Format Conversion Tool

Operation Manual for Users

Ver. 7.0 07/09/2024

Changes and status paragraphs

Revision	Date	Modified or	Reason for change
		added paragraphs	
1.0	10/03/2016	Creation	-
1.1	18/03/2016	6.3	Wrote KMZ output file format specification.
1.2	14/06/2016	2,4.5	Wrote the output conditions of the KMZ.
2.0	26/11/2016	2	Wrote the Binary Format of GPM product, which is available to convert into other formats. Wrote the GCOM-W product. It is available to convert into NetCDF format. Condition to convert was changed.
2.0	26/11/2016	4.2	Wrote the manual about colorbar setting screen.
2.0	26/11/2016	4.5	Wrote the button to set colorbar.
2.0	26/11/2016	4.6	Wrote the explanation about colorbar setting screen.
2.0	26/11/2016	6.1	Wrote NetCDF format which is outputted.
2.0	26/11/2016	6.3.2	Wrote the output setting parameters.
2.0	26/11/2016	8.1.1	Wrote "GSMaP Daily Rainfall in 0.25、 0.1-deg(Binary)" to GPM product.
2.0	26/11/2016	8.2	Wrote colorbar.
2.0	26/11/2016	-	Moved Section 8.1 to Appendix A.
2.0	26/11/2016	-	Moved Section 8.2 to Appendix B.
3.0	20/6/2017	4.5 Figure.5	Wrote "DPR Daily L3" KuNS product which is outputted.
3.0	20/6/2017	4.1	Changed the version of the tool.
3.0	20/6/2017	4.2, 4.3	Corrected of errors. $\lceil Run \rfloor$ was changed to $\lceil Exec \rfloor$.
3.1	21/7/2017	4.1	Changed the version of the tool.
3.1	21/7/2017	-	We have released the data format conversion tool v3.1 to solve a bug of memory leak in trying GSMaP binary data conversion.
3.1	21/7/2017	Appendix B 1.1.4	Corrected of errors. 「GSMaP Monthly L3」 was changed to 「DPR Monthly L3」
3.2	29/7/2019	6.3.3	Fixed the linked URL
3.3	24/9/2019	5.1, 5.2	Fixed the linked URL
4.0	12/3/2020	1	Added AQUA product and NetCDF format to description.
4.0	12/3/2020	2	Aqua products added to target products.
4.0	12/3/2020	4.1	Changed the version of the tool.
4.0	12/3/2020	4.1,4.2,4.3,4.5	Added a modified screen with the addition of Aqua products.
4.0	12/3/2020	5.1,5.2	Modify the link destination with the addition of Aqua products.
4.0	12/3/2020	6.1	Modify the output file with the addition of

			Aqua products.
4.0	12/3/2020	6.2,6.3	With the addition of Aqua products, modify GeoTIFF output specifications and KMZ
			output specifications.
4.0	12/3/2020	7.1,7.2	With the addition of Aqua products, modify the use cases in the image viewer and GIS
			software.
5.0	29/3/2021	1	Added GCOM-C products as tools.
5.0	29/3/2021	Table 1	Added GCOM-C products to the list of products to be converted.
5.0	29/3/2021	3	Removed Windows 8 from supported OS.
5.0	29/3/2021	4.1	Change the version of the tool.
			v4.0→v5.0
5.0	29/3/2021	4.26	Added a note about the output of GCOM-C products.
5.0	29/3/2021	5.1	Added the source of input files for GCOM-C products.
5.0	29/3/2021	5.2	Added the link destination of the input file format of GCOM-C products.
5.0	29/3/2021	6.1	Added the output file name of GCOM-C product.
5.0	29/3/2021	6.2.1 Table 12	Added the output specifications of the header
5.0	29/3/2021	6.2.2	Added the output specifications of the data part of GCOM-C products.
5.0	29/3/2021	7	Added use cases for GCOM-C products.
6.0	28/10/2021	4.1	Change the version of the tool due to the version upgrade (V7) of the GPM / DPR product. $v_5 \to v_6 \to 0$
7.0	27/00/2024	2	Addad Windows 11 to the list of supported
7.0	27/09/2024	5	operating systems.
7.0	27/09/2024	4.1	Changed the tool version to support Windows 11. $V6.0 \rightarrow v7.0$

1. Introduction	1
2. Conversion target products	2
3. Supported operating systems (OSs)	2
4. Operation description	3
4.1 Basic procedures of the Format Conversion Tool	3
4.2 Format conversion process (basic)	5
4.3 Main screen	9
4.4 Folder selection screen	
4.5 Options screen	11
4.6 Colorbar setting screen	
4.7 Help screen	17
5. Input file	18
5.1 List of URL to get input files	
5.2 List of URL written about input file format	
6. Output file	18
6.1 Output file name	
6.2 GeoTIFF Output Specification	
6.2.1 GeoTIFF header part output specification	
6.2.2 GeoTIFF data part output specification	
6.3 KMZ output specification	24
6.3.1 KML output specification	
6.3.2 TIFF Output specification	25
6.4 NetCDF Output specification	
7. Examples of using Format Conversion Tool	27
7.1 Use by GIS Software	
7.2 Use by GIS Software	

1. Introduction

This documentation explains how to use Format Conversion Tool.

Format Conversion Tool is used to convert Binary Format data such as HDF5/HDF4 to GeoTIFF format data and KMZ format data and NetCDF format data.

HDF Format is used for many JAXA's satellite products such as GPM, GCOM-W, AQUA, JASMES, GCOM-C.

HDF format is also used for satellite data. Because multidimensional arrays and database-like tables can be nested in HDF file. It is useful to handle data.

However, it is needed to install some softwares or libraries for reading HDF product, so it is too hard for the general user to use HDF product (Fig. 1).



Fig. 1 HDF Data Handling without Format Conversion

User get to use GPM products in GeoTIFF or KMZ or NetCDF to view, edit or analyze the GIS information by using GIS software such as ArcGIS, QGIS, Google Earth and Image Viewers. If user use Format Conversion tool, GPM Data can be used more fields (Fig. 2).



Fig. 2 Expanding Data Utilization after Format Conversion

2. Conversion target products

The conversion target products are listed in Table 1.

Target products *1	Input format	Output format
CDM and the sta	HDF5	GeoTIFF
GPM products	Binary	KMZ
		GeoTIFF
GCOM-W products	LIDE5	TIFF + TEXT *2
	през	KMZ
		NetCDF
LASMES and ducts	HDF4	GeoTIFF
JASMES products	Binary	KMZ
		GeoTIFF
AOUA products	HDF5	TIFF + TEXT *2
AQUA products	IIDI'J	KMZ
		NetCDF
GCOM-C products	HDF5	GeoTIFF

Table 1 List of conversion target products

*1 The details of conversion target products are written in appendix A.

*2 It is available only L1 and L2 product.

3. Supported operating systems (OSs)

The OSs supported by the Format Conversion Tool are listed below.

➢ Windows 11, Windows 10

4. Operation description

The basic procedures of the Format Conversion Tool are listed in "4.1," quick explanation of Format conversion process(basic) are listed in "4.2" and detailed explanations of each screen are listed in "4.3-4.6."

4.1 Basic procedures of the Format Conversion Tool

- ① Execute FormatConversionTool Setup v7.0.exe
- ② Click "Yes" button on the following page.



③ If .NET Framework, Visual C++ 14 Runtime Libraries(v142) is not installed, the following dialog is displayed. Click the "Install" button. You may need to restart after installation.



④ Click "Next" button on Setup Wizard page.(When restarting, it is necessary to perform ①.)



(5) Click "Next" button on Select Installation Folder page.

🕼 FormatConversionTool	-		×
Select Installation Folder			-
The installer will install FormatConversionTool to the following folder.			
To install in this folder, click "Next". To install to a different folder, enter it belo	ow or c	lick "Brow	se".
Eolder:			
C:¥Program Files (x86)¥FormatConversionTool¥		Browse.	
		<u>D</u> isk Cos	t
Install FormatConversionTool for yourself, or for anyone who uses	this c	omputer:	
● Everyone			
⊖Just <u>m</u> e			
< Back Next >		Car	icel

6 Click "Next" button on Confirm Installation page.

🕼 FormatConversionTool	-		×
Confirm Installation			5
The installer is ready to install FormatConversionTool on your computer.			
Click "Next" to start the installation.			
< <u>B</u> ack <u>Next</u> >		Ca	ncel

1 Click "Close" button on Installation Complete page.

🕼 FormatConversionTool			-		×
Installation Complete					
FormatConversionTool has been succe	essfully installed.				
Click "Close" to exit.					
Please use Windows Update to check f	ior any critical upda	tes to the .NET Fre	imework	c	
	< <u>B</u> ack	<u>C</u> lose		Can	cel

4.2 Format conversion process (basic)

① Run FormatConversionTool.exe and launch this tool.

		😾 Format Conversion Tool	– 🗆 ×
=	A [Output Format Image: Second FF Image:	Option Help
	Acrobat Reader DC		Data Leta
	Alarms & Clock	Name Date Size Name	Date Size
	Audio Controls		
	c		
	Calculator		
	Calendar		
	Camera		
	Cortana	Even Cancel	Close
	E X II - Liter 2010	Information	
	Explzh	It is displayed at run time progress, error, etc.	^
8			
D	FormatConversion 个		~
	FormatConversionTooLexe 新規		
ø	📙 Fuji Xerox 🗸 🗸		
		HP Client Security	
Ö			

② Press the "Options" button on the main screen. In the Options screen, set the output file projection method, physical quantity, and physical quantity prefix. (Optional)

💀 Format Conversion Tool	– 🗆 X
Input	Output Format GeoTIFF KMZ TIFF+TEXT NetCDF Option Help Output
Name 💀 OptionForm	- 🗆 X
GPM [GCOM-W] AQUA JASMES Projection(KM2/ lat/lon (EQR)	Color bar setting
Target 🔽 TPW TPW	CLW CLW SSW ISSW SST_STD
SST_RSR SST_RSR	SND SND IV ONULOWE JOINLOWE IV SMC
SIC SIC	
AMSR ^{*****} ss Temperature	
Projection(GeoTIFF) 🙃 lat/lon (EQR) 🔿 polar stered	North and South
Project st/lon (EQR)	Color bar setting
It is disple Target IV BT H BT_H IV B	TV BTV
AMSR2 L3 Geophysical Data	
Projection(GeoTIFF)	North and South 🖃 Select projection
Projection(KMZ) lat/lon (EQR)	Color bar setting
Target 🔽 TPW TPW	CLW CLW PRC PRC SSW SSW
Prefix ♥ SST_STD SST_STD	SST_RSR SST_RSR IF SND SND IF SND_SWE
SMC SMC	I⊽ SIC SIC
	Save Close

③ Press the "Colorbar Setting" button in the Option and input the parameter of colorbar when it is outputted as KMZ format.

It is possible to omit.

📱 OptionForm	- 🗆 X]
GPM GCOM-W AQUA	A JASMES	
Global	·	
Projection(GeoTIFF)	lat/lon (EQR)	
Projection(KMZ)	lat/lon (EQR) Color bar setting	
Target	v chla chla v dpa dpar v lst llst v ndvi ndvi	
	v olst olst v par v ptw v ptw v rgb rgb	
	Version ColorbarSettingForm -	>
	JASMES Global	_
	C chla	
Japan Area	C Custom Min 0 Max 0 Type Linear 💌 Invalid value	
Projection(GeoTIFF)	lat dpar	
Projection(KMZ)	lat 🕫 Default	
Target	C Custom Min 0 Max 0 Type Linear Invalid value	
	l ∽ Ist	
	✓ Operault	
	C Custom Min 0 Max 0 Type Linear 🔽 Invalid value	
	Save	ose

④ In the main screen, select the output format (GeoTIFF, KMZ, TIFF+TEXT or NetCDF).

🔛 Format Conversion Tool			_	
Input		Output Format ↓ GeoTIFF ↓ KMZ ↓ TIFF+TEXT ↓ NetCDF Output ↓	Option	Help
Name	Date Size	Name	Date	Size
	Exec	Cancel		Close
Information				
It is displayed at run time progress, error, etc.				< >



(5) In the main screen, select the input/output folders.

(6) Select conversion target file(s) from the main screen input file list and press "Exec"

🖳 Format Conversion Tool			-	
Input	tdata¥1.GPM¥	1gsmap-hou	Output Format GeoTIFF KMZ TIFF+TEXT NetCDF Option Output CitUsers¥006000ASNARO¥Desktop¥Format¥testdata¥output	Help
Name	Date	Size	Name Date	Size
GPMMRG_MAP_1403010000_H_L3S_MCH_04Bh5	2017/06/	4.41 MiB		
GPMMRG_MAP_1705200000_H_L3R_MFW_04Ch5	2017/06/	3.80 MiB		
GPMMRG_MAP_1706010000_H_L3S_MCH_04Dh5	2017/08/	4.37 MiB		
		Exec	Cancel	Close
Information				
There is no-files in Output folder.				<

- * For GCOM-C products, it takes time to output the file due to its large size. Please wait until complete is displayed in Information. You can shorten the output time by narrowing down the Target on the options screen.
- ⑦ The converted format files will be output to the output folder. (Complete)

🖳 Format Conversion Tool			— [⊐ ×
Input	tdata¥1.GPM¥1gsmap-hou	Output Format GeoTIFF KMZ TIFF+TEXT NetCDF Output C¥Users¥006000.ASNARO¥Desktop¥Format¥test	Option data¥output	Help
Name	Date Size	Name	Date	Size
GPMMRG_MAP_1403010000_H_L3S_MCH_04Bh5	2017/06/ 4.41 MiB	GPMMRG_MAP_1403010000_H_L3S_MCH_04B_PRC.tif	2020/03/	. 24.73 MiB
GPMMRG_MAP_1705200000_H_L3R_MFW_04Ch5	2017/06/ 3.80 MiB	GPMMRG_MAP_1705200000_H_L3R_MFW_04C_PRC.tif	2020/03/.	. 24.73 MiB
GPMMRG_MAP_1706010000_H_L3S_MCH_04D.h5	2017/08/ 4.37 MiB	GPMMRG_MAP_1706010000_H_L3S_MCH_04D_PRC.tif		
	Exec	Cancel		Close
Information				
GPMMRG_MAP_1706010000_H_L3S_MCH_04Dh5' is pro It is GSMaP/Hourly-L3 Product. Reading product data Generate image files GeoTIFF file(GPMMRG_MAP_1706010000_H_L3S_MCH_0	cessing, now			^

4.3 Main screen

This is the screen for executing format conversions according to the selected mode.

Select the input file, the output format, and the output folder and pressing the Exec button. The converted format file will be output to the output folder.

A screenshot of the main screen is shown in Fig. 3, and descriptions of screen elements are listed in Table 2.



Fig. 3 Screenshot of the main screen

Table 2 Main screen elements

No.	Name	Description
1	Output format	Selects the output file format (GeoTIFF, KMZ, TIFF+TEXT or NetCDF).
	selection checkbox	
2	Input folder selection	Opens the folder selection screen.
	button	
3	Input folder box	Displays the folder path selected in the folder selection screen.
4	Input file list	It is possible to add to the list by dragging and dropping.
		Multiple files can also be selected using Shift and Ctrl.
		Displays a list of files in the selected folder path.
5	Output folder	Opens the folder selection screen.
	selection button	
6	Output folder box	Displays the folder path selected in the folder selection screen.
7	Output file list	It is possible to perform conversions by dragging and dropping from the list of input files.
		It is possible to change file name by choosing file.
		Displays a list of files in the selected folder. (Black)
		Displays the output files created after conversion. (Red)
8	Exec button	Runs the conversion process. Outputs converted files to the output folder based on the
		input file and output format.
9	Cancel button	Stops the conversion process.
10	Options button	Opens the options screen.
11	Help button	Displays the help screen.
12	Close button	Exits tool.
13	Information box	Displays the activity log and errors.

4.4 Folder selection screen

This is the screen for selecting folders. The selected folder will be reflected in the main screen's input folder and output folder.

A screenshot of the folder selection screen is shown in Fig. 4, and descriptions of screen elements are listed in Table 3.

1		
v 🚺	testdata	^
~	1.GPM	
	1.gsmap-hourly	
	2.gsmap-monthly	
	3.gsmap-daily-0.25	
	4.gsmap-daily-0.1	
	5.dpr-daily	
	6.dpr-monthly	
	x.other	
~	2.GCW	
	111-	

Fig. 4 A screenshot of the folder selection screen

No.	Name	Description
1	Folder selection box	Selects the output folder.
2	OK button	Closes the folder selection screen. Select the main screen input/output folder box to display the folder path, and all files contained in that path will be displayed as a list of input/output files.
3	Cancel button	Closes the folder selection screen.

4.5 Options screen

This screen is for setting the output file projection method, physical quantity, and physical quantity prefix (end character string of output file). When executing a conversion from the main screen, the format conversion process is run according to the settings in this screen.

Screenshots of the options screen are shown in Fig. 5, Fig. 6, Fig. 7, Fig. 8 and descriptions of screen elements are listed in Table 4.

🖳 OptionForm						_		×
GPM GCOM-W AQUA	JASMES 1							
GSMap Hourly L3		•						_
2 Projection(GeoTIFF)	lat/lon (EQR)							
3 Projection(KMZ)	lat/lon (EQR)	Color bar setting						
5) Target(PrecipRate)	PrecipRate							
GSMap Monthly L3								
Projection(GeoTIFF)	lat/lon (EQR)							
Projection(KMZ)	lat/lon (EQR)	Color bar setting						
Target(PrecipRate)	PrecipRate PRO)						
DPR Daily L3								
Projection(GeoTIFF)	lat/lon (EQR)							
Projection(KMZ)	lat/lon (EQR)	Color bar setting						
Target(PrecipRate)	DPRMS Ascending	PRC_DPM_A	✓ DPRMS Descending	PRC_DPM_D				
	V KuNS Ascending	PRC_KUN_A	🔽 KuNS Decsending	PRC_KUN_D				
DPR Monthly L3								
Projection(GeoTIFF) Projection(KMZ)	lat/lon (EQR) lat/lon (EQR)	Color bar setting						
Target(PrecipRate)	— KuNS stratiform	PRC_KUN_STR	🔲 KuNS convective	PRC_KUN_CON	🔽 KuNS all	PRC_KUN_AI	LL	
	🔲 KaMS stratiform	PRC_KAM_STR	🔲 KaMS convective	PRC_KAM_CON	🔲 KaMS all	PRC_KAM_A	LL	
	🔲 KaHS stratiform	PRC_KAH_STR	🔲 KaHS convective	PRC_KAH_CON	🔲 KaHS all	PRC_KAH_A	LL	
	DPRMS stratiform	PRC_DPM_STR	DPRMS convective	PRC_DPM_CON	🗖 DPRMS all	PRC_DPM_A	LL	
	🔲 KuMS stratiform	PRC_KUM_STR	🔲 KuMS convective	PRC_KUM_CON	🔲 KuMS all	PRC_KUM_A	LL	
					(7) Save	Close	. 8	

Fig. 5 Screenshot of options screen (GPM tab)

OptionForm								- 0
PM GCOM-W AQUA	JASMES (1)	7						
AMSD1110 Observent	an Count /I 1D Drinknoo							
Projection(GeoTIFF)	lat/lon (EOB)	s remperature –						
Projection(KMZ)	lat/lon (EQR)		Color bar set	ting				
Target		•			E 3000 U			2001
TGIBO(IV 0.9GHZ,H).9GHz_H (6	0.9GHZ,V	0.9GHz_V	J ⊻ 7.3GHz,H	7.3GHz_H	♥ 7.3GH2,V	7.3GHz_V
	▽ 10.7GHz,H 1	10.7GHz_H	✓ 10.7GHz,V	10.7GHz_V	I& 18.7GHz,H	18.7GHz_H	I8.7GH,V	18.7GHz_V
	✓ 23.8GHz,H	23.8GHz_H	✓ 23.8GHz,V	23.8GHz_V	🔽 36.5GHz,H	36.5GHz_H	☑ 36.5GHz,V	36.5GHz_V
	🔽 89GHz−A,H	39.0GHz-A_H	✓ 89GHz-A,V	89.0GHz-A_V	🔽 89GHz-B,H	89.0GHz-B_H	▼ 89GHz-B,V	89.0GHz-B_V
	Tomporatura							
Projection(GeoTIFF)	lat/lon (FOR)							
Projection(KMZ)	lat/lon (EQR)		Color bar set	ting				
Targat		-		(III)				
Talget	resouo	r06 6.9GHz H	✓ 6.9GHz,V	r06 6.9GHz V	▼ 7.3GHz,H	r06 7.3GHz H	▼ 7.3GHz,V	r06 7.3GHz V
	▼ 10.7GHz,H	r06 10.7GHz H	✓ 10.7GHz,V	r06 10.7GHz V	✓ 18.7GHz,H	r06 18.7GHz H	✓ 18.7GH,V	r06 18.7GHz \
	✓ 23.8GHz,H	r06 23.8GHz H	✓ 23.8GHz,V	r06 23.8GHz V	✓ 36.5GHz,H	r06 36.5GHz H	✓ 36.5GHz,V	r06 36.5GHz \
	₩ 89.0GHz.H	106 89.0GHz H	▼ 89.0GHz.V	r06 89.0GHz V		1		1
	reso10			here have a second s				
	🔽 10.7GHz,H 🛛	10_10.7GHz_H	☑ 10.7GHz,V	r10_10.7GHz_V	🔽 18.7GHz,H	r10_18.7GHz_H	▼ 18.7GHz,V	r10_18.7GHz_\
	🔽 23.8GHz,H 🔤	10_23.8GHz_H	☑ 23.8GHz,V	r10_23.8GHz_V	🔽 36.5GHz,H	r10_36.5GHz_H	₩ 36.5GHz,V	r10_36.5GHz_\
	🔽 89.0GHz,H 🛛	10_89.0GHz_H	▼ 89.0GHz,V	r10_89.0GHz_V				
	reso23				_			
	I8.7GHz,H r	23_18.7GHz_H	✓ 18.7GHz,V	r23_18.7GHz_V	✓ 23.8GHz,H	r23_23.8GHz_H	✓ 23.8GHz,V	r23_23.8GHz_\
	▼ 36.5GHz,H	23_36.5GHz_H	☑ 36.5GHz,V	r23_36.5GHz_V	🔽 89.0GHz,H	r23_89.0GHz_H	▼ 89.0GHz,V	r23_89.0GHz_\
	reso36 I 36.5GHz,H I	⁻ 86_36.5GHz_H	☑ 36.5GHz,V	r36_36.5GHz_V	🔽 89.0GHz,H	r36_89.0GHz_H	🔽 89.0GHz,V	r36_89.0GHz_\
	original I⊽ 89GHz-A,H [r	r89-89GHz-A	✓ 89GHz-A.V	r89_89GHz-A \	✓ 89GHz-B.H	r89 89GHz-B ł	▼ 89GHz-B.V	r89 89GHz-B
				,		,		, -
AMSR2 L2 High resolu	tion Geophysical Data—							
Projection(GeoTIFF)	lat/lon (EQR)							
Projection(KMZ)	lat/lon (EQR)		Color bar set	ting				
Target	RPC for 89A	PRC_89A	I	RPC for 89B	PRC_89B			
AMSR2 L2 Low resolut	ion Geophysical Data							
Projection(GeoTIFE)	lat (lan (EOD)							
Projection(KMZ)	lat/lon (EQR)		Color has and					
Target			Color bar set					
larget		W	ici wor⊽ Secure s	LW	SSW S	SW	SST_STD	SST_STD
	IV SSI_RSR SS	ST_RSR	IV SND ISI	ND	IN SND_SWE S	ND_SWE	Iv SMC	SMC
	l ∧ sic si	G						
AMSR2L3Brightness	Temperature							
Projection(GeoTIFF)	Iat/lon (EQR)	C polar stereo	North and Sou	th 🔻				
Projection(KMZ)	lat/lon (EQR)		Color bar set	ting				
Target	₽ ВТН ВТН	I I I I I I I I I I I I I I I I I	VBTV					
	- J		1					
AMSR2 L3 Geophysica	Data							
Projection(GeoTIFF)	Iat/Ion (EQR)	C polar stereo	North and Sou	ith 🔻				
Projection(KMZ)	lat/lon (EQR)		Color bar se	tting				
Target	TPW TPW		CLW I	CLW	PRC PR	C	▼ SSW	SSW
			I					
	SST_STD SST_S	TD	SST_RSR	SST_RSR	SND SN	D	I▼ SND_SWE	SND_SWE
	SMC SMC		🔽 SIC	SIC				
	,							

Fig. 6 Screenshot of options screen (GCOM-W tab)

🖳 OptionForm			– 🗆 ×
GPM GCOM-W AQUA	[JASMES] (1)		
Global			
Projection(GeoTIFF)	lat/lon (EQR)		
BProjection(KMZ)	lat/lon (EQR) (4 Color bar setting		
Target	🔽 chla 🙃 🔽 dpar dpar	lst 🔽 🔽 ndvi	ndvi
	🔽 olst 🔽 🔽 par par	ptw 🔽 🔽 reb	rgb
	🔽 rpar 🔽 🖾 swr swr	taua 🛛 🔽 tip	tip
	🔽 uva 🛛 uvb 🗤b	wf 🔽 wst	wst
	▼ snwcfr_ghrm5c(cs_flg_tpf) sg5c_cft ▼ snwcfr_ghrm5	5c(Surface_Flag) sg5c_sft	
	▼ snwcfr_mds10c(cs_flg_tpf) snwcfr_mds1	Oc(Surface_Flag) sm10c_sft	
Japan Area			
Projection(GeoTIFF)	lat/lon (EQR)		
Projection(KMZ)	lat/lon (EQR) Color bar setting		
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	<pre>✓ snwcfr(cs_fig_tpf) s_cft</pre> ✓ snwcfr(Surface_File)	lag) s_sf	
Thailand Area			
Projection(GeoTIFF)	lat/lon (EQR)		
Projection(KMZ)	lat/lon (EQR) Color bar setting		
Target	🔽 chla 🔽 🔽 dpar 🖉 ni	dvi ndvi 🔽 olst	olst
	Iv par par Iv ptw ptw Iv re	gb rgb 🔽 rpar	rpar
	🔽 swr 🛛 swr 🔽 🔽 taua 🕅 taua	ip tip 🔽 uva	uva
	v uvb vvb vvf vvf vvf vv	vst wst	
Gobi Desert Area			
Projection(GeoTIFF)	lat/lon (EQR)		
Projection(KMZ)	lat/lon (EQR) Color bar setting		
Target(aerosol)	I⊽ rcr Ircr I⊽ taua Itaua I⊽ aot	aot	
		Save	Close (8)

Fig. 7 Screenshot of options screen (JASMES tab)

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AMSR-E L3 Brightness Temperature Projection(GeoTIFF) ist/lon (EQR) color bar setting Target Frojection(KMZ) AMSR-E L3 Geophysical Data Projection(GeoTIFF) ist/lon (EQR) polar stereo North and South Projection(KMZ) Iat/lon (EQR) polar stereo North and South Projection(KMZ) Iat/lon (EQR) polar stereo North and South Projection(KMZ) Target Frogection(KMZ) Target Frogection(SMZ) FrogeCieve(SMZ) F	MSR-E L3 Brightness Temperature Projection(GeoTIFF) © lat/lon (EQR) C polar stereo North and South ▼ Projection(KMZ) lat/lon (EQR) Color bar setting Parget IFTH IFTH IFTH Projection(GeoTIFF) © lat/lon (EQR) C polar stereo NMSR-E L3 Geophysical Data Image: Color bar setting Projection(KMZ) Iat/lon (EQR) C polar stereo Projection(KMZ) lat/lon (EQR) C color bar setting Projection(KMZ) lat/lon (EQR) C color bar setting Projection(KMZ) lat/lon (EQR) C color bar setting Projection(KMZ) lat/lon (EQR) Image: Color bar setting Projection(KMZ) Ist/lon (EQR) Image: Color bar setting Projection(KMZ) Ist/lon (EQR) Image: Color bar setting Farget Image: Color bar setting Image: Color bar setting Image: Image: Image: Image: Image: Color bar setting Image: Color bar setting Image: I		IV SST_RSR S	ST_RSR	IZ SND SI	ND	SND_SWE S	ND_SWE	SMC	SMC
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Projection(KMZ) lat/lon (EQR) Color bar setting Target IF BT H IF BT V BT_V AMSR-E L3 Geophysical Data Image: Color bar setting Image: Color bar setting Projection(GeoTIFF) Image: Color bar setting Image: Color bar setting Projection(KMZ) Iat/lon (EQR) C polar stereo North and South Image: Color bar setting Target Image: Color bar setting Target Image: Color bar setting Image: Image	Introjection(KMZ) Iat/Ion (EQR) Color bar setting iarget IF BTH BTH IF BTV BTV IMSR-E L3 Geophysical Data Projection(GeoTIFF) Ist/Ion (EQR) Iat/Ion (EQR) Color bar setting Projection(KMZ) Iat/Ion (EQR) Iat/Ion (EQR) Color bar setting Farget If TPW If SST_STD If SST_RSR If SST_STD If SST_RSR If SMC SMC	Projection(GeoTIFF)	Iat/Ion (EQR)	C polar stereo	North and Sou	ith 🔻				
Target IF BT H BT V BT_V AMSR-E L3 Geophysical Data Projection(GeoTIFF) • Iat/lon (EQR) • Clor bar setting Target • Iat/lon (EQR) • Clow Color bar setting Target • Operator of the setting • SST_STD • SST_STD • SST_RSR • SST_RSR • SND • SND_SWE SND_	arget V BT H BT H V BT V BT V MSR-EL3 Geophysical Data Projection(GeoTIFF) I at/lon (EQR) O polar stereo Projection(KMZ) Iat/lon (EQR) Color bar setting Farget V TPW TPW V SST_STD V SST_RSR V SND V SMC SMC V SIC V SMC SMC V SIC	Projection(KMZ)	lat/lon (EQR)		Color bar set	ting				
AMSR-E L3 Geophysical Data Projection(GeoTIFF) • lat/lon (EQR) • polar stereo North and South Projection(KMZ) lat/lon (EQR) • Clow • Clw • PRC • PRC • SSW SSW Target • TPW • TPW • CLW • CLW • CLW • PRC • PRC • SSW • SSW • SST_STD • SST_RSR • SST_RSR • SND • SND_SWE • SND_SWE • SND_SWE • SND_SWE • SND_SWE • SND_SWE	IMSR-EL3 Geophysical Data Projection(GeoTIFF) Iat/Ion (EQR) Color bar setting Farget ITPW ITPW	Target			V BTV					
AMSR-E L3 Geophysical Data Projection(GeoTIFF) Ist/lon (EQR) Polar stereo North and South Ist/lon (EQR) Iat/lon (EQR) Color bar setting Target If TPW If SST_STD If SST_RSR If SMC SMC Ist SIG	MSR-E L3 Geophysical Data Projection(GeoTIFF)			l€ Di	v 101_v					
Projection(GeoTIFF) Iat/lon (EQR) Projection(KMZ) Iat/lon (EQR) Color bar setting Target TPW TPW CLW CLW CLW PRC PRC PRC SSW SSW SST_STD SST_RSR SND SND_SWE SND_SWE SND_SWE SND_SWE SND_SWE SND_SWE 	Projection(GeoTIFF) Ist/lon (EQR) O polar stereo North and South Image: Color bar setting Projection(KMZ) Iat/lon (EQR) Color bar setting Image: Color bar setting Farget Image: TPW TPW Image: Color bar setting Image: Image: Image: Color bar setting Image: Color bar setting Image: Image: Image: Color bar setting Image: Color bar setting Image: Image: Image: Color bar setting Image: Color bar setting Image: Image: Image: Color bar setting Image: Color bar setting Image: Image: Image: Color bar setting Image: Color bar setting Image: Image: Image: Color bar setting Image: Color bar setting Image: Image: Image: Color bar setting Image: Color bar setting Image: Image: Image: Color bar setting Image: Color bar setting Image: Image: Image: Color bar setting Image: Color bar setting Image: Image: Image: Color bar setting Image: Color bar setting Image: Image: Image: Image: Image: Color bar setting Image: Color bar setting Image: Image: Image: Image: Image: Image: Color bar setting Image: Color bar setting Image: I	AMSR-EL3 Geophysic	al Data							
Projection(KMZ) Iat/Ion (EQR) Color bar setting Target IF TPW TPW IF CLW IF PRC IF SSW ISSW IF SST_STD IF SST_RSR IF SND IF SND_SWE ISND_SWE ISND_SWE ISND_SWE IF SMC ISMC IF SIC ISIC IF IF IF IF	Projection(KMZ) lat/lon (EQR) Color bar setting Farget IF TPW IF CLW IF PRC IF SSW SSW IF SST_STD IF SST_RSR IF SND IF SND_SWE SND_SWE SND_SWE IF SMC SMC IF SIC IF SIC SIC SIC	Projection(GeoTIFF)	Iat/Ion (EQR)	C polar stereo	North and Sou	ıth 💌				
Target IF TPW IF CLW IF PRC IF SSW IF SST_STD IF SST_RSR IF SND IF SND_SWE IF SMC IF SIC ISIC	Fareet IF TPW TPW IF CLW CLW IF PRC PRC IF SSW ISSW IF SST_STD ISST_STD IF SST_RSR ISST_RSR IF SND SND IF SND_SWE ISND_SWE IF SMC ISMC IF SIC ISIC	Projection(KMZ)	lat/lon (EQR)		Color bar se	tting				
Image: String of the string	Image: Structure Image: Structure <td>Target</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>0</td> <td>SSW</td> <td>SSW</td>	Target						0	SSW	SSW
IF SST_STD IF SST_RSR ISST_RSR IF SND SND IF SND_SWE ISND_SWE IF SMC IF SIC ISIC	Image: SST_STD Image: SST_SST_SST Image: SND_SWE Image: SN		,			~ E 11		~	,• 0011	
IZ SMC ISIC ISIC			SST_STD SST_S	STD	SST_RSR	SST_RSR	SND SN	D	SND_SWE	SND_SWE
			SMC SMC		r sic [SIC				
			1							

iCOM-CL1BVNR		-				
Projection(GeoTIFF)	lat/lon (EQR) (2)					
Target	✓ Land_warer_flag	Land_water_flag	Lt_VN01	Lt_VN01	✓ Lt_VN02	Lt_VN02
5	✓ Lt_VN03	Lt_VN03	✓ Lt_VN04	Lt_VN04	✓ Lt_VN05	Lt_VN05
	✓ Lt_VN06	Lt_VN06 (6)	✓ Lt_VN07	Lt_VN07	✓ Lt_VN08	Lt_VN08
	✓ Lt_VN09	Lt_VN09	Lt_VN10	Lt_VN10	ELL_VN11	Lt_VN11
	🔽 QA_flag	QA_flag	-	,		
	1.1/1 (FOP)					
Torget	lat/ion (EQR)					
larget	Land_warer_flag	Land_water_flag	✓ Lt_P1_0	Lt_P1_0	✓ Lt_P1_m60	Lt_P1_m60
	60 Lt_P1	Lt_P1_p60	✓ Lt_P2_0	Lt_P2_0	✓ Lt_P2_m60	Lt_P2_m60
	60م_Lt_P2	Lt_P2_p60	✓ Lt_PI01	Lt_PI01	Lt_PI02	Lt_PI02
	✓ Lt_PQ01	Lt_PQ01	Lt_PQ02	Lt_PQ02	Lt_PU01	Lt_PU01
	✓ Lt_PU02	Lt_PU02	🔽 QA_flag	QA_flag		
Projection(GeoTIFF)	lat/lon (EOP)					
Target		I and writes Also		1+ \$1001	I + SM00	1+ 5000
	Iv Lang_warer_flag	juang_water_flag				Lt_SW02
		Lt_SW08	IV Lt_SW04	Lt_SW04	I≪ Lt_1101	[Lt_1101
	I✔ Lt_1102	Lt_TI02	I✔ QA_tlag	QA_flag		
COM-CL2NWLR						
Projection(GeoTIFF)	lat/lon (EQR)					
Target	VELR 380	NWLB 380	VWLB 412	NWLB 412	VWLR 443	NWLB 443
	VWI R 490	NWI R 490	VWI B 530	NWI R 590	VWLR 565	NWI R 565
		NWLD 670		DVD		
		INWLR_070		TALLA COL	IV GM_Hdg	JUH_TIAE
	I€ 1MOM_070	11MUM_070	A 1004_009	11MUM_800		
COM-CL2IWPR						
Projection(GeoTIFF)	lat/lon (EQR)					
Target	CDOM	CDOM	CHLA	CHLA	QA_flag	QA_flag
	TSM	TSM	_	,) - -
		,				
Brojection(GeoTIEE)	1.1/1(50.0)					
Trupection(Geo HFF7	lat/lon (EQR)					
larget	Cloud_probability	Cloud_probability	☑ QA_flag	QA_flag	SST	SST
GCOM-CI2ITOA						
Projection(GeoTIFF)	lat/lon (EQR)					
Target	Jand water flag	I and water then		LA D1 0		LA D1 80
	I♥ Lariu_water_riag	Land_water_flag				
	IV Lt_P1_pou	Lt_P1_p60	IV Lt_P2_0	Lt_P2_0	IV Lt_P2_mou	Lt_P2_mb0
	IV Lt_P2_p60	Lt_P2_p60	IV Lt_PIU1	Lt_PI01	IV Lt_P102	Lt_PI02
	✓ Lt_PQ01	Lt_PQ01	I✓ Lt_PQ02	Lt_PQ02	I Lt_PU01	Lt_PU01
	✓ Lt_PU02	Lt_PU02	✓ Lt_SW01	Lt_SW01	✓ Lt_SW02	Lt_SW02
	✓ Lt_SW03	Lt_SW03	I Lt_SW04	Lt_SW04	✓ Lt_TI01	Lt_TI01
	✓ Lt_TI02	Lt_TI02	✓ Lt_VN01	Lt_VN01	✓ Lt_VN02	Lt_VN02
	Lt_VN03	Lt_VN08	Lt_VN04	Lt_VN04	Lt_VN05	Lt_VN05
	I Lt_VN06	Lt VN06		Lt_VN07	Lt_VN08	Lt VN08
	Lt VN08P	Lt VN08P	Lt VN09	Lt VN09	Lt VN10	Lt VN10
	Lt VN11	Lt VN11	Lt_VN11P	Lt VN11P	QA flag	QA flag
		1		1		Laurina a
COM-CL2RSRF						
Projection(GeoTIFF)	lat/lon (EQR)					
Target	Angstrom	Angstrom	✓ Land_water_flag	Land_water_flag	PAR	PAR
	🔽 QA flag	QA flag	Rs PI01	Rs PI01	Rs PI02	Rs PI02
	Rs SW01	Bs SW01	Rs SW02	Bs SW02	Rs SW03	Rs SW02
	Re SW04	Re SW04	Rs VN01	Rs \/N01	Re 1/N02	Re V/N02
	Re VM02	Do 1/N09				
				D= 1/0/07		
	IM RS_VNU6	KS_VNU6	VINU/	KS_VNU/	IV Rs_VN08	KS_VNU8
	Rs_VN08P	Rs_VN08P	IV Rs_VN09	Rs_VN09	IM Rs_VN10	Rs_VN10
	I Rs_VN11	Rs_VN11	I▼ Rs_VN11P	Rs_VN11P	I▼ SWR	SWR
	✓ Tau_500	Tau_500	Г ТЪ_ТІ01	TB_TI01	Г ТЬ_ТІ02	Tb_TI02
COM-CL2IST						
Projection(GeoTIFF)	lat/lon (EQR)					
Target	E E01	E01	E E02	E00		ICT
-	V DA flag		- L02	102	I. 191	LOI
	i. ∧u ¹ ia£	lau"ila				
COM-CL2CLFG						
Projection(GeoTIFF)	lat/lon (EQR)					
Farget	✓ Cloud_flag	Cloud_flag				

Fig. 9 Screenshot of options screen (GCOM-C tab)

Table 4 Options screen elements

No.	Name	Description		
1	Select product tab	Select the product (GPM, GCOM-W, AQUA, JASMES or GCOM-C) to set options		
		for.		
2	GeoTIFF output	Select the projection method (parallel latitude/longitude projection, polar stereo		
	projection	projection) for when exporting GeoTIFF.		
		When selecting polar stereo projection, select the target output area (northern &		
		southern hemispheres, northern hemisphere, or southern hemisphere).		
3	KMZ output projection	L3 product is only available for KML output.		
		When outputting KMZ, it is parallel latitude/longitude projection only.		
4	Colorbar setting button.	Colarbar setting screen is opend.		
5	Output physical quantity	Select the physical quantity considered the output target.		
6	Output physical quantity	Enter a prefix for each physical quantity. The character string set here is used to name		
	prefix output files. Output file name: input file (no extension) + prefix +.tif OR .kmz			
7	Save button	Save the parameter you inputed in option screen and close the screen.		
8	Close button	Closes the screen.		

4.6 Colorbar setting screen.

This screen is used to output as colored KMZ file.

Colorbar is needed for colored KMZ file.

If you choose Default parameter, recommended setting is inputted.

If you choose Custom parameter, you can input the parameter you want to use.

Screenshots of the colarbar setting screen is shown in Fig. 10 and descriptions of screen elements are listed in Table 5.

•	Color	barSettingFor	rm				_		×
	ASMES chla	S Global ——							^
	1	 Default Custom 	Min 0	3 Max 0	Type Linear	▼ Invalid value			
	dpar	O Default	Min 0	May _0	Tupo Linou	- Invalid value			
	lst	G Dafault	Miri Jo	max ju	Type Linear				
		C Custom	Min 0	Max 0	Type Linear	✓ Invalid value			~
						6	Save	Clos	e (7

Fig. 10 Colarbar setting screen

Table 5 Colarbar setting screen elements

No.	Name	Description
1	Choose colobar type	You can choose colorbar type. There are two types, Default or Custom.
		If you choose Default parameter, recommended setting is inputted. (Appendix B)

No.	Name	Description
		If you choose Custom parameter, you can input the parameter of No.2, No.3 and No.4 in
		elements you want to use.
2	Minimum value of Custom colarbar	You can input the minimum value of Custom colarbar.
3	Maximum value of Custom colarbar	You can input the maximum value of Custom colarbar.
4	Choose Custom colorbar type	You can input Custom colorbar type. There are two types, Linear or Log.
5	Invalid value of Custom colorbar	You can input invalid value, which is used as transparrncy on map. You can use multiple values by using "," character.
		Ex) When you set -3000、-10、3000 as Invalid values. -3000,-10,3000
		You can input successive invalid values by using '_' character.
		3000,-10,3000_
6	Save button	Save the parameter you inputed and close the screen.
7	Close button	Close the screen.

4.7 Help screen

This screen explains basic operation procedures for this tool.

A screenshot of the help screen is show in Fig. 11.



Fig. 11 A screenshot of the help screen

5. Input file

- 5.1 List of URL to get input files
- GPM Product
 G-Portal: <u>https://gportal.jaxa.jp/gpr/</u>
- GCOM-W Product
 G-Portal: <u>https://gportal.jaxa.jp/gpr/</u>
- JASMES Product JASMES: <u>http://kuroshio.eorc.jaxa.jp/JASMES/index.html</u>
- AQUA Product
 G-Portal: <u>https://gportal.jaxa.jp/gpr/</u>
- GCOM-C Product
 G-Portal: <u>https://gportal.jaxa.jp/gpr/</u>
- 5.2 List of URL written about input file format
- GPM Product <u>https://www.eorc.jaxa.jp/GPM/en/archives.html</u>
- GCOM-W Product <u>https://gportal.jaxa.jp/gpr/information/tool/#GCOM-W1</u>
- JASMES Product <u>http://kuroshio.eorc.jaxa.jp/JASMES/doc_index_j.html</u>
- AQUA Product <u>https://gportal.jaxa.jp/gpr/information/tool/#AQUA</u>
- GCOM-C Product <u>https://shikisai.jaxa.jp</u>

6. Output file

6.1 Output file name

The following is displayed concerning the naming conventions for output file names.

- ➢ GeoTIFF
 - Parallel latitude/longitude projection

GPM, GCOM-W L3, JASMES, AQUA L3

(Input file name [not extension]) _ (Physical quantity prefix) .tif
GCOM-W L1, L2, AQUA L1, L2,GCOM-C
(Input file name [not extension]) (Physical quantity prefix) proj.tif

- Polar stereo projection Northern Hemisphere

 (Input file name [not extension]) _ (Physical quantity prefix) _N.tif
- Polar stereo projection Southern Hemisphere

 (Input file name [not extension]) _ (Physical quantity prefix) _S.tif

> TIFF+TEXT

Parallel latitude/longitude projection

 (Input file name [not extension]) _ (Physical quantity prefix) .tif
 (Input file name [not extension]) .txt

► KMZ

Parallel latitude/longitude projection

 (Input file name [not extension]) _ (Physical quantity prefix) .kmz

> NetCDF

- Parallel latitude/longitude projection

 (Input file name [not extension]) _ (Physical quantity prefix) .nc
- Polar stereo projection

 (Input file name [not extension]) _ (Physical quantity prefix) .nc
- * Physical quantity prefix : it is inputted parameters on Options screen (reference to Fig. 5 ⑥, Fig. 6 ⑥, Fig. 7 ⑥, Fig. 8⑥).
- 6.2 GeoTIFF Output Specification
- 6.2.1 GeoTIFF header part output specification
 - A) GPM product

Tag names and parameters about GeoTIFF Header part of GPM product are written on Table 6.

Table 6 List of tag names and parameters about GeoTIFF header part of GPM product

No.	Tag name	Parameter
1	TIFFTAG_ImageWidth	Pixel
2	TIFFTAG_ImageLength	Line
3	TIFFTAG_BitsPerSample	32
4	Compression	Uncompressed
5	TIFFTAG_PhotometricInterpretation	BlackIsZero
6	TIFFTAG_SamplesPerPixel	1
7	TIFFTAG_SampleFormat	Floating Point
8	ModelPixelScaleTag	GSMap Hourly L3 : 0.1, 0.1, 0.0
		GSMap Monthly L3 : 0.1, 0.1, 0.0

No.	Tag name	Parameter
		DPR Daily L3 : 0.25, 0.25, 0.0
		DPR Monthly L3 : 0.25, 0.25, 0.0
9	ModelTiePointTag	GSMap Hourly L3 : 0.0, 0.0, 0.0, -180.0, 90.0, 0.0
		GSMap Monthly L3 : 0.0, 0.0, 0.0, -180.0, 90.0, 0.0
		DPR Daily L3 : 0.0, 0.0, 0.0, -180.0, 67.0, 0.0
		DPR Monthly L3 : 0.0, 0.0, 0.0, -180.0, 67.0, 0.0
10	GTModelTypeGeoKey	ModelTypeGeographic
11	GTRasterTypeGeoKey	RasterPixelIsArea
12	GeographicTypeGeoKey	GCS_WGS_84
13	GeogAngularUnitsGeoKey	Angular_Degree

B) GCOM-W product

Tag names and parameters about GeoTIFF Header part of GCOM-W product are written on Table 7 and Table 8.

 Table 7
 List of tag names and parameters about GeoTIFF header part of GCOM-W product (parallel latitude/longitude projection)

No.	Tag name	Parameter
1	TIFFTAG_ImageWidth	Pixel
2	TIFFTAG_ImageLength	Line
3	BitsPerSample	16
4	Compression	Uncompressed
5	TIFFTAG_PhotometricInterpretation	BlackIsZero
6	TIFFTAG_SamplesPerPixel	1
7	TIFFTAG_SampleFormat	L1A : Signed Integer
		L1B : Unsigned Integer
		L1R : Unsigned Integer
		L2 High resolution : Signed Integer
		L2 Low resolution : Signed Integer
		L3 Brightness Temperature : Unsigned Integer
		L3 Geophysical Data : Signed Integer
8	ModelPixelScaleTag	L1A : 0.1, 0.1, 0.0
		L1B : 0.1, 0.1, 0.0
		L1R : 0.1, 0.1, 0.0
		L2 High resolution : 0.1, 0.1, 0.0
		L2 Low resolution : 0.1, 0.1, 0.0
		L3 Brightness Temperature : 0.1, 0.1, 0.0
		L3 Geophysical Data : 0.25, 0.25, 0.0
9	ModelTiePointTag	0.0, 0.0, 0.0, -180.0, 90.0, 0.0
10	GTModelTypeGeoKey	ModelTypeGeographic
11	GTRasterTypeGeoKey	RasterPixelIsArea
12	GeographicTypeGeoKey	GCS WGS 84
13	GeogGeodeticDatumGeoKey	Datum_WGS84
14	GeogAngularUnitsGeoKey	Angular_Degree
15	GeogEllipsoidGeoKey	Ellipse WGS 84

Table 8List of tag names and parameters about GeoTIFF header part of GCOM-W product
(polar stereo projection)

No.	Tag name	Parameter
1	TIFFTAG_ImageWidth	Pixel
2	TIFFTAG_ImageLength	Line

No.	Tag name	Parameter
3	BitsPerSample	16
4	TIFFTAG_Compression	Uncompressed
5	TIFFTAG_PhotometricInterpretation	BlackIsZero
6	TIFFTAG_SamplesPerPixel	1
7	TIFFTAG_SampleFormat	Brightness Temperature : Unsigned Integer
		Geophysical Data : Signed Integer
8	GTModelTypeGeoKey	ModelTypeProjected
9	GTRasterTypeGeoKey	RasterPixelIsArea
10	GTCitationGeoKey	Brightness Temperature North : NSIDC Sea Ice Polar Stereographic North
		Brightness Temperature South : NSIDC Sea Ice Polar Stereographic South
		See Ice Concentration North : NSIDC Sea Ice Polar Stereographic North
		See Ice Concentration South : NSIDC Sea Ice Polar Stereographic South
		Snow Depth North : JAXA Snow Depth Polar Stereographic North
11	GeogCitationGeoKev	Unspecified datum based upon the Hughes 1980 ellipsoid
12	GeogSemiMajorAxisGeoKey	6378273.0
13	GeogSemiMinorAxisGeoKey	6356889.449
14	ProjLinearUnitsGeoKey	Linear_Meter
15	ProjOriginLatGeoKey	Brightness Temperature North: 70.0
		Brightness Temperature South : -70.0
		See Ice Concentration North : 70.0
		See Ice Concentration South : -70.0
		Snow Depth North: 70.0
16	ProjFalseEastingGeoKey	0.0
17	ProjFalseNorthingGeoKey	0.0
18	ProjScaleAtOriginGeoKey	1.0
19	ProjStraightVertPoleLongGeoKey	Brightness Temperature North : -45.0
		Brightness Temperature South : 0.0
		See Ice Concentration North : -45.0
		See Ice Concentration South : 0.0
		Snow Depth North : 90.0

C) JASMES product

Tag names and parameters about GeoTIFF Header part of JASMES product are written on Table 9

 Table 9
 List of tag names and parameters about GeoTIFF header part of JASMES product (parallel latitude/longitude projection)

No.	Tag name	parameter
1	TIFFTAG_ImageWidth	Pixel
2	TIFFTAG_ImageLength	Line
3	TIFFTAG_BitsPerSample	rgb : 8,8,8
		wf、snwcfr_ghrm5c、snwcfr_ghrm10c、snwcfr : 8
		Others : 32
4	TIFFTAG_Compression	Uncompressed
5	TIFFTAG_PhotometricInterpretation	rgb : RGB
		Others : BlackIsZero
6	TIFFTAG_SamplesPerPixel	rgb : 3
		Others : 1
7	TIFFTAG_SampleFormat	rgb : Unsigned Integer, Unsigned Integer, Unsigned Integer
		wf、snwcfr_ghrm5c、snwcfr_ghrm10c、snwcfr : Unsigned Integer
		Others : Floating Point
8	ModelPixelScaleTag	360/Pixel,180/Line,0
9	ModelTiePointTag	Global : 0.0, 0.0, 0.0, -180.025, 90.025, 0.0
		Japan Area : 0.0, 0.0, 0.0, 122.995, 50.005, 0.0

No.	Tag name	parameter
		Thai Area : 0.0, 0.0, 0.0, 89.995, 25.005, 0.0
		Gobi Desert : 0.0, 0.0, 0.0, 74.975, 50.025, 0.0
10	GTModelTypeGeoKey	ModelTypeGeographic
11	GTRasterTypeGeoKey	RasterPixelIsArea
12	GeographicTypeGeoKey	GCS_WGS_84
13	GeogAngularUnitsGeoKey	Angular_Degree

D) AQUA product

Tag names and parameters about GeoTIFF Header part of AQUA product are written on Table 10 and Table 11.

 Table 10
 List of tag names and parameters about GeoTIFF header part of AQUA product (parallel latitude/longitude projection)

No.	Tag name	Parameter
1	TIFFTAG_ImageWidth	Pixel
2	TIFFTAG_ImageLength	Line
3	BitsPerSample	16
4	Compression	Uncompressed
5	TIFFTAG_PhotometricInterpretation	BlackIsZero
6	TIFFTAG_SamplesPerPixel	1
7	TIFFTAG_SampleFormat	L1B : Unsigned Integer
		L1R : Unsigned Integer
		L2 High resolution : Signed Integer
		L2 Low resolution : Signed Integer
		L3 Brightness Temperature : Unsigned Integer
		L3 Geophysical Data : Signed Integer
8	ModelPixelScaleTag	L1B: 0.1, 0.1, 0.0
		L1R : 0.1, 0.1, 0.0
		L2 High resolution : 0.1, 0.1, 0.0
		L2 Low resolution : 0.1, 0.1, 0.0
		L3 Brightness Temperature : 0.1, 0.1, 0.0
		L3 Geophysical Data : 0.25, 0.25, 0.0
9	ModelTiePointTag	0.0, 0.0, 0.0, -180.0, 90.0, 0.0
10	GTModelTypeGeoKey	ModelTypeGeographic
11	GTRasterTypeGeoKey	RasterPixelIsArea
12	GeographicTypeGeoKey	GCS_WGS_84
13	GeogGeodeticDatumGeoKey	Datum_WGS84
14	GeogAngularUnitsGeoKey	Angular_Degree
15	GeogEllipsoidGeoKey	Ellipse_WGS_84

 Table 11
 List of tag names and parameters about GeoTIFF header part of AQUA product (polar stereo projection)

No.	Tag name	Parameter
1	TIFFTAG_ImageWidth	Pixel
2	TIFFTAG_ImageLength	Line
3	BitsPerSample	16
4	TIFFTAG_Compression	Uncompressed
5	TIFFTAG_PhotometricInterpretation	BlackIsZero
6	TIFFTAG_SamplesPerPixel	1
7	TIFFTAG_SampleFormat	Brightness Temperature : Unsigned Integer
		Geophysical Data : Signed Integer

No.	Tag name	Parameter
8	GTModelTypeGeoKey	ModelTypeProjected
9	GTRasterTypeGeoKey	RasterPixelIsArea
10	GTCitationGeoKey	Brightness Temperature North : NSIDC Sea Ice Polar Stereographic North
		Brightness Temperature South : NSIDC Sea Ice Polar Stereographic South
		See Ice Concentration North : NSIDC Sea Ice Polar Stereographic North
		See Ice Concentration South : NSIDC Sea Ice Polar Stereographic South
		Snow Depth North : JAXA Snow Depth Polar Stereographic North
11	GeogCitationGeoKey	Unspecified datum based upon the Hughes 1980 ellipsoid
12	GeogSemiMajorAxisGeoKey	6378273.0
13	GeogSemiMinorAxisGeoKey	6356889.449
14	ProjLinearUnitsGeoKey	Linear_Meter
15	ProjOriginLatGeoKey	Brightness Temperature North: 70.0
		Brightness Temperature South : -70.0
		See Ice Concentration North: 70.0
		See Ice Concentration South : -70.0
		Snow Depth North: 70.0
16	ProjFalseEastingGeoKey	0.0
17	ProjFalseNorthingGeoKey	0.0
18	ProjScaleAtOriginGeoKey	1.0
19	ProjStraightVertPoleLongGeoKey	Brightness Temperature North : -45.0
		Brightness Temperature South : 0.0
		See Ice Concentration North : -45.0
		See Ice Concentration South : 0.0
		Snow Depth North: 90.0

E) GCOM-C product

Tag names and parameters about GeoTIFF Header part of GCOM-C product are written on Table 12.

 Table 12
 List of tag names and parameters about GeoTIFF header part of GCOM-C product

 (parallel latitude/longitude projection)

No.	Tag name	Parameter
1	TIFFTAG_ImageWidth	Pixel
2	TIFFTAG_ImageLength	Line
3	BitsPerSample	8
		16
4	Compression	Uncompressed
5	TIFFTAG_PhotometricInterpretation	BlackIsZero
6	TIFFTAG_SamplesPerPixel	1
7	TIFFTAG_RowsPerStrip	1
8	TIFFTAG_SampleFormat	Unsigned Integer
9	ModelPixelScaleTag	Set the size in the model space of 1 pixel (varies depending
		on the image)
10	ModelTiePointTag	Set the superposition point of raster image information and
		geographic coordinate information (varies depending on the
		image)
11	GTModelTypeGeoKey	ModelTypeGeographic
12	GTRasterTypeGeoKey	RasterPixelIsArea
13	GeographicTypeGeoKey	GCS_WGS_84
14	GeoCitationGeoKey	WGS 84
15	GeogAngularUnitsGeoKey	Angular_Degree
16	GeogSemiMajorAxisGeoKey	6378137.0
17	GeogInvFlatteningGeoKey	298.257223563

6.2.2 GeoTIFF data part output specification

Output product type is the same as appndixA. Supplement (Details of conversion target products).

A) GPM product
 Output data parameters are the same as Input data type such as scale and factors.

B) GCOM-W product

Output data parameters are the same as Input data type such as scale factors.

C) JASMES product

Output data parameters about rgb, wf, snwcfr_ghrm5c, snwcfr_ghrm10c and snwcfr are the same as Input data type such as scale and factor. Other than those above product are set as float type by using slope and offset parameters.

But if non-tolerance is in input data, output data parameter is set -10.

D) AQUA product

Output data parameters are the same as Input data type such as scale factors.

E) GCOM-C product

Output data parameters are the same as Input data type such as scale factors.

6.3 KMZ output specification

KMZ file is consisted of KML file and TIFF file.

6.3.1 KML output specification

A) GPM product

Tag names and Parameters about GPM product's KML file are written on Table 13.

No.	Tag name	Parameter
1	kml- GroundOverlay-name	TIFF file name (Not extension)
2	kml- GroundOverlay-Icon-href	TIFF file path
3	kml- GroundOverlay-LatLonBox-north	GSMap Hourly L3: 90.000000
		GSMap Monthly L3 : 90.000000
		DPR Daily L3 : 67.000000
		DPR Monthly L3 : 67.000000
4	kml- GroundOverlay-LatLonBox-south	GSMap Hourly L3 : -90.000000
		GSMap Monthly L3 : -90.000000
		DPR Daily L3 : -67.000000
		DPR Monthly L3 : -67.000000
5	kml- GroundOverlay-LatLonBox-east	180.000000
6	kml- GroundOverlay-LatLonBox-west	-180.000000

Table 13 List of tag names and parameters about GPM product's KML file

B) GCOM-W product

Tag names and Parameters about GCOM-W product's KML file are written on Table 14.

Table 14	List of tag name	s and parameters	about GCOM-W	product's KML file
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No.	Tag name	Parameter
1	kml- GroundOverlay-name	TIFF file name (Not extension)
2	kml- GroundOverlay-Icon-href	TIFF file path
3	kml- GroundOverlay-	Lower left coordinate (-180.00,-90.00,0.0)
	gx:LatLonQuad-coordinates	Lower right coordinate (180.00,-90.00,0.0)
		Upper left coordinates (180.00,90.00, ,0.0)
		Upper right coordinates (-180.00,90.00,0.0)

C) JASMES product

Tag names and Parameters about JASMES product's KML file are written on Table 15.

Table	15 List of tag	names and	parameters about	JASMES	product's	KML file
	<u> </u>		1		1	

No.	Tag name	Parameter			
1	kml- GroundOverlay-name	TIFF file name (Not extension)			
2	kml- GroundOverlay-Icon-href	TIFF file path			
3	kml- GroundOverlay-LatLonBox-north	Global : 90.025000			
		Japan Area : 50.005000			
		Thailand Area: 25.005000			
		Gobi Desert : 50.025000			
4	kml- GroundOverlay-LatLonBox-south	Global : -90.025000			
		Japan Area : 23.995000			
		Thailand Area : -5.005000			
		Gobi Desert : 26.975000			
5	kml- GroundOverlay-LatLonBox-east	Global : 359.975000			
		Japan Area : 150.005000			
		Thailand Area: 120.005000			
		Gobi Desert : 147.025000			
6	kml- GroundOverlay-LatLonBox-west	Global : -0.025000			
		Japan Area : 122.995000			
		Thailand Area: 89.995000			
		Gobi Desert : 74.975000			

D) AQUA product

Tag names and Parameters about AQUA product's KML file are written on Table 16.

Table 16 List of tag names and parameters about AQUA product's KML file

No.	Tag name	Parameter
1	kml- GroundOverlay-name	TIFF file name (Not extension)
2	kml- GroundOverlay-Icon-href	TIFF file path
3	kml- GroundOverlay-	Lower left coordinate (-180.00,-90.00,0.0)
	gx:LatLonQuad-coordinates	Lower right coordinate (180.00,-90.00,0.0)
		Upper left coordinates (180.00,90.00, ,0.0)
		Upper right coordinates (-180.00,90.00,0.0)

6.3.2 TIFF Output specification

Output data type is the same as appndixA. Supplement (Details of conversion target products).

A) GPM Product

Inputted parameter on data part is converted into RGB by using colorbar on appndixB

B) GCOM-W Product
 Inputted Parameter on data part is converted into RGB by using colorbar on appndixB

C) JASMES product

Inputted Parameter on data part is calculated by using slope parameter and offset parameter and converted into RGB by using colorbar.

D) AQUA Product

Inputted Parameter on data part is converted into RGB by using colorbar on appndixB

6.4 NetCDF Output specification

Output specification of NetCDF is wrriten in the following pdf file of chapter 5.

https://gportal.jaxa.jp/gpr/assets/mng_upload/GCOM-W/format_guide_e.pdf

7. Examples of using Format Conversion Tool

7.1 Use by GIS Software

GeoTIFF format data is readable as image data by popular viewers such as the Paint and the photo viewer. This image data is easy for editing itself and uploading SNS.

> Use case of viewing and editing GPM product



Fig. 12 Example of viewing and editing GPM Data by Viewers

> Use case of viewing and editing GCOM-W, AQUA product, GCOM-C product



Fig. 13 Example of viewing and editing GCOM-W, AQUA, GCOM-C Data by Viewers

> Use case of viewing and editing JASMES product



Fig. 14 Example of viewing and editing JASMES Data by Viewers

7.2 Use by GIS Software

Users can view, edit and analyze GPM product by using popular GIS software such as ArcGIS and QGIS more easily.

It is easily to refer the GeoTIFF precipitation data by mapping on world map, analyze and edit values of data.

KMZ format file is used for Google Earth.

Reference of GPM product



Fig. 15 GPM product using by GIS software

> Reference of GCOM-W, AQUA, GCOM-C product



Fig. 16 Reference of GCOM-W, AQUA, GCOM-C product using by GIS software

Reference of JASMES product



Fig. 17 Reference of JASMES product using by GIS software

> Use GIS software to analyze and edit GPM product.

Analysis: Histogram display	14(82.83	Edit: Convert Projection	Edit: Country-by-country distribution display

Fig. 18 Case of analyzing and editing GPM product by using GIS software

> Use GIS software to analyze and distribute GCOM-W, AQUA,GCOM-C product.



Fig. 19 Case of analyzing and distributing GCOM-W, AQUA, GCOM-C product by using GIS software

▶ Use GIS software to analyze and edit JASMES product.

Analysis: Attribute search	Analysis	: Time line display.	Edit: Graphic overlay _	

Fig. 20 Case of analyzing and distributing JASMES product by using GIS software