ADEOS-II GLI Level-1 Product

Format Description

December, 2003

Japan Aerospace Exploration Agency (JAXA)

GLI Level-1 Product Format Specifications Revison History

ver.	date	page	contents
1.0	2003.12.12	-	First version

Table of Contents

1   Outline

This document presents the specifications of GLI level 1 products.GLI products use formats that conform to the OCTS Product Formats description manual (Version 1.3, published March 15, 1996) and HDF (Hierarchical Data Format) Version 4.1, and take into consideration compatibility with ADEOS/OCTS.

The GLI level products are categorized as follows:

-Level 1A	GLI-1kmVNIR (visible near-infrared)
	GLI-1km SWIR (short wavelength infrared)
	GLI-1kmMTIR (mid-thermal infrared)
	GLI-250m
	near real-time
-Level 1B	GLI-1kmVNIR
	GLI-1km SWIR
	GLI-1km MTIR,
	GLI-1km satellite position information
	GLI-250m
-Level 1B MAP	GLI-1kmVNIR
	GLI-1kmSWIR
	GLI-1km MTIR
	GLI-250m

1.1 Global Attributes

Global attributes explains types and contents, etc. of products. The name of V data is HDF tag = VH(V data description), and the data is HDF tag = VS (V data). Therefore, data can be searched and viewed in HDF library by name of V data.Note that the data types in throughout this document are expressed with followings:

Ch: character line
Short: 2 byte integer (signed)
Ushort: 2 byte integer (unsigned)
Long: 4 byte integer (signed)
Ulong: 4 byte integer (unsigned)
Real: 4 byte real number
Double: 8 byte real number
Byte: 1 byte integer
SByte: 1 byte integer (signed)

1.2 V Group

V group describes the data extracted from a satellite itself or, processed or edited. The V group name is HDF tag = VG (Vgroup) . Each V group is indicated with HDF tag = SDD(Scientific data dimension) , and each dimension have dimension name which is indicated with HDF tag = VG (Vgroup). The content of long_name, valid_range, units, etc. in HDF tag = VH (Vdata description) are indicated by HDF tag = VS (Vdata) . The actual data is described as scientific data of HDF tag = SD (Scientific data) . These data sets can be searched and viewed in HDF library by V group names. Here, all the data can be viewed in HDF library without dealing with the contents of data set.

1.3 Image Data

Image data is described as scientific data as it is in V group. Therefore, V group name is HDF tag = VG (V group), and dimension of each V group is indicated with HDF tag = SDD (Scientific data dimension), and image data and palette data is described as scientific data of HDF tag = SD (Scientific data).

2   LEVEL 1A Data

2.1 Overview

Level 1A data consists of two types of products, 1km data and 250m data, according to the two GLI resolution types. From the standpoint of observation wavelengths, 1km data is further subdivided into VNIR (visible near-infrared), SWIR (short wavelength infrared), and MTIR (mid-thermal infrared). In addition to these standard products, NRT (near real-time) products, which can extract specific bands or areas for specific organizations, are provided. The data obtained in calibration mode is saved in a format that conforms to the level 1 products. GLI does not use the distinctions that correspond to GAC (Global Area Coverage) and LAC (Local Area Coverage) of OCTS.

In descriptions below, the data types are represented as follows:

Ch	character string
Short	2-byte integer (signed)
Ushort	2-byte integer (unsigned)
Long	4-byte integer
Ulong	4-byte integer (unsigned)
Real	4-byte real
Double	8-byte real
Byte	1-byte integer (unsigned)
SByte	1-byte integer (signed)

2.2 File Names

Product file names are defined as listed below.

File name	Type
A2GLI*YYMMDDPPSSMMT_X*V1A0000000.00	VNIR
A2GLI*YYMMDDPPSSMMT_X*S1A0000000.00	SWIR
A2GLI*YYMMDDPPSSMMT_X*M1A0000000.00	MTIR
A2GL2*YYMMDDPPSSMMT_X*01A0000000.00	250m
A2GL1*YYMMDDPPNNNNN_X*01A0000000.00	near real-time

The components of the file names represent the following:

A2	Type of satellite (ADEOS-II)
GLx	Sensor type and resolution (GL1 = GLI 1km; GL2 = GLI 250m)
YYMMDD	Observation date
PP	Path number
SS	Scene number
MM	Observation mode (OD = daytime observation mode; ON = nighttime observation mode)
T	Tilt (1 = nadir view, 2 = rear view, 3 = front view)
X	Product type (P = planned; N = near real-time, O = ordered)
NNNNN	Elapsed time after passing the ascending node where extraction was started in a near real-time product

Global Attributes

Scan-Line Attributes

msec	smp_blk
st_tai	det
scan_start	det_2km
miss_qual	lat
eng_qual	lat_2km
s_satp	lon
s_satp_2km	lon_2km
pxl_int	

Sensor Tilt

tilt_seg

Navigation

orb_vec
orb_vel
sun_ref
att_ang

Spacecraft Time Error

num_inf
orbit_count
path_date
path_num
start_time
end_time
period_count
ref_count
ref_time

GPS Orbit Data

gps_points
utc_tai
ut1r_tai
polar_motion
GPS_nav_dat
GPS_pos_dat
GPS_vel_dat

Converted PCD

sc_time
GPS_timing
GPS_nav_time
GPS_pos
GPS_vel
sc_att
sc_attr
orbit_num
orbit_timer

Raw ADEOS-II Data

ADEOS2_PCD
gli_supl
l1a_data
l1a_data_2km
blk_data
deep_data_vs
deep_data_mt
deep_data_2km
wall_clump

Converted Supplement

scan_off
opr_mode
tilt_flag
tilt_angle
mirror_surface
scan_angle
halogen_light
halogen_temp
black_temp
optics_temp
diffuser_temp
sunlight
mtdet_temp
ele_signal
lamp_vol1
lamp_vol2
convert_coef

Radiometric Correction (VNIR/SWIR)

offset_vs
offset_2km
non_linear_vs
inc_angle_vs
inc_angle_2km
rel_det_vs
rel_det_2km
gcal
gcal_2km
gsys
gsys_2km

Radiometric Correction (MTIR)

offset_mt
inc_angle_mt
bbc_mt
c1

× channels

raw radiance counts (0-4095)

lines

pixels

3-D array
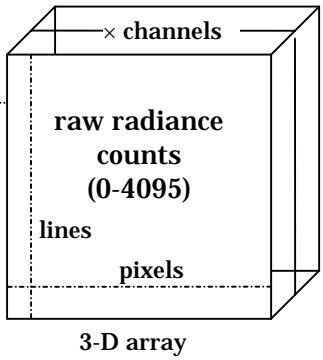
Orbit Data

num_rec	o_start_date
precision	o_interval
o_utc_tai	o_num_points
o_ut1r_tai	o_sc_pos
o_polar_motion	o_sc_vel

Data Quality Flag

qf_sc_time	
qf_GSP_timing	qf_diffuser_temp
qf_GPS_nav_time	qf_sunlight
qf_GPS_pos	qf_mtdet_temp
qf_GPS_vel	qf_ele_signal
qf_sc_att	qf_lamp_vol1
qf_sc_attr	qf_lamp_vol2
qf_orbit_num	qf_VS_dsp
qf_orbit_timer	qf_dsp_2km
qf_scan_off	qf_MT_dsp
qf_tilt_angle	qf_wall
qf_scan_angle	qf_bb
qf_halogen_light	qf_sun_lump
qf_halogen_temp	qf_sun_lump_2km
qf_black-temp	lost_info
qf_optics_temp	

Calibration

gcel_coef	spnz_coef0
gcal_coef_2km	----
gttl_coef	spnz_coef5
gttl_coef_2km	spnz_coef0_2km
gscan_coef	----
gscan_coef_2km	spnz_coef5_2km
k_tgtch_dn	mt_spnz_coef0
k_refch_rad	----
mt_offset	mt_spnz_coef5
mt_nlgain	nonlinear_sat_dn
mt_eta	z_gcal_coef
mt_bbc_coef	z_gsys_coef
mt_av_scan	z_gcal_coef_2km
mt_params	z_gsys_coef_2km
mt_bb_rad	mt_offsetnoise
mt_av_pix	
mt_bbc_date	

2.1 Level-1A Product

2.3 Global Attributes

2.3.1 Mission and Documentation

Data Name	Type	Number of data	Format	Explanation	Notes
Product Name	Ch	1	(see 2.2)	product file name	
Title	Ch	1	"GLI Level-1A Data" "GLI Level-1A NRT Data"	Plan processing NRT processing	
Data Center	Ch	1	"JAXA/Earth　Observation Center"	This denotes it is processed at EOC.	
Station Name	Ch	1	"JAXA/Earth　Observation Center"	This denotes it is received at EOC.	NRT case only
Station Latitude	Real	1	Latitude[deg]	receiving station latitude	NRT case only
Station Longitude	Real	1	Longitude[deg]	receiving station longitude	NRT case only
Mission	Ch	1	"ADEOS-II GLI"	mission name (satellite name, sensor name)	
Mission Characteristics	Ch	1	"Nominal orbit:inclination = 98.62(Sun-Synchronous); node = 10:15-10:45 AM(descending); eccentricity < 0.0012; altitude = 803km; ground speed = 6.6km/sec; revolutions per day = 14 + 1/4"	-	
Sensor	Ch	1	"Global Imager(GLI)"	sensor name	
Sensor Characteristics	Ch	1	"1km:Number of bands = 30, 250m:Number of bands = 6; 1km:Number of detectors per bands = 12, 250m:Number of detectors per bands = 48; 1km bits per pixel = 13, 250m:bits per pixel = 12; Scan period = 1.8sec; 1km:bit rate = 3.8676Mbit/sec, 250m:bit rate = 60Mbit/sec"	-	
Data Type	Ch	1	"1km" "250m" "NRT"	Plan processing (1km) Plan processing (250m) NRT processing (1km)	
Data Sub-type	Ch	1	"VNIR" "SWIR" "MTIR"	Band Type	1km product only

Data Name	Type	Number of data	Format	Explanation	Notes
Number of 1km Channels	Ch	1	NN	Number of processing target channels of 1km data.	1km product only
Number of 250m/2km Channels	Ch	1	NN	Number of processing target channels of 250m/2km data.	1kmSWIR product only
Number of 250 Channels	Ch	1	NN	Number of processing target channels of 250m data.	250m product only
Processing Channels	Ch	1	(pattern1) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 (pattern2)24 25 26 27 28 29 (pattern3)1 2 3 4 5 6 7 8 9 10 11 12 14 16 18 30 34 35 36	Channel numbers are listed, separated by a blank. parttern1 is VNIR product parttern2 is SWIR product parttern3 is NRT product	
Replacement Flag	Ch	1	"ORIGINAL"	This denotes the product is generated at EOC	
Software ID	Ch	1	UVNNNNNNN	software version ID at EOC U : GLI correction/physical parameter calculation software version V : GLI HMI software version NNNNNNN :local version	
Processing Time	Ch	1	YYYYMMDD hh:mm:ss.ttt	processing time	
Processing Result	Ch	1	(omit)	processing result record for the product	

2.3.2 Data Time

Data Name	Type	Number of data	Format	Explanation	Notes
Start Time	Ch	1	YYYYMMDD hh:mm:ss.ttt	scene start time in UTC	
End Time	Ch	1	YYYYMMDD hh:mm:ss.ttt	scene end time in UTC	
Scene Center Time	Ch	1	YYYYMMDD hh:mm:ss.ttt	scene center time in UTC	
Node Crossing Time	Ch	1	YYYYMMDD hh:mm:ss.ttt	descending node crossing time in UTC	
Start Year	Short	1	-	year of "Start Time"	
Start Day	Short	1	-	day of the year of "Start Time"	
Start Millisec	Long	1	-	millisecond of the day of "Start Time"	
End Year	Short	1	-	year of "End Time"	
End Day	Short	1	-	day of the year of "End time"	
End Millisec	Long	1	-	millisecond of the day of "End Time"	
Orbit Number	Long	1	1-399	PCD orbit number	
Last Maneuver Start Time	Ch	1	YYYYMMDD hh:mm:ss	-	
Last Maneuver End Time	Ch	1	YYYYMMDD hh:mm:ss	-	
Last Maneuver Type	Ch	1	"+dV" "-dV" "dI"	+dV in-plane accelaration -dV in-plane decelaration dI out-of-plane maneuver	

2.3.3 Data Quality

Data Name	Type	Number of data	Format	Explanation	Notes
Pixels per Scan Line	Long	1	1276 5104	1km case 250m case	SCS/LCA pixels in case of SCA/LCA ECA pixels in case of ECA
Pixels per Scan Line for SWIR 2km	Long	1	638	number of pixel (SWIR 250m/2km)	SWIR product only
Number of Scan Lines	Long	1	-	number of scans	[Stantard] 140
Line per Scan for SWIR 2km	Long	1	6	number of pixcel (SWIR 250m/2km)	1km SWIR product only
Lines per Scan	Long	1	12 48	1km case 250m case	
Missing Packets	Long	1	-	number of lost packets for the scene	1km product only
Missing Frames	Long	1	-	number of lost frames for the scene	250m product only
Missing Lines	Long	1	-	number of missing lines for the scene.	[In case of 1scan loss] 1km : 12line loss 250m: 48line loss
GPS Flag	Ch	1	"OK" "NG" "TE" "TX"	GPS　available case GPS　unavailable case TT unavailable case 　　　(base ST of farst scan) TT unavailable case 　　　(scan start time is estimated)	refer 2.5.4

2.3.4 File Metrics

Data Name	Type	Number of data	Format	Explanation	Notes
Saturated Pixels	Long	N1	-	number of saturated pixels	N1 denotes the number of processing channels.
Saturated Pixels for SWIR 2km	Long	N1	-	number of saturated pixels (SWIR 2km)	N1 denotes the number of processing channels 1km SWIR product only
Non-Saturated Pixels	Long	N1	-	number of non-saturated pixels	N1 denotes the number of processing channels.
Non-Saturated Pixels SWIR 2km	Long	N1	-	number of non-saturated pixels (SWIR 2km)	N1 denotes the number of processing channels 1km SWIR product only

2.3.5　Scene Coordinates

Data Name	Type	Number of data	Format	Explanation	Notes
Latitude Units	Ch	1	"degrees North"	latitude unit of used product	geodetic latitude
Longitude Units	Ch	1	"degrees East"	longitude unit of used product	
Scene Center Latitude	Real	1	-	-	Latitude and longitude are calculated at the center of light axis.
Scene Center Longitude	Real	1	-	-	
Upper Left Latitude	Real	1	-	-	
Upper Left Longitude	Real	1	-	-	
Upper Right Latitude	Real	1	-	-	
Upper Right Longitude	Real	1	-	-	
Lower Left Latitude	Real	1	-	-	
Lower Left Longitude	Real	1	-	-	
Lower Right Latitude	Real	1	-	-	
Lower Right Longitude	Real	1	-	-	
Orbit Node Longitude	Real	1	-	-	
Start path number	Short	1	-	path number at the beginning of the scene	
Start argument of Latitude	Real	1	-	argument of latitude at the beginning of the scene	
End path number	Short	1	-	path number at the end of the scene	
End argument of Latitude	Real	1	-	argument of latitude at the beginning of the scene	

2.4 V Group

2.4.1 Scan Line Attributes

V group name	V group class
Scan-Line Attributes	Scan_Line_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)
n : the column direction addresses of the pixels of which latitude and longitude are calculated("smp_blk" value)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
msec	Long	number of scans	"rec"	s	"Scan-line time, milliseconds of day"	"msec" (0,86400000)	UTC Time
st_tai	Double	number of scans	"rec"	s	"Spacecraft TAI time"	"sec"	
scan_start	Ch	number of scans (string length)	"rec" (not defined)	s 22	"Scan Start Time"	-	
miss_qual	Byte	number of scans	"rec"	s	"Missing frame flag"	-	
eng_qual	Byte	number of scans	"rec"	s	"Engineering data-out-of-range flags"	-	
s_satp	Short	number of channels number of lines	"chnls" "lines"	19[V], 4[S], 7[M], 6[250m] s×12[V,S,M] s×48[250m]	"Number of saturated pixels per band"	-	
s_satp_2km	Short	number of channels number of lines	"chnls2k" "lines2k"	2 s×6	"Number of saturated pixels per band for SWIR 2km"	-	SWIR only
pxl_int	Short	(constants)	(not defined)	1	"L1A Sample block interval"	-	12 for 1km 48 for 250m
smp_blk	Short	(constants)	(not defined)	1	"L1A Sample blocks"	-	
det	Short	detector number	"det2"	2	"Detector number of pixels"	-	1, 12 for 1km 1, 48 for 250m
det_2km	Short	detector number	"det2"	2	"Detector number of pixels for 2km"	-	1km SWIR only 8, 48

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
lat	Real	number of channels	"chnls"	19[V], 4[S], 7[M], 6[250m]	"Scan point latitude"	"deg" (-90.0,90.0)	latitude of the grid points of which addresses are expressed by pxl_int and det. det order is 1, 12. Samples are 1, 13, 25, ...
		number of addresses for detector direction	"det2"	2			
		number of scans	"rec"	s			
		number of addresses for column direction	"pxls"	n			
lat_2km	Real	number of channels	"chnls2k"	2	"Scan point latitude"	"deg" (-90.0,90.0)	SWIR only
		number of addresses for detector direction	"det2"	2			
		number of scans	"rec"	s			
		number of addresses for column direction	"pxls"	n			
lon	Real	number of channels	"chnls"	19[V], 4[S], 7[M], 6[250m]	"Scan point longitude"	"deg" (-180.0,180.0)	longitude of the grid points of which addresses are expressed by pxl_int and det. det order is 1, 12. Samples are 1, 13, 25, ...
		number of addresses for detector direction	"det2"	2			
		number of scans	"rec"	s			
		number of addresses for column direction	"pxls"	n			
lon_2km	Real	number of channels	"chnls2k"	2	"Scan point longitude for 2km"	"deg" (-180.0,180.0)	SWIR only
		number of addresses for detector direction	"det2"	2			
		number of scans	"rec"	s			
		number of addresses for column direction	"pxls"	n			

2.4.2 Raw ADEOS-II Data

V group name	V group class
Raw ADEOS-II Data	Scan_Line_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)
p : number of pixels(samples) for 1 line(1km,250m)("Pixels per Scan Line" in Data Quality group of the Global Attributes)
p2 : number of pixels(samples) for 1 line(SWIR 2km)("Pixels per Scan Line for SWIR 2km" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
ADEOS2_PCD	Ushort	number of scans number of PCD data	"rec" "instr"	s 41	"ADEOS-II PCD Data"	-	9 PCD data are stored in word unit
gli_supl	Ushort	number of scans number of GLI supplement data	"rec" "suppl"	s 1314	"GLI supplement data"	-	16 PCD data are staved in word unit

l1a_data	Ushort	number of channels
		
		number of lines
		
		number of samples
			"chnls"
			
			"lines"
			
			"nsamp"
				19[V], 4[S], 7[M], 6[250m]
				s×12[V,S,M],
				s×48[250m]
				p
					"Level-1A data"
					  observation case
					"SCA Calibration"
					  Sun Cal Mode case
					"LCA Caribration"
					  Lamp Cal Mode case
						-	13 bits image data is stored in 16 bits unit

l1a_data_2km	Ushort	number of channels number of lines number of samples	"chnls2k" "lines2k" "nsamp2k"	2 s×6 p2	"Level-1A data for 2km"		SWIR only
blk_data	Ushort	number of channels number of lines number of samples	"chnlsmt" "lines" "nsampb"	7 s×12 30	"Black body data"	-	MTIR only
deep_data_vs	Ushort	number of channels number of lines number of samples	"chnlsvs" "lines" "nsampd"	19[V], 4[S], 6[250m] s×12[V,S], s×48[250m] 28[V,S], 112[250m]	"Deep space data"	-	VNIR/SWIR only

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
deep_data_mt	Ushort	number of channels number of lines number of samples	"chnlsmt" "lines" "nsampd"	7 s×12 20	"Deep space data"	-	MTIR only
deep_data_2km	Ushort	number of channels number of lines number of samples	"chnls2k" "lines2k" "nsampd2k"	2 s×6 14	"Deep space data for 2km"	-	SWIR only
wall_clump	Ushort	number of channels number of lines number of samples	"chnlsmt" "lines" "nsampw"	7 s×12 10	"Wall clump signal"	-	MTIR only

2.4.3 PCD Engineering Data

V group name	V group class
Converted PCD	Scan_Line_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
sc_time	Ulong	number of scans	"rec"	s	"Spacecraft counter time"	-	Lower 5 bits(bit 0-4) are not used and higher bits than 5th configure the counter. 1 count expresses 1 second after 5bits shift to right.
GPS_timing	Real	number of scans	"rec"	s	"GPS timing"	"sec" (0.0,59.999)	
GPS_nav_time	Real	number of scans	"rec"	s	"GPS navigation time"	"sec" (0.0,59.999)	
GPS_pos	Real	number of scans 3-dim vector	"rec" "vec"	s 3	"GPS position"	"km"	
GPS_vel	Real	number of scans 3-dim vector	"rec" "vec"	s 3	"GPS velocity"	"km/sec"	
sc_att	Real	number of scans 3-dim vector	"rec" "vec"	s 3	"Spacecraft attitude roll, pitch, yaw"	"deg" (-32.7,32.7)	
sc_attr	Real	number of scans 3-dim vector	"rec" "vec"	s 3	"Spacecraft attitude rate"	"deg/sec" (-3.27.3.27)	
orbit_num	Ushort	number of scans	"rec"	s	"Orbit number"	- (0,399)	
orbit_timer	Ushort	number of scans	"rec"	s	"Orbit timer"	"sec" (1,6054)	

2.4.4 GLI Supplement Engineering Data

V group name	V group class
Converted Supplement	Scan_Line_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
scan_off	Ulong	number of scans	"rec"	s	"Scan start time offset"	-	
opr_mode	Ushort	number of scans	"rec"	s	"Operation mode"	- (0, 15)	bit3: Day/Night 0:Night, 1:Day bit2: Electric Cal Mode 0: OFF, 1:ON bit1: Lamp Cal Mode 0:OFF, 1:ON bit0: Sun Cal Mode 0:OFF, 1:ON
tilt_flag	Ushort	number of scans	"rec"	s	"Tilt angle flag"	-	1: forward 2: nadir 3: backward
tilt_angle	Real	number of scans	"rec"	s	"Tilt angle for scan line"	"deg" (-20.0,20.0)	
mirror_surface	Byte	number of scans	"rec"	s	"Scan mirror surface"	- (0,1)	0: Surface A 1: Surface B
scan_angle	Real	number of scans number of scan angle sampels	"rec" sa	s 1276	"Scan angle"	-	1km scale
halogen_light	Real	number of scans number of halogen lamp monitor	"rec" "hal"	s 2	"Halogen light"	-	
halogen_temp	Real	number of scans number of halogen lamp monitor	"rec" "hal"	s 2	"Halogen temperature"	"Kelvin"	

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
black_temp	Real	number of scans number of blackbody temperature sensors	"rec" "bbt"	s 5	"Black body temperature"	" Kelvin "	
optics_temp	Real	number of scans number of optics temperature sensors	"rec" "opt"	s 5	"Optics temperature"	" Kelvin "	
diffuser_temp	Real	number of scans	"rec"	s	"Diffuser temperature"	" Kelvin "	
sunlight	Real	number of scans number of solar monitor samples	"rec" "sun"	s 2	"Sun light"	-	
mtdet_temp	Real	number of scans	"rec"	s	"MTIR detector temperature"	" Kelvin "	
ele_signal	Real	number of scans number of electric calibration signals	"rec" "ele"	s 12	"Electric calibration signal"	"volt"	
lamp_vol1	Real	number of scans	"rec"	s	"Lamp drive voltage 1"	"volt"	
lamp_vol2	Real	number of scans	"rec"	s	"Lamp drive voltage 2"	"volt"	
convert_coef	Double	number of data type number of coef	"datano" "coef"	32 3	"Supplement Convert Coefficient"	-	

2.4.5　Navigation

V group name	V group class
Navigation	Scan_Line_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
orb_vec	Real	number of scans 3-dim vector	"rec" "vec"	s 3	"Orbit position vector at scan line time in ECR"	"km" (-7200.0,7200.0)	Orbit position vector at scan line time in ECR frame. Interpolated from GPS or orbit server data.
orb_vel	Real	number of scans 3-dim vector	"rec" "vec"	s 3	"Orbit velocity at scan line time in ECR"	"km/sec" (-8.0, 8.0)	Orbit velocity at scan line time in ECR frame. Interpolated from GPS or orbit server data.
sun_ref	Real	number of scans 3-dim vector	"rec" "vec"	s 3	"Reference Sun vector in ECR frame"	-	Reference Sun vector in ECR frame.
att_ang	Real	number of scans 3-dim vector	"rec" "vec"	s 3	"Computed roll, pitch, yaw"	"deg"	angle in each Scan Start Time attitude

2.4.6　Tilt

V group name	V group class
Sensor Tilt	Scan_Line_Data

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
tilt_seg	Short	(constants)	(not defined)	1	"Tilt segment number"	- (0, 2)	Tilt Setting 0: No-tilt0[deg] 1:Forward tilt(18.5[deg]) 2:Backward tilt(-18.5[deg])

2.4.7　Calibration Coefficients

V group name	V group class
Calibration	Parameter

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
The order of gains for piecewise linear channels(chnlsvspw) is H to L(ch1, 2, 3, 4H, 4L, 5H, 5L, 6, 7H, 7L, 8H, 8L, 9, ...)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
gcal_coef	Real	number of gains number of detectors number of surface	"chnlsvspw" "dets" "sur"	23[V], 4[S], 6[250m] 12[V,S], 48[250m] 2	"Correction coefficient for VNIR/SWIR"	-	Gcal VNIR/SWIR/250m only
gcal_coef_2km	Real	number of gains number of detectors number of surface	"chnls2k" "dets2k" "sur"	2 6 2	"Correction coefficient for SWIR 2km"	-	Gcal SWIR only
gttl_coef	Real	number of gains number of detectors number of surface	"chnlsvspw" "dets" "sur"	23[V], 4[S], 6[250m] 12[V,S], 48[250m] 2	"General gain coefficient for VNIR/SWIR"	-	Gttl VNIR/SWIR/250m only
gttl_coef_2km	Real	number of gains number of detectors number of surface	"chnls2k" "dets2k" "sur"	2 6 2	"General gain coefficient for SWIR 2km"	-	Gttl SWIR only
gscan_coef	Real	number of gains number of coefficients number of surface	"chnlsvs" "coef" "sur"	19[V], 4[S], 6[250m] 3 2	"Incident angle dependency coefficient for VNIR/SWIR"	-	VNIR/SWIR/250m only
gscan_coef_2km	Real	number of gains number of coefficients number of surface	"chnls2k" "coef" "sur"	2 3 2	"Incident angle dependency coefficient for SWIR 2km"	-	SWIR only
k_tgtch_dn	Real	number of channels number of detectors number of surface	"chnlsk" "dets" "sur"	6 12 2	"Judgment DN of Over saturation channels"	-	VNIR only Over saturation channles only
k_refch_rad	Real	number of channels number of detectors number of surface	"chnlsk" "dets" "sur"	6 12 2	"Judgment Radiance of reference channels"	-	VNIR only Reference channles only
mt_offset	Real	number of channels number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Offset term for MTIR"	-	C0 MTIR only
mt_nlgain	Real	number of channels number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Non-Linear gain term for MTIR"	-	C2 MTIR only

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
mt_eta	Real	number of channels number of coefficients number of surface	"chnlsmt" "coef" "sur"	7 3 2	"Incident angle dependency coefficient for MTIR"	-	MTIR only
mt_bbc_coef	Real	number of channels number of surface	"chnlsmt" "sur"	7 2	"Correction coefficient for Blackbody radiance"	-	MTIR only
mt_av_scan	Short	(constants)	(not defined)	1	" Blackbody process average scans"	-	MTIR only
mt_params	Real	number of channels number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Correction coefficient for MTIR"	-	MTIR only
mt_bb_rad	Real	number of channels number of surface	"chnlsmt" "sur"	7 2	"Heat radiance of Scan mirror"	-	MTIR only
mt_av_pix	Short	pairs	"pairs"	2	"Blackbody process average pixels"	-	MTIR only
mt_bbc_date	Ch	(constants)	(not defined)	19	"C1 coefficient file name"	-	MTIR only
spnz_coef0	Real	number of gains number of detectors number of surface	"chnlsvspw" "dets" "sur"	23[V], 4[S], 6[250m] 12[V,S], 48[250m] 2	"Stripe Noise Correction Coefficient0 for VNIR/SWIR"	-	VNIR/SWIR/250m only
spnz_coef1	Real	number of gains number of detectors number of surface	"chnlsvspw" "dets" "sur"	23[V], 4[S], 6[250m] 12[V,S], 48[250m] 2	"Stripe Noise Correction Coefficient1 for VNIR/SWIR"	-	VNIR/SWIR/250m only
spnz_coef2	Real	number of gains number of detectors number of surface	"chnlsvspw" "dets" "sur"	23[V], 4[S], 6[250m] 12[V,S], 48[250m] 2	"Stripe Noise Correction Coefficient2 for VNIR/SWIR"	-	VNIR/SWIR/250m only
spnz_coef3	Real	number of gains number of detectors number of surface	"chnlsvspw" "dets" "sur"	23[V], 4[S], 6[250m] 12[V,S], 48[250m] 2	"Stripe Noise Correction Coefficient3 for VNIR/SWIR"	-	VNIR/SWIR/250m only
spnz_coef4	Real	number of gains number of detectors number of surface	"chnlsvspw" "dets" "sur"	23[V], 4[S], 6[250m] 12[V,S], 48[250m] 2	"Stripe Noise Correction Coefficient4 for VNIR/SWIR"	-	VNIR/SWIR/250m only
spnz_coef5	Real	number of gains number of detectors number of surface	"chnlsvspw" "dets" "sur"	23[V], 4[S], 6[250m] 12[V,S], 48[250m] 2	"Stripe Noise Correction Coefficient5 for VNIR/SWIR"	-	VNIR/SWIR/250m only
spnz_coef0_2km	Real	number of gains number of detectors number of surface	"chnls2k" "dets2k" "sur"	2 6 2	"Stripe Noise Correction Coefficient0 for SWIR 2km"	-	SWIR only
spnz_coef1_2km	Real	number of gains number of detectors number of surface	"chnls2k" "dets2k" "sur"	2 6 2	"Stripe Noise Correction Coefficient1 for SWIR 2km"	-	SWIR only

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
spnz_coef2_2km	Real	number of gains number of detectors number of surface	"chnls2k" "dets2k" "sur"	2 6 2	"Stripe Noise Correction Coefficient2 for SWIR 2km"	-	SWIR only
spnz_coef3_2km	Real	number of gains number of detectors number of surface	"chnls2k" "dets2k" "sur"	2 6 2	"Stripe Noise Correction Coefficient3 for SWIR 2km"	-	SWIR only
spnz_coef4_2km	Real	number of gains number of detectors number of surface	"chnls2k" "dets2k" "sur"	2 6 2	"Stripe Noise Correction Coefficient4 for SWIR 2km"	-	SWIR only
spnz_coef5_2km	Real	number of gains number of detectors number of surface	"chnls2k" "dets2k" "sur"	2 6 2	"Stripe Noise Correction Coefficient5 for SWIR 2km"	-	SWIR only
mt_spnz_coef0	Real	number of gains number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Stripe Noise Correction Coefficient0 for MTIR"	-	MTIR only
mt_spnz_coef1	Real	number of gains number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Stripe Noise Correction Coefficient1 for MTIR"	-	MTIR only
mt_spnz_coef2	Real	number of gains number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Stripe Noise Correction Coefficient2 for MTIR"	-	MTIR only
mt_spnz_coef3	Real	number of gains number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Stripe Noise Correction Coefficient3 for MTIR"	-	MTIR only
mt_spnz_coef4	Real	number of gains number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Stripe Noise Correction Coefficient4 for MTIR"	-	MTIR only
mt_spnz_coef5	Real	number of gains number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Stripe Noise Correction Coefficient5 for MTIR"	-	MTIR only
nonlinear_sat_dn	Real	number of channels number of detectors number of surface	"chnldn" "dets" "sur"	10[V], 2[250m] 12[V], 48[250] 2	"Saturation DN of Non_linear Channel"		Ch13,15,17,19,22,23 only VNIR/250m only
z_gcal_coef	Real	number of channels	"chnlsvspw"	23[V], 4[S], 6[250m]	"Absolute Calibration Coef Gcal for VNIR/SWIR"		VNIR/SWIR/250m only
z_gsys_coef	Real	number of channels	"chnlsvspw"	23[V], 4[S], 6[250m]	"Absolute Calibration Coef Gsys for VNIR/SWIR"		VNIR/SWIR/250m only
z_gcal_coef_2km	Real	number of channels	"chnls2k"	2	"Absolute Calibration Coef Gcal for SWIR 2km"		SWIR only

| Name | Type | Dimension | | | long name | units (valid range) | Notes |
		Contents	Name	Value			
z_gsys_coef_2km	Real	number of channels	"chnls2k"	2	"Absolute Calibration Coef Gsys for SWIR 2km"		SWIR only
mt_offsetnoise	Real	number of channels number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Offset Noise Coef for MTIR "		MTIR only
mt_offsetnoise_obd	Real	number of channels number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Offset Noise Coef for MTIR in OBD"		MTIR only

2.4.8　Time Information

V group name	V group class
Spacecraft Time Error	Ephemeris_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
d : number of time information("num_inf" value)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
num_inf	Short	(constants)	(not defined)	1	"Number of time difference data"	-	
orbit_count	Long	number of time info records	"ndatas"	d	"Orbit accumulation number"	-	
path_date	Ch	number of time info records (string length)	"ndatas" (not defined)	d 9	"Crossing date of target path"	-	
path_num	Ushort	number of time info records	"ndatas"	d	"Number of target path"	-	
start_time	Ch	n number of time info records (string length)	"ndatas" (not defined)	d 19	"Start time of time difference data"	-	
end_time	Ch	number of time info records (string length)	"ndatas" (not defined)	d 19	"End time of time difference data"	-	
period_count	Real	number of time info records	"ndatas"	d	"Counter period of SC clock"	"sec"	
ref_count	Ulong	number of time info records	"ndatas"	d	"Reference counter of SC clock"	"sec"	
ref_time	Ch	number of time info records (string length)	"ndatas" (not defined)	d 19	"Reference time (UT) of ground"	-	

2.4.9 GPS Orbit Data

V group name	V group class
GPS Orbit Data	Ephemeris_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
g : number of GPS data(" gps_points" value)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
gps_points	Long	(constants)	(not defined)	1	"Number of GPS data"	-	
utc_tai	Long	(constants)	(not defined)	1	"UTC-TAI"	"sec"	
ut1r_tai	Double	(constants)	(not defined)	1	"UT1R-TAI"	"sec"	
polar_motion	Double	pairs	"pairs"	2	"Polar motion parameters"	-	
GPS_nav_dat	Double	number of GPS data	"gpsdata"	g	"GPS navigation time"	-	restored GPS NT
GPS_pos_dat	Double	number of GPS data 3-dim vector	"gpsdata" "vec"	g 3	"GPS spacecraft position"	"km"	
GPS_vel_dat	Double	number of GPS data 3-dim vector	"gpsdata" "vec"	g 3	"GPS spacecraft velocity"	"km/sec"	

2.4.10   Orbit Data(GPS unavailable case only)

V group name	V group class
Orbit Data	Ephemeris_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
m : number of orbit data records ("num_rec" value)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
num_rec	Long	(constants)	(not defined)	1	"Number of records"	-	
precision	Short	number of data records	"odatas"	m	"Orbit data precision"	-	0:forecast 1:decision
o_utc_tai	Long	number of data records	"odatas"	m	"UTC-TAI"	"sec"	
o_ut1r_tai	Double	number of data records	"odatas"	m	"UT1R-TAI"	"sec"	
o_polar_motion	Double	number of data records pairs	"odatas" "pairs"	m 2	"Polar motion parameters"	-	
o_start_date	Ch	number of data records (string length)	"odatas" "ndata22"	m 22	"Orbit data start date"	-	
o_interval	Double	number of data records	"odatas"	m	"Data interval time"	"sec"	
o_num_points	Long	number of data records	"odatas"	m	"Number of data points"	-	
o_sc_pos	Double	number of data records number of data points 3-dim vector	"odatas" "onpnt" "vec"	m 1440 3	"Spacecraft position"	"km"	(ECR)
o_sc_vel	Double	number of data records number of data points 3-dim vector	"odatas" "onpnt" "vec"	m 1440 3	"Spacecraft velocity"	"km/sec"	(ECR)

2.4.11 Radiometric Correction Coefficients

V group name	V group class
Radiometric Correction	Radiometric_Correction_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
offset_vs	Real	number of channels number of detectors number of scans even/odd	"chnlsvspw" "dets" "rec" "evod"	23[V], 4[S], 6[250m] 12[V,S], 48[250m] s 2	"Offset correction table for VNIR/SWIR"	-	VNIR/SWIR/250m only
offset_2km	Real	number of channles number of detectors number of scans	"chnls2k" "dets2k" "rec"	2 6 s	"Offset correction table for SWIR 2km"	-	SWIR only
non_linear_vs	Real	number of channles number of detectors counts number of surface	"chnonlin" "dets" "counts" "sur"	10[V], 2[250m] 12[V,S], 48[250m] 4096 2	"Non-Linearity correction table for VNIR/SWIR"	-	VNIR/250m only Non-linear channels only
inc_angle_vs	Real	number of channels number of surface number of samples	"chnlsvs" "sur" "nsamp"	19[V]. 4[S], 6[250m] 2 12[V,S], 48[250m] 1276[V,S], 5104[250m]	"Incident angle dependency correction table for VNIR/SWIR"	-	VNIR/SWIR/250m only
inc_angle_2km	Real	number of channles number of surface number of samples	"chnls2k" "sur" "nsamp"	2 2 638	"Incident angle dependency correction table for SWIR 2km"	-	SWIR only
rel_det_vs	Real	number of channels number of detectors number of surface	"chnlsvspw" "dets" "sur"	23[V], 4[S], 6[250m] 12[V,S], 48[250m] 2	"Detector gain correction for VNIR/SWIR"	-	VNIR/SWIR/250m only

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
rel_det_2km	Real	number of channles number of detectors number of surface	"chnls2k" "dets2k" "sur"	2 6 2	"Detector gain correction for SWIR 2km	-	SWIR only
gcal	Real	number of channles	"chnlsvspw"	23[V], 4[S], 6[250m]	"Gcal"	-	VNIR/SWIR/250m only
gcal_2km	Real	number of channles	"chnls2k"	2	"Gcal 2km"	-	SWIR only
gsys	Real	number of channles	"chnlsvspw"	23[V], 4[S], 6[250m]	"Gsys"	-	VNIR/SWIR/250m only
gsys_2km	Real	number of channles	"chnls2k"	2	"Gsys 2km"	-	SWIR only
offset_mt	Real	number of channles number of detectors number of scans	"chnlsmt" "dets" "rec"	7 12 s	"Deep space clump level correction table for MTIR"	-	MTIR only
inc_angle_mt1	Real	number of channles number of surface number of samples	"chnlsmt" "sur" "nsamp_ang"	7 2 1276	"Incident angle dependency correction table for MTIR Image"	-	MTIR only
inc_angle_mt2	Real	number of channles number of surface	"chnlsmt" "sur"	7 2	"Incident angle dependency correction table for MTIR Clamp"	-	MTIR only
bbc_mt	Real	number of channles number of detectors number of scans	"chnlsmt" "dets" "rec"	7 12 s	" Correction coefficient for Blackbody calibration "	-	MTIR only
c1	Real	number of channles	"chnlsmt"	7	"C1"	-	MTIR only

2.4.12 Data Quality Flag

V group name	V group class
Data Quality Flag	Scan_Line_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
qf_sc_time	Byte	number of scans	"rec"	s	"Spacecraft counter time quality flag"	-	
qf_GPS_timing	Byte	number of scans	"rec"	s	"GPS timing quality flag"	-	
qf_GPS_nav_time	Byte	number of scans	"rec"	s	"GPS navigation time quality flag"	-	
qf_GPS_pos	Byte	number of scans	"rec"	s	"GPS position quality flag"	-	
qf_GPS_vel	Byte	number of scans	"rec"	s	"GPS velocity quality flag"	-	
qf_sc_att	Byte	number of scans 3-dim vector	"rec" "vec"	s 3	"Spacecraft attitude roll, pitch, yaw quality flag"	-	
qf_sc_attr	Byte	number of scans 3-dim vector	"rec" "vec"	s 3	"Spacecraft attitude rate quality flag"	-	
qf_orbit_num	Byte	number of scans	"rec"	s	"Orbit number quality flag"	-	
qf_orbit_timer	Byte	number of scans	"rec"	s	"Orbit timer quality flag"	-	
qf_scan_off	Byte	number of scans	"rec"	s	"Scan start time offset quality flag"	-	
qf_tilt_angle	Byte	number of scans	"rec"	s	"Tilt angle quality flag"	-	
qf_scan_angle	Byte	number of scans	"rec"	s	"Scan angle quality flag"	-	
qf_halogen_light	Byte	number of scans number of halogen monitor	"rec" "hal"	s 2	"Halogen light quality flag"	-	
qf_halogen_temp	Byte	number of scans number of halogen monitor	"rec" "hal"	s 2	"Halogen temperature quality flag"	-	
qf_black_temp	Byte	number of scans number of blackbody temperature sensors	"rec" "bbt"	s 5	"Black body temperature quality flag"	-	

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
qf_optics_temp	Byte	number of scans number of optics temperature sensors	"rec" "opt"	s 5	"Optics temperature quality flag"	-	
qf_diffuser_temp	Byte	number of scans	"rec"	s	"Diffuser temperature quality flag"	-	
qf_sunlight	Byte	number of scans number of solar monitor samples	"rec" "sun"	s 2	"Sun light quality flag"	-	
qf_mtdet_temp	Byte	number of scans	"rec"	s	"MTIR detector temperature quality flag"	-	
qf_ele_signal	Byte	number of scans number of electric calibration signals	"rec" "ele"	s 12	"Electric calibration signal quality flag"	-	
qf_lamp_vol1	Byte	number of scans	"rec"	s	"Lamp drive voltage 1 quality flag"	-	
qf_lamp_vol2	Byte	number of scans	"rec"	s	"Lamp drive voltage 2 quality flag"	-	
qf_VS_dsp	Byte	number of channels number of lines	"chnlsvs" "lines"	19[V], 4[S], 6[250m] s×12[V,S],s×48[250m]	"VNIR/SWIR deep space data quality flag"	-	VNIR/SWIR/250m only
qf_dsp_2km	Byte	number of channels number of lines	"chnls2k" "lines2k"	2 s×6	"SWIR 2km deep space data quality flag"	-	SWIR only
qf_MT_dsp	Byte	number of channels number of lines	"chnlsmt" "lines"	7[M] s×12	"MTIR deep space data quality flag"	-	MTIR only
qf_wall	Byte	number of channels number of lines	"chnlsmt" "lines"	7[M] s×12	"MTIR wall clump data quality flag"	-	MTIR only
qf_bb	Byte	number of channels number of lines	"chnlsmt" "lines"	7[M] s×12	"MTIR blackbody data quality flag"	-	MTIR only
qf_sun_lump	Byte	number of channels number of lines	"chnlsvs" "lines"	19[V], 4[S], 6[250m] s×12	"Sun or Lump data quality flag"	-	calibration product only
qf_sun_lump_2km	Byte	number of channels number of lines	"chnlsvs" "lines"	2 s×6	"Sun or Lump 2km data quality flag"	-	calibration product only

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
lost_info	Long	number of items for quality infomation	(not defined)	5	"Lost Information"	-	obs. image packet/frame, cal. image packet/frame, PCD packet/frame, supplement packet/frame, image lines;
		number of types	(not defined)	4			(OK/FAIR, Fair/Poor, Poor/NG, Lost count)

2.5 Notes
2.5.1 Flags in Observation Image Pixel

In the Level 1A products, the positions of the observation image data bits are as follows.
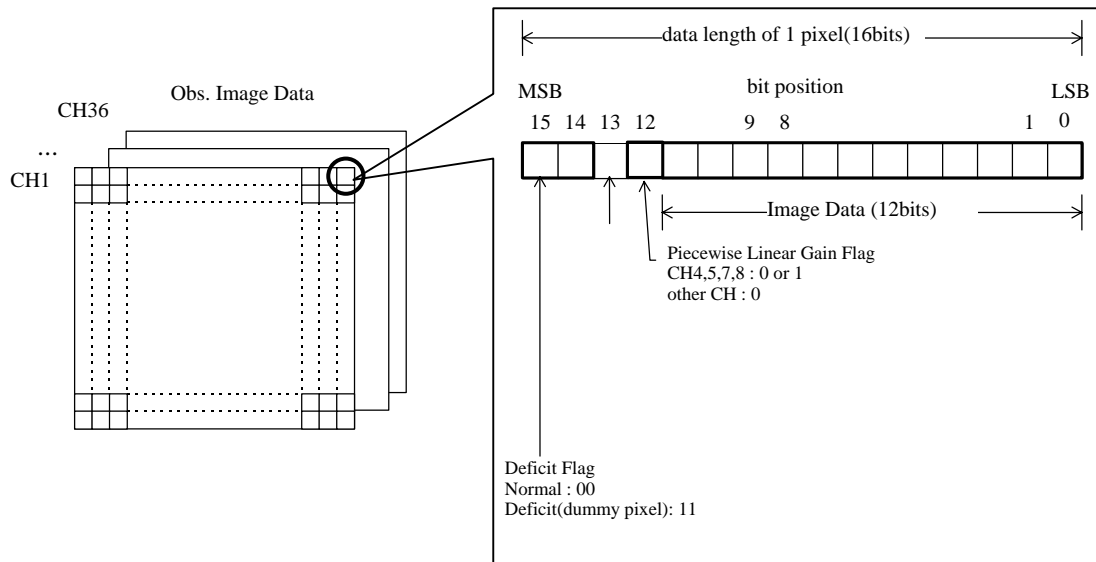
The flags for the level 1A image are as follows.

Position	Item	Definition and description	Remarks
12	Piecewise-linear gain flag	This flag is always set to 0 except for ch4, 5, 7, and 8. When the most significant bit of 13-bit data distributed from the GLI sensor is the piecewise-linear gain flag and is set to 1, high gain is indicated. When it is set to 0, normal gain is indicated for ch4, 5, 7, and 8.	
13	(not used)	Always 0	
14 15	Loss flag	If a dummy pixel is added due to a lost packet frame (12 image data bits are all zeros), the loss flag is set to 11. Otherwise, this flag is set to 00.	

2.5.2 2km Sampling Data

2km samplimg data of SWIR 2km channel is sampled from detector 8,16,24,32,40,48 and sample 1,9,17,…,5097

2.5.3   Data Quality Flags

For PCD engineering data and image correction data, flags are normally defined in a byte-type arrangement with the same dimensions as PCD engineering data and image correction data flags.

The flags are assigned to the bits as shown below.

		MSB							LSB
Bit position		7	6	5	4	3	2	1	0
Description		Whether or not data was checked	Unused				Whether or not data was interpolated	Whether or not data is erroneous	Whether or not data was lost
Meaning of bit	1	Not checked					Interpolated	Erroneous	Lost
	0	Checked	Always 0				Not interpolated	Normal	Normal

The bits have the following meanings:
Bit 0   Loss
         Set to 1 when the packet or frame has been lost and no data exists.   Otherwise, it is 0.   If the data value extends over more than one packet or frame, the bit is set to 1 if any packet or frame is lost.

Bit 1   Data error
         Set to 1 when the data is regarded as erroneous (including when data exists) by any of the following: threshold check, continuity check, or dispersion check. Otherwise, it is 0.   If one flag is used for more than one data value, the bit is set to 1 if any of the data values is erroneous.

Bit 2   Interpolation
         Set to 1 when there has been a data error or loss and the data was recalculated or corrected by interpolation.   Otherwise, it is 0. It is also 0 when one scan has obtained more than one data value and processing was done using the remaining data after discarding data that was determined by the dispersion check to be erroneous.   If one flag is used for more than one data value, the bit is set to 1 if any of the data values has been interpolated.

Bits 3 to 6   Unused
         Always 0.

Bit 7   Checking
         Set to 1 when no checking was performed because the data values cannot be checked individually or the data was not used in level 1 processing. It is 0 when threshold checking, continuity checking, dispersion checking, or another kind of checking has been performed.   If this bit is 1, a value of 0 for bit 1, which indicates whether or not data is normal, has no meaning.   However, the meanings of bit 0, which indicates whether data has been lost, and bit 2, which indicates whether data has been interpolated, are have meaning.

Note, however, that the dimensions of the data items listed below differ from the dimensions of engineering data.

GPS position	Engineering data values of satellite positions are three-dimensional. The quality of more than one data value is collectively indicated by a single flag.
GPS velocity	Same as above.
Scan angle signal	Each scan of scan angle signal data obtains 1,276 data values. The quality of all these data values is collectively indicated by a single flag.

For the three types of data listed above, a bit continues to be 0 only when all of the data values qualify for 0.   The bit is set to 1 if any of the data values qualifies for 1.

For the calibration data of deep space image data of VNIR or SWIR, and for the calibration data for deep space image data, blackbody image data, and wall clump image data of MTIR, each scan is provided with one byte of data, which is arranged according to the dimension of the number of scans.   The bits continue to be 0 only when all of the samples qualify for 0, and are set to 1 when any of the samples qualifies for 0.

The flags are assigned to the bits as shown below (the bit assignments are the same as those for PCD engineering data and image correction data).

	MSB								LSB
Bit position		7	6	5	4	3	2	1	0
Description		Whether or not data was checked	Unused				Whether or not data was interpolated	Whether or not data is erroneous	Whether or not data was lost
Meaning of bit	1	Not checked	-				Interpolated	Erroneous	Lost
	0	Checked	Always 0				Not interpolated	Normal	Normal

2.5.4 GPS Flag

Global attribute "GPS Flag" shows below

GPS Flag	Orbit Data	Scan Start Time	Notes
"OK"	GPS Orbit Data is Used	Retrieve from TT	
"NG"	ELMD(PLN) or ELMP(NRT) is used	Retrieve from TT	
"TE"	ELMD or ELMP orbit data isued in proccesing time	ST of first scan (adout 1 sec error)	
"TX"	ELMD(PLN) or ELMP(NRT) is used	Calculated from ST and scan start time offset (about 10m sec error)	

3   Level 1B Data

3.1 Overview

Level 1B data consists of two types of products, 1km data and 250m data, according to the two GLI resolution types. From the standpoint of observation wavelengths, 1km data is further subdivided into four types: VNIR (visible near-infrared), SWIR (short wavelength infrared), MTIR (mid-thermal infrared), and the satellite position information product.   The satellite position information product is used as auxiliary data for VNIR and SWIR.

In the following material, the data types are represented as follows:

Ch	character string
Short	2-byte integer (signed)
Ushort	2-byte integer (unsigned)
Long	4-byte integer
Ulong	4-byte integer (unsigned)
Real	4-byte real
Double	8-byte real
Byte	1-byte integer (unsigned)
SByte	1-byte integer (signed)

3.2 File Names

Product file names are defined as listed below.

File name	Type
A2GLI*YYMMDDPPSSMMT_X*V1B0000000.00	VNIR
A2GLI*YYMMDDPPSSMMT_X*S1B0000000.00	SWIR
A2GLI*YYMMDDPPSSMMT_X*M1B0000000.00	MTIR
A2GL1*YYMMDDPPSSMMT_X*P1B0000000.00	Satellite position information
A2GL2*YYMMDDPPSSMMT_X*01B0000000.00	250m
A2GL1*YYMMDDPPNNNNN_X*01B0000000.00	near real-time

The components of the file names represent the following:

A2G	Type of the satellite (ADEOS-II)
GLx	Sensor type and resolution (GL1 = GLI 1km; GL2 = GLI 250m)
YYMMDD	Observation date
PP	Path number
SS	Scene number
MM	Observation mode (OD = daytime observation mode; O = nighttime observation mode)
T	Tilt (1 = nadir view, 2 = rear view, 3 = front view)
X	Product type (P = planned; N = near real-time, O = Made to order)
NNNNN	Elapsed time after passing the ascending node where extraction was started in a near real-time product

Global Attributes

GLI Level 1B Data

l1b_ch1_data	
....	(VNIR)
l1b_ch19_data	
l1b_ch24_data	
....	(SWIR)
l1b_ch27_data	
l1b_ch28_data_2km	
l1b_ch29_data_2km	
l1b_ch30_data	
....	(MTIR)
l1b_ch36_data	
l1b_ch20_data	
....	
l1b_ch23_data	(250m)
l1b_ch28_data	
l1b_ch29_data	

x channels

lines   pixels

2-D array x channels

Scan-Line Attributes

msec	l1b_blk_int
scan_start	l1b_blk_num
miss_qual	l1b_pos_samp
eng_qual	l1b_pos_line
s_satp	l1b_bound
s_satp_2km	l1b_blk_lat
	l1b_blk_lon
	l1b_blk_affin

Navigation

orb_vec	sun_ref
orb_vel	att_ang

Spacecraft Time Error

num_inf	end_time
orbit_count	period_count
path_date	ref_count
path_num	ref_time
start_time	

GPS Orbit Data

gps_points	GPS_nav_dat
utc_tai	GPS_pos_dat
ut1r_tai	GPS_vel_dat
polar_motion	

Orbit Data

num_rec	o_interval
precision	o_num_points
o_utc_tai	o_sc_pos
o_ut1r_tai	o_sc_val
o_start_date	o_polar_motion

Calibration

gcel_coef	spnz_coef0
gcal_coef_2km	....
gttl_coef	spnz_coef5
gttl_coef_2km	spnz_coef0_2km
gscan_coef	....
gscan_coef_2km	spnz_coef5_2km
k_tgtch_dn	mt_spnz_coef0
k_refch_rad	....
mt_offset	mt_spnz_coef5
mt_nlgain	nonlinear_sat_dn
mt_eta	z_gcal_coef
mt_bbc_coef	z_gsys_coef
mt_av_scan	z_gcal_coef_2km
mt_params	z_gsys_coef_2km
mt_bb_rad	mt_offsetnoise
mt_av_pix	
mt_bbc_date	

Calibration Coefficient

gcal	
gcal_2km	c1
gsys	
gsys_2km	

Raw ADEOS-II Data

ADEOS2_PCD	wall_clump
gli_supl	
blk_data	
deep_data_vs	
deep_data_mt	
deep_data_2km	

Converted PCD

sc_time	sc_att
GPS_timing	sc_attr
GPS_nav_time	orbit_num
GPS_pos	orbit_timer
GPS_vel	

Scan Geometry

nav_pxl	solar_azimuth
nav_row	sc_zenith
solar_zenith	sc_azimuth

Data Quality Flag

qf_sc_time	qf_optics_temp
qf_GSP_timing	qf_diffuser_temp
qf_GPS_nav_time	qf_sunlight
qf_GPS_pos	qf_mtdet_temp
qf_GPS_vel	qf_ele_signal
qf_sc_att	qf_lamp_vol1
qf_sc_attr	qf_lamp_vol2
qf_orbit_num	qf_VS_dsp
qf_orbit_timer	qf_dsp_2km
qf_scan_off	qf_MT_dsp
qf_tilt_angle	qf_wall
qf_scan_angle	qf_bb
qf_halogen_light	qf_sun_lump
qf_halogen_temp	lost_info
qf_black-temp	

Sensor Tilt

tilt_seg
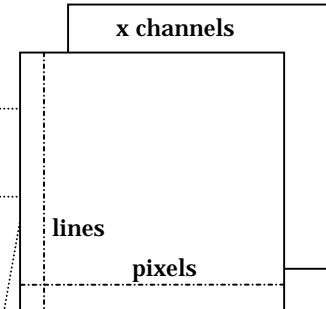
Converted Supplement

scan_off	optics_temp
opr_mode	diffuser_temp
tilt_flag	sunlight
tilt_angle	mtdet_temp
mirror_surface	ele_signal
scan_angle	lamp_vol1
halogen_light	lamp_vol2
halogen_temp	convert_coef
black_temp	

Land-Water Flag

land_value	land_water_flag
water_value	

Det_Infomation

det_info_ch1	scan_info_ch30
....	....
det_info_ch19	scan_info_ch36
det_info_ch24	scan_indo_ch20
....	....
det_info_ch27	scan_info_ch23
det_info_ch28_2km	scan_info_ch28
det_info_ch29_2km	scan_info_ch29
det_info_ch30	sample_info_ch1
....	....
det_info_ch36	sample_info_ch19
det_indo_ch20	sample_info_ch30
....	....
det_info_ch23	sample_info_ch36
det_info_ch28	sample_info_ch24
det_info_ch29	....
scan_info_ch1	sample_info_ch27
....	sample_info_ch28_2km
scan_info_ch19	sample_info_ch29_2km
scan_info_ch24	sample_indo_ch20
....	....
scan_info_ch27	sample_info_ch23
scan_info_ch28_2km	sample_info_ch28
scan_info_ch29_2km	sample_info_ch29

Spacecraft Position Ref Time*

base_time	time_unit

Spacecraft Position Ref Data Time*

refer Det Information (1km channel only)

*:SLPT product only

3.1 Level 1B Product (VNIR/SWIR/MTIR/250m)

3.3 Global Attribute

3.3.1 Mission and Documentation

Data Name	Type	Number of data	Format	Explanation	Notes
Product Name	Ch	1	(see 3.2)	product file name	
Title	Ch	1	"GLI Level-1B Data" "GLI Level-1B NRT Data"	Plan processing NRT processing	
Data Center	Ch	1	"JAXA/Earth　Observation Center"	This denotes it is processed at EOC.	
Station Name	Ch	1	"JAXA/Earth　Observation Center"	This denotes it is received at EOC.	NRT case only
Station Latitude	Real	1	Latitude[deg]	receiving station latitude	NRT case only
Station Longitude	Real	1	Longitude[deg]	receiving station longitude	NRT case only
Mission	Ch	1	"ADEOS-II GLI"	mission name (satellite name, sensor name)	
Mission Characteristics	Ch	1	"Nominal orbit:inclination = 98.62(Sun-Synchronous); node = 10:15-10:45 AM(descending); eccentricity < 0.0012; altitude = 803km; ground speed = 6.6km/sec; revolutions per day = 14 + 1/4"	-	
Sensor	Ch	1	"Global Imager(GLI)"	sensor name	
Sensor Characteristics	Ch	1	"1km:Number of bands = 30, 250m: Number of bands = 6; 1km:Number of detectors per bands = 12, 250m:Number of detectors per bands = 48; 1km bits per pixel = 13, 250m:bits per pixel = 12; Scan period = 1.8sec; 1km:bit rate = 3.8676Mbit/sec, 250m:bit rate = 60Mbit/sec"	-	
Data Type	Ch	1	"1km" "250m" "NRT"	Plan processing (1km) Plan processing (250m) NRT processing (1km)	
Data Sub-type	Ch	1	"VNIR" "SWIR" "MTIR" "SLPT"	band type SLPT is Spacecraft infomation	1km product only

Data Name	Type	Number of data	Format	Explanation	Notes
Number of 1km Channels	Ch	1	NN	Number of processing target channels of 1km data.	1km product only
Number of 250m/2km Channels	Ch	1	NN	Number of processing target channels of 250m/2km data.	1kmSWIR product only
Number of 250m Channels	Ch	1	NN	Number of processing target channels of 250m data.	250 product only
Processing Channels	Ch	1	(pattern1) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 (pattern2)24 25 26 27 28 29 (pattern3)1 2 3 4 5 6 7 8 9 10 11 12 14 16 18 30 34 35 36	Channel numbers are listed, separated by a blank. parttern1 is VNIR product parttern2 is SWIR product parttern3 is NRT product	
Replacement Flag	Ch	1	"ORIGINAL"	This denotes the product is generated at EOC	
Software ID	Ch	1	UVNNNNNNN	software version ID at EOC U : GLI correction/physical parameter calculation software version V : GLI HMI software version NNNNNNN :local version	
Parameter Ver.	Ch	1	UVWX******	Processing parameter version ID at EOC. U : processing type 　　(V:normal,R:reprocess) V: Calibration parameter(1-9,A-Z) W: Land-Water data(1-9,A-Z) X: Threshold parameter(1-9,A-Z)	
Processing Time	Ch	1	YYYYMMDD　　hh:mm:ss.ttt	processing time	
Processing Result	Ch	1	(omit)	processing result record for the product	

3.3.2 Data Time

Data Name	Type	Number of data	Format	Explanation	Notes
Start Time	Ch	1	YYYYMMDD hh:mm:ss.ttt	scene start time in UTC	
End Time	Ch	1	YYYYMMDD hh:mm:ss.ttt	scene end time in UTC	
Scene Center Time	Ch	1	YYYYMMDD hh:mm:ss.ttt	scene center time in UTC	
Node Crossing Time	Ch	1	YYYYMMDD hh:mm:ss.ttt	descending node crossing time in UTC	
Start Year	Short	1	-	year of "Start Time"	
Start Day	Short	1	-	day of the year of "Start Time"	
Start Millisec	Long	1	-	millisecond of the day of "Start Time"	
End Year	Short	1	-	year of "End Time"	
End Day	Short	1	-	day of the year of "End time"	
End Millisec	Long	1	-	millisecond of the day of "End Time"	
Orbit Number	Long	1	1-399	PCD orbit number	
Last Maneuver Start Time	Ch	1	YYYYMMDD hh:mm:ss	-	
Last Maneuver End Time	Ch	1	YYYYMMDD hh:mm:ss	-	
Last Maneuver Type	Ch	1	"+dV" "-dV" "dI"	+dV in-plane accelaration -dV in-plane decelaration dI out-of-plane maneuver	

3.3.3　Data Quality

Data Name	Type	Number of data	Format	Explanation	Notes
Pixels per Scan Line	Long	1	1236 4944	1km case 250m case	
Pixels per Scan Line for SWIR 2km	Long	1	618	number of pixel (SWIR 250m/2km)	SWIR 2km resampling data only
Number of Scan Lines	Long	1	-	number of scans	[Stantard] 138
Number of Scan Lines for SWIR 2km	Long	1	6	number of pixel (SWIR 250m/2km)	SWIR/SLPT only
Lines per Scan	Long	1	12 48	1km case 250m case	
Missing Packets	Long	1	-	number of lost packets for the scene	1km only
Missing Frames	Long	1	-	number of lost frames for the scene	250m only
Missing Lines	Long	1	-	number of missing lines for the scene.	
GPS Flag	Ch	1	"OK" "NG" "TE" "TX"	GPS　available case GPS　unavailable case TT unavailable case 　　　(base ST of farst scan) TT unavailable case 　　　(scan start time is estimated)	refer 2.5.4

3.3.4　File Metrics

These are not included in SATP product.

Data Name	Type	Number of data	Format	Explanation	Notes
Saturated Pixels	Long	N1	-	number of saturated pixels	N1 denotes the number of processing channels.
Saturated Pixels for SWIR 2km	Long	N1	-	number of saturated pixels (SWIR 2km)	N1 denotes the number of processing channels.
Non-Saturated Pixels	Long	N1	-	number of non-saturated pixels	N1 denotes the number of processing channels.
Non-Saturated Pixels for SWIR 2km	Long	N1	-	number of non-saturated pixels (SWIR 2km)	N1 denotes the number of processing channels.

3.3.5 Scene Coordinates

These are not included in SATP product.

Data Name	Type	Number of data	Format	Explanation	Notes
Latitude Units	Ch	1	"degrees North"	latitude unit of used product	geodetic latitude
Longitude Units	Ch	1	"degrees East"	longitude unit of used product	
Scene Center Latitude	Real	1	-	-	Latitude and longitude are calculated at the center of light axis
Scene Center Longitude	Real	1	-	-	
Upper Left Latitude	Real	1	-	-	
Upper Left Longitude	Real	1	-	-	
Upper Right Latitude	Real	1	-	-	
Upper Right Longitude	Real	1	-	-	
Lower Left Latitude	Real	1	-	-	
Lower Left Longitude	Real	1	-	-	
Lower Right Latitude	Real	1	-	-	
Lower Right Longitude	Real	1	-	-	
Orbit Node Longitude	Real	1	-	-	
Start path number	Short	1	-	path number at the beginning of the scene	
Start argument of Latitude	Real	1	-	argument of latitude at the beginning of the scene	
End path number	Short	1	-	path number at the end of the scene	
End argument of Latitude	Real	1	-	argument of latitude at the beginning of the scene	

3.4 V Group (VNIR/SWIR/MTIR/250m)

3.4.1 Scan Line Attributes

V group name	V group class
Scan-Line Attributes	Scan_Line_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)
m : the column direction addresses of the pixels of which latitude and longitude are calculated (the value of "l1b_pos_samp" dimension)
n : the row direction addresses of the pixels of which latitude and longitude are calculated (the value of "l1b_pos_line" dimension)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
msec	Long	number of scans	"rec"	s	"Scan-line time, milliseconds of day"	"msec" (0,86400000)	UTC Time
scan_start	Ch	number of scans (string length)	"rec" (not defined)	s 22	"Scan Start Time"	-	
miss_qual	Byte	number of scans	"rec"	s	"Missing frame flag"	-	
eng_qual	Byte	number of scans	"rec"	s	"Engineering data-out-of-range flags"	-	
s_satp	Short	number of channels number of lines	"chnls" "lines"	19[V], 4[S], 7[M], 6[250m] s×12[V,S,M] s×48[250m]	"Number of saturated pixels per band"	-	
s_satp_2km	Short	number of channels number of lines	"chnls2k" "lines2k"	2 s×6	"Number of saturated pixels per band for SWIR 2km"		SWIR only
l1b_blk_int	Short	sample/line	"pairs"	2	"L1B block interval(sample/line)"	-	12 for 1km 48 for 250m
l1b_blk_num	Short	sample/line	"pairs"	2	"Number of L1B blocks(sample/line)"	-	
l1b_pos_samp	Long	number of sample direction addresses	"blk_samp"	m	"Column direction address of pixels"	-	
l1b_pos_line	Long	number of line direction addresses	"blk_line"	n	"Row direction address of pixels"	-	

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
l1b_bound	Long	latitude/longitude	"pairs"	2	"Over boundary flag(latitude/longitude)"	-	
l1b_blk_lat	Double	number of addresses for line direction	"blk_line"	n	"Block point latitude"	-	
		number of addresses for sample direction	"blk_samp"	m			
l1b_blk_lon	Double	number of addresses for line direction	"blk_line"	n	"Block point longitude"	-	
		number of addresses for sample direction	"blk_samp"	m			
l1b_blk_affin	Double	number of addresses for line direction	"blk_line_m1"	n-1	"Block coefficient"	-	
		number of addresses for sample direction	"blk_samp_m1"	m-1			
		number of pseudo affine coefficients	"affin"	8			

3.4.2 GLI Level 1B Data

V group name	V group class
GLI Level 1B Data	Scan_Line_Data

(1) VNIR

s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)
p : number of pixels(samples) for 1 line("Pixels per Scan Line" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
l1b_ch1_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch1 data"	-	
l1b_ch2_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch2 data"	-	
l1b_ch3_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch3 data"	-	
l1b_ch4_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch4 data"	-	
l1b_ch5_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch5 data"	-	
l1b_ch6_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch6 data"	-	
l1b_ch7_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch7 data"	-	
l1b_ch8_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch8 data"	-	
l1b_ch9_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch9 data"	-	
l1b_ch10_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch10 data"	-	
l1b_ch11_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch11 data"	-	
l1b_ch12_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch12 data"	-	

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
l1b_ch13_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch13 data"	-	
l1b_ch14_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch14 data"	-	
l1b_ch15_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch15 data"	-	
l1b_ch16_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch16 data"	-	
l1b_ch17_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch17 data"	-	
l1b_ch18_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch18 data"	-	
l1b_ch19_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch19 data"	-	

(2)SWIR

s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)
p : number of pixels(samples) for 1 line(1km, 250m)("Pixels per Scan Line" in Data Quality group of the Global Attributes)
p2 : number of pixels(samples) for 1 line(SWIR 2km)("Pixels per Scan Line for SWIR 2km" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
l1b_ch24_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch24 data"	-	
l1b_ch25_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch25 data"	-	
l1b_ch26_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch26 data"	-	
l1b_ch27_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch27 data"	-	
l1b_ch28_data_2km	Ushort	number of lines number of samples	lines nsamp	s×6 p2	"Level-1B ch28 data for 2km"	-	
l1b_ch29_data_2km	Ushort	number of lines number of samples	lines nsamp	s×6 p2	"Level-1B ch29 data for 2km"	-	

(3)MTIR

s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)
p : number of pixels(samples) for 1 line("Pixels per Scan Line" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
l1b_ch30_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch30 data"	-	
l1b_ch31_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch31 data"	-	
l1b_ch32_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch32 data"	-	
l1b_ch33_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch33 data"	-	
l1b_ch34_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch34 data"	-	
l1b_ch35_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch35 data"	-	
l1b_ch36_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B ch36 data"	-	

(4)250m

s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)
p : number of pixels(samples) for 1 line("Pixels per Scan Line" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
l1b_ch20_data	Ushort	number of lines number of samples	lines nsamp	s×48 p	"Level-1B ch20 data"	-	
l1b_ch21_data	Ushort	number of lines number of samples	lines nsamp	s×48 p	"Level-1B ch21 data"	-	
l1b_ch22_data	Ushort	number of lines number of samples	lines nsamp	s×48 p	"Level-1B ch22 data"	-	
l1b_ch23_data	Ushort	number of lines number of samples	lines nsamp	s×48 p	"Level-1B ch23 data"	-	
l1b_ch28_data	Ushort	number of lines number of samples	lines nsamp	s×48 p	"Level-1B ch28 data"	-	
l1b_ch29_data	Ushort	number of lines number of samples	lines nsamp	s×48 p	"Level-1B ch29 data"	-	

3.4.3 Raw ADEOS-II Data

V group name	V group class
Raw ADEOS-II Data	Scan_Line_Data

s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)
p : number of pixels(samples) for 1 line("Pixels per Scan Line" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
ADEOS2_PCD	Ushort	number of scans number of PCD data	"rec" "instr"	s 41	"ADEOS-II PCD Data"	-	
gli_supl	Ushort	number of scans number of GLI supplement data	"rec" "suppl"	s 1314	"GLI supplement data"	-	
blk_data	Ushort	number of channels number of lines number of samples	"chnlsmt" "lines" "nsampb"	7 s×12 30	"Black body data"	-	MTIR only
deep_data_vs	Ushort	number of channels number of lines number of samples	"chnlsvs" "lines" "nsampdvs"	19[V], 4[S], 6[250m] s×12[V,S], s×48[250m] 28[V,S], 112[250m]	"Deep space data"	-	VNIR/SWIR only
deep_data_mt	Ushort	number of channels number of lines number of samples	"chnlsmt" "lines" "nsampdmt"	7 s×12 20	"Deep space data"	-	MTIR only
deep_data_2km	Ushort	number of channels number of lines number of samples	"chnls2k" "lines2k" "nsampd2k"	2 s×6 14	"Deep space data for 2km"	-	SWIR only
wall_clump	Ushort	number of channels number of lines number of samples	"chnlsmt" "lines" "nsampw"	7 s×12 10	"Wall clump signal"	-	MTIR only

3.4.4 PCD Engineering Data

V group name	V group class
Converted PCD	Scan_Line_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
sc_time	Ulong	number of scans	"rec"	s	"Spacecraft counter time"	-	Lower 5 bits(bit 0-4) are not used and higher bits than 5th configure the counter. 1 count expresses 1 second after 5bits shift to right.
GPS_timing	Real	number of scans	"rec"	s	"GPS timing"	"sec" (0,59.999)	
GPS_nav_time	Real	number of scans	"rec"	s	"GPS navigation time"	"sec" (0,59.999)	
GPS_pos	Real	number of scans 3-dim vector	"rec" "vec"	s 3	"GPS position"	"km"	
GPS_vel	Real	number of scans 3-dim vector	"rec" "vec"	s 3	"GPS velocity"	"km/sec"	
sc_att	Real	number of scans 3-dim vector	"rec" "vec"	s 3	"Spacecraft attitude roll, pitch, yaw"	"deg" (-32.7,32.7)	
sc_attr	Real	number of scans 3-dim vector	"rec" "vec"	s 3	"Spacecraft attitude rate"	"deg/sec" (-3.27.3.27)	
orbit_num	Ushort	number of scans	"rec"	s	"Orbit number"	- (0,399)	
orbit_timer	Ushort	number of scans	"rec"	s	"Orbit timer"	"sec" (1,6054)	

3.4.5 GLI Supplement Engineering Data

V group name	V group class
Converted Supplement	Scan_Line_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
scan_off	Ulong	number of scans	"rec"	s	"Scan start time offset"	-	
opr_mode	Ushort	number of scans	"rec"	s	"Operation mode"	- (0, 15)	bit3: Day/Night 0:Night, 1:Day bit2: Electric Cal Mode 0: OFF, 1:ON bit1: Lamp Cal Mode 0:OFF, 1:ON bit0: Sun Cal Mode 0:OFF, 1:ON
tilt_flag	Ushort	number of scans	"rec"	s	"Tilt angle flag"	-	1: forward 2: nadir 3: backward
tilt_angle	Real	number of scans	"rec"	s	"Tilt angle for scan line"	"deg" (-20.0,20.0)	
mirror_surface	Byte	number of scans	"rec"	s	"Scan mirror surface"	- (0,1)	0: Surface A 1: Surface B
scan_angle	Real	number of scans number of scan angle sampels	"rec" sa	s 1276	"Scan angle"	-	
halogen_light	Real	number of scans number of halogen lamp monitor	"rec" "hal"	s 2	"Halogen light"	-	
halogen_temp	Real	number of scans number of halogen lamp monitor	"rec" "hal"	s 2	"Halogen temperature"	"Kelvin"	

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
black_temp	Real	number of scans number of blackbody temperature sensors	"rec" "bbt"	s 5	"Black body temperature"	"Kelvin"	
optics_temp	Real	number of scans number of optics temperature sensors	"rec" "opt"	s 5	"Optics temperature"	"Kelvin"	
diffuser_temp	Real	number of scans	"rec"	s	"Diffuser temperature"	"Kelvin"	
sunlight	Real	number of scans number of solar monitor samples	"rec" "sun"	s 2	"Sun light"	-	
mtdet_temp	Real	number of scans	"rec"	s	"MTIR detector temperature"	"Kelvin"	
ele_signal	Real	number of scans number of electric calibration signals	"rec" "ele"	s 12	"Electric calibration signal"	"volt"	
lamp_vol1	Real	number of scans	"rec"	s	"Lamp drive voltage 1"	"volt"	
lamp_vol2	Real	number of scans	"rec"	s	"Lamp drive voltage 2"	"volt"	
convert_coef	Double	number of data type number of coef	"datano" "coef"	32 3	"Supplement Convert Coefficient"	-	

3.4.6 Navigation

V group name	V group class
Navigation	Scan_Line_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
orb_vec	Real	number of scans 3-dim vector	"rec" "vec"	s 3	"Orbit position vector at scan line time in ECR"	"km" (-7200.0,7200.0)	
orb_vel	Real	number of scans 3-dim vector	"rec" "vec"	s 3	"Orbit velocity at scan line time in ECR"	"km/sec" (-8.0, 8.0)	
sun_ref	Real	number of scans 3-dim vector	"rec" "vec"	s 3	"Reference Sun vector in ECR frame"	-	
att_ang	Real	number of scans 3-dim vector	"rec" "vec"	s 3	"Computed roll, pitch, yaw"	"deg"	Attitude-angle in each Scan Start Time

3.4.7　Tilt

V group name	V group class
Sensor Tilt	Scan_Line_Data

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
tilt_seg	Short	(constants)	(not defined)	1	"Tilt segment number"	- (0, 2)	Tilt Setting 0: No-tilt0[deg] 1:Forward tilt(18.5[deg]) 2:Backward tilt(-18.5[deg])

3.4.8 Calibration Coefficients

V group name	V group class
Calibration	Parameter

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
The order of gains for piecewise linear channels(chnlsvspw) is H to L(ch1, 2, 3, 4H, 4L, 5H, 5L, 6, 7H, 7L, 8H, 8L, 9, ...)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
gcal_coef	Real	number of gains number of detectors number of surface	"chnlsvspw" "dets" "sur"	23[V], 4[S], 6[250m] 12[V,S], 48[250m] 2	"Correction coefficient for VNIR/SWIR"	-	Gcal VNIR/SWIR/250m only
gcal_coef_2km	Real	number of gains number of detectors number of surface	"chnls2k" "dets2k" "sur"	2 6 2	"Correction coefficient for SWIR 2km"	-	Gcal SWIR only
gttl_coef	Real	number of gains number of detectors number of surface	"chnlsvspw" "dets" "sur"	23[V], 4[S], 6[250m] 12[V,S], 48[250m] 2	"General gain coefficient for VNIR/SWIR"	-	Gttl VNIR/SWIR/250m only
gttl_coef_2km	Real	number of gains number of detectors number of surface	"chnls2k" "dets2k" "sur"	2 6 2	"General gain coefficient for SWIR 2km"	-	Gttl SWIR only
gscan_coef	Real	number of gains number of coefficients number of surface	"chnlsvs" "coef" "sur"	19[V], 4[S], 6[250m] 3 2	"Incident angle dependency coefficient for VNIR/SWIR"	-	VNIR/SWIR/250m only
gscan_coef_2km	Real	number of gains number of coefficients number of surface	"chnls2k" "coef" "sur"	2 3 2	"Incident angle dependency coefficient for SWIR 2km"	-	SWIR only
k_tgtch_dn	Real	number of channels number of detectors number of surface	"chnlsk" "dets" "sur"	6 12 2	"Judgment DN of Over saturation channels"	-	VNIR only Over saturation channles only
k_refch_rad	Real	number of channels number of detectors number of surface	"chnlsk" "dets" "sur"	6 12 2	"Judgment Radiance of reference channels"	-	VNIR only Reference channles only
mt_offset	Real	number of channels number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Offset term for MTIR"	-	C0 MTIR only
mt_nlgain	Real	number of channels number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Non-Linear gain term for MTIR"	-	C2 MTIR only

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
mt_eta	Real	number of channels number of parameters number of surface	"chnlsmt" "mtpar" "sur"	7 3 2	"Incident angle dependency coefficient for MTIR"	-	MTIR only
mt_bbc_coef	Real	number of channels number of surface	"chnlsmt" "sur"	7 2	"Correction coefficient for Blackbody radiance"	-	MTIR only
mt_av_scan	Short	(constants)	(not defined)	1	" Blackbody process average scans"	-	MTIR only
mt_params	Real	number of channels number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Correction coefficient for MTIR"	-	MTIR only
mt_bb_rad	Real	number of channels number of surface	"chnlsmt" "sur"	7 2	"Heat radiance of Scan_mirror"	-	MTIR only
mt_av_pix	Short	pairs	"pairs"	2	"Blackbody process average pixels"	-	MTIR only
mt_bbc_date	Ch	(constants)	(not defined)	1	"C1 coefficient file name"	-	MTIR only
spnz_coef0	Real	number of gains number of detectors number of surface	"chnlsvspw" "dets" "sur"	23[V], 4[S], 6[250m] 12[V,S], 48[250m] 2	"Stripe Noise Correction Coefficient0 for VNIR/SWIR"	-	VNIR/SWIR/250m only
spnz_coef1	Real	number of gains number of detectors number of surface	"chnlsvspw" "dets" "sur"	23[V], 4[S], 6[250m] 12[V,S], 48[250m] 2	"Stripe Noise Correction Coefficient1 for VNIR/SWIR"	-	VNIR/SWIR/250m only
spnz_coef2	Real	number of gains number of detectors number of surface	"chnlsvspw" "dets" "sur"	23[V], 4[S], 6[250m] 12 2	"Stripe Noise Correction Coefficient2 for VNIR/SWIR"	-	VNIR/SWIR/250m only
spnz_coef3	Real	number of gains number of detectors number of surface	"chnlsvspw" "dets" "sur"	23[V], 4[S], 6[250m] 12[V,S], 48[250m] 2	"Stripe Noise Correction Coefficient3 for VNIR/SWIR"	-	VNIR/SWIR/250m only
spnz_coef4	Real	number of gains number of detectors number of surface	"chnlsvspw" "dets" "sur"	23[V], 4[S], 6[250m] 12[V,S], 48[250m] 2	"Stripe Noise Correction Coefficient4 for VNIR/SWIR"	-	VNIR/SWIR/250m only
spnz_coef5	Real	number of gains number of detectors number of surface	"chnlsvspw" "dets" "sur"	23[V], 4[S], 6[250m] 12[V,S], 48[250m] 2	"Stripe Noise Correction Coefficient5 for VNIR/SWIR"	-	VNIR/SWIR/250m only
spnz_coef0_2km	Real	number of gains number of detectors number of surface	"chnls2k" "dets2k" "sur"	2 6 2	"Stripe Noise Correction Coefficient0 for SWIR 2km"	-	SWIR only
spnz_coef1_2km	Real	number of gains number of detectors number of surface	"chnls2k" "dets2k" "sur"	2 6 2	"Stripe Noise Correction Coefficient1 for SWIR 2km"	-	SWIR only

| Name | Type | Dimension | | | long name | units (valid range) | Notes |
		Contents	Name	Value			
spnz_coef2_2km	Real	number of gains number of detectors number of surface	"chnls2k" "dets2k" "sur"	2 6 2	"Stripe Noise Correction Coefficient2 for SWIR 2km"	-	SWIR only
spnz_coef3_2km	Real	number of gains number of detectors number of surface	"chnls2k" "dets2k" "sur"	2 6 2	"Stripe Noise Correction Coefficient3 for SWIR 2km"	-	SWIR only
spnz_coef4_2km	Real	number of gains number of detectors number of surface	"chnls2k" "dets2k" "sur"	2 6 2	"Stripe Noise Correction Coefficient4 for SWIR 2km"	-	SWIR only
spnz_coef5_2km	Real	number of gains number of detectors number of surface	"chnls2k" "dets2k" "sur"	2 6 2	"Stripe Noise Correction Coefficient5 for SWIR 2km"	-	SWIR only
mt_spnz_coef0	Real	number of gains number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Stripe Noise Correction Coefficient0 for MTIR"	-	MTIR only
mt_spnz_coef1	Real	number of gains number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Stripe Noise Correction Coefficient1 for MTIR"	-	MTIR only
mt_spnz_coef2	Real	number of gains number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Stripe Noise Correction Coefficient2 for MTIR"	-	MTIR only
mt_spnz_coef3	Real	number of gains number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Stripe Noise Correction Coefficient3 for MTIR"	-	MTIR only
mt_spnz_coef4	Real	number of gains number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Stripe Noise Correction Coefficient4 for MTIR"	-	MTIR only
mt_spnz_coef5	Real	number of gains number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Stripe Noise Correction Coefficient5 for MTIR"	-	MTIR only
nonlinear_sat_dn	Real	number of channels number of detectors number of surface	"chnldn" "dets" "sur"	10[V], 2[250m] 12[V], 48[250m] 2	"Saturation DN of Non_linear Channel"		Ch13,15,17,19,22,23 only VNIR/250m only
z_gcal_coef	Real	number of channels	"chnlsvspw"	23[V], 4[S], 6[250m]	"Absolute Calibration Coef Gcal for VNIR/SWIR"		VNIR/SWIR/250m only
z_gsys_coef	Real	number of channels	"chnlsvspw"	23[V], 4[S], 6[250m]	"Absolute Calibration Coef Gsys for VNIR/SWIR"		VNIR/SWIR/250m only
z_gcal_coef_2km	Real	number of channels	"chnls2km"	2	"Absolute Calibration Coef Gcal for SWIR for 2km"		SWIR only

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
z_gsys_coef_2km	Real	number of channels	"chnls"	23[V], 4[S], 6[250m]	"Absolute Calibration Coef Gsys for SWIR 2km"		SWIR only
mt_offsetnoise	Real	number of channels number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Offset Noise Coef for MTIR"		MTIR only
mt_offsetnoise_obd	Real	number of channels number of detectors number of surface	"chnlsmt" "dets" "sur"	7 12 2	"Offset Noise Coef for MTIR in OBD"		MTIR only

3.4.9 Time Information

V group name	V group class
Spacecraft Time Error	Ephemeris_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
d : number of time information("num_inf" value)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
num_inf	Short	(constants)	(not defined)	1	"Number of time difference data"	-	
orbit_count	Long	number of time info records	"ndatas"	d	"Orbit accumulation number"	-	
path_date	Ch	number of time info records (string length)	"ndatas" (not defined)	d 9	"Crossing date of target path"	-	
path_num	Ushort	number of time info records	"ndatas"	d	"Number of target path"	-	
start_time	Ch	n number of time info records (string length)	"ndatas" (not defined)	d 19	"Start time of time difference data"	-	
end_time	Ch	number of time info records (string length)	"ndatas" (not defined)	d 19	"End time of time difference data"	-	
period_count	Real	number of time info records	"ndatas"	d	"Counter period of SC clock"	"sec"	
ref_count	Ulong	number of time info records	"ndatas"	d	"Reference counter of SC clock"	"sec"	
ref_time	Ch	number of time info records (string length)	"ndatas" (not defined)	d 19	"Reference time (UT) of ground"	-	

3.4.10 GPS Orbit Data

V group name	V group class
GPS Orbit Data	Ephemeris_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
g : number of GPS data(" gps_points" value)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
gps_points	Long	(constants)	(not defined)	1	"Number of GPS data"	-	
utc_tai	Long	(constants)	(not defined)	1	"UTC-TAI"	"sec"	
ut1r_tai	Double	(constants)	(not defined)	1	"UT1R-TAI"	"sec"	
polar_motion	Double	pairs	"pairs"	2	"Polar motion parameters"	-	
GPS_nav_dat	Double	number of GPS data	"gpsdata"	g	"GPS navigation time"	-	restored GPS NT
GPS_pos_dat	Double	number of GPS data 3-dim vector	"gpsdata" "vec"	g 3	"GPS spacecraft position"	"km"	
GPS_vel_dat	Double	number of GPS data 3-dim vector	"gpsdata" "vec"	g 3	"GPS spacecraft velocity"	"km/sec"	

3.4.11 Orbit Data(GPS unavailable case only)

V group name	V group class
Orbit Data	Ephemeris_Data

m : number of orbit data records ("num_rec" value)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
num_rec	Long	(constants)	(not defined)	1	"Number of records"	-	
precision	Short	number of data records	"odatas"	m	"Orbit data precision"	-	0:forecast 1:decision
o_utc_tai	Long	number of data records	"odatas"	m	"UTC-TAI"	"sec"	
o_ut1r_tai	Double	number of data records	"odatas"	m	"UT1R-TAI"	"sec"	
o_polar_motion	Double	number of data records pairs	"odatas" "pairs"	m 2	"Polar motion parameters"	-	
o_start_date	Ch	number of data records (string length)	"odatas" "ndata22"	m 22	"Orbit data start date"	-	
o_interval	Double	number of data records	"odatas"	m	"Data interval time"	"sec"	
o_num_points	Long	number of data records	"odatas"	m	"Number of data points"	-	
o_sc_pos	Double	number of data records number of data points 3-dim vector	"odatas" "onpnt" "vec"	m 1440 3	"Spacecraft position"	"km"	(ECR)
o_sc_vel	Double	number of data records number of data points 3-dim vector	"odatas" "onpnt" "vec"	m 1440 3	"Spacecraft velocity"	"km/sec"	(ECR)

3.4.12   Land-Water Flag

V group name	V group class
Land-Water Flag	Image_Flag_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)
p : number of pixels(samples) for 1 line("Pixels per Scan Line" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
land_value	SByte	(constants)	(not defined)	1	"Land pixel value"	-	1(fix)
water_value	SByte	(constants)	(not defined)	1	"Water pixel value"	-	0(fix)
land_water_flag	SByte	number of lines number of samples	lines nsamp	s×12[V,S,M], s×48[250m] p	"Land-Water flag image"	- (0, 1)	

3.4.13   Scan Geometry

V group name	V group class
Scan Geometry	Scan_Line_Data

nc : the column direction addresses of the pixel which zenith and azimuth angles are calculated(the value of "nav_pxl" dimension)
nr : the row direction addresses of the pixel which zenith and azimuth angles are calculated (the value of "nav_row" dimension)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
nav_pxl	Long	number of column direction addresses	navpxls	nc	"Column direction address of navigation data"	-	
nav_row	Long	number of row direction addresses	navrows	nr	"Row direction address of navigation data"	-	
solar_zenith	Real	number of column direction addresses	navrows	nr	"Solar zenith angle"	"deg" (0.0,180.0)	
		number of row direction addresses	navpxls	nc			
solar_azimuth	Real	number of column direction addresses	navrows	nr	"Solar azimuth angle"	"deg" (-180.0,180.0)	
		number of row direction addresses	navpxls	nc			
sc_zenith	Real	number of column direction addresses	navrows	nr	"Spacecraft zenith angle"	"deg" (0.0,180.0)	
		number of row direction addresses	navpxls	nc			
sc_azimuth	Real	number of column direction addresses	navrows	nr	"Spacecraft azimuth angle"	"deg" (-180.0,180.0)	
		number of row direction addresses	navpxls	nc			

3.4.14 Absolute Calibration Table

V group name	V group class
Calibration Coefficient	Parameter

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
gcal	Real	number of channels	"chnlsvspw"	23[V], 4[S], 6[250m]	"Gcal"	-	VNIR/SWIR/250m only
gcal_2km	Real	number of channels	"chnls2k"	2	"Gcal 2km"	-	SWIR only
gsys	Real	number of channels	"chnlsvspw"	23[V], 4[S], 6[250m]	"Gsys"	-	VNIR/SWIR/250m only
gsys_2km	Real	number of channels	"chnls2k"	2	"Gsys 2km"	-	SWIR only
c1	Real	number of channels	"chnlsmt"	7	"C1"	-	MTIR only

3.4.15　Data Quality Flag

V group name	V group class
Data Quality Flag	Scan_Line_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
qf_sc_time	Byte	number of scans	"rec"	s	"Spacecraft counter time quality flag"	-	
qf_GPS_timing	Byte	number of scans	"rec"	s	"GPS timing quality flag"	-	
qf_GPS_nav_time	Byte	number of scans	"rec"	s	"GPS navigation time quality flag"	-	
qf_GPS_pos	Byte	number of scans	"rec"	s	"GPS position quality flag"	-	
qf_GPS_vel	Byte	number of scans	"rec"	s	"GPS velocity quality flag"	-	
qf_sc_att	Byte	number of scans 3-dim vector	"rec" "vec"	s 3	"Spacecraft attitude roll, pitch, yaw quality flag"	-	
qf_sc_attr	Byte	number of scans 3-dim vector	"rec" "vec"	s 3	"Spacecraft attitude rate quality flag"	-	
qf_orbit_num	Byte	number of scans	"rec"	s	"Orbit number quality flag"	-	
qf_orbit_timer	Byte	number of scans	"rec"	s	"Orbit timer quality flag"	-	
qf_scan_off	Byte	number of scans	"rec"	s	"Scan start time offset quality flag"	-	
qf_tilt_angle	Byte	number of scans	"rec"	s	"Tilt angle flag quality flag"	-	
qf_scan_angle	Byte	number of scans	"rec"	s	"Scan angle quality flag"	-	
qf_halogen_light	Byte	number of scans number of halogen monitor	"rec" "hal"	s 2	"Halogen light quality flag"	-	
qf_halogen_temp	Byte	number of scans number of halogen monitor	"rec" "hal"	s 2	"Halogen temperature quality flag"	-	
qf_black_temp	Byte	number of scans number of blackbody temperature sensors	"rec" "bbt"	s 5	"Black body temperature quality flag"	-	

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
qf_optics_temp	Byte	number of scans number of optics temperature sensors	"rec" "opt"	s 5	"Optics temperature quality flag"	-	
qf_diffuser_temp	Byte	number of scans	"rec"	s	"Diffuser temperature quality flag"	-	
qf_sunlight	Byte	number of scans number of solar monitor samples	"rec" "sun"	s 2	"Sun light quality flag"	-	
qf_mtdet_temp	Byte	number of scans	"rec"	s	"MTIR detector temperature quality flag"	-	
qf_ele_signal	Byte	number of scans number of electric calibration signals	"rec" "ele"	s 12	"Electric calibration signal quality flag"	-	
qf_lamp_vol1	Byte	number of scans	"rec"	s	"Lamp drive voltage 1 quality flag"	-	
qf_lamp_vol2	Byte	number of scans	"rec"	s	"Lamp drive voltage 2 quality flag"	-	
qf_VS_dsp	Byte	number of channels number of lines	"chnlsvs" "lines"	19[V], 4[S], 6[250m] s×12[V,S], s×48[250m]	"VNIR/SWIR deep space data quality flag"	-	VNIR/SWIR/250m only
qf_dsp_2km	Byte	number of channels number of lines	"chnls2k" "lines2k"	2 s×6	"SWIR 2km deep space data quality flag"	-	SWIR only
qf_MT_dsp	Byte	number of channels number of lines	"chnlsmt" "lines"	7[M] s×12	"MTIR deep space data quality flag"	-	MTIR only
qf_wall	Byte	number of channels number of lines	"chnlsmt" "lines"	7[M] s×12	"MTIR wall clump data quality flag"	-	MTIR only
qf_bb	Byte	number of channels number of lines	"chnlsmt" "lines"	7[M] s×12	"MTIR blackbody data quality flag"	-	MTIR only

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
lost_info	Long	number of items for quality infomation number of types	(not defined) (not defined)	5 4	"Lost Information"	-	obs. image packet/frame, cal. image packet/frame, PCD packet/frame, supplement packet/frame, image lines; (OK/FAIR, Fair/Poor, Poor/NG, Lost count)

3.4.16   GLI Level 1B Source Pixel Number Information

V group name	V group class
Det Information	Scan_Line_Data

(1)VNIR

s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)
p : number of pixels per scan("Pixels per Scan Line" in Data Quality group of the Global Attributs)

SDSs in this group are stored using deflate compressing, but readable by the same way as normal HDF SDS reading.

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
det_info_ch1	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch1data"	- (1-12)	Detector number of L1A source pixels corresponding to each L1B pixels. "0" denote that the source pixel was missing data.
det_info_ch2	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch2 data"	- (1-12)	
det_info_ch3	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch3 data"	- (1-12)	
det_info_ch4	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch4 data"	- (1-12)	
det_info_ch5	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch5 data"	- (1-12)	
det_info_ch6	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch6 data"	- (1-12)	
det_info_ch7	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch7 data"	- (1-12)	
det_info_ch8	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch8 data"	- (1-12)	
det_info_ch9	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch9 data"	- (1-12)	
det_info_ch10	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch10 data"	- (1-12)	

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
det_info_ch11	SByte	number of lines	lines	s×12	"Det Information ch11 data"	-	
		number of samples	nsamp	p		(1-12)	
det_info_ch12	SByte	number of lines	lines	s×12	"Det Information ch12 data"	-	
		number of samples	nsamp	p		(1-12)	
det_info_ch13	SByte	number of lines	lines	s×12	"Det Information ch13 data"	-	
		number of samples	nsamp	p		(1-12)	
det_info_ch14	SByte	number of lines	lines	s×12	"Det Information ch14 data"	-	
		number of samples	nsamp	p		(1-12)	
det_info_ch15	SByte	number of lines	lines	s×12	"Det Information ch15 data"	-	
		number of samples	nsamp	p		(1-12)	
det_info_ch16	SByte	number of lines	lines	s×12	"Det Information ch16 data"	-	
		number of samples	nsamp	p		(1-12)	
det_info_ch17	SByte	number of lines	lines	s×12	"Det Information ch17 data"	-	
		number of samples	nsamp	p		(1-12)	
det_info_ch18	SByte	number of lines	lines	s×12	"Det Information ch18 data"	-	
		number of samples	nsamp	p		(1-12)	
det_info_ch19	SByte	number of lines	lines	s×12	"Det Information ch19 data"	-	
		number of samples	nsamp	p		(1-12)	
scan_info_ch1	Byte	number of lines	lines	s×12	"Scan Information ch1 data"	-	Scan number of L1A source pixels corresponding to each L1B pixels, by 1 origin expression. "0" denote that the source pixel was missing data.
		number of samples	nsamp	p			
scan _info_ch2	Byte	number of lines	lines	s×12	"Scan Information ch2 data"	-	
		number of samples	nsamp	p			
scan _info_ch3	Byte	number of lines	lines	s×12	"Scan Information ch3 data"	-	
		number of samples	nsamp	p			
scan _info_ch4	Byte	number of lines	lines	s×12	"Scan Information ch4 data"	-	
		number of samples	nsamp	p			
scan _info_ch5	Byte	number of lines	lines	s×12	"Scan Information ch5 data"	-	
		number of samples	nsamp	p			
scan_info_ch6	Byte	number of lines	lines	s×12	"Scan Information ch6 data"	-	
		number of samples	nsamp	p			
scan_info_ch7	Byte	number of lines	lines	s×12	"Scan Information ch7 data"	-	
		number of samples	nsamp	p			
scan_info_ch8	Byte	number of lines	lines	s×12	"Scan Information ch8 data"	-	
		number of samples	nsamp	p			

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
scan_info_ch9	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch9 data"	-	
scan_info_ch10	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch10 data"	-	
scan_info_ch11	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch11 data"	-	
scan_info_ch12	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch12 data"	-	
scan_info_ch13	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch13 data"	-	
scan_info_ch14	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch14 data"	-	
scan_info_ch15	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch15 data"	-	
scan_info_ch16	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch16 data"	-	
scan_info_ch17	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch17 data"	-	
scan_info_ch18	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch18 data"	-	
scan_info_ch19	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch19 data"	-	
sample_info_ch1	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch1 data"	-	Relative sample number of L1A source pixels corresponding to each L1B pixels. "0" denote that the source pixel was missing data.
sample _info_ch2	SBytet	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch2 data"	-	
sample _info_ch3	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch3 data"	-	
sample _info_ch4	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch4 data"	-	
sample _info_ch5	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch5 data"	-	
sample_info_ch6	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch6 data"	-	

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
sample_info_ch7	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch7 data"	-	
sample_info_ch8	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch8 data"	-	
sample_info_ch9	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch9 data"	-	
sample_info_ch10	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch10 data"	-	
sample_info_ch11	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch11 data"	-	
sample_info_ch12	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch12 data"	-	
sample_info_ch13	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch13 data"	-	
sample_info_ch14	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch14 data"	-	
sample_info_ch15	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch15 data"	-	
sample_info_ch16	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch16 data"	-	
sample_info_ch17	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch17 data"	-	
sample_info_ch18	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch18 data"	-	
sample_info_ch19	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch19 data"	-	

(2)SWIR

s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)
p : number of pixels per scan("Pixels per Scan Line" in Data Quality group of the Global Attributs)

SDSs in this group are stored using deflate compressing, but readable by the same way as normal HDF SDS reading.

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
det_info_ch24	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch24data"	-	Detector number of L1A source pixels corresponding to each L1B pixels. "0" denote that the source pixel was missing data.
det_info_ch25	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch25 data"	-	
det_info_ch26	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch26 data"	-	
det_info_ch27	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch27 data"	-	
det_info_ch28_2km	SByte	number of lines number of samples	lines2k nsamp2k	s×6 p	"Det Information ch28 2km data"	-	
det_info_ch29_2km	SByte	number of lines number of samples	lines2k nsamp2k	s×6 p	"Det Information ch29 2km data"	-	
scan_info_ch24	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch24 data"	-	Scan number of L1A source pixels corresponding to each L1B pixels, by 1 origin expression. "0" denote that the source pixel was missing data.
scan_info_ch25	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch25 data"	-	
scan_info_ch26	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch26 data"	-	
scan_info_ch27	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch27 data"	-	
scan_info_ch28_2km	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch28 2km data"	-	
scan_info_ch29_2km	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch29 2km data"	-	

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
sample_info_ch24	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch24 data"	-	Relative sample number of L1A source pixels corresponding to each L1B pixels. "0" denote that the source pixel was missing data.
sample_info_ch25	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch25 data"	-	
sample_info_ch26	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch26 data"	-	
sample_info_ch27	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch27 data"	-	
sample_info_ch28_2km	SByte	number of lines number of samples	lines nsamp	s×6 p	"Sample Information ch28 2km data"	-	
sample_info_ch29_2km	SByte	number of lines number of samples	lines nsamp	s×6 p	"Sample Information ch29 2km data"	-	

(3)MTIR

s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)
p : number of pixels per scan("Pixels per Scan Line" in Data Quality group of the Global Attributs)

SDSs in this group are stored using deflate compressing, but readable by the same way as normal HDF SDS reading.

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
det_info_ch30	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch30data"	-	Detector number of L1A source pixels corresponding to each L1B pixels. "0" denote that the source pixel was missing data.
det_info_ch31	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch31 data"	-	
det_info_ch32	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch32 data"	-	
det_info_ch33	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch33 data"	-	
det_info_ch34	SByte	number of lines number of samples	lines2k nsamp2k	s×12 p	"Det Information ch34 data"	-	
det_info_ch35	SByte	number of lines number of samples	lines2k nsamp2k	s×12 p	"Det Information ch35 data"	-	
det_info_ch36	SByte	number of lines number of samples	lines2k nsamp2k	s×12 p	"Det Information ch36 data"	-	
scan_info_ch30	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch30 data"	-	Scan number of L1A source pixels corresponding to each L1B pixels, by 1 origin expression. "0" denote that the source pixel was missing data.
scan_info_ch31	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch31 data"	-	
scan_info_ch32	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch32 data"	-	
scan_info_ch33	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch33 data"	-	
scan_info_ch34	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch34 data"	-	
scan_info_ch35	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch35 data"	-	

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
scan_info_ch36	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch36 data"	-	
sample_info_ch30	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch30 data"	-	Relative sample number of L1A source pixels corresponding to each L1B pixels. "0" denote that the source pixel was missing data.
sample_info_ch31	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch31 data"	-	
sample_info_ch32	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch32 data"	-	
sample_info_ch33	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch33 data"	-	
sample_info_ch34	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch34 data"	-	
sample_info_ch35	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch35 data"	-	
sample_info_ch36	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch36 data"	-	

(4)250m

s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)
p : number of pixels per scan("Pixels per Scan Line" in Data Quality group of the Global Attributs)

SDSs in this group are stored using deflate compressing, but readable by the same way as normal HDF SDS reading.

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
det_info_ch20	SByte	number of lines number of samples	lines nsamp	s×48 p	"Det Information ch20data"	-	Detector number of L1A source pixels corresponding to each L1B pixels. "0" denote that the source pixel was missing data.
det_info_ch21	SByte	number of lines number of samples	lines nsamp	s×48 p	"Det Information ch21 data"	-	
det_info_ch22	SByte	number of lines number of samples	lines nsamp	s×48 p	"Det Information ch22 data"	-	
det_info_ch23	SByte	number of lines number of samples	lines nsamp	s×48 p	"Det Information ch23 data"	-	
det_info_ch28	SByte	number of lines number of samples	lines2k nsamp2k	s×48 p	"Det Information ch28 data"	-	
det_info_ch29	SByte	number of lines number of samples	lines2k nsamp2k	s×48 p	"Det Information ch29 data"	-	
scan_info_ch20	Byte	number of lines number of samples	lines nsamp	s×48 p	"Scan Information ch20 data"	-	Scan number of L1A source pixels corresponding to each L1B pixels, by 1 origin expression. "0" denote that the source pixel was missing data.
scan_info_ch21	Byte	number of lines number of samples	lines nsamp	s×48 p	"Scan Information ch21 data"	-	
scan_info_ch22	Byte	number of lines number of samples	lines nsamp	s×48 p	"Scan Information ch22 data"	-	
scan_info_ch23	Byte	number of lines number of samples	lines nsamp	s×48 p	"Scan Information ch23 data"	-	
scan_info_ch28	Byte	number of lines number of samples	lines nsamp	s×48 p	"Scan Information ch28 data"	-	
scan_info_ch29	Byte	number of lines number of samples	lines nsamp	s×48 p	"Scan Information ch29 data"	-	

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
sample_info_ch20	SByte	number of lines number of samples	lines nsamp	s×48 p	"Sample Information ch20 data"	-	Relative sample number of L1A source pixels corresponding to each L1B pixels. "0" denote that the source pixel was missing data.
sample_info_ch21	SByte	number of lines number of samples	lines nsamp	s×48 p	"Sample Information ch21 data"	-	
sample_info_ch22	SByte	number of lines number of samples	lines nsamp	s×48 p	"Sample Information ch22 data"	-	
sample_info_ch23	SByte	number of lines number of samples	lines nsamp	s×48 p	"Sample Information ch23 data"	-	
sample_info_ch28	SByte	number of lines number of samples	lines nsamp	s×48 p	"Sample Information ch28 data"	-	
sample_info_ch29	SByte	number of lines number of samples	lines nsamp	s×48 p	"Sample Information ch29 data"	-	

3.5   V group (Spacecraft Position Information)

3.5.1   Base Time

V group name	V group class
Spacecarft Position Ref Time	Satpos_Data

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
base_time	Ch	string length	data22	22	"Satpos reference time"	-	

3.5.2 Spacecarft Position Information Data

V group name	V group class
Spacecarft Position Ref Data	Satpos_Data

s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)
p : number of pixels per scan("Pixels per Scan Line" in Data Quality group of the Global Attributs)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
det_info_ch1	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch1data"	-	Detector number of L1A source pixels corresponding to each L1B pixels. "0" denote that the source pixel was missing data.
det_info_ch2	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch2 data"	-	
det_info_ch3	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch3 data"	-	
det_info_ch4	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch4 data"	-	
det_info_ch5	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch5 data"	-	
det_info_ch6	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch6 data"	-	
det_info_ch7	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch7 data"	-	
det_info_ch8	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch8 data"	-	
det_info_ch9	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch9 data"	-	
det_info_ch10	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch10 data"	-	
det_info_ch11	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch11 data"	-	
det_info_ch12	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch12 data"	-	
det_info_ch13	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch13 data"	-	

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
det_info_ch14	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch14 data"	-	
det_info_ch15	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch15 data"	-	
det_info_ch16	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch16 data"	-	
det_info_ch17	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch17 data"	-	
det_info_ch18	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch18 data"	-	
det_info_ch19	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch19 data"	-	
det_info_ch24	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch24 data"	-	
det_info_ch25	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch25 data"	-	
det_info_ch26	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch26 data"	-	
det_info_ch27	SByte	number of lines number of samples	lines nsamp	s×12 p	"Det Information ch27 data"	-	
det_info_ch28_2km	SByte	number of lines number of samples	lines nsamp	s×6 p	"Det Information ch28 2km data"	-	
det_info_ch29_2km	SByte	number of lines number of samples	lines nsamp	s×6 p	"Det Information ch29 2km data"	-	
scan_info_ch1	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch1 data"	-	Scan number of L1A source pixels corresponding to each L1B pixels, by 1 origin expression. "0" denote that the source pixel was missing data.
scan _info_ch2	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch2 data"	-	
scan _info_ch3	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch3 data"	-	
scan _info_ch4	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch4 data"	-	
scan _info_ch5	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch5 data"	-	

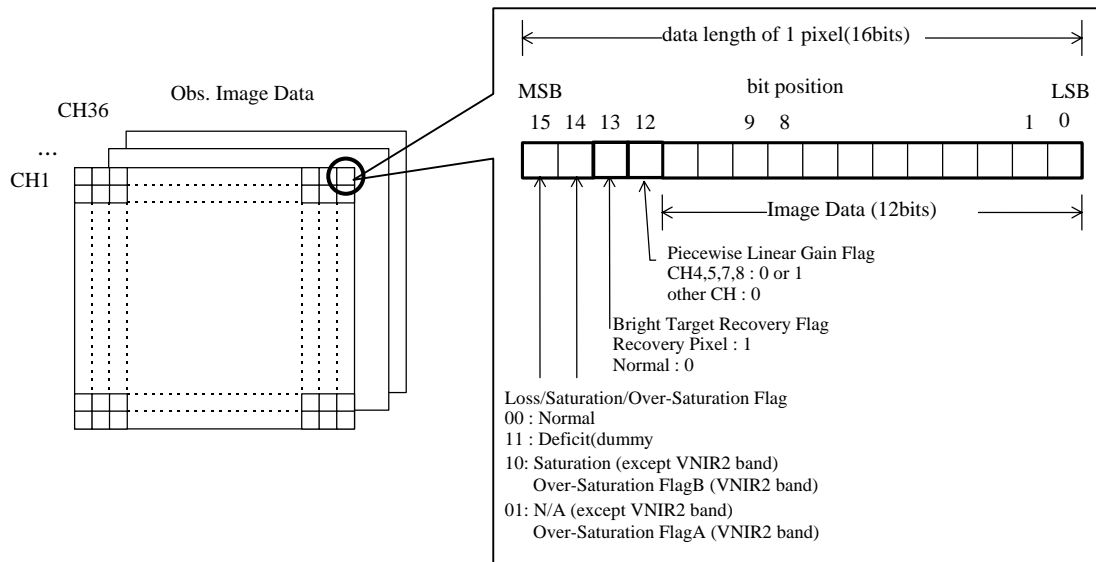| Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
scan_info_ch6	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch6 data"	-	
scan_info_ch7	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch7 data"	-	
scan_info_ch8	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch8 data"	-	
scan_info_ch9	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch9 data"	-	
scan_info_ch10	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch10 data"	-	
scan_info_ch11	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch11 data"	-	
scan_info_ch12	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch12 data"	-	
scan_info_ch13	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch13 data"	-	
scan_info_ch14	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch14 data"	-	
scan_info_ch15	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch15 data"	-	
scan_info_ch16	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch16 data"	-	
scan_info_ch17	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch17 data"	-	
scan_info_ch18	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch18 data"	-	
scan_info_ch19	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch19 data"	-	
scan_info_ch24	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch24 data"	-	
scan_info_ch25	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch25 data"	-	
scan_info_ch26	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch26 data"	-	

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
scan_info_ch27	Byte	number of lines number of samples	lines nsamp	s×12 p	"Scan Information ch27 data"	-	
scan_info_ch28_2km	Byte	number of lines number of samples	lines nsamp	s×6 p	"Scan Information ch28 2km data"	-	
scan_info_ch29_2km	Byte	number of lines number of samples	lines nsamp	s×6 p	"Scan Information ch29 2km data"	-	
sample_info_ch1	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch1 data"	-	Relative sample number of L1A source pixels corresponding to each L1B pixels. "0" denote that the source pixel was missing data.
sample _info_ch2	SBytet	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch2 data"	-	
sample _info_ch3	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch3 data"	-	
sample _info_ch4	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch4 data"	-	
sample _info_ch5	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch5 data"	-	
sample_info_ch6	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch6 data"	-	
sample_info_ch7	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch7 data"	-	
sample_info_ch8	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch8 data"	-	
sample_info_ch9	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch9 data"	-	
sample_info_ch10	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch10 data"	-	
sample_info_ch11	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch11 data"	-	
sample_info_ch12	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch12 data"	-	
sample_info_ch13	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch13 data"	-	
sample_info_ch14	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch14 data"	-	

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
sample_info_ch15	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch15 data"	-	
sample_info_ch16	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch16 data"	-	
sample_info_ch17	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch17 data"	-	
sample_info_ch18	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch18 data"	-	
sample_info_ch19	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch19 data"	-	
sample_info_ch24	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch24 data"	-	
sample_info_ch25	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch25 data"	-	
sample_info_ch26	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch26 data"	-	
sample_info_ch27	SByte	number of lines number of samples	lines nsamp	s×12 p	"Sample Information ch27 data"	-	
sample_info_ch28_2km	SByte	number of lines number of samples	lines nsamp	s×6 p	"Sample Information ch28 2km data"	-	
sample_info_ch29_2km	SByte	number of lines number of samples	lines nsamp	s×6 p	"Sample Information ch29 2km data"	-	

3.6 Notes
**3.6.1   Flags in Observation Image Pixel**

In the Level 1B products, the positions of the observation image data bits are as follows.

The flags for the level 1B image are as follows.

Position	Item	Definition and description	Remarks
12	Piecewise-linear gain flag	This flag is always set to 0 except for ch4, 5, 7, and 8. When the most significant bit of 13-bit data distributed from the GLI sensor is the piecewise-linear gain flag and is set to 1, high gain is indicated. When it is set to 0, normal gain is indicated for ch4, 5, 7, and 8.	
13	Dummy	0	
14 15	Loss/Saturation/ Over-Saturation flag	11: Deficit Pixel(Dummy Pixel) 10: Saturation(except VNIR2), Over-saturation Status B(VNIR2) 01: N/A(except VNIR2) Over-Saturation Status A(VNIR2) 00: Normal	

Land-Water flag is stored in another area. It is common to all channels.

Land-Water Flag
(common to all channels)

Land-Water Flag

MSB 7   bit position   LSB 0

not used: 0

Land-Water Flag
Land : 1
Water : 0
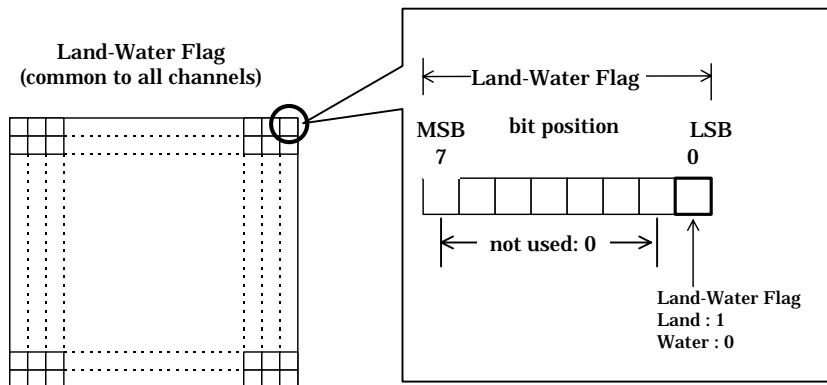
3.6.2　2km Sampling Data

2km samplimg data of SWIR 2km channel is sampled from detector 8,16,24,32,40,48 and sample 1,9,17,…,5097

3.6.3　Data Quality Flags
Data Quality Flags are the same as those of Level 1A.

3.6.4　Pseudo-Affin Coefficients

In L1B products, Pseudo-Affin coefficients named "l1b_blk_affin" are stored, which are used to calculate latitudes and longitudes for each pixels from line/pixel numbers. These coefficients are used in Pseudo-Affin transformation that is expressed in the following equations:

$$
\begin{cases}
u = \mathbf{a}xy + \mathbf{b}x + \mathbf{c}y + \mathbf{d} \\
v = \mathbf{e}xy + \mathbf{f}x + \mathbf{g}y + \mathbf{h}
\end{cases}
$$

where
      x : sample number
      y : line number
      u : latitude
      v : longitude

The "l1b_blk_affin" data stores these 8 elements for each blocks, in the order of a,b,c,d,e,f,g,h.

4   Level 1B MAP Data

4.1 Overview

Level 1B MAP data consists of two types of products, 1km data and 250m data, according to the two GLI resolution types. From the standpoint of observation wavelengths, 1km data is further subdivided into four types: VNIR (visible near-infrared), SWIR (short wavelength infrared), MTIR (mid-thermal infrared), and the satellite position information product.

In the following material, the data types are represented as follows:

Ch	character string
Short	2-byte integer (signed)
Ushort	2-byte integer (unsigned)
Long	4-byte integer
Ulong	4-byte integer (unsigned)
Real	4-byte real
Double	8-byte real
Byte	1-byte integer (unsigned)
SByte	1-byte integer (signed)

4.2 File Names

Product file names are defined as listed below.

File name	Type
A2GLI*YYMMDDPPSSMMT_X*V1M*MXnnREV.*.00	VNIR
A2GLI*YYMMDDPPSSMMT_X*S1M*MXnnREV*.00	SWIR
A2GLI*YYMMDDPPSSMMT_X*M1M*MXnnREV* .00	MTIR
A2GL2*YYMMDDPPSSMMT_X*01M*MXnnREV*.00	250m
A2GL1*YYMMDDPPNNNNN_X*01M*MXnnREV*.00	near real-time

The components of the file names represent the following:

A2G	Type of the satellite (ADEOS-II)
GLx	Sensor type and resolution (GL1 = GLI 1km; GL2 = GLI 250m)
YYMMDD	Observation date
PP	Path number
SS	Scene number
MM	Observation mode (OD = daytime observation mode; O = nighttime observation mode)
T	Tilt (1 = nadir view, 2 = rear view, 3 = front view)
X	Product type (P = planned; N = near real-time, O = Made to order)
NNNNN	Elapsed time after passing the ascending node where extraction was started in a near real-time product
M	Map projection mode (E=Parallel latitude/longitude, M=Mercator, P=Polar Stereo)
Xnn	Base latitude
R	Resampling Mode (N=Nearlest neighbor, B=Byliner, C=Cabic Convolution)
E	Earth Ellipsoid (W=WGS84)
V	Map Projection direction (T=True North, M=Map North)

Global Attributes

Scan-Line Attributes
map_blk_nt
map_blk_num
map_pos_samp
map_pos_line
map_bound
map_blk_lat
map_blk_lon
map_blk_affin

Sensor Tilt
tilt_seg

GLI Level 1B MAP Data
l1bmap_ch1_data   **....** (VNIR)   **l1bmap_ch19_data**
l1bmap_ch24_data   **....** (SWIR)   **l1bmap_ch27_data**
l1bmap_ch30_data   **....** (MTIR)   **l1bmap_ch36_data**
l1bmap_ch20_data   **....**   **l1bmap_ch23_data** (250m)   **l1bmap_ch28_data**   **l1bmap_ch29_data**

× channels

lines

pixels
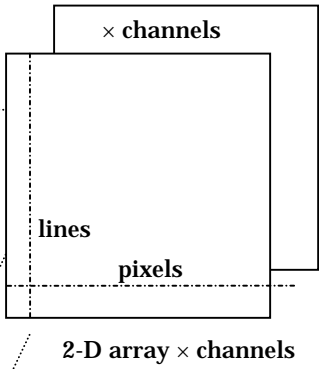
2-D array × channels

4.1 Level 1B MAP Product

4.3 Global Attribute

4.3.1　Mission and Documentation

Data Name	Type	Number of data	Format	Explanation	Notes
Product Name	Ch	1	(see 4.2)	product file name	
Title	Ch	1	"GLI Level-1B MAP Data"	ORD processing	
Data Center	Ch	1	"JAXA/Earth　Observation Center"	This denotes it is processed at EOC.	
Station Name	Ch	1	"JAXA/Earth　Observation Center"	This denotes it is received at EOC.	NRT case only
Station Latitude	Real	1	Latitude[deg]	receiving station latitude	NRT case only
Station Longitude	Real	1	Longitude[deg]	receiving station longitude	NRT case only
Mission	Ch	1	"ADEOS-II GLI"	mission name (satellite name, sensor name)	
Mission Characteristics	Ch	1	"Nominal orbit:inclination = 98.62(Sun-Synchronous); node = 10:15-10:45 AM(descending); eccentricity < 0.0012; altitude = 803km; ground speed = 6.6km/sec; revolutions per day = 14 + 1/4"	-	
Sensor	Ch	1	"Global Imager(GLI)"	sensor name	
Sensor Characteristics	Ch	1	"1km:Number of bands = 30, 250m: Number of bands = 6; 1km:Number of detectors per bands = 12, 250m:Number of detectors per bands = 48; 1km bits per pixel = 13, 250m:bits per pixel = 12; Scan period = 1.8sec; 1km:bit rate = 3.8676Mbit/sec, 250m:bit rate = 60Mbit/sec"	-	
Data Type	Ch	1	"1km" "250m" "NRT"	Plan processing (1km) Plan processing (250m) NRT processing (1km)	
Data Sub-type	Ch	1	"VNIR" "SWIR" "MTIR"	band type	1km product only

Data Name	Type	Number of data	Format	Explanation	Notes
Number of 1km Channels	Ch	1	NN	Number of processing target channels of 1km data.	1km product only
Number of 250m Channels	Ch	1	NN	Number of processing target channels of 250m data.	250 product only
Processing Channels	Ch	1	(pattern1) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 (pattern2)24 25 26 27 (pattern3)30 31 32 34 35 36 (pattern4)20 21 22 23 28 29	Channel numbers are listed, separated by a blank. parttern1 is VNIR product parttern2 is SWIR product parttern3 is MTIR product pattern4 is 250m product	
Replacement Flag	Ch	1	"ORIGINAL"	This denotes the product is generated at EOC	
Software ID	Ch	1	UVNNNNNNN	software version ID at EOC U : GLI correction/physical parameter calculation software version V : GLI HMI software version NNNNNNN :local version	
Processing Time	Ch	1	YYYYMMDD hh:mm:ss.ttt	processing time	
Processing Result	Ch	1	(omit)	processing result record for the product	

4.3.2   Data Time

Data Name	Type	Number of data	Format	Explanation	Notes
Start Time	Ch	1	YYYYMMDD hh:mm:ss.ttt	scene start time in UTC	
End Time	Ch	1	YYYYMMDD hh:mm:ss.ttt	scene end time in UTC	
Scene Center Time	Ch	1	YYYYMMDD hh:mm:ss.ttt	scene center time in UTC	
Node Crossing Time	Ch	1	YYYYMMDD hh:mm:ss.ttt	descending node crossing time in UTC	
Start Year	Short	1	-	year of "Start Time"	
Start Day	Short	1	-	day of the year of "Start Time"	
Start Millisec	Long	1	-	millisecond of the day of "Start Time"	
End Year	Short	1	-	year of "End Time"	
End Day	Short	1	-	day of the year of "End time"	
End Millisec	Long	1	-	millisecond of the day of "End Time"	
Orbit Number	Long	1	1-399	PCD orbit number	

4.3.3 Parent Product Information

Data Name	Type	Number of data	Format	Explanation	Notes
Parent Pixels per Scan Line	Long	1	1236 4944	1km case 250m case	
Parent Number of Scan Lines	Long	1	-	number of scans	[Stantard] 138
Parent Missing Packets	Long	1	-	number of lost packets for the scene	1km only
Parent Missing Frames	Long	1	-	number of lost frames for the scene	250m only
Parent Missing Lines	Long	1	-	number of missing lines for the scene.	
Parent GPS Flag	Ch	1	"OK" "NG" "TE" "TX"	GPS available case GPS unavailable case TT unavailable case (base ST of farst scan) TT unavailable case (scan start time is estimated)	refer 2.5 4
Parent Saturated Pixels	Long	N1	-	number of saturated pixels	N1 denotes the number of processing channels
Parent Non-Saturated Pixels	Long	N1	-	number of non- saturated pixels	N1 denotes the number of processing channels

4.3.4　Scene Coordinates

Data Name	Type	Number of data	Format	Explanation	Notes
Latitude Units	Ch	1	"degrees North"	latitude unit of used product	geodetic latitude
Longitude Units	Ch	1	"degrees East"	longitude unit of used product	
Scene Center Latitude	Real	1	-	-	
Scene Center Longitude	Real	1	-	-	
Upper Left Latitude	Real	1	-	-	
Upper Left Longitude	Real	1	-	-	
Upper Right Latitude	Real	1	-	-	Latitude and longitude are calculated at the center of light axis
Upper Right Longitude	Real	1	-	-	
Lower Left Latitude	Real	1	-	-	
Lower Left Longitude	Real	1	-	-	
Lower Right Latitude	Real	1	-	-	
Lower Right Longitude	Real	1	-	-	
Orbit Node Longitude	Real	1	-	-	
Start path number	Short	1	-	path number at the beginning of the scene	
Start argument of Latitude	Real	1	-	argument of latitude at the beginning of the scene	
End path number	Short	1	-	path number at the end of the scene	
End argument of Latitude	Real	1	-	argument of latitude at the beginning of the scene	
Upper Left Latitude for Mapped Scene	Real	1	-	-	
Upper Left Longitude for Mapped Scene	Real	1	-	-	
Upper Right Latitude for Mapped Scene	Real	1	-	-	
Upper Right Longitude for Mapped Scene	Real	1	-	-	
Lower Left Latitude for Mapped Scene	Real	1	-	-	
Lower Left Longitude for Mapped Scene	Real	1	-	-	

Data Name	Type	Number of data	Format	Explanation	Notes
Lower Right Latitude for Mapped Scene	Real	1	-	-	
Lower Right Longitude for Mapped Scene	Real	1	-	-	

4.3.5 Map Information

Data Name	Type	Number of data	Format	Explanation	Notes
Number of Columns	Long	1	-	-	
Number of Lines	Long	1	-	-	
Pixel Spacing	Real	1	-	-	
Map Projection	Ch	1	"EQR" "MER" "PS"	Parallel latitude/longitude Mercator Polar Stereo	
Resampling Method	Ch	1	"NN" "BL" "CC"	Nearlest Neighbor Byliner Cubic Convolution	
Standard Latitude	Real	1	-	-	
Standard Longitude	Real	1	-	-	
Earth Ellipsoid Type	Ch	1	"WGS84"	-	
Equatorial Radius	Real	1	-	-	
Polar Radius	Real	1	-	-	
Latitude Grid Interval	Real	1	-	-	"Map Projection" equal "EQR" case only
Longitude Grid Interval	Real	1	-	-	"Map Projection" equal "EQR" case only

4.4 V Group

4.4.1   Scan Line Attributes

V group name	V group class
Scan-Line Attributes	Mapping_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m
m : the column direction addresses of the pixels of which latitude and longitude are calculated (the value of "map_pos_samp" dimension)
n : the row direction addresses of the pixels of which latitude and longitude are calculated (the value of "map_pos_line" dimension)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
map_blk_int	Short	sample/line	"pairs"	2	"L1B MAP block interval(sample/line)"	-	
map_blk_num	Short	sample/line	"pairs"	2	"Number of L1B MAP blocks(sample/line)"	-	
map_pos_samp	Long	number of sample direction addresses	"blk_samp"	m	"Column direction address of pixels"	-	
map_pos_line	Long	number of line direction addresses	"blk_line"	n	"Row direction address of pixels"	-	
map_bound	Long	latitude/longitude	"pairs"	2	"Over boundary flag(latitude/longitude)"	-	
map_blk_lat	Double	number of addresses for line direction number of addresses for sample direction	"blk_line" "blk_samp"	n m	"Block point latitude"	-	
map_blk_lon	Double	number of addresses for line direction number of addresses for sample direction	"blk_line" "blk_samp"	n m	"Block point longitude"	-	
map_blk_affin	Double	number of addresses for line direction number of addresses for sample direction number of pseudo affine coefficients	"blk_line_m1" "blk_samp_m1" "affin"	n-1 m-1 8	"Block coefficient"	-	

4.4.2 GLI Level 1B MAP Data

V group name	V group class
GLI Level 1B MAP Data	Mapped_Image

(1) VNIR

s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)
p : number of pixels(samples) for 1 line("Pixels per Scan Line" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
l1bmap_ch1_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch1 data"	-	
l1bmap_ch2_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch2 data"	-	
l1bmap_ch3_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch3 data"	-	
l1bmap_ch4_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch4 data"	-	
l1bmap_ch5_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch5 data"	-	
l1bmap_ch6_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch6 data"	-	
l1bmap_ch7_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch7 data"	-	
l1bmap_ch8_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch8 data"	-	
l1bmap_ch9_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch9 data"	-	
l1bmap_ch10_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch10 data"	-	
l1bmap_ch11_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch11 data"	-	

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
l1bmap_ch12_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch12 data"	-	
l1bmap_ch13_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch13 data"	-	
l1bmap_ch14_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch14 data"	-	
l1bmap_ch15_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch15 data"	-	
l1bmap_ch16_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch16 data"	-	
l1bmap_ch17_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch17 data"	-	
l1bmap_ch18_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch18 data"	-	
l1bmap_ch19_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch19 data"	-	

(2)SWIR

s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)
p : number of pixels(samples) for 1 line("Pixels per Scan Line" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
l1bmap_ch24_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch24 data"	-	
l1bmap_ch25_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch25 data"	-	
l1bmap_ch26_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch26 data"	-	
l1bmap_ch27_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch27 data"	-	

(3)MTIR

s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)
p : number of pixels(samples) for 1 line("Pixels per Scan Line" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
l1bmap_ch30_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch30 data"	-	
l1bmap_ch31_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch31 data"	-	
l1bmap_ch32_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch32 data"	-	
l1bmap_ch33_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch33 data"	-	
l1bmap_ch34_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch34 data"	-	
l1bmap_ch35_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch35 data"	-	
l1bmap_ch36_data	Ushort	number of lines number of samples	lines nsamp	s×12 p	"Level-1B MAP ch36 data"	-	

(4)250m

s : number of scans ("Number of Scan Lines" in Data Quality group of the Global Attributes)
p : number of pixels(samples) for 1 line("Pixels per Scan Line" in Data Quality group of the Global Attributes)

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
l1bmap_ch20_data	Ushort	number of lines number of samples	lines nsamp	s×48 p	"Level-1B MAP ch20 data"	-	
l1bmap_ch21_data	Ushort	number of lines number of samples	lines nsamp	s×48 p	"Level-1B MAP ch21 data"	-	
l1bmap_ch22_data	Ushort	number of lines number of samples	lines nsamp	s×48 p	"Level-1B MAP ch22 data"	-	
l1bmap_ch23_data	Ushort	number of lines number of samples	lines nsamp	s×48 p	"Level-1B MAP ch23 data"	-	
l1bmap_ch28_data	Ushort	number of lines number of samples	lines nsamp	s×48 p	"Level-1B MAP ch28 data"	-	
l1bmap_ch29_data	Ushort	number of lines number of samples	lines nsamp	s×48 p	"Level-1B MAP ch29 data"	-	

4.4.3 Tilt

V group name	V group class
Sensor Tilt	Scan_Line_Data

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
tilt_seg	Short	(constants)	(not defined)	1	"Tilt segment number"	- (0, 2)	Tilt Setting 0: No-tilt0[deg] 1:Forward tilt(18.5[deg]) 2:Backward tilt(-18.5[deg])

4.4.4 Absolute Calibration Table

V group name	V group class
Calibration Table	Parameter

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
gcal	Real	number of channels	"chnlsvspw"	23[V], 4[S], 6[250m]	"Gcal"	-	VNIR/SWIR/250m only
gsys	Real	number of channels	"chnlsvspw"	23[V], 4[S], 6[250m]	"Gsys"	-	VNIR/SWIR/250m only
c1	Real	number of channels	"chnlsmt"	7	"C1"	-	MTIR only

4.4.5 Data Quality Flag

V group name	V group class
Data Quality Flag	Scan_Line_Data

[V]: 1kmVNIR, [S]: 1kmSWIR, [M]: 1kmMTIR, [250m]: 250m

Name	Type	Dimension			long name	units (valid range)	Notes
		Contents	Name	Value			
lost_info	Long	number of items for quality infomation number of types	(not defined) (not defined)	5 4	"Lost Information"	-	obs. image packet/frame, cal. image packet/frame, PCD packet/frame, supplement packet/frame, image lines; (OK/FAIR, Fair/Poor, Poor/NG, Lost count)

4.5 Notes
4.5.1   Flags in Observation Image Pixel

In the Level 1B MAP products, the positions of the observation image data bits are as follows.

Obs. Image Data

CH36
...
CH1

data length of 1 pixel(16bits)

MSB   bit position   LSB

15 14 13 12   9 8   1 0

Image Data (12bits)

0

Bright Target Recovery Flag
Recovery Pixel : 1
Normal : 0

Loss/Saturation/Over-Saturation Flag
00 : Normal
11 : Deficit(dummy
10: Saturation (except VNIR2 band)
    Over-Saturation FlagB (VNIR2 band)
01: N/A (except VNIR2 band)
    Over-Saturation FlagA (VNIR2 band)
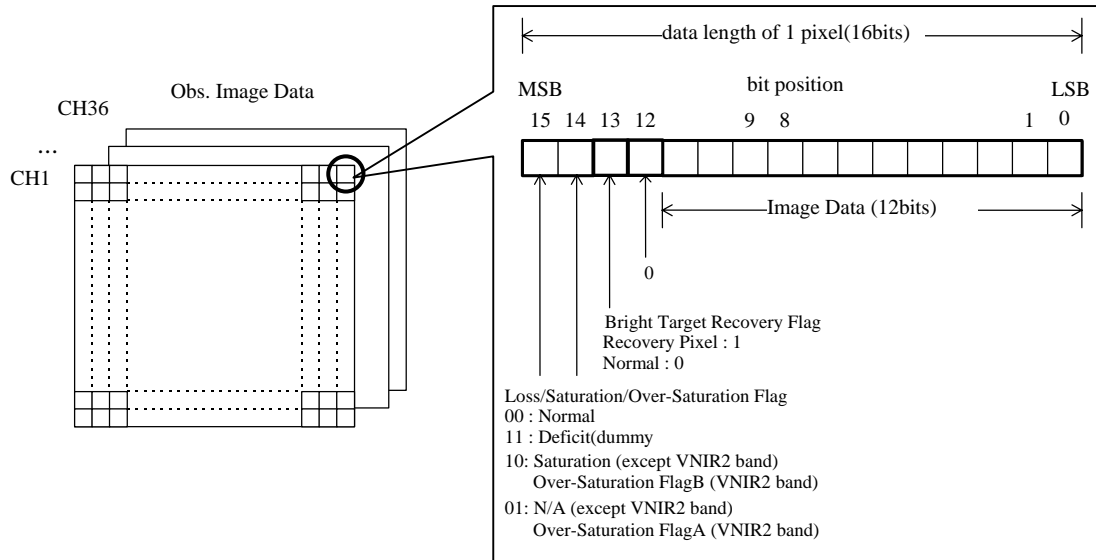
The flags for the level 1B MAP image are as follows.

Position	Item	Definition and description	Remarks
12	Dummy	0	
13	Dummy	0	
14 15	Loss/Saturation/ Over-Saturation flag	11: Deficit Pixel(Dummy Pixel) 10: Saturation(except VNIR2), Over-saturation Status B(VNIR2) 01: N/A(except VNIR2) Over-Saturation Status A(VNIR2) 00: Normal	Over-saturation Status B is set up,when BL/CC sampling is processed Over-saturation Status A and B are mixed.