	-9999			[range bin number]	2-byte integer	774200	2	49	nscan	1	1	1	1	
			sigmaZeroMeasured[nray][nscan]	-9999.9			[dB]	4-byte float	1548400	4	49	nscan	1	1	1	1	
			zFactorMeasured[nbin][nray][nscan]	-9999.9			[dBZ]	4-byte float	272518400	4	176	49	nscan	1	1	1	
			ellipsoidBinOffset[nray][nscan]	-9999			[m]	4-byte float	1548400	4	49	nscan	1	1	1	1	
			snRatioAtRealSurface[nray][nscan]	-9999				4-byte float	1548400	4	49	nscan	1	1	1	1	
			binZeroDeg[nray][nscan]	-9999			[range bin number]	2-byte integer	774200	2	49	nscan	1	1	1	1	Range bin number with 0 degrees C level.
			attenuationNP[nbin][nray][nscan]	-9999.9			[dB/km]	4-byte float	272518400	4	176	49	nscan	1	1	1	

	Group Name 1	Group Name 2	DPR Initial 1B21 Value Name	missing	min	max	unit	type	Data size	type	array				remark
		VER	plaNp[nP][nray][nscan]	-9999.9			[dB]	4-byte float	6193600	4	4	49	nscan	1	
			sigmaZeroNPCorrected[nray][nscan]	-9999.9			[dB]	4-byte float	1548400	4	49	nscan	1	1	
		CSF	heightZeroDeg[nray][nscan]	-9999.9			[m]	4-byte float	1548400	4	49	nscan	1	1	
			flagBB[nray][nscan]	-9999				4-byte integer	1548400	4	49	nscan	1	1	Bright band (BB) exists or not. 0 BB not detected 1 BB detected -1111 No rain value
			binBBPeak[nray][nscan]	-9999			[range bin number]	2-byte integer	774200	2	49	nscan	1	1	
			binBBTop[nray][nscan]	-9999			[range bin number]	2-byte integer	774200	2	49	nscan	1	1	
			binBBBottom[nray][nscan]	-9999			[range bin number]	2-byte integer	774200	2	49	nscan	1	1	
			heightBB[nray][nscan]	-9999.9			[m]	4-byte float	1548400	4	49	nscan	1	1	
			widthBB[nray][nscan]	-9999.9			[m]	4-byte float	1548400	4	49	nscan	1	1	
			qualityBB[nray][nscan]	-9999				4-byte integer	1548400	4	49	nscan	1	1	Quality of the bright band. 1 Good 0 BB not detected in the case of rain -1111 No rain value -9999 Missing value
			typePrecip[nray][nscan]	-9999				4-byte integer	1548400	4	49	nscan	1	1	Precipitation type is expressed by an 8-digit number. The three major rain categories, stratiform, onvective, 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
			qualityTypePrecip[nray][nscan]	-9999				4-byte integer	1548400	4	49	nscan	1	1	Quality of the precipitation type. 1 Good -1111 No rain value
			flagShallowRain[nray][nscan]	-9999				4-byte integer	1548400	4	49	nscan	1	1	Type of shallow rain 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
		SRT	PIAAltmethod[nray][nscan]	-9999.9			[dB]	4-byte float	9290400	4	6	49	nscan	1	
			RFactorAltmethod[nray][nscan]	-9999.9				4-byte float	9290400	4	6	49	nscan	1	
			PIAWeightmethod[nray][nscan]	-9999.9				4-byte float	9290400	4	6	49	nscan	1	
			pathAtten[nray][nscan]	-9999.9			[dB]	4-byte float	1548400	4	49	nscan	1	1	
			reliabFactor[nray][nscan]	-9999.9				4-byte float	1548400	4	49	nscan	1	1	
			reliabFlag[nray][nscan]	-9999				2-byte integer	774200	2	49	nscan	1	1	
		DSD	refScanID[nearFar][oreBack][nray][nscan]	-9999			[Number]	2-byte integer	3096800	2	2	2	49	nscan	
			phase[nbin][nray][nscan]	255				1-byte char	68129600	1	176	49	nscan	1	
		Experimental	binNode[nNode][nray][nscan]	-9999				2-byte integer	3871000	2	5	49	nscan	1	
			precipRateESurface2[nray][nscan]	-9999.9			[mm/hr]	4-byte float	1548400	4	49	nscan	1	1	
			precipRateESurface2Status[nray][nscan]	255				1-byte char	387100	1	49	nscan	1	1	
			sigmaZeroProfile[nbinSZP][nray][nscan]	-9999.9			[dB]	4-byte float	10838800	4	7	49	nscan	1	
		SLV	binDEML2[nray][nscan]	-9999			[range bin number]	2-byte integer	774200	2	49	nscan	1	1	
			flagSLV[nbin][nray][nscan]	-99				1-byte integer	68129600	1	176	49	nscan	1	
			binEchoBottom[nray][nscan]	-9999				2-byte integer	774200	2	49	nscan	1	1	
			piaFinal[nray][nscan]	-9999.9			[dB]	4-byte float	1548400	4	49	nscan	1	1	
			sigmaZeroCorrected[nray][nscan]	-9999.9			[dB]	4-byte float	1548400	4	49	nscan	1	1	
			zFactorCorrected[nbin][nray][nscan]	-9999.9			[dBZ]	4-byte float	272518400	4	176	49	nscan	1	
			zFactorCorrectedESurface[nray][nscan]	-9999.9			[dBZ]	4-byte float	1548400	4	49	nscan	1	1	
			zFactorCorrectedNearSurface[nray][nscan]	-9999.9			[dBZ]	4-byte float	1548400	4	49	nscan	1	1	
			paramDSD[nDSD][nbin][nray][nscan]	-9999.9				4-byte float	545036800	4	2	176	49	nscan	
			precipRate[nbin][nray][nscan]	-9999.9			[mm/hr]	4-byte float	272518400	4	176	49	nscan	1	
			precipWaterIntegrated[LS][nray][nscan]	-9999.9			[kg/m^2]	4-byte float	3096800	4	2	49	nscan	1	
			precipRateNearSurface[nray][nscan]	-9999.9			[mm/hr]	4-byte float	1548400	4	49	nscan	1	1	
			precipRateESurface[nray][nscan]	-9999.9			[mm/hr]	4-byte float	1548400	4	49	nscan	1	1	
			precipRateAve24[nray][nscan]	-9999.9			[mm/hr]	4-byte float	1548400	4	49	nscan	1	1	
			phaseNearSurface[nray][nscan]	255				1-byte char	387100	1	49	nscan	1	1	
			epsilon[nbin][nray][nscan]	-9999.9				4-byte float	272518400	4	176	49	nscan	1	
		FLG	flagEcho[nbin][nray][nscan]		0x00	0xff		8-bit	68129600	1	176	49	nscan	1	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
			qualityData[nray][nscan]		-9999			4-byte integer	1548400	4	49	nscan	1	1	Flag of quality data. Bit range from 8 to 23 contains flags by each module. Each module flag has 2 bits of information. 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: Bit Meaning 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
			flagSensor[nscan]					1-byte integer	7900	1	nscan	1	1	1	Flag of input Ku/Ka data condition. Value Meaning 1 Valid -99 Invalid (judged by dataQuality)
MetaData-2AKu	FileHeader		DOI						256						
			AlgorithmID						50						
			AlgorithmVersion						50						
			FileName						50						
			SatelliteName						10						
			InstrumentName						10						
			GenerationDateTime						50						
			StartGranuleDateTime						50						
			StopGranuleDateTime						50						
			GranuleNumber						50						
			NumberOfSwaths						50						
			NumberOfGrids						50						
			GranuleStart						50						
			TimeInterval						50						
			ProcessingSystem						50						
			ProductVersion						50						
			EmptyGranule						50						
			MissingData						50						
	InputRecord	(N/A)	InputFileNames						1000						
			InputAlgorithmVersions						1000						
			InputGenerationDateTimes						1000						
	AlgorithmRuntimeInfo	(N/A)	(N/A)												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.
	NavigationRecord	(N/A)	LongitudeOnEquator						50						
			UTCDateTimeOnEquator						50						
			MeanSolarBetaAngle						50						
			EphemerisFileName						50						
			AttitudeFileName						50						
			GeoControlFileName						50						
			EphemerisSource						50						
			AttitudeSource						50						
			GeoToolkitVersion						50						
			SensorAlignmentFirstRotationAngle						50						
			SensorAlignmentSecondRotationAngle						50						
			SensorAlignmentThirdRotationAngle						50						
			SensorAlignmentFirstRotationAxis						50						
			SensorAlignmentSecondRotationAxis						50						
			SensorAlignmentThirdRotationAxis						50						
	FileInfo	(N/A)	DataFormatVersion						50						
			TKCodeBuildVersion						50						
			MetadataVersion						50						
			FormatPackage						50						
			BlueprintFilename						50						
			BlueprintVersion						50						
			TKIOVersion						50						
			MetadataStyle						50						
	JAXAInfo	(N/A)	EndianType						50						
			GranuleFirstScanUTCDateTime						50						
			GranuleLastScanUTCDateTime						50						
			TotalQualityCode						50						
			FirstScanLat						50						
			FirstScanLon						50						
			LastScanLat						50						
			LastScanLon						50						
			NumberOfRainPixelsNS						50						
			NumberOfRainPixelsMS						50						

	Group Name 1	Group Name 2	DPR Initial 1B21 Value Name	missing	min	max	unit	type	Data size	type	array				remark		
			NumberOfRainPixelsHS						50								
			ProcessingSubSystem						50								
			ProcessingMode						50								
			LightSpeed						TBD								
			DielectricConstantKa						TBD								
			DielectricConstantKu						TBD								
	NS	SwathHeader	NumberScansInSet						50								
			MaximumNumberScansTotal						50								
			NumberScansBeforeGranule						50								
			NumberScansGranule						50								
			NumberScansAfterGranule						50								
			NumberPixels						50								
			ScanType														
												2222971376					

表 2.3-2 KaPR レベル 2 プロダクトフォーマット(標準プロダクト・準リアルタイムプロダクト)

	Group Name 1	Group Name 2	DPR Initial 1B21 Value Name	missing	min	max	unit	type	Data size	type	array				remark
NS			Year[nscan]	-9999	1950	2100	[years]	2-byte integer	15800	2	nscan	1	1	1	
			Month[nscan]	-99	1	12	[months]	1-byte integer	7900	1	nscan	1	1	1	
			DayOfMonth[nscan]	-99	1	31	[days]	1-byte integer	7900	1	nscan	1	1	1	
			Hour[nscan]	-99	0	23	[hours]	1-byte integer	7900	1	nscan	1	1	1	
			Minute[nscan]	-99	0	59	[minutes]	1-byte integer	7900	1	nscan	1	1	1	
			Second[nscan]	-99	0	60	[s]	1-byte integer	7900	1	nscan	1	1	1	
			MilliSecond[nscan]	-9999	0	999	[ms]	2-byte integer	15800	2	nscan	1	1	1	
			DayOfYear[nscan]	-9999	1	366	[days]	2-byte integer	15800	2	nscan	1	1	1	
			SecondOfDay[nscan]	-9999.9	0	86400	[s]	8-byte float	63200	8	nscan	1	1	1	
			(N/A) Latitude[nrayMS][nscan]	-9999.9	-90	90	[degrees]	4-byte float	790000	4	25	nscan	1	1	
			(N/A) Longitude[nrayMS][nscan]	-9999.9	-180	180	[degrees]	4-byte float	790000	4	25	nscan	1	1	
			dataQuality[nscan]		0x00	0xff		8-bit	7900	1	nscan	1	1	1	A summary of data quality in the scan. Bit Meaning if bit = 1 0 missing 5 geoError is not zero 6 modeStatus is not zero
			dataWarning[nscan]					1-byte integer	7900	1	nscan	1	1	1	Flag of data warning for each scan. 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
			missing[nscan]		0x00	0xff		8-bit	7900	1	7900	1	1	1	Indicates whether information is contained in the scan data. Bit Meaning if bit = 1 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)
			modeStatus[nscan]		0x00	0xff		8-bit	7900	1	nscan	1	1	1	A summary of status modes. Bit Meaning if bit = 1 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)
			geoError[nscan]		0x0000	0xffff		16-bit	15800	2	nscan	1	1	1	
			geoWarning[nscan]		0x0000	0xffff		16-bit	15800	2	nscan	1	1	1	
			SCorientation[nscan]		-9999			2-byte integer	15800	2	nscan	1	1	1	Value Meaning 0 +X forward (yaw 0) 180 -X forward (yaw 180) -8000 Non-nominal pointing
			pointingStatus[nscan]		-9999			2-byte integer	15800	2	nscan	1	1	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
			acsModeMidScan[nscan]					1-byte integer	7900	1	nscan	1	1	1	Value Meaning 0 LAUNCH 1 RATENUILL 2 SUNPOINT 3 GSPM (Gyro-less Sun Point) 4 MSM (Mission Science Mode) 5 SLEW 6 DELTAH 7 DELTAV -99 UNKNOWN --- ACS mode unavailable
			targetSelectionMidScan[nscan]		-99			1-byte integer	7900	1	nscan	1	1	1	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
			operationalMode[nscan]			1	20	1-byte integer	7900	1	nscan	1	1	1	
			limitErrorFlag[nscan]					1-byte integer	7900	1	nscan	1	1	1	Bit flags for every ray with information about echo power limit checks. limitErrorFlag may be used in modeStatus. 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)
			FractionalGranuleNumber[nscan]	-9999.9	0	100000		8-byte float	63200	8	nscan	1	1	1	
			scPos[XYZ][nscan]	-9999.9	-1E+07	10000000	[m]	4-byte float	94800	4	3	nscan	1	1	
			scVel[XYZ][nscan]	-9999.9	-1E+07	10000000	[m/s]	4-byte float	94800	4	3	nscan	1	1	
			scLat[nscan]	-9999.9	-70	70	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scLon[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAlt[nscan]	-9999.9	350000	500000	[m]	4-byte float	31600	4	nscan	1	1	1	
			dprAlt[nscan]	-9999.9	350000	500000	[m]	4-byte float	31600	4	nscan	1	1	1	
			scAttRollGeoc[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttPitchGeoc[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttYawGeoc[nscan]	-9999.9	-135	225	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttRollGeod[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttPitchGeod[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttYawGeod[nscan]	-9999.9	-135	225	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			greenHourAng[nscan]	-9999.9	0	390	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			timeMidScan[nscan]	-9999.9	0	1E+10	[s]	8-byte float	63200	8	nscan	1	1	1	
			timeMidScanOffset[nscan]	-9999.9	0	100	[s]	8-byte float	63200	8	nscan	1	1	1	
			elevation[nrayMS][nscan]	-9999.9			[m]	4-byte float	790000	4	25	nscan	1	1	
			landSurfaceType[nrayMS][nscan]	-9999	0	399		4-byte integer	790000	4	25	nscan	1	1	Land surface type. 0 - 99 Ocean 100 - 199 Land 200 - 299 Coast 300 - 399 Inland water
			localZenithAngle[nrayMS][nscan]	-9999.9			[degrees]	4-byte float	790000	4	25	nscan	1	1	
			flagPrecip[nrayMS][nscan]	-9999				4-byte integer	790000	4	25	nscan	1	1	1 No precipitation 2 Precipitation
			binRealSurface[nrayMS][nscan]	-9999			[range bin number]	2-byte integer	395000	2	25	nscan	1	1	
			binStormTop[nrayMS][nscan]	-9999			[range bin number]	2-byte integer	395000	2	25	nscan	1	1	
			heightStormTop[nrayMS][nscan]	-9999.9			[m]	4-byte float	790000	4	25	nscan	1	1	
			binClutterFreeBottom[nrayMS][nscan]	-9999			[range bin number]	2-byte integer	395000	2	25	nscan	1	1	
			sigmaZeroMeasured[nrayMS][nscan]	-9999.9			[dB]	4-byte float	790000	4	25	nscan	1	1	
			zFactorMeasured[nbin][nrayMS][nscan]	-9999.9			[dBZ]	4-byte float	139040000	4	176	25	nscan	1	
			ellipsoidBinOffset[nrayMS][nscan]	-9999			[m]	4-byte float	790000	4	25	nscan	1	1	
			snRatioAtRealSurface[nrayMS][nscan]	-9999				4-byte float	790000	4	25	nscan	1	1	
			binZeroDeg[nrayMS][nscan]	-9999			[range bin number]	2-byte integer	395000	2	25	nscan	1	1	1 Range bin number with 0 degrees C level.
			attenuationNP[nbin][nrayMS][nscan]	-9999.9			[dB/km]	4-byte float	139040000	4	176	25	nscan	1	
			piaNP[nNP][nrayMS][nscan]	-9999.9			[dB]	4-byte float	3160000	4	4	25	nscan	1	
			sigmaZeroNPCorrected[nrayMS][nscan]	-9999.9			[dB]	4-byte float	790000	4	25	nscan	1	1	
			heightZeroDeg[nrayMS][nscan]	-9999.9			[m]	4-byte float	790000	4	25	nscan	1	1	
			flagBB[nrayMS][nscan]	-9999				4-byte integer	790000	4	25	nscan	1	1	Bright band (BB) exists or not. 0 BB not detected 1 BB detected -1111 No rain value
			binBBPeak[nrayMS][nscan]	-9999			[range bin number]	2-byte integer	395000	2	25	nscan	1	1	
			binBBTop[nrayMS][nscan]	-9999			[range bin number]	2-byte integer	395000	2	25	nscan	1	1	
			binBBBottom[nrayMS][nscan]	-9999			[range bin number]	2-byte integer	395000	2	25	nscan	1	1	
			heightBB[nrayMS][nscan]	-9999.9			[m]	4-byte float	790000	4	25	nscan	1	1	
			widthBB[nrayMS][nscan]	-9999.9			[m]	4-byte float	790000	4	25	nscan	1	1	
			qualityBB[nrayMS][nscan]	-9999				4-byte integer	790000	4	25	nscan	1	1	Quality of the bright band. 1 Good 0 BB not detected in the case of rain -1111 No rain value
			typePrecip[nrayMS][nscan]	-9999				4-byte integer	790000	4	25	nscan	1	1	Precipitation type is expressed by an 8-digit number. The three major rain categories, stratiform, onvective, and other, can be obtained as follows: 1 When typePrecip is greater than zero, Major rain type = typePrecip/10000000 = 1 stratiform = 2 convective = 3 other -1111 No rain value
			qualityTypePrecip[nrayMS][nscan]	-9999				4-byte integer	790000	4	25	nscan	1	1	Quality of the precipitation type. 1 Good -1111 No rain value

	Group Name 1	Group Name 2	DPR Initial 1B21 Value Name	missing	min	max	unit	type	Data size	type	array				remark
2AKa			flagShallowRain[nrayMS][nscan]	-9999				4-byte integer	790000	4	25	nscan		1	Type of shallow rain 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 value
			PIAalt[method][nrayMS][nscan]	-9999.9			[dB]	4-byte float	4740000	4	6	25	nscan	1	
			RFactorAlt[method][nrayMS][nscan]	-9999.9				4-byte float	4740000	4	6	25	nscan	1	
			PIAweight[method][nrayMS][nscan]	-9999.9				4-byte float	4740000	4	6	25	nscan	1	
			pathAtten[nrayMS][nscan]	-9999.9			[dB]	4-byte float	790000	4	25	nscan	1	1	
			reliabFactor[nrayMS][nscan]	-9999.9				4-byte float	790000	4	25	nscan	1	1	
			reliabFlag[nrayMS][nscan]	-9999				2-byte integer	395000	2	25	nscan	1	1	
			refScanID[nrayMS][nscan]	-9999			[Number]	2-byte integer	1580000	2	2	25	nscan	1	
			phase[nbin][nrayMS][nscan]	255				1-byte char	34760000	1	176	25	nscan	1	
			binNode[nNode][nrayMS][nscan]	-9999				2-byte integer	1975000	2	5	25	nscan	1	
		DSD	precipRateESurface2[nrayMS][nscan]	-9999.9			[mm/hr]	4-byte float	790000	4	25	nscan	1	1	
			precipRateESurface2Status[nrayMS][nscan]	255				1-byte char	197500	1	25	nscan	1	1	
			sigmaZeroProfile[nbinSZP][nrayMS][nscan]	-9999.9			[dB]	4-byte float	5530000	4	7	25	nscan	1	
			binDEML2[nrayMS][nscan]	-9999			[range bin number]	2-byte integer	395000	2	25	nscan	1	1	
		Experimental	flagSLV[nbin][nrayMS][nscan]	-99				1-byte integer	34760000	1	176	25	nscan	1	
			binEchoBottom[nrayMS][nscan]	-9999				2-byte integer	395000	2	25	nscan	1	1	
			piaFinal[nrayMS][nscan]	-9999.9			[dB]	4-byte float	790000	4	25	nscan	1	1	
			sigmaZeroCorrected[nrayMS][nscan]	-9999.9			[dB]	4-byte float	790000	4	25	nscan	1	1	
			zFactorCorrected[nbin][nrayMS][nscan]	-9999.9			[dBZ]	4-byte float	139040000	4	176	25	nscan	1	
			zFactorCorrectedESurface[nrayMS][nscan]	-9999.9			[dBZ]	4-byte float	790000	4	25	nscan	1	1	
			zFactorCorrectedNearSurface[nrayMS][nscan]	-9999.9			[dBZ]	4-byte float	790000	4	25	nscan	1	1	
			paramDSD[nDSD][nbin][nrayMS][nscan]	-9999.9				4-byte float	278080000	4	2	176	25	nscan	
			precipRate[nbin][nrayMS][nscan]	-9999.9			[mm/hr]	4-byte float	139040000	4	176	25	nscan	1	
			precipWaterIntegrated2[nrayMS][nscan]	-9999.9			[kg/m^2]	4-byte float	1580000	4	2	25	nscan	1	
			precipRateNearSurface[nrayMS][nscan]	-9999.9			[mm/hr]	4-byte float	790000	4	25	nscan	1	1	
			precipRateNearSurface[nrayMS][nscan]	-9999.9			[mm/hr]	4-byte float	790000	4	25	nscan	1	1	
			precipRateAve24[nrayMS][nscan]	-9999.9			[mm/hr]	4-byte float	790000	4	25	nscan	1	1	
			phaseNearSurface[nrayMS][nscan]	255				1-byte char	197500	1	25	nscan	1	1	
			epsilon[nbin][nrayMS][nscan]	-9999.9				4-byte float	139040000	4	176	25	nscan	1	
		SLV	flagSLV[nbin][nrayMS][nscan]	-99				1-byte integer	34760000	1	176	25	nscan	1	
			binEchoBottom[nrayMS][nscan]	-9999				2-byte integer	395000	2	25	nscan	1	1	
			piaFinal[nrayMS][nscan]	-9999.9			[dB]	4-byte float	790000	4	25	nscan	1	1	
		FLG	flagEcho[nbin][nrayMS][nscan]	0x00	0xff			8-bit	34760000	1	176	25	nscan	1	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
			qualityData[nrayMS][nscan]												Flag of quality data. Bit range from 8 to 23 contains flags by each module. Each module flag has 2 bits of information. 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 Bit Meaning 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:
			flagSensor[nscan]												Flag of input Ku/Ka data condition. Value Meaning 1 Valid -99 Invalid (judged by dataQuality)
			Year[nscan]	-9999	1950	2100	[years]	2-byte integer	15800	2	nscan	1		1	1
			Month[nscan]	-99	1	12	[months]	1-byte integer	7900	1	nscan	1		1	1
			DayOfMonth[nscan]	-99	1	31	[days]	1-byte integer	7900	1	nscan	1		1	1
			Hour[nscan]	-99	0	23	[hours]	1-byte integer	7900	1	nscan	1		1	1
			Minute[nscan]	-99	0	59	[minutes]	1-byte integer	7900	1	nscan	1		1	1
			Second[nscan]	-99	0	60	[s]	1-byte integer	7900	1	nscan	1		1	1
			MilliSecond[nscan]	-9999	0	999	[ms]	2-byte integer	15800	2	nscan	1		1	1
			DayOfYear[nscan]	-9999	1	366	[days]	2-byte integer	15800	2	nscan	1		1	1
			SecondOfDay[nscan]	-9999.9	0	86400	[s]	8-byte float	63200	8	nscan	1		1	1
			(N/A) Latitude[nrayHS][nscan]	-9999.9	-90	90	[degrees]	4-byte float	758400	4	24	nscan	1		1
			(N/A) Longitude[nrayHS][nscan]	-9999.9	-180	180	[degrees]	4-byte float	758400	4	24	nscan	1		1
		ScanTime	dataQuality[nscan]	0x00	0xff			8-bit	7900	1	nscan	1	1	1	A summary of data quality in the scan. Bit Meaning if bit = 1 0 missing 5 geoError is not zero 6 modeStatus is not zero
			dataWarning[nscan]												Flag of data warning for each scan. 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
			missing[nscan]												Indicates whether information is contained in the scan data. Bit Meaning if bit = 1 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)
			modeStatus[nscan]	0x00	0xff			8-bit	7900	1	nscan	1	1	1	A summary of status modes. Bit Meaning if bit = 1 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)
			geoError[nscan]												
			geoWarning[nscan]												
		scanStatus	SCorientation[nscan]	-9999				2-byte integer	15800	2	nscan	1		1	Value Meaning 0 +X forward (yaw 0) 180 -X forward (yaw 180) -8000 Non-nominal pointing
			pointingStatus[nscan]	-9999				2-byte integer	15800	2	nscan	1		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
			acsModeMidScan[nscan]					1-byte integer	7900	1	nscan	1	1	1	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
			targetSelectionMidScan[nscan]												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
			operationalMode[nscan]			1	20	1-byte integer	7900	1	nscan	1		1	

	Group Name 1	Group Name 2	DPR Initial 1B21 Value Name	missing	min	max	unit	type	Data size	type	array				remark
HS			limitErrorFlag[nscan]					1-byte integer	7900	1	nscan	1	1	1	Bit flags for every ray with information about echo power limit checks. limitErrorFlag may be used in modeStatus. 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)
			FractionalGranuleNumber[nscan]	-9999.9	0	100000	[Number]	8-byte float	63200	8	nscan	1	1	1	
			scPos[XYZ][nscan]	-9999.9	-1E+07	10000000	[m]	4-byte float	94800	4	3	nscan	1	1	
			scVel[XYZ][nscan]	-9999.9	-1E+07	10000000	[m/s]	4-byte float	94800	4	3	nscan	1	1	
			scLat[nscan]	-9999.9	-70	70	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scLon[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAlt[nscan]	-9999.9	350000	500000	[m]	4-byte float	31600	4	nscan	1	1	1	
			dprAlt[nscan]	-9999.9	350000	500000	[m]	4-byte float	31600	4	nscan	1	1	1	
			scAttRollGeoc[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttPitchGeoc[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttYawGeoc[nscan]	-9999.9	-135	225	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttRollGeod[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttPitchGeod[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttYawGeod[nscan]	-9999.9	-135	225	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			greenHourAng[nscan]	-9999.9	0	390	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			timeMidScan[nscan]	-9999.9	0	1E+10	[s]	8-byte float	63200	8	nscan	1	1	1	
			timeMidScanOffset[nscan]	-9999.9	0	100	[s]	8-byte float	63200	8	nscan	1	1	1	
			elevation[nrayHS][nscan]	-9999.9			[m]	4-byte float	758400	4	24	nscan	1	1	
		PRE	landSurfaceType[nrayHS][nscan]	-9999	0	399		4-byte integer	758400	4	24	nscan	1	1	Land surface type. 0 - 99 Ocean 100 - 199 Land 200 - 299 Coast 300 - 399 Inland water
			localZenithAngle[nrayHS][nscan]	-9999.9			[degrees]	4-byte float	758400	4	24	nscan	1	1	
			flagPrecip[nrayHS][nscan]	-9999				4-byte integer	758400	4	24	nscan	1	1	Precipitation or no precipitation. 1 No precipitation 2 Precipitation
			binRealSurface[nrayHS][nscan]	-9999			[range bin number]	2-byte integer	379200	2	24	nscan	1	1	
			binStormTop[nrayHS][nscan]	-9999			[range bin number]	2-byte integer	379200	2	24	nscan	1	1	
			heightStormTop[nrayHS][nscan]	-9999.9			[m]	4-byte float	758400	4	24	nscan	1	1	
			binClutterFreeBottom[nrayHS][nscan]	-9999			[range bin number]	2-byte integer	379200	2	24	nscan	1	1	
			sigmaZeroMeasured[nrayHS][nscan]	-9999.9			[dB]	4-byte float	758400	4	24	nscan	1	1	
			zFactorMeasured[nbinHS][nrayHS][nscan]	-9999.9			[dBZ]	4-byte float	66739200	4	88	24	nscan	1	
			ellipsoidBinOffset[nrayHS][nscan]	-9999			[m]	4-byte float	758400	4	24	nscan	1	1	
		VER	snRatioAtRealSurface[nrayHS][nscan]	-9999				4-byte float	758400	4	24	nscan	1	1	
			binZeroDeg[nrayHS][nscan]	-9999			[range bin number]	2-byte integer	379200	2	24	nscan	1	1	
			attenuationNP[nbinHS][nrayHS][nscan]	-9999.9			[dB/km]	4-byte float	66739200	4	88	24	nscan	1	
			piNP[nNP][nrayHS][nscan]	-9999.9			[dB]	4-byte float	3033600	4	4	24	nscan	1	
			sigmaZeroNPCorrected[nrayHS][nscan]	-9999.9			[dB]	4-byte float	758400	4	24	nscan	1	1	
			heightZeroDeg[nrayHS][nscan]	-9999.9			[m]	4-byte float	758400	4	24	nscan	1	1	
		CSF	flagBB[nrayHS][nscan]	-9999				4-byte integer	758400	4	24	nscan	1	1	Bright band (BB) exists or not. 0 BB not detected 1 BB detected -1111 No rain value
			binBBPeak[nrayHS][nscan]	-9999			[range bin number]	2-byte integer	379200	2	24	nscan	1	1	
			binBBTop[nrayHS][nscan]	-9999			[range bin number]	2-byte integer	379200	2	24	nscan	1	1	
			binBBBottom[nrayHS][nscan]	-9999			[range bin number]	2-byte integer	379200	2	24	nscan	1	1	
			heightBB[nrayHS][nscan]	-9999.9			[m]	4-byte float	758400	4	24	nscan	1	1	
			widthBB[nrayHS][nscan]	-9999.9			[m]	4-byte float	758400	4	24	nscan	1	1	
			qualityBB[nrayHS][nscan]	-9999				4-byte integer	758400	4	24	nscan	1	1	Quality of the bright band. 1 Good 0 BB not detected in the case of rain -1111 No rain value
			typePrecip[nrayHS][nscan]	-9999				4-byte integer	758400	4	24	nscan	1	1	Precipitation type is expressed by an 8-digit number. The three major rain categories, stratiform, onvective, 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
			qualityTypePrecip[nrayHS][nscan]	-9999				4-byte integer	758400	4	24	nscan	1	1	Quality of the precipitation type. 1 Good -1111 No rain value
			flagShallowRain[nrayHS][nscan]	-9999				4-byte integer	758400	4	24	nscan	1	1	Type of shallow rain 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
		SRT	PIAalt[method][nrayHS][nscan]	-9999.9			[dB]	4-byte float	4550400	4	6	24	nscan	1	
			RFactorAlt[method][nrayHS][nscan]	-9999.9				4-byte float	4550400	4	6	24	nscan	1	
			PIAweight[method][nrayHS][nscan]	-9999.9				4-byte float	4550400	4	6	24	nscan	1	
			pathAtten[nrayHS][nscan]	-9999.9			[dB]	4-byte float	758400	4	24	nscan	1	1	
			reliabFactor[nrayHS][nscan]	-9999.9				4-byte float	758400	4	24	nscan	1	1	
			reliabFlag[nrayHS][nscan]	-9999				2-byte integer	379200	2	24	nscan	1	1	
		DSD	refScanID[nearFar][foreBack][nrayHS][nscan]	-9999			[Number]	2-byte integer	1516800	2	2	2	24	nscan	1
			phase[nbinHS][nrayHS][nscan]	255				1-byte char	16684800	1	88	24	nscan	1	
			binNode[nNode][nrayHS][nscan]	-9999				2-byte integer	1896000	2	5	24	nscan	1	
		Experimental	precipRateESurface2[nrayHS][nscan]	-9999.9			[mm/hr]	4-byte float	758400	4	24	nscan	1	1	
			precipRateESurface2Status[nrayHS][nscan]	255				1-byte char	189600	1	24	nscan	1	1	
			sigmaZeroProfile[nbinSZPHS][nrayHS][nscan]	-9999.9			[dB]	4-byte float	3792000	4	5	24	nscan	1	
		SLV	binDEML2[nrayHS][nscan]	-9999			[range bin number]	2-byte integer	379200	2	24	nscan	1	1	
			flagSLV[nbinHS][nrayHS][nscan]	-99				1-byte integer	16684800	1	88	24	nscan	1	
			binEchoBottom[nrayHS][nscan]	-9999				2-byte integer	379200	2	24	nscan	1	1	
			piaFinal[nrayHS][nscan]	-9999.9			[dB]	4-byte float	758400	4	24	nscan	1	1	
			sigmaZeroCorrected[nrayHS][nscan]	-9999.9			[dB]	4-byte float	758400	4	24	nscan	1	1	
			zFactorCorrected[nbinHS][nrayHS][nscan]	-9999.9			[dBZ]	4-byte float	66739200	4	88	24	nscan	1	
			zFactorCorrectedESurface[nrayHS][nscan]	-9999.9			[dBZ]	4-byte float	758400	4	24	nscan	1	1	
			zFactorCorrectedNearSurface[nrayHS][nscan]	-9999.9			[dBZ]	4-byte float	758400	4	24	nscan	1	1	
			paramDSD[nDSD][nbinHS][nrayHS][nscan]	-9999.9				4-byte float	133478400	4	2	88	24	nscan	
			precipRate[nbinHS][nrayHS][nscan]	-9999.9			[mm/hr]	4-byte float	66739200	4	88	24	nscan	1	
			precipWaterIntegrated[LS][nrayHS][nscan]	-9999.9			[kg/m^2]	4-byte float	1516800	4	2	24	nscan	1	
			precipRateNearSurface[nrayHS][nscan]	-9999.9			[mm/hr]	4-byte float	758400	4	24	nscan	1	1	
			precipRateESurface[nrayHS][nscan]	-9999.9			[mm/hr]	4-byte float	758400	4	24	nscan	1	1	
			precipRateAve24[nrayHS][nscan]	-9999.9			[mm/hr]	4-byte float	758400	4	24	nscan	1	1	
			phaseNearSurface[nrayHS][nscan]	255				1-byte char	1896000	1	24	nscan	1	1	
			epsilon[nbinHS][nrayHS][nscan]	-9999.9				4-byte float	66739200	4	88	24	nscan	1	
		FLG	flagEcho[nbinHS][nrayHS][nscan]		0x00	0xff		8-bit	16684800	1	88	24	nscan	1	Flag of precipitation and main/side lobe clutter information of each range bin. 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
			qualityData[nrayHS][nscan]	-9999				4-byte integer	758400	4	24	nscan	1	1	Flag of quality data. Bit range from 8 to 23 contains flags by each module. Each module flag has 2 bits of information. 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: Bit Meaning 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
			flagSensor[nscan]					1-byte integer	7900	1	7900	1	1	1	Flag of input Ku/Ka data condition. Value Meaning 1 Valid -99 Invalid (judged by dataQuality)
			DOI						256						
			AlgorithmID						50						
			AlgorithmVersion						50						

	Group Name 1	Group Name 2	DPR Initial 1B21 Value Name	missing	min	max	unit	type	Data size	type	array				remark
MetaData-2AKa	FileHeader	(N/A)	FileName						50						
			SatelliteName						10						
			InstrumentName						10						
			GenerationDateTime						50						
			StartGranuleDateTime						50						
			StopGranuleDateTime						50						
			GranuleNumber						50						
			NumberOfSwaths						50						
			NumberOfGrids						50						
			GranuleStart						50						
			TimeInterval						50						
			ProcessingSystem						50						
			ProductVersion						50						
			EmptyGranule						50						
			MissingData						50						
	InputRecord	(N/A)	InputFileNames						1000						
			InputAlgorithmVersions						1000						
			InputGenerationDateTimes						1000						
	AlgorithmRuntimeInfo	(N/A)													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.
	NavigationRecord	(N/A)	LongitudeOnEquator						50						
			UTCDateTimeOnEquator						50						
			MeanSolarBetaAngle						50						
			EphemerisFileName						50						
			AttitudeFileName						50						
			GeoControlFileName						50						
			EphemerisSource						50						
			AttitudeSource						50						
			GeoToolkitVersion						50						
			SensorAlignmentFirstRotationAngle						50						
			SensorAlignmentSecondRotationAngle						50						
			SensorAlignmentThirdRotationAngle						50						
			SensorAlignmentFirstRotationAxis						50						
			SensorAlignmentSecondRotationAxis						50						
			SensorAlignmentThirdRotationAxis						50						
	FileInfo	(N/A)	DataFormatVersion						50						
			TKCodeBuildVersion						50						
			MetadataVersion						50						
			FormatPackage						50						
			BlueprintFilename						50						
			BlueprintVersion						50						
			TKIOVersion						50						
			MetadataStyle						50						
			EndianType						50						
			GranuleFirstScanUTCDateTime						50						
	JAXAInfo	(N/A)	GranuleLastScanUTCDateTime						50						
			TotalQualityCode						50						
			FirstScanLat						50						
			FirstScanLon						50						
			LastScanLat						50						
			LastScanLon						50						
			NumberOfRainPixelsNS						50						
			NumberOfRainPixelsMS						50						
			NumberOfRainPixelsHS						50						
			ProcessingSubSystem						50						
			ProcessingMode						50						
			LightSpeed						TBD						
			DielectricConstantKa						TBD						
			DielectricConstantKu						TBD						
	MS	MS SwathHeader	NumberScansInSet						50						
			MaximumNumberScansTotal						50						
			NumberScansBeforeGranule						50						
			NumberScansGranule						50						
			NumberScansAfterGranule						50						
	HS	HS SwathHeader	NumberPixels						50						
			ScanType						50						
			NumberScansInSet						50						
			MaximumNumberScansTotal						50						
			NumberScansBeforeGranule						50						
			NumberScansGranule						50						
			NumberScansAfterGranule						50						
			NumberPixels						50						
			ScanType						50						

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表 2.3-3 DPR レベル 2 プロダクトフォーマット(標準プロダクト・準リアルタイムプロダクト)

	Group Name 1	Group Name 2	DPR Initial 1B21 Value Name	missing	min	max	unit	type	Data size	type	array				remark
	NS	ScanTime	Year[nscan]	-9999	1950	2100	[years]	2-byte integer	15800	2	nscan	1	1	1	
			Month[nscan]	-99	1	12	[months]	1-byte integer	7900	1	nscan	1	1	1	
			DayOfMonth[nscan]	-99	1	31	[days]	1-byte integer	7900	1	nscan	1	1	1	
			Hour[nscan]	-99	0	23	[hours]	1-byte integer	7900	1	nscan	1	1	1	
			Minute[nscan]	-99	0	59	[minutes]	1-byte integer	7900	1	nscan	1	1	1	
			Second[nscan]	-99	0	60	[s]	1-byte integer	7900	1	nscan	1	1	1	
			MilliSecond[nscan]]	-9999	0	999	[ms]	2-byte integer	15800	2	nscan	1	1	1	
			DayOfYear[nscan]	-9999	1	366	[days]	2-byte integer	15800	2	nscan	1	1	1	
			SecondOfDay[nscan]	-9999.9	0	86400	[s]	8-byte float	63200	8	nscan	1	1	1	
			(N/A)	Latitude[nray][nscan]	-9999.9	-90	90	[degrees]	4-byte float	1548400	4	49	nscan	1	1
		(N/A)	Longitude[nray][nscan]	-9999.9	-180	180	[degrees]	4-byte float	1548400	4	49	nscan	1	1	
		scanStatus	dataQuality[nscan]		0x00	0xff		8-bit	7900	1	nscan	1	1		A summary of data quality in the scan. Bit Meaning if bit = 1 0 missing 5 geoError is not zero 6 modeStatus is not zero
			dataWarning[nscan]					1-byte integer	7900	1	nscan	1	1		Flag of data warning for each scan. 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
			missing[nscan]		0x00	0xff		8-bit	7900	1	nscan	1	1		Indicates whether information is contained in the scan data. Bit Meaning if bit = 1 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)
			modeStatus[nscan]		0x00	0xff		8-bit	7900	1	nscan	1	1		A summary of status modes. Bit Meaning if bit = 1 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)
			geoError[nscan]		0x0000	0xffff		16-bit	15800	2	nscan	1	1		A summary of geolocation errors in the scan. Bit Meaning if bit = 1 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)
			geoWarning[nscan]		0x0000	0xffff		16-bit	15800	2	nscan	1	1		A summary of geolocation warnings in the scan. Bit Meaning if bit = 1 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)
			SCorientation[nscan]	-9999				2-byte integer	15800	2	nscan	1	1		Value Meaning 0 +X forward (yaw 0) 180 -X forward (yaw 180) -8000 Non-nominal pointing
			pointingStatus[nscan]	-9999				2-byte integer	15800	2	nscan	1	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
			acsModeMidScan[nscan]					1-byte integer	7900	1	nscan	1	1		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
			targetSelectionMidScan[nscan]	-99				1-byte integer	7900	1	nscan	1	1		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
		operationalMode[nscan]		1	20		1-byte integer	7900	1	nscan	1	1	1		
		limitErrorFlag[nscan]					1-byte integer	7900	1	nscan	1	1		Bit flags for every ray with information about echo power limit checks. limitErrorFlag may be used in modeStatus. 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)	
		FractionalGranuleNumber[nscan]	-9999.9	0	100000	[Number]	8-byte float	63200	8	nscan	1	1	1		
		navigation	scPos[3][nscan]	-9999.9	-10000000	10000000	[m]	4-byte float	94800	4	3	nscan	1	1	1
			scVel[3][nscan]	-9999.9	-100000000	100000000	[m/s]	4-byte float	94800	4	3	nscan	1	1	1
			scLat[nscan]	-9999.9	-70	70	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scLon[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAlt[nscan]	-9999.9	350000	500000	[m]	4-byte float	31600	4	nscan	1	1	1	
			dprAlt[nscan]	-9999.9	350000	500000	[m]	4-byte float	31600	4	nscan	1	1	1	
			scAttRollGeoc[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttPitchGeoc[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttYawGeoc[nscan]	-9999.9	-135	225	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttRollGeod[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
		scAttPitchGeod[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1		
		scAttYawGeod[nscan]	-9999.9	-135	225	[degrees]	4-byte float	31600	4	nscan	1	1	1		
		greenHourAng[nscan]	-9999.9	0	390	[degrees]	4-byte float	31600	4	nscan	1	1	1		
		timeMidScan[nscan]	-9999.9	0	10000000000	[s]	8-byte float	63200	8	nscan	1	1	1		
		timeMidScanOffset[nscan]	-9999.9	0	100	[s]	8-byte float	63200	8	nscan	1	1	1		
		elevation[nray][nscan]	-9999.9			[m]	4-byte float	1548400	4	49	nscan	1	1	1	
		PRE	landSurfaceType[nray][nscan]	-9999	0	399		4-byte integer	1548400	4	49	nscan	1		Land surface type. 0 - 99 Ocean 100 - 199 Land 200 - 299 Coast 300 - 399 Inland water
			localZenithAngle[nray][nscan]	-9999.9			[degrees]	4-byte float	1548400	4	49	nscan	1		
			flagPrecip[nray][nscan]	-9999				4-byte integer	1548400	4	49	nscan	1		Precipitation or no precipitation. 1 No precipitation 2 Precipitation
			binRealSurface[nray][nscan]	-9999			[range bin number]	2-byte integer	774200	2	49	nscan	1		

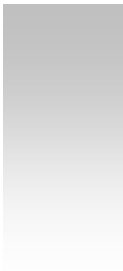
	Group Name 1	Group Name 2	DPR Initial 1B21 Value Name	missing	min	max	unit	type	Data size	type	array					remark	
			binStormTop[nray][nscan]	-9999			[range bin number]	2-byte integer	774200	2	49	nscan	1	1			
			heightStormTop[nray][nscan]	-9999.9			[m]	4-byte float	1548400	4	49	nscan	1	1			
			binClutterFreeBottom[nray][nscan]	-9999			[range bin number]	2-byte integer	774200	2	49	nscan	1	1			
			sigmaZeroMeasured[nray][nscan]	-9999.9			[dB]	4-byte float	1548400	4	49	nscan	1	1			
			zFactorMeasured[nbin][nray][nscan]	-9999.9			[dBZ]	4-byte float	272518400	4	176	49	nscan	1			
			ellipsoidBinOffset[nray][nscan]	-9999			[m]	4-byte float	1548400	4	49	nscan	1	1			
			snRatioAtRealSurface[nray][nscan]	-9999				4-byte float	1548400	4	49	nscan	1	1			
			binZeroDeg[nray][nscan]	-9999			[range bin number]	2-byte integer	774200	2	49	nscan	1	1	Range bin number with 0 degrees C level.		
			attenuationNP[nbin][nray][nscan]	-9999.9			[dB/km]	4-byte float	272518400	4	176	49	nscan	1			
			piaNP[4][nray][nscan]	-9999.9			[dB]	4-byte float	6193600	4	4	49	nscan	1			
		sigmaZeroNPCorrected[nray][nscan]	-9999.9			[dB]	4-byte float	1548400	4	49	nscan	1	1				
		heightZeroDeg[nray][nscan]	-9999.9			[m]	4-byte float	1548400	4	49	nscan	1	1				
			flagBB[nray][nscan]	-9999				4-byte integer	1548400	4	49	nscan	1	1	Bright band (BB) exists or not. 0 BB not detected 1 BB detected -1111 No rain value		
			binBBPeak[nray][nscan]	-9999			[range bin number]	2-byte integer	774200	2	49	nscan	1	1			
			binBBTop[nray][nscan]	-9999			[range bin number]	2-byte integer	774200	2	49	nscan	1	1			
			binBBBottom[nray][nscan]	-9999			[range bin number]	2-byte integer	774200	2	49	nscan	1	1			
			heightBB[nray][nscan]	-9999.9			[m]	4-byte float	1548400	4	49	nscan	1	1			
			widthBB[nray][nscan]	-9999.9			[m]	4-byte float	1548400	4	49	nscan	1	1			
			qualityBB[nray][nscan]	-9999				4-byte integer	1548400	4	49	nscan	1	1	Quality of the bright band. 1 Good 0 BB not detected in the case of rain -1111 No rain value		
			typePrecip[nray][nscan]	-9999				4-byte integer	1548400	4	49	nscan	1	1	Precipitation type is expressed by an 8-digit number. The three major rain categories, stratiform, onvective, 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		
		qualityTypePrecip[nray][nscan]	-9999				4-byte integer	1548400	4	49	nscan	1	1	Quality of the precipitation type. 1 Good -1111 No rain value			
		flagShallowRain[nray][nscan]	-9999				4-byte integer	1548400	4	49	nscan	1	1	Type of shallow rain 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			
			PIAalt[6][nray][nscan]	-9999.9			[dB]	4-byte float	9290400	4	6	49	nscan	1			
			RFactorAlt[6][nray][nscan]	-9999.9				4-byte float	9290400	4	6	49	nscan	1			
			PIAweight[6][nray][nscan]	-9999.9				4-byte float	9290400	4	6	49	nscan	1			
			pathAtten[nray][nscan]	-9999.9			[dB]	4-byte float	1548400	4	49	nscan	1	1			
			reliabFactor[nray][nscan]	-9999.9				4-byte float	1548400	4	49	nscan	1	1			
			reliabFlag[nray][nscan]	-9999				2-byte integer	774200	2	49	nscan	1	1			
			refScanID[2][2][nray][nscan]	-9999			[Number]	2-byte integer	3096800	2	2	2	49	nscan			
			phase[nbin][nray][nscan]	255				1-byte char	68129600	1	176	49	nscan	1			
			binNode[5][nray][nscan]	-9999				2-byte integer	3871000	2	5	49	nscan	1			
			precipRateESurface2[nray][nscan]	-9999.9			[mm/hr]	4-byte float	1548400	4	49	nscan	1	1			
			precipRateESurface2Status[nray][nscan]	255				1-byte char	387100	1	49	nscan	1	1			
			sigmaZeroProfile[nbinSZP][nray][nscan]	-9999.9			[dB]	4-byte float	10838800	4	7	49	nscan	1			
			binDEML2[nray][nscan]	-9999			[range bin number]	2-byte integer	774200	2	49	nscan	1	1			
			flagSLV[nbin][nray][nscan]	-99				1-byte integer	68129600	1	176	49	nscan	1			
			binEchoBottom[nray][nscan]	-9999				2-byte integer	774200	2	49	nscan	1	1			
			piaFinal[nray][nscan]	-9999.9			[dB]	4-byte float	1548400	4	49	nscan	1	1			
			sigmaZeroCorrected[nray][nscan]	-9999.9			[dB]	4-byte float	1548400	4	49	nscan	1	1			
			zFactorCorrected[nbin][nray][nscan]	-9999.9			[dBZ]	4-byte float	272518400	4	176	49	nscan	1			
			zFactorCorrectedESurface[nray][nscan]	-9999.9			[dBZ]	4-byte float	1548400	4	49	nscan	1	1			
			zFactorCorrectedNearSurface[nray][nscan]	-9999.9			[dBZ]	4-byte float	1548400	4	49	nscan	1	1			
			paramDSD[2][nbin][nray][nscan]	-9999.9				4-byte float	545036800	4	2	176	49	nscan			
			precipRate[nbin][nray][nscan]	-9999.9			[mm/hr]	4-byte float	272518400	4	176	49	nscan	1			
			precipWaterIntegrated[2][nray][nscan]	-9999.9			[kg/m^2]	4-byte float	3096800	4	2	49	nscan	1			
			precipRateNearSurface[nray][nscan]	-9999.9			[mm/hr]	4-byte float	1548400	4	49	nscan	1	1			
			precipRateESurface[nray][nscan]	-9999.9			[mm/hr]	4-byte float	1548400	4	49	nscan	1	1			
			precipRateAve24[nray][nscan]	-9999.9			[mm/hr]	4-byte float	1548400	4	49	nscan	1	1			
			phaseNearSurface[nray][nscan]	255				1-byte char	387100	1	49	nscan	1	1			
			epsilon[nbin][nray][nscan]	-9999.9				4-byte float	272518400	4	176	49	nscan	1	1		
			flagEcho[nbin][nray][nscan]		0x00	0xff		8-bit	68129600	1	176	49	nscan	1	1	Flag of precipitation and main/side lobe clutter information of each range bin. 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	
				qualityData[nray][nscan]	-9999				4-byte integer	1548400	4	49	nscan	1	1	1	Flag of quality data. Bit range from 8 to 23 contains flags by each module. Each module flag has 2 bits of information. 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: Bit Meaning 0 - 7 Copy of dataQuality in level 1B product 8 - 9 Flag by input module 10 - 11 Flag by preparation 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
					flagSensor[nscan]					1-byte integer	7900	1	nscan	1	1	1	Flag of input Ku/Ka data condition. Value Meaning 1 Valid -99 Invalid (judged by dataQuality)
					Year[nscan]	-9999	1950	2100	[years]	2-byte integer	15800	2	nscan	1	1	1	1
				Month[nscan]	-99	1	12	[months]	1-byte integer	7900	1	nscan	1	1	1	1	
				DayOfMonth[nscan]	-99	1	31	[days]	1-byte integer	7900	1	nscan	1	1	1	1	
				Hour[nscan]	-99	0	23	[hours]	1-byte integer	7900	1	nscan	1	1	1	1	
				Minute[nscan]	-99	0	59	[minutes]	1-byte integer	7900	1	nscan	1	1	1	1	
		Second[nscan]		-99	0	60	[s]	1-byte integer	7900	1	nscan	1	1	1	1		
		MilliSecond[nscan]		-9999	0	999	[ms]	2-byte integer	15800	2	nscan	1	1	1	1		
		DayOfYear[nscan]		-9999	1	366	[days]	2-byte integer	15800	2	nscan	1	1	1	1		
		SecondOfDay[nscan]		-9999.9	0	86400	[s]	8-byte float	63200	8	nscan	1	1	1	1		
		(N/A)		Latitude[nrayMS][nscan]	-9999.9	-90	90	[degrees]	4-byte float	790000	4	25	nscan	1	1	1	
		(N/A)	Longitude[nrayMS][nscan]	-9999.9	-180	180	[degrees]	4-byte float	790000	4	25	nscan	1	1	1		
			dataQuality[nscan]		0x00	0xff		8-bit	7900	1	nscan	1	1	1	1	A summary of data quality in the scan. Bit Meaning if bit = 1 0 missing 5 geoError is not zero 6 modeStatus is not zero	
			dataWarning[nscan]					1-byte integer	7900	1	nscan	1	1	1	1	Flag of data warning for each scan. 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	
			missing[nscan]		0x00	0xff		8-bit	7900	1	nscan	1	1	1	1	Indicates whether information is contained in the scan data. Bit Meaning if bit = 1 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)	

	Group Name 1	Group Name 2	DPR Initial 1B21 Value Name	missing	min	max	unit	type	Data size	type	array				remark
2ADPR	MS	scanStatus	modeStatus[nscan]		0x00	0xff		8-bit	7900	1	nscan	1	1	1	A summary of status modes. Bit Meaning if bit = 1 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)
			geoError[nscan]		0x0000	0xffff		16-bit	15800	2	nscan	1	1	1	A summary of geolocation errors in the scan. Bit Meaning if bit = 1 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)
			geoWarning[nscan]		0x0000	0xffff		16-bit	15800	2	nscan	1	1	1	A summary of geolocation warnings in the scan. Bit Meaning if bit = 1 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)
			SCorientation[nscan]	-9999				2-byte integer	15800	2	nscan	1	1	1	Value Meaning 0 +X forward (yaw 0) 180 -X forward (yaw 180) -8000 Non-nominal pointing
			pointingStatus[nscan]	-9999				2-byte integer	15800	2	nscan	1	1	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
			acsModeMidScan[nscan]					1-byte integer	7900	1	nscan	1	1	1	Value Meaning 0 LAUNCH 1 RATENUILL 2 SUNPOINT 3 GSPM (Gyro-less Sun Point) 4 MSM (Mission Science Mode) 5 SLEW 6 DELTAH 7 DELTAV -99 UNKNOWN --- ACS mode unavailable
			targetSelectionMidScan[nscan]	-99				1-byte integer	7900	1	nscan	1	1	1	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
			operationalMode[nscan]		1	20		1-byte integer	7900	1	nscan	1	1	1	
			limitErrorFlag[nscan]					1-byte integer	7900	1	nscan	1	1	1	Bit flags for every ray with information about echo power limit checks. limitErrorFlag may be used in modeStatus. Detailed information is defined in L1B Product Format edited by JAXA/EORC. 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)
		navigation	FractionalGranuleNumber[nscan]	-9999.9	0	100000	[Number]	8-byte float	63200	8	nscan	1	1	1	
			scPos[3][nscan]	-9999.9	-10000000	10000000	[m]	4-byte float	94800	4	3	nscan	1	1	
			scVel[3][nscan]	-9999.9	-100000000	100000000	[m/s]	4-byte float	94800	4	3	nscan	1	1	
			scLat[nscan]	-9999.9	-70	70	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scLon[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAlt[nscan]	-9999.9	350000	500000	[m]	4-byte float	31600	4	nscan	1	1	1	
			dprAlt[nscan]	-9999.9	350000	500000	[m]	4-byte float	31600	4	nscan	1	1	1	
			scAttRollGeoc[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttPitchGeoc[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttYawGeoc[nscan]	-9999.9	-135	225	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttRollGeod[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttPitchGeod[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttYawGeod[nscan]	-9999.9	-135	225	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			greenHourAng[nscan]	-9999.9	0	390	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			timeMidScan[nscan]	-9999.9	0	10000000000	[s]	8-byte float	63200	8	nscan	1	1	1	
			timeMidScanOffset[nscan]	-9999.9	0	100	[s]	8-byte float	63200	8	nscan	1	1	1	
			elevation[nrayMS][nscan]	-9999.9			[m]	4-byte float	790000	4	25	nscan	1	1	
		PRE	landSurfaceType[nrayMS][nscan]	-9999	0	399		4-byte integer	790000	4	25	nscan	1	1	Land surface type. 0 - 99 Ocean 100 - 199 Land 200 - 299 Coast 300 - 399 Inland water
			localZenithAngle[nrayMS][nscan]	-9999.9			[degrees]	4-byte float	790000	4	25	nscan	1	1	
			flagPrecip[nrayMS][nscan]	-9999				4-byte integer	790000	4	25	nscan	1	1	Precipitation or no precipitation. 1 No precipitation 2 Precipitation
			binRealSurface[nrayMS][nscan]	-9999			[range bin number]	2-byte integer	395000	2	25	nscan	1	1	
			binStormTop[nrayMS][nscan]	-9999			[range bin number]	2-byte integer	395000	2	25	nscan	1	1	
			heightStormTop[nrayMS][nscan]	-9999.9			[m]	4-byte float	790000	4	25	nscan	1	1	
			binClutterFreeBottom[nrayMS][nscan]	-9999			[range bin number]	2-byte integer	395000	2	25	nscan	1	1	
			sigmaZeroMeasured[nrayMS][nscan]	-9999.9			[dB]	4-byte float	790000	4	25	nscan	1	1	
			zFactorMeasured[nbin][nrayMS][nscan]	-9999.9			[dBZ]	4-byte float	139040000	4	176	25	nscan	1	
			ellipsoidBinOffset[nrayMS][nscan]	-9999			[m]	4-byte float	790000	4	25	nscan	1	1	
		VER	snRatioAtRealSurface[nrayMS][nscan]	-9999				4-byte float	790000	4	25	nscan	1	1	
			binZeroDeg[nrayMS][nscan]	-9999			[range bin number]	2-byte integer	395000	2	25	nscan	1	1	Range bin number with 0 degrees C level.
			attenuationNP[nbin][nrayMS][nscan]	-9999.9			[dB/km]	4-byte float	139040000	4	176	25	nscan	1	
			piNP[4][nrayMS][nscan]	-9999.9			[dB]	4-byte float	3160000	4	4	25	nscan	1	
			sigmaZeroNPCorrected[nrayMS][nscan]	-9999.9			[dB]	4-byte float	790000	4	25	nscan	1	1	
			heightZeroDeg[nrayMS][nscan]	-9999.9			[m]	4-byte float	790000	4	25	nscan	1	1	
		CSF	flagBB[nrayMS][nscan]	-9999				4-byte integer	790000	4	25	nscan	1	1	Bright band (BB) exists or not. 0 BB not detected 1 BB detected -1111 No rain value
			binBBPeak[nrayMS][nscan]	-9999			[range bin number]	2-byte integer	395000	2	25	nscan	1	1	
			binBBTop[nrayMS][nscan]	-9999			[range bin number]	2-byte integer	395000	2	25	nscan	1	1	
			binBBBottom[nrayMS][nscan]	-9999			[range bin number]	2-byte integer	395000	2	25	nscan	1	1	
			heightBB[nrayMS][nscan]	-9999.9			[m]	4-byte float	790000	4	25	nscan	1	1	
			widthBB[nrayMS][nscan]	-9999.9			[m]	4-byte float	790000	4	25	nscan	1	1	
			qualityBB[nrayMS][nscan]	-9999				4-byte integer	790000	4	25	nscan	1	1	Quality of the bright band. 1 Good 0 BB not detected in the case of rain -1111 No rain value
			typePrecip[nrayMS][nscan]	-9999				4-byte integer	790000	4	25	nscan	1	1	When typePrecip is greater than zero, Major rain type = typePrecip/10000000 = 1 stratiform = 2 convective = 3 other -1111 No rain value
			qualityTypePrecip[nrayMS][nscan]	-9999				4-byte integer	790000	4	25	nscan	1	1	Quality of the precipitation type. 1 Good -1111 No rain value

	Group Name 1	Group Name 2	DPR Initial 1B21 Value Name	missing	min	max	unit	type	Data size	type	array				remark
			flagShallowRain[nrayMS][nscan]	-9999				4-byte integer	790000	4	25	nscan		1	Type of shallow rain 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
			PIAalt[6][nrayMS][nscan]	-9999.9			[dB]	4-byte float	4740000	4	6	25	nscan	1	
			RFactorAlt[6][nrayMS][nscan]	-9999.9				4-byte float	4740000	4	6	25	nscan	1	
			PIAweight[6][nrayMS][nscan]	-9999.9				4-byte float	4740000	4	6	25	nscan	1	
			pathAtten[nrayMS][nscan]	-9999.9			[dB]	4-byte float	790000	4	25	nscan	1	1	
			reliabFactor[nrayMS][nscan]	-9999.9				4-byte float	790000	4	25	nscan	1	1	
			reliabFlag[nrayMS][nscan]	-9999				2-byte integer	395000	2	25	nscan	1	1	
			refScanID[2][2][nrayMS][nscan]	-9999			[Number]	2-byte integer	1580000	2	2	2	25	nscan	
			binNode[5][nrayMS][nscan]	-9999				2-byte integer	1975000	2	5	25	nscan	1	
		Experimental	precipRateESurface2[nrayMS][nscan]	-9999.9			[mm/hr]	4-byte float	790000	4	25	nscan	1	1	
			precipRateESurface2Status[nrayMS][nscan]	255				1-byte char	197500	1	25	nscan	1	1	
			sigmaZeroProfile[nbinSZP][nrayMS][nscan]	-9999.9			[dB]	4-byte float	5530000	4	7	25	nscan	1	
			binDEML2[nrayMS][nscan]	-9999			[range bin number]	2-byte integer	395000	2	25	nscan	1	1	
		SLV	binEchoBottom[nrayMS][nscan]	-9999				2-byte integer	395000	2	25	nscan	1	1	
			piaFinal[nrayMS][nscan]	-9999.9			[dB]	4-byte float	790000	4	25	nscan	1	1	
			sigmaZeroCorrected[nrayMS][nscan]	-9999.9			[dB]	4-byte float	790000	4	25	nscan	1	1	
			zFactorCorrected[nbin][nrayMS][nscan]	-9999.9			[dBZ]	4-byte float	139040000	4	176	25	nscan	1	
			zFactorCorrectedESurface[nrayMS][nscan]	-9999.9			[dBZ]	4-byte float	790000	4	25	nscan	1	1	
			zFactorCorrectedNearSurface[nrayMS][nscan]	-9999.9			[dBZ]	4-byte float	790000	4	25	nscan	1	1	
			precipWaterIntegrated[2][nrayMS][nscan]	-9999.9			[kg/m ²]	4-byte float	1580000	4	2	25	nscan	1	
			precipRateNearSurface[nrayMS][nscan]	-9999.9			[mm/hr]	4-byte float	790000	4	25	nscan	1	1	
			precipRateESurface[nrayMS][nscan]	-9999.9			[mm/hr]	4-byte float	790000	4	25	nscan	1	1	
			precipRateAve24[nrayMS][nscan]	-9999.9			[mm/hr]	4-byte float	790000	4	25	nscan	1	1	
			phaseNearSurface[nrayMS][nscan]	255				1-byte char	197500	1	25	nscan	1	1	
			epsilon[nbin][nrayMS][nscan]	-9999.9				4-byte float	139040000	4	176	25	nscan	1	
		FLG	flagEcho[nbin][nrayMS][nscan]					1-byte integer	34760000	1	176	25	nscan	1	Flag of precipitation and main/side lobe clutter information of each range bin. 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
			qualityData[nrayMS][nscan]	-9999				4-byte integer	790000	4	25	nscan	1	1	Flag of quality data. Bit range from 8 to 23 contains flags by each module. Each module flag has 2 bits of information. 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: Bit Meaning 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
			flagSensor[nscan]					1-byte integer	7900	1	nscan	1	1	1	Flag of input Ku/Ka data condition. Value Meaning 1 Valid -99 Invalid (judged by dataQuality)
		ScanTime	Year[nscan]	-9999	1950	2100	[years]	2-byte integer	15800	2	nscan	1	1	1	
			Month[nscan]	-99	1	12	[months]	1-byte integer	7900	1	nscan	1	1	1	
			DayOfMonth[nscan]	-99	1	31	[days]	1-byte integer	7900	1	nscan	1	1	1	
			Hour[nscan]	-99	0	23	[hours]	1-byte integer	7900	1	nscan	1	1	1	
			Minute[nscan]	-99	0	59	[minutes]	1-byte integer	7900	1	nscan	1	1	1	
			Second[nscan]	-99	0	60	[s]	1-byte integer	7900	1	nscan	1	1	1	
			MilliSecond[nscan]	-9999	0	999	[ms]	2-byte integer	15800	2	nscan	1	1	1	
			DayOfYear[nscan]	-9999	1	366	[days]	2-byte integer	15800	2	nscan	1	1	1	
			SecondOfDay[nscan]	-9999.9	0	86400	[s]	8-byte float	63200	8	nscan	1	1	1	
			(N/A)												
			Latitude[nrayHS][nscan]	-9999.9	-90	90	[degrees]	4-byte float	758400	4	24	nscan	1	1	
			Longitude[nrayHS][nscan]	-9999.9	-180	180	[degrees]	4-byte float	758400	4	24	nscan	1	1	
			dataQuality[nscan]		0x00	0xff		8-bit	7900	1	nscan	1	1	1	A summary of data quality in the scan. Bit Meaning if bit = 1 0 missing 5 geoError is not zero 6 modeStatus is not zero
			dataWarning[nscan]					1-byte integer	7900	1	nscan	1	1	1	Flag of data warning for each scan. 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
			missing[nscan]		0x00	0xff		8-bit	7900	1	nscan	1	1	1	Indicates whether information is contained in the scan data. Bit Meaning if bit = 1 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)
			modeStatus[nscan]		0x00	0xff		8-bit	7900	1	nscan	1	1	1	A summary of status modes. Bit Meaning if bit = 1 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)
			geoError[nscan]		0x0000	0xffff		16-bit	15800	2	nscan	1	1	1	A summary of geolocation errors in the scan. Bit Meaning if bit = 1 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)
		ScanStatus													

	Group Name 1	Group Name 2	DPR Initial 1B21 Value Name	missing	min	max	unit	type	Data size	type	array				remark
HS		scanStatus	geoWarning[nscan]		0x0000	0xffff		16-bit	15800	2	nscan	1	1	1	A summary of geolocation warnings in the scan. Bit Meaning if bit = 1 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)
			SCorientation[nscan]	-9999				2-byte integer	15800	2	nscan	1	1	1	Value Meaning 0 +X forward (yaw 0) 180 -X forward (yaw 180) -8000 Non-nominal pointing
			pointingStatus[nscan]	-9999				2-byte integer	15800	2	nscan	1	1	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
			acsModeMidScan[nscan]					1-byte integer	7900	1	nscan	1	1	1	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
			targetSelectionMidScan[nscan]	-99				1-byte integer	7900	1	nscan	1	1	1	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
			operationalMode[nscan]		1	20		1-byte integer	7900	1	nscan	1	1	1	
			limitErrorFlag[nscan]					1-byte integer	7900	1	nscan	1	1	1	Bit flags for every ray with information about echo power limit checks. limitErrorFlag may be used in modeStatus. 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)
			FractionalGranuleNumber[nscan]	-9999.9	0	100000	[Number]	8-byte float	63200	8	nscan	1	1	1	
		navigation	scPos[XYZ][nscan]	-9999.9	-10000000	10000000	[m]	4-byte float	94800	4	3	nscan	1	1	
			scVel[XYZ][nscan]	-9999.9	-10000000	10000000	[m/s]	4-byte float	94800	4	3	nscan	1	1	
			scLat[nscan]	-9999.9	-70	70	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scLon[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAlt[nscan]	-9999.9	350000	500000	[m]	4-byte float	31600	4	nscan	1	1	1	
			dprAlt[nscan]	-9999.9	350000	500000	[m]	4-byte float	31600	4	nscan	1	1	1	
			scAttRollGeoc[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttPitchGeoc[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttYawGeoc[nscan]	-9999.9	-135	225	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttRollGeod[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttPitchGeod[nscan]	-9999.9	-180	180	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			scAttYawGeod[nscan]	-9999.9	-135	225	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			greenHourAng[nscan]	-9999.9	0	390	[degrees]	4-byte float	31600	4	nscan	1	1	1	
			timeMidScan[nscan]	-9999.9	0	1000000000	[s]	8-byte float	63200	8	nscan	1	1	1	
			timeMidScanOffset[nscan]	-9999.9	0	100	[s]	8-byte float	63200	8	nscan	1	1	1	
			elevation[nrayHS][nscan]	-9999.9	0		[m]	4-byte float	758400	4	24	nscan	1	1	
		PRE	landSurfaceType[nrayHS][nscan]	-9999	0	399		4-byte integer	758400	4	24	nscan	1	1	Land surface type. 0 - 99 Ocean 100 - 199 Land 200 - 299 Coast 300 - 399 Inland water
			localZenithAngle[nrayHS][nscan]	-9999.9			[degrees]	4-byte float	758400	4	24	nscan	1	1	
			flagPrecip[nrayHS][nscan]	-9999				4-byte integer	758400	4	24	nscan	1	1	Precipitation or no precipitation. 1 No precipitation 2 Precipitation
			binRealSurface[nrayHS][nscan]	-9999			[range bin number]	2-byte integer	379200	2	24	nscan	1	1	
			binStormTop[nrayHS][nscan]	-9999			[range bin number]	2-byte integer	379200	2	24	nscan	1	1	
			heightStormTop[nrayHS][nscan]	-9999.9			[m]	4-byte float	758400	4	24	nscan	1	1	
			binClutterFreeBottom[nrayHS][nscan]	-9999			[range bin number]	2-byte integer	379200	2	24	nscan	1	1	
		VER	sigmaZeroMeasured[nrayHS][nscan]	-9999.9			[dB]	4-byte float	758400	4	24	nscan	1	1	
			zFactorMeasured[nbinHS][nrayHS][nscan]	-9999.9			[dBZ]	4-byte float	66739200	4	88	24	nscan	1	
			ellipsoidBinOffset[nrayHS][nscan]	-9999			[m]	4-byte float	758400	4	24	nscan	1	1	
			snRatioAtRealSurface[nrayHS][nscan]	-9999				4-byte float	758400	4	24	nscan	1	1	
			binZeroDeg[nrayHS][nscan]	-9999			[range bin number]	2-byte integer	379200	2	24	nscan	1	1	Range bin number with 0 degrees C level.
			attenuationNP[nbinHS][nrayHS][nscan]	-9999.9			[dB/km]	4-byte float	66739200	4	88	24	nscan	1	
			piainP[nNP][nrayHS][nscan]	-9999.9			[dB]	4-byte float	3033600	4	4	24	nscan	1	
			sigmaZeroNPCorrected[nrayHS][nscan]	-9999.9			[dB]	4-byte float	758400	4	24	nscan	1	1	
			heightZeroDeg[nrayHS][nscan]	-9999.9			[m]	4-byte float	758400	4	24	nscan	1	1	
			flagBB[nrayHS][nscan]	-9999				4-byte integer	758400	4	24	nscan	1	1	Bright band (BB) exists or not. 0 BB not detected 1 BB detected -1111 No rain value
		CSF	binBBPeak[nrayHS][nscan]	-9999			[range bin number]	2-byte integer	379200	2	24	nscan	1	1	
			binBBTop[nrayHS][nscan]	-9999			[range bin number]	2-byte integer	379200	2	24	nscan	1	1	
			binBBBottom[nrayHS][nscan]	-9999			[range bin number]	2-byte integer	379200	2	24	nscan	1	1	
			heightBB[nrayHS][nscan]	-9999.9			[m]	4-byte float	758400	4	24	nscan	1	1	
			widthBB[nrayHS][nscan]	-9999.9			[m]	4-byte float	758400	4	24	nscan	1	1	
			qualityBB[nrayHS][nscan]	-9999				4-byte integer	758400	4	24	nscan	1	1	Quality of the bright band. 1 Good 0 BB not detected in the case of rain -1111 No rain value
			typePrecip[nrayHS][nscan]	-9999				4-byte integer	758400	4	24	nscan	1	1	When typePrecip is greater than zero. Major rain type = typePrecip/10000000 = 1 stratiform = 2 convective = 3 other -1111 No rain value
			qualityTypePrecip[nrayHS][nscan]	-9999				4-byte integer	758400	4	24	nscan	1	1	Quality of the precipitation type. 1 Good -1111 No rain value
			flagShallowRain[nrayHS][nscan]	-9999				4-byte integer	758400	4	24	nscan	1	1	Type of shallow rain 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
			PIAalt[method][nrayHS][nscan]	-9999.9			[dB]	4-byte float	4550400	4	6	24	nscan	1	
		SRT	RFactorAlt[method][nrayHS][nscan]	-9999.9				4-byte float	4550400	4	6	24	nscan	1	
			PIAweight[method][nrayHS][nscan]	-9999.9				4-byte float	4550400	4	6	24	nscan	1	
			pathAtten[nrayHS][nscan]	-9999.9			[dB]	4-byte float	758400	4	24	nscan	1	1	
		DSD	reliabFactor[nrayHS][nscan]	-9999.9				4-byte float	758400	4	24	nscan	1	1	
			reliabFlag[nrayHS][nscan]	-9999				2-byte integer	379200	2	24	nscan	1	1	
			refScanD[nearFar][foreBack][nrayHS][nscan]	-9999			[Number]	2-byte integer	1516800	2	2	2	24	nscan	
		Experimental	phase[nbinHS][nrayHS][nscan]	255				1-byte char	16684800	1	88	24	nscan	1	
			binNode[nNode][nrayHS][nscan]	-9999				2-byte integer	1896000	2	5	24	nscan	1	
			precipRateESurface2[nrayHS][nscan]	-9999.9			[mm/hr]	4-byte float	758400	4	24	nscan	1	1	
			precipRateESurface2Status[nrayHS][nscan]	255				1-byte char	1896000	1	24	nscan	1	1	
		SLV	sigmaZeroProfile[nbinSZP][nrayHS][nscan]	-9999.9			[dB]	4-byte float	3792000	4	5	24	nscan	1	
			binDEML2[nrayHS][nscan]	-9999			[range bin number]	2-byte integer	379200	2	24	nscan	1	1	
			flagSLV[nbinHS][nrayHS][nscan]	-99				1-byte integer	16684800	1	88	24	nscan	1	
			binEchoBottom[nrayHS][nscan]	-9999				2-byte integer	379200	2	24	nscan	1	1	
			piainFinal[nrayHS][nscan]	-9999.9			[dB]	4-byte float	758400	4	24	nscan	1	1	
			sigmaZeroCorrected[nrayHS][nscan]	-9999.9			[dB]	4-byte float	758400	4	24	nscan	1	1	
			zFactorCorrected[nbinHS][nrayHS][nscan]	-9999.9			[dBZ]	4-byte float	66739200	4	88	24	nscan	1	
			zFactorCorrectedESurface[nrayHS][nscan]	-9999.9			[dBZ]	4-byte float	758400	4	24	nscan	1	1	
			zFactorCorrectedNearSurface[nrayHS][nscan]	-9999.9			[dBZ]	4-byte float	758400	4	24	nscan	1	1	
			paramDSD[nDSD][nbinHS][nrayHS][nscan]	-9999.9				4-byte float	133478400	4	2	88	24	nscan	
			precipRate[nbinHS][nrayHS][nscan]	-9999.9			[mm/hr]	4-byte float	66739200	4	88	24	nscan	1	
			precipWaterIntegrated[LS][nrayHS][nscan]	-9999.9				4-byte float	1516800	4	2	24	nscan	1	
			precipRateNearSurface[nrayHS][nscan]	-9999.9			[mm/hr]	4-byte float	758400	4	24	nscan	1	1	
			precipRateESurface[nrayHS][nscan]	-9999.9			[mm/hr]	4-byte float	758400	4	24	nscan	1	1	
			precipRateAve24[nrayHS][nscan]	-9999.9			[mm/hr]	4-byte float	758400	4	24	nscan	1	1	
			phaseNearSurface[nrayHS][nscan]	255				1-byte char	1896000	1	24	nscan	1	1	
			epsilon[nbinHS][nrayHS][nscan]	-9999.9				4-byte float	66739200	4	88	24	nscan	1	

	Group Name 1	Group Name 2	DPR Initial 1B21 Value Name	missing	min	max	unit	type	Data size	type	array				remark	
		FLG	flagEcho[nbinHS][nrayHS][nscan]		0x00	0xff		8-bit	16684800	1	88	24	nscan	1	Flag of precipitation and main/side lobe clutter information of each range bin. 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	
			qualityData[nrayHS][nscan]		-9999				4-byte integer	758400	4	24	nscan	1	1 Flag of quality data. Bit range from 8 to 23 contains flags by each module. Each module flag has 2 bits of information. 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: Bit Meaning 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	
			flagSensor[nscan]					1-byte integer	7900	1	nscan	1	1	1 Flag of input Ku/Ka data condition. Value Meaning 1 Valid -99 Invalid (judged by dataQuality)		
MetaData-2ADPR	FileHeader	(N/A)	DOI						256							
			AlgorithmID						50							
			AlgorithmVersion						50							
			FileName						50							
			SatelliteName						10							
			InstrumentName						10							
			GenerationDateTime						50							
			StartGranuleDateTime						50							
			StopGranuleDateTime						50							
			GranuleNumber						50							
			NumberOfSwaths						50							
			NumberOfGrids						50							
			GranuleStart						50							
			TimeInterval						50							
			ProcessingSystem						50							
			ProductVersion						50							
			EmptyGranule						50							
			MissingData						50							
	InputRecord	(N/A)	InputFileNames						1000							
			InputAlgorithmVersions						1000							
			InputGenerationDateTimes						1000							
	AlgorithmRuntimeInfo	(N/A)													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.	
	NavigationRecord	(N/A)	LongitudeOnEquator						50							
			UTCDateTimeOnEquator						50							
			MeanSolarBetaAngle						50							
			EphemerisFileName						50							
			AttitudeFileName						50							
			GeoControlFileName						50							
			EphemerisSource						50							
			AttitudeSource						50							
			GeoToolkitVersion						50							
			SensorAlignmentFirstRotationAngle						50							
			SensorAlignmentSecondRotationAngle						50							
			SensorAlignmentThirdRotationAngle						50							
			SensorAlignmentFirstRotationAxis						50							
			SensorAlignmentSecondRotationAxis						50							
			SensorAlignmentThirdRotationAxis						50							
	FileInfo	(N/A)	DataFormatVersion						50							
			TKCodeBuildVersion						50							
			MetadataVersion						50							
			FormatPackage						50							
			BlueprintFilename						50							
			BlueprintVersion						50							
			TKIOVersion						50							
			MetadataStyle						50							
			EndianType						50							
									50							
	JAXAInfo	(N/A)	GranuleFirstScanUTCDateTime						50							
			GranuleLastScanUTCDateTime						50							
			TotalQualityCode						50							
			FirstScanLat						50							
			FirstScanLon						50							
			LastScanLat						50							
			LastScanLon						50							
			NumberOfRainPixelsNS						50							
			NumberOfRainPixelsMS						50							
			NumberOfRainPixelsHS						50							
			ProcessingSubSystem						50							
			ProcessingMode						50							
			LightSpeed						TBD							
			DielectricConstantKa						TBD							
			DielectricConstantKu						TBD							
	NS	NS SwathHeader	NumberScansInSet						50							
			MaximumNumberScansTotal						50							
			NumberScansBeforeGranule						50							
			NumberScansGranule						50							
			NumberScansAfterGranule						50							
			NumberPixels						50							
	MS	MS SwathHeader	ScanType						50							
			NumberScansInSet						50							
			MaximumNumberScansTotal						50							
			NumberScansBeforeGranule						50							
			NumberScansGranule						50							
			NumberScansAfterGranule						50							
	HS	HS SwathHeader	NumberPixels						50							
			ScanType						50							
			NumberScansInSet						50							
			MaximumNumberScansTotal						50							
			NumberScansBeforeGranule						50							
			NumberScansGranule						50							
										3441562876						



3. レベル3 プロダクトフォーマット仕様

3.1. 処理概要

レベル3 アルゴリズムはレベル2 プロダクト(降水強度プロファイル等)を入力し、レベル3 プロダクト(日平均降水量・月平均降水量)を出力する。レベル3 の標準アルゴリズムは、レベル2 の標準アルゴリズムの各プロダクトの結果を時空間的に統計処理し、地図投影を行うものである。

レベル3 アルゴリズムは、標準アルゴリズムのみである。

3.2. ファイル入出力

「図 3.2-1 DPRレベル0からレベル3処理全体のフロー」に標準処理におけるレベル0からレベル3までの処理全体のフローを示す(図3.2-1は図2.2-1と同様の図である)。「表3.2-1 レベル3処理の入出力ファイル」にDPR レベル3で使用する入力データ、出力プロダクトを示す。

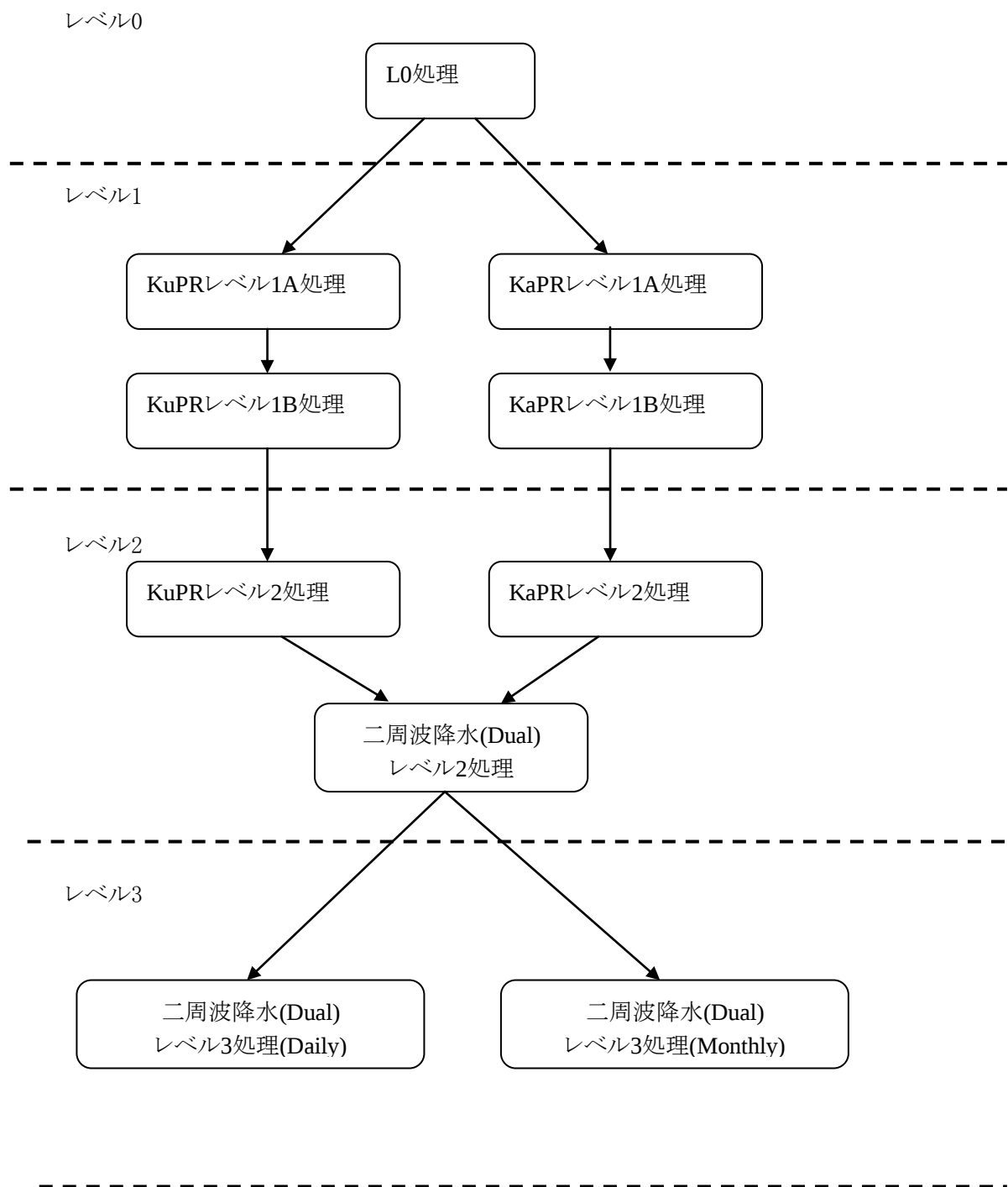


図 3.2-1 DPRレベル0からレベル3処理全体のフロー

表3.2-1 レベル3処理の入出力ファイル

(凡例 I:Input/O:Output)

No.	標準処理	I/O
1	DPR レベル 2 (1 日分)	I
2	KuPR レベル 2 (1 日分)	I
3	KaPR レベル 2 (1 日分)	I
4	DPR レベル 3 (Daily) (0.1x0.1, Text)	O
5	DPR レベル 3 (Daily) (0.25x0.25, HDF5)	O
6	DPR レベル 3temp (Monthly) (0.25x0.25, binary)	I/O
7	DPR レベル 3 (Monthly) (0.25x0.25, HDF5)	O

3.3. プロダクトフォーマット

レベル3プロダクトフォーマット説明を以下に示す。

3.3.1. テキストプロダクト

(1) 標準プロダクト

① レコード構成

表 3.3-1 レベル3プロダクト 標準プロダクト(テキスト)のレコード構成

ヘッダー部(1行)	レコード1
データ部(N行)	レコード1
	レコード2
	...
	...
	レコードN

② レコードフォーマット

表 3.3-2 レベル3プロダクト 標準プロダクト(テキスト)ヘッダー部の内容

No.	項目	内容
1	経度	“Lon” 固定文字列
2	区切り	「 」(空白(半角1文字)。以下同様)
3	緯度	“Lat” 固定文字列
4	区切り	
5	時間	“Hour” 固定文字列
6	区切り	
7	分	“Minute” 固定文字列
8	区切り	
9	秒	“Second” 固定文字列

No.	項目	内容
10	区切り	
11	地表降水強度	“PrecipRateESurfmean” 固定文字列
12	区切り	
13	A/D フラグ	“A/D_flag” 固定文字列
12	改行	0x0A

表 3.3-3 レベル3プロダクト 標準プロダクト(テキスト)のデータ部の内容

No.	項目	内容
1	経度	N・・・N 任意の実数
2	区切り	「 」(空白(半角1文字)。以下同様)
3	緯度	N・・・N 任意の実数
4	区切り	
5	時間	HH(in UTC) 整数(00—23)
6	区切り	
7	分	MM(in UTC) 整数(00—59)
8	区切り	
9	秒	SS(in UTC) 整数(00—59)
10	区切り	
11	地表降水強度	N・・・N 任意の実数
12	区切り	
13	A/D フラグ	X “A” または “D”
12	改行	0x0A

3.3.2. HDFプロダクト

(1) 標準プロダクト

二周波降水レーダレベル3プロダクト(日平均、0.25度格子)のフォーマットを「表3.3-4」に示す。

二周波降水レーダレベル3(月平均)のフォーマットを「表3.3-5」に示す。

表3.3-4 二周波降水レーダレベル3(日平均、0.25度格子) プロダクトフォーマット

	Group Name 1	Group Name 2	Group Name 3	DPR Initial 3DPR 30ue Name	missing	min	max	unit	type	Data size	type	array	remark
3DPR	Grids	G1	precipRate	count [tL][nL][chn][hgt][rt][st]	-9999				signed 4B int	1451520	4	28 72 4 4 5 3 3	
				mean [tL][nL][chn][hgt][rt][st]	-9999.9				4B float	1451520	4	28 72 4 4 5 3 3	
				stdev [tL][nL][chn][hgt][rt][st]	-9999.9				4B float	1451520	4	28 72 4 4 5 3 3	
			rainRate	hist [tL][nL][chn][hgt][rt][st][bin]	-9999				signed 4B int	0	4	28 72 4 4 5 3 3	30
				count [tL][nL][chn][hgt][rt][st]	-9999.9				signed 4B int	1451520	4	28 72 4 4 5 3 3	
				mean [tL][nL][chn][hgt][rt][st]	-9999.9				4B float	1451520	4	28 72 4 4 5 3 3	
			snowRate	stdev [tL][nL][chn][hgt][rt][st]	-9999.9				4B float	1451520	4	28 72 4 4 5 3 3	
				hist [tL][nL][chn][hgt][rt][st][bin]	-9999				signed 4B int	0	4	28 72 4 4 5 3 3	30
				count [tL][nL][chn][hgt][rt][st]	-9999.9				signed 4B int	1451520	4	28 72 4 4 5 3 3	
			mixedPhRate	mean [tL][nL][chn][hgt][rt][st]	-9999.9				4B float	1451520	4	28 72 4 4 5 3 3	
				stdev [tL][nL][chn][hgt][rt][st]	-9999.9				4B float	1451520	4	28 72 4 4 5 3 3	
				hist [tL][nL][chn][hgt][rt][st][bin]	-9999				signed 4B int	0	4	28 72 4 4 5 3 3	30
			precipRateESurface	count [tL][nL][chn][rt][st]	-9999				signed 4B int	290304	4	28 72 4 3 3	
				mean [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3	
				stdev [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3	
			precipRateESurface2	hist [tL][nL][chn][rt][st][bin]	-9999				signed 4B int	8709120	4	28 72 4 3 3	30
				count [tL][nL][chn][rt][st]	-9999				signed 4B int	290304	4	28 72 4 3 3	
				mean [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3	
			precipRateNearSurface	stdev [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3	
				hist [tL][nL][chn][rt][st][bin]	-9999				signed 4B int	8709120	4	28 72 4 3 3	30
				count [tL][nL][chn][rt][st]	-9999				signed 4B int	290304	4	28 72 4 3 3	
			rainRateNearSurface	mean [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3	
				stdev [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3	
				hist [tL][nL][chn][rt][st][bin]	-9999				signed 4B int	8709120	4	28 72 4 3 3	30
			snowRateNearSurface	count [tL][nL][chn][rt][st]	-9999				signed 4B int	290304	4	28 72 4 3 3	
				mean [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3	
				stdev [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3	
			mixedPhRateNearSurface	hist [tL][nL][chn][rt][st][bin]	-9999				signed 4B int	8709120	4	28 72 4 3 3	30
				count [tL][nL][chn][rt][st]	-9999				signed 4B int	290304	4	28 72 4 3 3	
				mean [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3	
			precipWaterIntegrated	stdev [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3	
				hist [tL][nL][chn][rt][st][bin]	-9999				signed 4B int	8709120	4	28 72 4 3 3	30
				count [tL][nL][chn][rt][st]	-9999				signed 4B int	290304	4	28 72 4 3 3	
			precipIceIntegrated	mean [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3	
				stdev [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3	
				hist [tL][nL][chn][rt][st][bin]	-9999				signed 4B int	8709120	4	28 72 4 3 3	30
			precipRateAve24	count [tL][nL][chn][rt][st]	-9999				signed 4B int	290304	4	28 72 4 3 3	
				mean [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3	
				stdev [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3	
			zFactorCorrected	hist [tL][nL][chn][rt][st][bin]	-9999				signed 4B int	8709120	4	28 72 4 3 3	30
				count [tL][nL][inst][hgt][rt][st]	-9999				signed 4B int	1088640	4	28 72 3 5 3 3	
				mean [tL][nL][inst][hgt][rt][st]	-9999.9				4B float	1088640	4	28 72 3 5 3 3	
			zFactorCorrectedESurface	stdev [tL][nL][inst][hgt][rt][st]	-9999.9				4B float	1088640	4	28 72 3 5 3 3	
				hist [tL][nL][inst][hgt][rt][st][bin]	-9999				signed 4B int	0	4	28 72 3 5 3 3	30
				count [tL][nL][inst][rt][st]	-9999				signed 4B int	217728	4	28 72 3 3 3	
			zFactorCorrectedNearSurface	mean [tL][nL][inst][rt][st]	-9999.9				4B float	217728	4	28 72 3 3 3	
				stdev [tL][nL][inst][rt][st]	-9999.9				4B float	217728	4	28 72 3 3 3	
				hist [tL][nL][inst][rt][st][bin]	-9999				signed 4B int	6531840	4	28 72 3 3 3	30
			zFactorCorrectedDPR	count [tL][nL][inst][hgt][rt][st]	-9999				signed 4B int	1088640	4	28 72 3 5 3 3	
				mean [tL][nL][inst][hgt][rt][st]	-9999.9				4B float	1088640	4	28 72 3 5 3 3	
				stdev [tL][nL][inst][hgt][rt][st]	-9999.9				4B float	1088640	4	28 72 3 5 3 3	
			zFactorCorrectedESurfaceDPR	hist [tL][nL][inst][hgt][rt][st][bin]	-9999				signed 4B int	0	4	28 72 3 5 3 3	30
				count [tL][nL][inst][rt][st]	-9999				signed 4B int	217728	4	28 72 3 3 3	
				mean [tL][nL][inst][rt][st]	-9999.9				4B float	217728	4	28 72 3 3 3	
			zFactorCorrectedNearSurfaceDPR	stdev [tL][nL][inst][rt][st]	-9999.9				4B float	217728	4	28 72 3 3 3	
				hist [tL][nL][inst][rt][st][bin]	-9999				signed 4B int	6531840	4	28 72 3 3 3	30
				count [tL][nL][inst][hgt][rt][st]	-9999				signed 4B int	1088640	4	28 72 3 5 3 3	
			zFactorMeasured	mean [tL][nL][inst][hgt][rt][st]	-9999.9				4B float	1088640	4	28 72 3 5 3 3	
				stdev [tL][nL][inst][hgt][rt][st]	-9999.9				4B float	1088640	4	28 72 3 5 3 3	
				hist [tL][nL][inst][hgt][rt][st][bin]	-9999				signed 4B int	0	4	28 72 3 5 3 3	30
			dm	count [tL][nL][hgt][rt][st]	-9999				signed 4B int	362880	4	28 72 5 3 3	
				mean [tL][nL][hgt][rt][st]	-9999.9				4B float	362880	4	28 72 5 3 3	
				stdev [tL][nL][hgt][rt][st]	-9999.9				4B float	362880	4	28 72 5 3 3	
			dBNw	hist [tL][nL][hgt][rt][st][bin]	-9999				signed 4B int	10886400	4	28 72 5 3 3	30
				count [tL][nL][hgt][rt][st]	-9999				signed 4B int	362880	4	28 72 5 3 3	
				mean [tL][nL][hgt][rt][st]	-9999.9				4B float	362880	4	28 72 5 3 3	
			epsilonDPR	stdev [tL][nL][hgt][rt][st]	-9999.9				4B float	362880	4	28 72 5 3 3	
				hist [tL][nL][hgt][rt][st][bin]	-9999				signed 4B int	0	4	28 72 3 5 3 3	30
				count [tL][nL][inst][hgt][rt][st]	-9999				signed 4B int	1088640	4	28 72 3 5 3 3	
			epsilon	mean [tL][nL][inst][hgt][rt][st]	-9999.9				4B float	1088640	4	28 72 3 5 3 3	
				stdev [tL][nL][inst][hgt][rt][st]	-9999.9				4B float	1088640	4	28 72 3 5 3 3	
				hist [tL][nL][inst][hgt][rt][st][bin]	-9999				signed 4B int	0	4	28 72 3 5 3 3	30
			piaSRT	count [tL][nL][inst][ang][rt][st]	-9999				signed 4B int	1524096	4	28 72 3 7 3 3	
				mean [tL][nL][inst][ang][rt][st]	-9999.9				4B float	1524096	4	28 72 3 7 3 3	
				stdev [tL][nL][inst][ang][rt][st]	-9999.9				4B float	1524096	4	28 72 3 7 3 3	
			piaSRTdpr	hist [tL][nL][inst][ang][rt][st][bin]	-9999				signed 4B int	0	4	28 72 3 7 3 3	30
				count [tL][nL][inst][ang][rt][st]	-9999				signed 4B int	1524096	4	28 72 3 7 3 3	
				mean [tL][nL][inst][ang][rt][st]	-9999.9				4B float	1524096	4	28 72 3 7 3 3	
			piaFinal	stdev [tL][nL][inst][ang][rt][st]	-9999.9				4B float	1524096	4	28 72 3 7 3 3	
				hist [tL][nL][inst][ang][rt][st][bin]	-9999				signed 4B int	0	4	28 72 3 7 3 3	30
				count [tL][nL][inst][ang][rt][st]	-9999				signed 4B int	1524096	4	28 72 3 7 3 3	
			piaFinalDPR	mean [tL][nL][inst][ang][rt][st]	-9999.9				4B float	1524096	4	28 72 3 7 3 3	
				stdev [tL][nL][inst][ang][rt][st]	-9999.9				4B float	1524096	4	28 72 3 7 3 3	
				hist [tL][nL][inst][ang][rt][st][bin]	-9999				signed 4B int	0	4	28 72 3 7 3 3	30
			piaFinalSubset	count [tL][nL][inst][ang][rt][st]	-9999				signed 4B int	1524096	4	28 72 3 7 3 3	
				mean [tL][nL][inst][ang][rt][st]	-9999.9				4B float	1524096	4	28 72 3 7 3 3	
				stdev [tL][nL][inst][ang][rt][st]	-9999.9				4B float	1524096	4	28 72 3 7 3 3	
			piaFinalDPRsubset	hist [tL][nL][inst][ang][rt][st][bin]	-9999				signed 4B int	0	4	28 72 3 7 3 3	30
				count [tL][nL][inst][ang][rt][st]	-9999				signed 4B int	1524096	4	28 72 3 7 3 3	
				mean [tL][nL][inst][ang][rt][st]	-9999.9				4B float	1524096	4	28 72 3 7 3 3	
			heightBB	stdev [tL][nL][inst][ang][rt][st]	-9999.9				4B float	1524096	4	28 72 3 7 3 3	
				hist [tL][nL][inst][ang][rt][st][bin]	-9999				signed 4B int	0	4	28 72 3 7 3 3	30
				count [tL][nL][chn][rt][st]	-9999				signed 4B int	290304	4	28 72 4 3 3	
			heightBBnadir	mean [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3	
				stdev [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3	
				hist [tL][nL][chn][rt][st][bin]	-9999				signed 4B int	8709120	4	28 72 4 3 3	30
			BBwidthNadir	count [tL][nL][chn][rt][st]	-9999				signed 4B int	290304	4	28 72 4 3 3	
				mean [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3	
				stdev [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3	
			heightStormTop	hist [tL][nL][chn][rt][st][bin]	-9999				signed 4B int	8709120	4	28 72 4 3 3	30
count [tL][nL][chn][rt][st]	-9999					signed 4B int	290304	4	28 72 4 3 3				
mean [tL][nL][chn][rt][st]	-9999.9					4B float	290304	4	28 72 4 3 3				
BBwidth	stdev [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3				
	hist [tL][nL][chn][rt][st][bin]	-9999				signed 4B int	8709120	4	28 72 4 3 3	30			
	count [tL][nL][chn][rt][st]	-9999				signed 4B int	290304	4	28 72 4 3 3				
observationCounts	mean [tL][nL][chn][rt][st]	-9999.9				4B float	290304	4	28 72 4 3 3				
	total [tL][nL][inst][st]	-9999				signed 4B int	8709120	4	28 72 4 3 3	30			
	localTime [tL][nL][inst][tim][st]	-9999				signed 4B int	72576	4	28 72 3 3				
precipRateLocalTime	pia [tL][nL][inst][ang][st]	-9999				signed 4B int	1741824	4	28 72 3 24 3				
	shallowRain [												

	Group Name 1	Group Name 2	Group Name 3	DPR Initial 3DPR 30ue Name	missing	min	max	unit	type	Data size	type	array							remark
MetaData-3DPR		G2	rainRate	mean [tH][lnH][chn][hgt][rt]	-9999.9				4B float	185241600	4	536	1440	4	5	3			
				stdev [tH][lnH][chn][hgt][rt]	-9999.9				4B float	185241600	4	536	1440	4	5	3			
			snowRate	count [tH][lnH][chn][hgt][rt]	-9999				signed 4B int	185241600	4	536	1440	4	5	3			
				mean [tH][lnH][chn][hgt][rt]	-9999.9				4B float	185241600	4	536	1440	4	5	3			
				stdev [tH][lnH][chn][hgt][rt]	-9999.9				4B float	185241600	4	536	1440	4	5	3			
			mixedPhRate	count [tH][lnH][chn][hgt][rt]	-9999				signed 4B int	185241600	4	536	1440	4	5	3			
				mean [tH][lnH][chn][hgt][rt]	-9999.9				4B float	185241600	4	536	1440	4	5	3			
				stdev [tH][lnH][chn][hgt][rt]	-9999.9				4B float	185241600	4	536	1440	4	5	3			
			precipRateESurface	count [tH][lnH][chn][rt]	-9999				signed 4B int	37048320	4	536	1440	4	3				
				mean [tH][lnH][chn][rt]	-9999.9				4B float	37048320	4	536	1440	4	3				
				stdev [tH][lnH][chn][rt]	-9999.9				4B float	37048320	4	536	1440	4	3				
			precipRateESurface2	count [tH][lnH][chn][rt]	-9999				signed 4B int	37048320	4	536	1440	4	3				
				mean [tH][lnH][chn][rt]	-9999.9				4B float	37048320	4	536	1440	4	3				
				stdev [tH][lnH][chn][rt]	-9999.9				4B float	37048320	4	536	1440	4	3				
			precipRateNearSurface	count [tH][lnH][chn][rt]	-9999				signed 4B int	37048320	4	536	1440	4	3				
				mean [tH][lnH][chn][rt]	-9999.9				4B float	37048320	4	536	1440	4	3				
				stdev [tH][lnH][chn][rt]	-9999.9				4B float	37048320	4	536	1440	4	3				
			rainRateNearSurface	count [tH][lnH][chn][rt]	-9999				signed 4B int	37048320	4	536	1440	4	3				
				mean [tH][lnH][chn][rt]	-9999.9				4B float	37048320	4	536	1440	4	3				
				stdev [tH][lnH][chn][rt]	-9999.9				4B float	37048320	4	536	1440	4	3				
			snowRateNearSurface	count [tH][lnH][chn][rt]	-9999				signed 4B int	37048320	4	536	1440	4	3				
				mean [tH][lnH][chn][rt]	-9999.9				4B float	37048320	4	536	1440	4	3				
				stdev [tH][lnH][chn][rt]	-9999.9				4B float	37048320	4	536	1440	4	3				
			mixedPhRateNearSurface	count [tH][lnH][chn][rt]	-9999				signed 4B int	37048320	4	536	1440	4	3				
				mean [tH][lnH][chn][rt]	-9999.9				4B float	37048320	4	536	1440	4	3				
				stdev [tH][lnH][chn][rt]	-9999.9				4B float	37048320	4	536	1440	4	3				
			precipWaterIntegrated	count [tH][lnH][chn][rt]	-9999				signed 4B int	37048320	4	536	1440	4	3				
				mean [tH][lnH][chn][rt]	-9999.9				4B float	37048320	4	536	1440	4	3				
				stdev [tH][lnH][chn][rt]	-9999.9				4B float	37048320	4	536	1440	4	3				
			precipIceIntegrated	count [tH][lnH][chn][rt]	-9999				signed 4B int	37048320	4	536	1440	4	3				
				mean [tH][lnH][chn][rt]	-9999.9				4B float	37048320	4	536	1440	4	3				
				stdev [tH][lnH][chn][rt]	-9999.9				4B float	37048320	4	536	1440	4	3				
			precipRateAve24	count [tH][lnH][chn][rt]	-9999				signed 4B int	37048320	4	536	1440	4	3				
				mean [tH][lnH][chn][rt]	-9999.9				4B float	37048320	4	536	1440	4	3				
				stdev [tH][lnH][chn][rt]	-9999.9				4B float	37048320	4	536	1440	4	3				
			zFactorCorrected	count [tH][lnH][inst][hgt][rt]	-9999				signed 4B int	138931200	4	536	1440	3	5	3			
				mean [tH][lnH][inst][hgt][rt]	-9999.9				4B float	138931200	4	536	1440	3	5	3			
				stdev [tH][lnH][inst][hgt][rt]	-9999.9				4B float	138931200	4	536	1440	3	5	3			
			zFactorCorrectedESurface	count [tH][lnH][inst][rt]	-9999				signed 4B int	27786240	4	536	1440	3	3				
				mean [tH][lnH][inst][rt]	-9999.9				4B float	27786240	4	536	1440	3	3				
				stdev [tH][lnH][inst][rt]	-9999.9				4B float	27786240	4	536	1440	3	3				
			zFactorCorrectedNearSurface	count [tH][lnH][inst][rt]	-9999				signed 4B int	27786240	4	536	1440	3	3				
				mean [tH][lnH][inst][rt]	-9999.9				4B float	27786240	4	536	1440	3	3				
				stdev [tH][lnH][inst][rt]	-9999.9				4B float	27786240	4	536	1440	3	3				
			zFactorCorrectedDPR	count [tH][lnH][inst][hgt][rt]	-9999				signed 4B int	138931200	4	536	1440	3	5	3			
				mean [tH][lnH][inst][hgt][rt]	-9999.9				4B float	138931200	4	536	1440	3	5	3			
				stdev [tH][lnH][inst][hgt][rt]	-9999.9				4B float	138931200	4	536	1440	3	5	3			
			zFactorCorrectedESurfaceDPR	count [tH][lnH][inst][rt]	-9999				signed 4B int	27786240	4	536	1440	3	3				
				mean [tH][lnH][inst][rt]	-9999.9				4B float	27786240	4	536	1440	3	3				
				stdev [tH][lnH][inst][rt]	-9999.9				4B float	27786240	4	536	1440	3	3				
			zFactorCorrectedNearSurfaceDPR	count [tH][lnH][inst][rt]	-9999				signed 4B int	27786240	4	536	1440	3	3				
				mean [tH][lnH][inst][rt]	-9999.9				4B float	27786240	4	536	1440	3	3				
				stdev [tH][lnH][inst][rt]	-9999.9				4B float	27786240	4	536	1440	3	3				
			zFactorMeasured	count [tH][lnH][inst][hgt][rt]	-9999				signed 4B int	138931200	4	536	1440	3	5	3			
				mean [tH][lnH][inst][hgt][rt]	-9999.9				4B float	138931200	4	536	1440	3	5	3			
				stdev [tH][lnH][inst][hgt][rt]	-9999.9				4B float	138931200	4	536	1440	3	5	3			
			dm	count [tH][lnH][hgt][rt]	-9999				signed 4B int	46310400	4	536	1440	5	3				
				mean [tH][lnH][hgt][rt]	-9999.9				4B float	46310400	4	536	1440	5	3				
				stdev [tH][lnH][hgt][rt]	-9999.9				4B float	46310400	4	536	1440	5	3				
			dBNw	count [tH][lnH][hgt][rt]	-9999				signed 4B int	46310400	4	536	1440	5	3				
				mean [tH][lnH][hgt][rt]	-9999.9				4B float	46310400	4	536	1440	5	3				
				stdev [tH][lnH][hgt][rt]	-9999.9				4B float	46310400	4	536	1440	5	3				
			epsilonDPR	count [tH][lnH][inst][hgt][rt]	-9999				signed 4B int	138931200	4	536	1440	3	5	3			
				mean [tH][lnH][inst][hgt][rt]	-9999.9				4B float	138931200	4	536	1440	3	5	3			
				stdev [tH][lnH][inst][hgt][rt]	-9999.9				4B float	138931200	4	536	1440	3	5	3			
			epsilon	count [tH][lnH][inst][rt]	-9999				signed 4B int	27786240	4	536	1440	3	3				
				mean [tH][lnH][inst][rt]	-9999.9				4B float	27786240	4	536	1440	3	3				
				stdev [tH][lnH][inst][rt]	-9999.9				4B float	27786240	4	536	1440	3	3				
			piaSRT	count [tH][lnH][inst][ang][rt]	-9999				signed 4B int	194503680	4	536	1440	3	7	3			
				mean [tH][lnH][inst][ang][rt]	-9999.9				4B float	194503680	4	536	1440	3	7	3			
				stdev [tH][lnH][inst][ang][rt]	-9999.9				4B float	194503680	4	536	1440	3	7	3			
			piaSRTdpr	count [tH][lnH][inst][ang][rt][st]	-9999				signed 4B int	194503680	4	536	1440	3	7	3			
				mean [tH][lnH][inst][ang][rt][st]	-9999.9				4B float	194503680	4	536	1440	3	7	3			
				stdev [tH][lnH][inst][ang][rt][st]	-9999.9				4B float	194503680	4	536	1440	3	7	3			
			piaFinal	count [tH][lnH][inst][ang][rt][st]	-9999				signed 4B int	194503680	4	536	1440	3	7	3			
				mean [tH][lnH][inst][ang][rt][st]	-9999.9				4B float	194503680	4	536	1440	3	7	3			
				stdev [tH][lnH][inst][ang][rt][st]	-9999.9				4B float	194503680	4	536	1440	3	7	3			
			piaFinalDPR	count [tH][lnH][inst][ang][rt][st]	-9999				signed 4B int	194503680	4	536	1440	3	7	3			
				mean [tH][lnH][inst][ang][rt][st]	-9999.9				4B float	194503680	4	536	1440	3	7	3			
				stdev [tH][lnH][inst][ang][rt][st]	-9999.9				4B float	194503680	4	536	1440	3	7	3			
			heightBB	count [tH][lnH][chn][rt]	-9999				signed 4B int	37048320	4	536	1440	4	3				
				mean [tH][lnH][chn][rt]	-9999.9				4B float	37048320	4	536	1440	4	3				

	Group Name 1	Group Name 2	Group Name 3	DPR Initial 3DPR 30ue Name	missing	min	max	unit	type	Data size	type	array								remark		
	JAXAInfo	(N/A)	(N/A)	NumberOfRainPixelsNS						50												
				NumberOfRainPixelsMS						50												
				NumberOfRainPixelsHS						50												
				ProcessingSubSystem						50												
				ProcessingMode						50												
				LightSpeed						TBD												
				DielectricConstantKa						TBD												
				DielectricConstantKu						TBD												
	Grids	G1	G1 GridHeader	BinMethod							50											
				Registration						50												
				LatitudeResolution						50												
				LongitudeResolution						50												
				NorthBoundingCoordinate						50												
				SouthBoundingCoordinate						50												
				EastBoundingCoordinate						50												
				WestBoundingCoordinate						50												
		G2	G2 GridHeader	Origin								50										
				BinMethod						50												
				Registration						50												
				LatitudeResolution						50												
				LongitudeResolution						50												
				NorthBoundingCoordinate						50												
				SouthBoundingCoordinate						50												
				EastBoundingCoordinate						50												
				WestBoundingCoordinate						50												
				Origin						50												
														8621911968								

表3.3-5 二周波降水レーダレベル3(月平均) プロダクトフォーマット

	Group Name 1	Group Name 2	DPR Initial 3DPRD Value Name	missing	min	max	unit	type	Data size	type	array					remark
3DPRD	Grid	(N/A)	precipRateMean [nlat][nlon][nalt][AD]	-9999.9			mm/hr	4B float	30873600	4	536	1440	5	2		
			rainRateMean [nlat][nlon][nalt][AD]	-9999.9			mm/hr	4B float	30873600	4	536	1440	5	2		
			mixedRateMean [nlat][nlon][nalt][AD]	-9999.9			mm/hr	4B float	30873600	4	536	1440	5	2		
			snowRateMean [nlat][nlon][nalt][AD]	-9999.9			mm/hr	4B float	30873600	4	536	1440	5	2		
			precipRateNearSurfMean [nlat][nlon][AD]	-9999.9			mm/hr	4B float	6174720	4	536	1440	2			
			rainRateNearSurfMean [nlat][nlon][AD]	-9999.9			mm/hr	4B float	6174720	4	536	1440	2			
			mixedRateNearSurfMean [nlat][nlon][AD]	-9999.9			mm/hr	4B float	6174720	4	536	1440	2			
			snowRateNearSurfMean [nlat][nlon][AD]	-9999.9			mm/hr	4B float	6174720	4	536	1440	2			
			precipRateESurfMean [nlat][nlon][AD]	-9999.9			mm/hr	4B float	6174720	4	536	1440	2			
			precipRateESurf2Mean [nlat][nlon][AD]	-9999.9			mm/hr	4B float	6174720	4	536	1440	2			
			totalPix [nlat][nlon][AD]	-9999				signed 2B int	3087360	2	536	1440	2			
			precipPix [nlat][nlon][nalt][AD]	-9999				signed 2B int	15436800	2	536	1440	5	2		
			precipPixNearSurf [nlat][nlon][AD]	-9999				signed 2B int	3087360	2	536	1440	2			
			precipPixESurf [nlat][nlon][AD]	-9999				signed 2B int	3087360	2	536	1440	2			
			convPrecipRateMean [nlat][nlon][nalt][AD]	-9999.9			mm/hr	4B float	30873600	4	536	1440	5	2		
			convPrecipRateNearSurfMean [nlat][nlon][AD]	-9999.9			mm/hr	4B float	6174720	4	536	1440	2			
			convPrecipRateESurfMean [nlat][nlon][AD]	-9999.9			mm/hr	4B float	6174720	4	536	1440	2			
			convPrecipPixNearSurf [nlat][nlon][AD]	-9999				signed 2B int	3087360	2	536	1440	2			
			stratPrecipRateMean [nlat][nlon][nalt][AD]	-9999.9			mm/hr	4B float	30873600	4	536	1440	5	2		
			stratPrecipRateNearSurfMean [nlat][nlon][AD]	-9999.9			mm/hr	4B float	6174720	4	536	1440	2			
			stratPrecipRateESurfMean [nlat][nlon][AD]	-9999.9			mm/hr	4B float	6174720	4	536	1440	2			
			stratPrecipPixNearSurf [nlat][nlon][AD]	-9999				signed 2B int	3087360	2	536	1440	2			
			bbHtMean [nlat][nlon][AD]	-9999.9			m	4B float	6174720	4	536	1440	2			
			stormHtMean [nlat][nlon][AD]	-9999.9			m	4B float	6174720	4	536	1440	2			
			phase [nlat][nlon][nalt][nvar][AD]	-9999				signed 2B int	46310400	2	536	1440	5	3	2	
			phaseNearSurf [nlat][nlon][nvar][AD]	-9999				signed 2B int	9262080	2	536	1440	3	2		
		GridTimeAsc	Year [nlat][nlon]	-9999	1950	2100		signed 2B int	1543680	2	536	1440				
			Month [nlat][nlon]	-99	1	12		signed 1B int	771840	1	536	1440				
			DayOfMonth [nlat][nlon]	-99	1	31		signed 1B int	771840	1	536	1440				
			Hour [nlat][nlon]	-99	0	23		signed 1B int	771840	1	536	1440				
			Minute [nlat][nlon]	-99	0	59		signed 1B int	771840	1	536	1440				
			Second [nlat][nlon]	-99	0	60		signed 1B int	771840	1	536	1440				
			MilliSecond [nlat][nlon]	-9999	0	999		signed 2B int	1543680	2	536	1440				
		GridTimeDes	DayOfYear [nlat][nlon]	-9999	1	366		signed 2B int	1543680	2	536	1440				
			Year [nlat][nlon]	-9999	1950	2100		signed 2B int	1543680	2	536	1440				
			Month [nlat][nlon]	-99	1	12		signed 1B int	771840	1	536	1440				
			DayOfMonth [nlat][nlon]	-99	1	31		signed 1B int	771840	1	536	1440				
			Hour [nlat][nlon]	-99	0	23		signed 1B int	771840	1	536	1440				
			Minute [nlat][nlon]	-99	0	59		signed 1B int	771840	1	536	1440				
			Second [nlat][nlon]	-99	0	60		signed 1B int	771840	1	536	1440				
MetaData-3DPRD	FileHeader	(N/A)	DOI						256							
			AlgorithmID						50							
			AlgorithmVersion						50							
			FileName						50							
			SatelliteName						10							
			InstrumentName						10							
			GenerationDateTime						50							
			StartGranuleDateTime						50							
			StopGranuleDateTime						50							
			GranuleNumber						50							
			NumberOfSwaths						50							
			NumberOfGrids						50							
			GranuleStart						50							
			TimeInterval						50							
			ProcessingSystem						50							
			ProductVersion						50							
			EmptyGranule						50							
			MissingData						50							
	InputFileNames	(N/A)	(N/A)												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.	
	InputAlgorithmVersions	(N/A)	(N/A)												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.	
	InputGenerationDateTimes	(N/A)	(N/A)												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.	
	FileInfo	(N/A)	DataFormatVersion							50						
			TKCodeBuildVersion							50						
			MetadataVersion							50						
			FormatPackage							50						
			BlueprintFilename							50						
			BlueprintVersion							50						
			TKIOVersion							50						
	JAXAInfo	(N/A)	MetadataStyle							50						
			EndianType							50						
			GranuleFirstScanUTCDateTime							50						
			GranuleLastScanUTCDateTime							50						
			TotalQualityCode							50						
			FirstScanLat							50						
			FirstScanLon							50						
			LastScanLat							50						
			LastScanLon							50						
			NumberOfRainPixelsNS							50						
			NumberOfRainPixelsMS							50						
			NumberOfRainPixelsHS							50						
	Grids	GridHeader	ProcessingSubSystem							50						
			ProcessingMode							50						
			LightSpeed							TBD						
			DielectricConstantKa							TBD						
			DielectricConstantKu							TBD						
			BinMethod							50						
			Registration							50						
			LatitudeResolution							50						
			LongitudeResolution							50						
			NorthBoundingCoordinate							50						
			SouthBoundingCoordinate							50						
			EastBoundingCoordinate							50						
			WestBoundingCoordinate							50						
			Origin							50						
									362767326							

略語一覧

A
B
C
D

DPR :Dual-frequency Precipitation Radar
二周波降水レーダ

E
F
G

GPM :Global Precipitation Measurement
全球降水観測計画

H

HDF :Hierarchical Data Format
階層型データフォーマット

I
J
K

KaPR :Ka-band Precipitation Radar
Ka帯降水レーダ

KuPR :Ku-band Precipitation Radar

Ku帯降水レーダ

L
M
N
O
P
Q
R
S
T
U

UTC :Universal Time Coordinate
協定世界時

V
W
X
Y
Z

GPM高次プロダクトフォーマット説明書

全球合成降水マップ編

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1. 概要

1.1. 目的

本文書は、GPM/DPRミッション運用系システムによって作成される全球合成降水マップ(GSMaPともいう)レベル3プロダクトフォーマットについて記述したものである。

全球合成降水マップレベル3プロダクトの記述フォーマットはHDF5 (Hierarchical Data Format、バージョン5)とテキストとする。本プロダクトはHDF5のライブラリ1.8を使用して作成している。

1.2. 関連文書

関連文書を以下に示す。

- (1)「ISO19115:2003 Geographic information_Metadata」(First edition 2003-05-01)
- (2)「ISO19115-2:2009 Geographic information_Metadata Part 2:Extensions for imagery and gridded data」(First edition 2009-02-15)
- (3)「HDF5 Reference Manual」(Release 1.8.5)
- (4)「HDF5 User's Guide」(Release 1.8.5)
- (5)「全球降水観測計画(GPM)アルゴリズム開発計画書(案)」(NDX-080013)
- (6)「GPMデータ利用ハンドブック」(MAS-140012)

1.3. レベル定義

プロダクトレベルの定義を表1.3-1に示す。

表1.3-1 DPRプロダクトレベル定義

名称	定義	備考
全球合成降水マップレベル3	GPM マイクロ波放射計(GMI) を含む複数のマイクロ波放射計(イメージャ/サウンダ)による降水量推定と、静止衛星赤外(IR)データによる雲移動の情報を複合し、時空間平均したレベル3 プロダクトを生成する。	

1.4. シーン定義

全球降水マッププロダクトの場合、シーンは定義しない。

1.5. ファイルの分割とサイズ

全球を対象としたデータが格納されているファイルを1ファイルとし分割は行わない。GSMaP標準処理のデータサイズを以下の「表1.5-1 プロダクトサイズ(標準処理)」に示す。GSMaP準リアルタイム処理のデータサイズを「表1.5-2 プロダクトサイズ(準リアルタイム処理)」に示す。

表1.5-1 プロダクトサイズ(標準処理)

名称	データサイズ
全球合成降水マップレベル3(時間平均)	1.7[MB/1時間]
全球合成降水マップレベル3(月平均)	45[MB/1カ月]

表1.5-2 プロダクトサイズ(準リアルタイム処理)

名称	データサイズ
全球合成降水マップレベル3R	1.7[MB/1時間]

1.6. プロダクト構成

1時間または1ヶ月の全球降水合成マップ1ファイルを1プロダクトとする。

1.7. HDFデータ構造

1.7.1. 全球合成降水マップレベル3(時間平均)のファイル構造

全球合成降水マップレベル3(時間平均)のファイル構造を以下に示す。

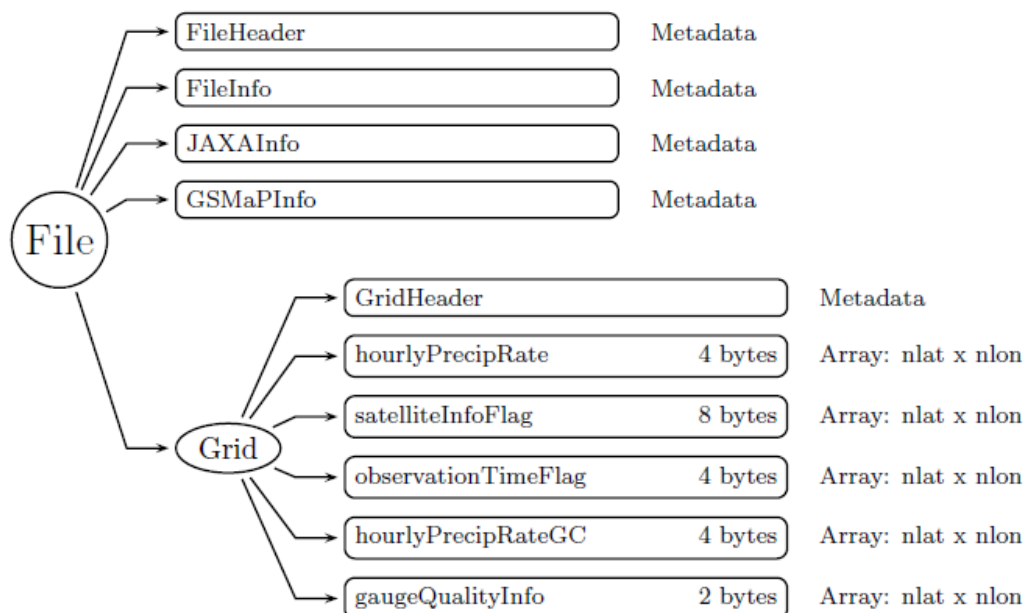


図 1.7-1 全球合成降水マップレベル3(時間平均)のファイル構造

1.7.2. 全球合成降水マップレベル3(月平均)のファイル構造

全球合成降水マップレベル3(月平均)のファイル構造を以下に示す。

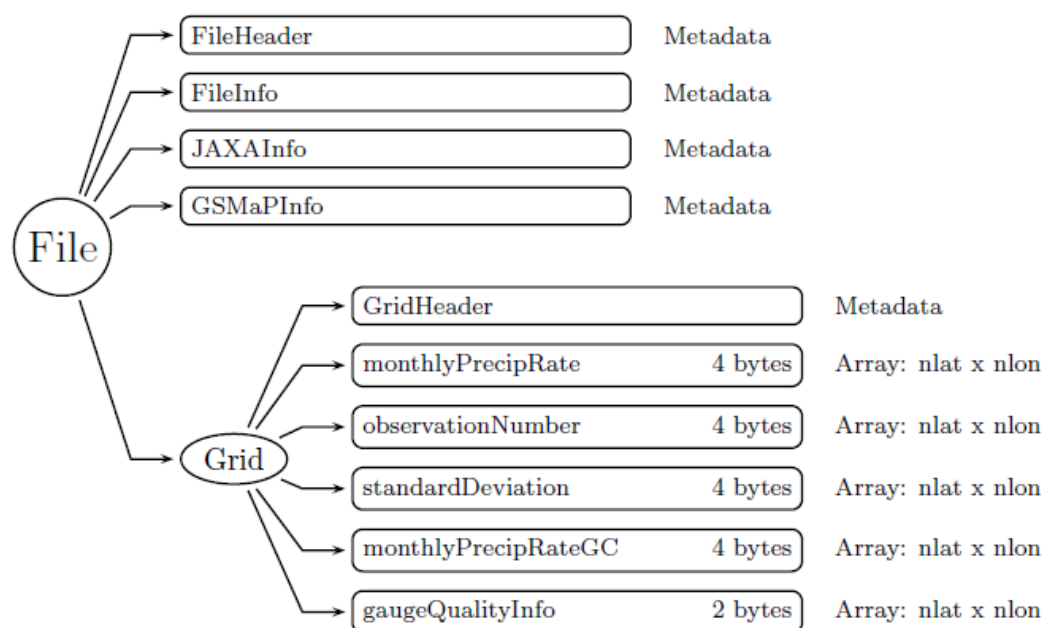


図 1.7-2 全球合成降水マップレベル3(月平均)のファイル構造

※nlat = 1800 : 緯度グリッド数(90° N～90° Sにおいて0.1° 毎)

※nlon = 3600 : 経度グリッド数(180° W～180° Eにおいて0.1° 毎)

1.8. ファイル名規約

グラニューールIDをファイル名とする。

全球合成降水マップレベル3プロダクトのファイル名規約を「図 1.8-1 GSMaPプロダクトのファイル名規約(HDF5)」と「図 1.8-2 GSMaPプロダクトのファイル名規約(Text)(TBD)」に示す。

図中の各項目の説明を「表 1.8-1 GSMaPプロダクトファイル名の規約」に示す。

1 概要

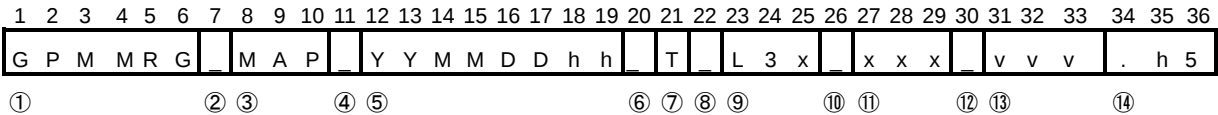


図 1.8-1 GSMapプロダクトのファイル名規約(HDF5)

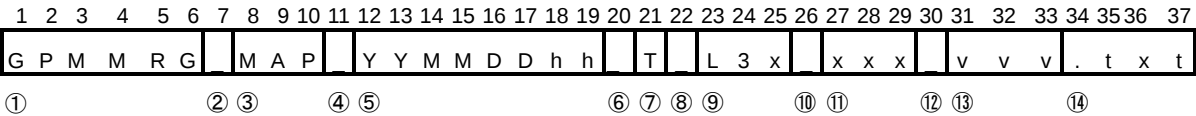


図 1.8-2 GSMapプロダクトのファイル名規約(Text)(TBD)

表 1.8-1 GSMapプロダクトファイル名の規約

No.	種別	名称	文字数	値
①	シーンID	ミッションID (ミッション名+衛星識別)	5	GPMMRG【固定】
②		セパレータ	1	「_」(アンダースコア)【固定】
③		センサID (センサ識別)	3	MAP【固定】
④		セパレータ	1	「_」(アンダースコア)【固定】

1 概要

No.	種別	名称	文字数	値
⑤		シーン開始時刻	4,6,10の いずれ か	UTC時刻 YYMM:Monthly YYMMDD:Daily YYMMDDhhmm:Hourly (include Half Hour) YY:西暦 MM:月 DD:月ごとの日 hh:時刻 0～23 mm:分
⑥		セパレータ	1	「_」(アンダースコア)【固定】
⑦		処理単位	1	M: Monthly, D: Daily, H: Hourly
⑧		セパレータ	1	「_」(アンダースコア)【固定】
⑨	プロダクトID	処理レベル	3	L3+x x: S:標準処理 R:準リアルタイム処理 T:試験
⑩		セパレータ	1	「_」(アンダースコア)【固定】
⑪		アルゴリズムID (処理アルゴリズム)	3	アルゴリズム種別と開発チームを特定
⑫		セパレータ	1	「_」(アンダースコア)【固定】

1 概要

No.	種別	名称	文字数	値
⑬		プロダクトバージョン	3	XX+A: XX: 自然数 01～99 A: 英文字 A～Z 再処理はバージョン番号の数字 2 桁のみで識別する。 3 桁目の英文字はマイナーなバージョン変更を意味する。 アルゴリズムバージョンとソフトウェアバージョンはメタで管理
⑭		ファイル拡張子	3または4	「.h5」HDF5形式 「.txt」Text形式

2. 全球合成降水マップ(GSMaP)プロダクトフォーマット仕様

2.1. 処理概要

全球合成降水マップ(GSMaP)アルゴリズムは、DPR のデータや情報によって精度を向上した、GPM マイクロ波放射計(GMI) を含む複数のマイクロ波放射計(イメージャ/サウンダ)による降水量推定と、静止衛星赤外(IR)データによる雲移動の情報を複合し、時空間平均したレベル3 プロダクトである全球合成降水マップを作成するためのアルゴリズムである。処理フローの概要を「図 2.1-1 全球合成降水マップアルゴリズムフロー」に示す。

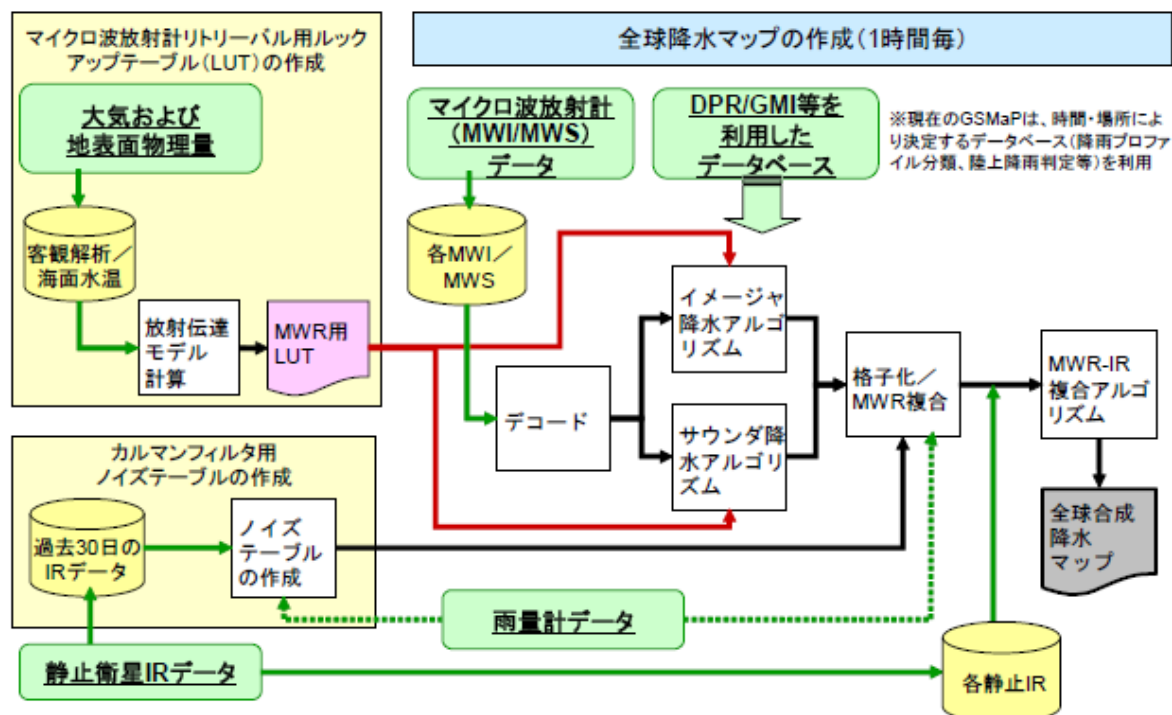


図 2.1-1 全球合成降水マップアルゴリズムフロー

(「図 2.1-1 全球合成降水マップアルゴリズムフロー」および下記文章は関連文書(5)より引用)

GSMaPアルゴリズムは、おおまかにマイクロ波イメージャ(MWI)アルゴリズム、マイクロ波サウンダ(MWS)アルゴリズム、マイクロ波-IR 複合(MVK)アルゴリズムの三種類に分けられる。

全球合成降水マップ処理は標準処理、準リアルタイム処理に分けられる。標準処理は1時間毎の観測データを処理するとともに、月平均処理を1ヶ月毎に行う。準リアルタイム処理は標準処理より即時性を確保する(1時間毎)。

2.2. ファイル入出力

「表 2.2-1 全球降水マップ処理の入出力ファイル」に全球降水マップ処理で使用する入出力ファイル

を示す。

表 2.2-1 全球降水マップ処理の入出力ファイル

(凡例 I:Input/O:Output)

No.	標準処理	準リアルタイム処理	I/O
1	マイクロ波放射計イメージ(MWI)データ	マイクロ波放射計イメージ(MWI)データ	I
2	マイクロ波放射計サウンダ(MWS)データ	マイクロ波放射計サウンダ(MWS)データ	I
3	全球客観解析値	予報値	I
4	全球日別海面水温データ(MGDSST)	全球日別海面水温データ(MGDSST)	I
5	日積算雨量計データ	日積算雨量計データ	I
6	NOAA/CPC の合成 IR データ	各衛星(GOES-EAST, GOES-WEST, INDEX, METEOSAT, MTSAT) の IR データ	I
7	全球合成降水マップレベル 3(時間平均)	全球合成降水マップレベル 3R(1 時間)	O
8	全球合成降水マップレベル 3(月平均)	なし	O

なお、「表 2.2-1 全球降水マップ処理の入出力ファイル」の「No.1,マイクロ波放射計イメージ(MWI)データ」と「No.2 マイクロ波放射計サウンダ(MWS)データ」について、具体的な副衛星のセンサ名を「表 2.2-2 全球降水マップ処理の入力ファイル(詳細)」に示す。

表 2.2-2 全球降水マップ処理の入力ファイル(詳細)

No.	衛星	センサ	区分
1	TRMM	TMI	MWI
2	Megha-Tropiques	MADRAS	MWI
		SAPHIR	MWS
3	DMSP-F16	SSMIS	MWI/MWS
4	DMSP-F17	SSMIS	MWI/MWS
5	DMSP-F18	SSMIS	MWI/MWS
6	DMSP-F19	SSMIS	MWI/MWS
7	DMSP-F20	SSMIS	MWI/MWS
8	NOAA-15	AMSU-A	MWS
		AMSU-B	MWS
9	NOAA-16	AMSU-A	MWS

No.	衛星	センサ	区分
		AMSU-B	MWS
10	NOAA-17	AMSU-A	MWS
		AMSU-B	MWS
11	NOAA-18	AMSU-A	MWS
		MHS	MWS
12	NOAA-19	AMSU-A	MWS
		MHS	MWS
13	NPP	ATMS	MWS
14	METOP-A	AMSU-A	MWS
		MHS	MWS
15	METOP-B	AMSU-A	MWS
		MHS	MWS
16	METOP-C	AMSU-A	MWS
		MHS	MWS
17	GCOM-W1	AMSR2	MWI
18	GCOM-W2	AMSR-2 f/o	MWI
19	GCOM-W3	AMSR-2 f/o	MWI
20	FY-3A	MWRI	MWI
		MWHS	MWS
		MWTS	MWS
21	FY-3B	MWRI	MWI
		MWHS	MWS
		MWTS	MWS
22	FY-3C	MWRI	MWI
		MWHS	MWS
		MWTS	MWS
23	FY-3D	MWRI	MWI
		MWHS	MWS
		MWTS	MWS
24	GPM LIO	GMI or GMI2	MWI
25	GPM-Br	GMI or MADRAS	MWI
26	JPSS-1	ATMS	MWI
27	GPM core	GMI	MWI

2.3. プロダクトフォーマット

全球合成降水マップレベル3プロダクトのフォーマット説明を以下に示す。

2.3.1. テキストプロダクト

テキストファイルのフォーマットを以下に示す。

(1) 標準プロダクト

① レコード構成

表 2.3-1 GSMaPプロダクト 標準プロダクト(テキスト)のレコード構成

ヘッダー部(1行)	レコード1
データ部(N行)	レコード1
	レコード2
	...
	...
	レコードN

② レコードフォーマット

表 2.3-2 GSMaPプロダクト 標準プロダクト(テキスト)のheaderの内容

No.	項目	内容
1	列名	Lat (固定文字列)
2	区切り	「,」(コンマ+半角空白)。以下同様
3	列名	Lon (固定文字列)
4	区切り	
5	列名	HourlyPrecipRate (固定文字列)
6	区切り	
7	列名	HourlyPrecipRateGC (固定文字列)

表 2.3-3 GSMaPプロダクト 標準プロダクト(テキスト)のdata部の内容

No.	項目	内容
1	緯度	(-)NN.NN 小数点以下 2 桁の実数
2	区切り	「,」(コンマ+半角空白複数)。以下同様
3	経度	(-)NNN.NN 小数点以下 2 桁の実数
4	区切り	
5	時間雨量	NN.NN 小数点以下 2 桁の実数
6	区切り	
7	雨量計補正済み時間雨量	NN.NN 小数点以下 2 桁の実数

(2) 準リアルタイムプロダクト(Text)

「標準プロダクト」と同様。

2.3.2. HDFプロダクト**(1) 標準プロダクト**

全球合成降水マップレベル 3 プロダクト（時間平均）のフォーマットを「表 2.3 8 全球合成降水マップレベル 3 プロダクトフォーマット（時間平均）」に示す。

全球合成降水マップレベル 3 プロダクト（月平均）のフォーマットを「表 2.3 9 全球合成降水マップレベル 3 プロダクトフォーマット（月平均）」に示す。

(2) 準リアルタイムプロダクト(時間平均)

全球合成降水マップレベル 3 プロダクト（時間平均）（準リアルタイム）のフォーマットは(1)と同じある。

表2.3-8全球合成降水マップレベル3(時間平均)プロダクトフォーマット

	Group Name 1	Group Name 2	DPR Initial 3GSMAPH Value Name	missing	min	max	unit	type	Data size	type	array	Remark
3GSMAPH	Grid	(N/A)	hourlyPrecipRate	[-4]-8]-9999.9]			mm/hr	4B float	25920000	4	1800 3600	Value Description: (0.0 or positive) Hourly precipitation rate [mm/hr]. -4 Missing due to sea ice within microwave algorithms. -8 Missing due to low temperature within microwave algorithms. -9999.9 Missing due to no observation by IR and/or microwave sensor. Dimension Description: The first dimension (the number of elements is 1800) represents latitude at 0.1 interval from -90 degree to +90 degree. The second dimension (the number of elements is 3600) represents longitude at 0.1 interval from -180 degree to +180 degree. This description goes for other datasets with 1800x3600 array.
			satelliteInfoFlag	-99				signed 8B int	51840000	8	1800 3600	satelliteInfoFlag indicates the information of all satellite/sensor which are used in estimation of precipitation rate at each pixel during one-hour time period. Data are stored in signed 8-byte integer (64-bit). Satellite and sensor name are assigned to each bit. If the flag shows value of 0, there is no satellite observation by both microwave and geo-stationary IR sensor. Missing value is defined as -99. Negative values indicates no microwave radiometer observation at that pixel. Below is a list of pixel values, bit, and corresponding instrument. Value Bit Sensor Category Satellite/Sensor 1 0 Infrared Imager NOAA/CPC aboard Geo-stationary Globally Merged IR data meteorological satellite 2 1 Microwave radiometer TRMM/TMI (imager/sounder) aboard low orbital satellite 4 2 GPM-Core/GMI 8 3 Megha-Tropiques/MADRAS 16 4 Megha-Tropiques/SAPHIR 32 5 ADEOS-11/AMSR 64 6 Aquas/AMSR-E 128 7 GCOM-W1/AMSR2 256 8 GCOM-W2/AMSR2 f/o (TBD) 512 9 GCOM-W3/AMSR2 f/o (TBD) 1024 10 DMSP-F11/SSM/I 2048 11 DMSP-F13/SSM/I 4096 12 DMSP-F14/SSM/I 8192 13 DMSP-F15/SSM/I 16384 14 DMSP-F16/SSM/I 32768 15 DMSP-F17/SSM/I 65536 16 DMSP-F18/SSM/I 131072 17 DMSP-F19/SSM/I 262144 18 DMSP-F20/SSM/I 524288 19 NOAA-15/AMSU-A/B 1048576 20 NOAA-16/AMSU-A/B 2097152 21 NOAA-17/AMSU-A/B 4194304 22 NOAA-18/AMSU-A/MHS 8388608 23 NOAA-19/AMSU-A/MHS 16777216 24 NPP/ATMS 33554432 25 JPSS-1/ATMS 67108864 26 MetOp-A/AMSU-A/MHS 134217728 27 MetOp-B/AMSU-A/MHS 268435456 28 MetOp-C/
			observationTimeFlag	-9999.9				4B float	25920000	4	1800 3600	Value Description 0 LE X LT 1 If value is positive and smaller than 1, microwave radiometer observation is available at the pixel during current one-hour period. X indicates relative observation time of latest microwave radiometer, and is stored as difference from the start time of the file. For example, if UTC of the file (HH) = 01 and X = 0.2, observation time of the pixel will be 01:12 UTC. 1 LE X If value is equal to or larger than 1, NO microwave radiometer observation is available at the pixel during time period of the file. X indicates relative observation time of coming microwave radiometer, and stored as differences from the start time of the file. For example, if UTC of the file (HH) = 01 and X= 2.5, coming observation time of microwave radiometer at the pixel will be 3:30 UTC. X LT 0 If value is negative, NO microwave radiometer observation is available at the pixel during time period of the file. X (X LT 0) indicates relative observation time of latest microwave radiometer, and stored as differences from the start time of the file. For example, if UTC of the file (HH) = 01 and X = -2.5, latest observation time of microwave radiometer at the pixel will be 22:30 UTC of previous day. X = -9999.9 No microwave observation (Missing)
			hourlyPrecipRateGC	-9999.9			mm/hr	4B float	25920000	4	1800 3600	
MetaData-3GSMAPH	FileHeader	(N/A)	gaugeQualityInfo	-9999			counts/day	signed 2B int	12960000	2	1800 3600	
			DOI						256			
			AlgorithmID						50			
			AlgorithmVersion						50			
			FileName						50			
			SatelliteName						10			
			InstrumentName						10			
			GenerationDateTime						50			
			StartGranuleDateTime						50			
			StopGranuleDateTime						50			
			GranuleNumber						50			
			NumberOfSwaths						50			
			NumberOfGrids						50			
			GranuleStart						50			
			TimeInterval						50			
			ProcessingSystem						50			
			ProductVersion						50			
			EmptyGranule						50			
			MissingData						50			
	FileInfo		DataFormatVersion					50				
			TKCodeBuildVersion					50				
			MetadataVersion					50				
			FormatPackage					50				
			BlueprintFilename					50				
			BlueprintVersion					50				
			TKIOVersion					50				
			MetadataStyle					50				
			EndianType					50				
			GranuleFirstScanUTCDateTime					50				
			GranuleLastScanUTCDateTime					50				
			TotalQualityCode					50				
	JAXAInfo		FirstScanLat					50				
			FirstScanLon					50				
			LastScanLat					50				
			LastScanLon					50				
			NumberOfRainPixelsNS					50				
			NumberOfRainPixelsMS					50				
			NumberOfRainPixelsHS					50				
			ProcessingSubSystem					50				
			ProcessingMode					50				
			AlgorithmName					100				
			CoverageRatio					100				
			InputMWSFileNumber					100				
	GSMaPInfo		InputRFileNumber					100				
			InputAncillaryFileNumber					100				
			BinMethod					50				
Registration						50						
Grid	GridHeader	LatitudeResolution						50				
		LongitudeResolution						50				
		NorthBoundingCoordinate						50				
		SouthBoundingCoordinate						50				
		EastBoundingCoordinate						50				
		WestBoundingCoordinate						50				
		Origin						50				
											142563026	

表2.3-9全球合成降水マップレベル3(月平均) プロダクトフォーマット

	Group Name 1	Group Name 2	DPR Initial GSMAPM Value Name	missing	min	max	unit	type	Data size	type array			Remark
3GSMAPM	Grid	(N/A)	monthlyPrecipRate	[-4]-8]-9999.9]			mm/hr	4B float	25920000	4	1800	3600	Value Description: (0.0 or positive) Monthly precipitation rate [mm/hr]. -4 Missing due to sea ice within microwave algorithms. -8 Missing due to low temperature within microwave algorithms. -9999.9 Missing due to no observation by IR and/or microwave sensor. Dimension Description: The first dimension (the number of elements is 1800) represents latitude at 0.1 interval from -90 degree to +90 degree. The second dimension (the number of elements is 3600) represents longitude at 0.1 interval from -180 degree to +180 degree. This description goes for other datasets with 1800x3600 array.
		(N/A)	observationNumber	-9999			counts/month	signed 4B int	25920000	4	1800	3600	
		(N/A)	standardDeviation	-9999.9			mm/hr	4B float	25920000	4	1800	3600	
		(N/A)	monthlyPrecipRateGC	-9999.9			mm/hr	4B float	25920000	4	1800	3600	
		(N/A)	gaugeQualityInfo	-9999			counts/month	signed 2B int	12960000	2	1800	3600	
MetaData-3GSMAPM	FileHeader	(N/A)	(N/A)	DOI					256				
				AlgorithmID					50				
				AlgorithmVersion					50				
				FileName					50				
				SatelliteName					10				
				InstrumentName					10				
				GenerationDateTime					50				
				StartGranuleDateTime					50				
				StopGranuleDateTime					50				
				GranuleNumber					50				
				NumberOfSwaths					50				
				NumberOfGrids					50				
				GranuleStart					50				
				TimeInterval					50				
				ProcessingSystem					50				
				ProductVersion					50				
				EmptyGranule					50				
				MissingData					50				
	FileInfo	(N/A)	(N/A)	DataFormatVersion					50				
				TKCodeBuildVersion					50				
				MetadataVersion					50				
				FormatPackage					50				
				BlueprintFilename					50				
				BlueprintVersion					50				
				TKIOVersion					50				
				MetadataStyle					50				
	JAXAInfo	(N/A)	(N/A)	EndianType					50				
				GranuleFirstScanUTCDateTime					50				
				GranuleLastScanUTCDateTime					50				
				TotalQualityCode					50				
				FirstScanLat					50				
				FirstScanLon					50				
				LastScanLat					50				
				LastScanLon					50				
				NumberOfRainPixelsNS					50				
				NumberOfRainPixelsMS					50				
				NumberOfRainPixelsHS					50				
				ProcessingSubSystem					50				
	GSMaPInfo	(N/A)	(N/A)	ProcessingMode					50				
				AlgorithmName					100				
				CoverageRatio					100				
				InputMWSFileNumber					100				
				InputIRFileNumber					100				
	Grid	(N/A)	GridHeader	InputAncillaryFileNumber					100				
				BinMethod					50				
				Registration					50				
				LatitudeResolution					50				
LongitudeResolution								50					
NorthBoundingCoordinate								50					
SouthBoundingCoordinate								50					
EastBoundingCoordinate								50					
WestBoundingCoordinate								50					
Origin								50					
									116643026				