GOSAT-1/2 Level 1 product reading toolkit

User's manual (Parameter file)

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Japan Aerospace Exploration Agency

Changing history

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1. Introduction

This document is the user's manual for GOSAT Level 1 product reading Toolkit (GTK). GTK is a programming library to read GOSAT-1/GOSAT-2 Level 1 product. GTK supports the programing language C, FORTRAN, IDL and MATLAB. This document describes about the parameter file.

2. Parameter files

Table 2-1 shows the list of GTK's parameter files.

Table 2-1 List of the GTK's parameter files(1/24)

No	Sensor	File name	Description	
1.	CAI-1	*YYYY_MM_*dark.csv	The night calibration data. (YYYY and MM are observation year/date)	
2.	CAI-1	msec_090408.csv	The integration time table	
3.	CAI-1	response_20100803a.csv	The radiance conversion coefficients	
4.	CAI-2	CAI2_Image_Parameter.csv	The number of pixels, The dark pixel position.	
5.	CAI-2	CAI2_Night_Observation.csv	The average pixel value of night observation in radiometric correction Xdk2	
6.	CAI-2	CAI2_Night_ObservationCondition.csv	The temperatures and integration times at Xdk2 was observed.	
7.	CAI-2	CAI2_Coefficient_A.csv	The polynomial coefficient "a" of radiometric correction, to specify the pre-amplifier temperature characteristics.	
8.	CAI-2	CAI2_Coefficient_B.csv	The polynomial coefficient "b" of radiometric correction, to specify the amplifier temperature characteristics.	
9.	CAI-2	CAI2_Coefficient_C.csv	The polynomial coefficient "c" of radiometric correction, to specify the sensor temperature characteristics.	
10.	CAI-2	CAI2_Coefficient_D.csv	The polynomial coefficient "d" of radiometric correction, to specify the exposure temperature characteristics.	
11.	CAI-2	CAI2_Coefficient_E.csv	The polynomial coefficient "e" of radiometric correction, to specify the exposure temperature characteristics.	

Table 2-1 List of the GTK's parameter files (2/4)

No	Sensor	File name	Description	
12.	CAI-2	CAI2_Coefficient_F.csv	The polynomial coefficient "f" of radiometric correction, to specify the sensor temperature characteristics.	
13.	CAI-2	CAI2_Brightness_conversion.csv	The brightness conversion coefficient "R" in radiometric correction	
14.	CAI-2	CAI2_Sensor_Alignment.csv	The alignment parameter to convert view vector from CAI-2 coordinate system to satellite coordinate system.	
15.	CAI-2	CAI2_VectorParameter.csv	The polynomial coefficient "g" of view vector x,y,z	
16.	CAI-2	CAI2_Pixel_Parameter.csv	The base pixel number Pc and pixel pitch Pdet to calculate view vector.	
17.	CAI-2	CAI2_Band_registration_CT.csv	The table of CT direction band-to-band registration (for the base band)	
18	CAI-2	CAI2_Band_registration_AT.csv	The table of AT direction band-to-band registration (for the base band)	
19.	CAI-2	CAI2_Band_registration_CT_B1.csv	The table of CT direction band-to-band registration (for band 1, out-of-band stray light correction)	
20	CAI-2	CAI2_Band_registration_AT_B1.csv	The table of AT direction band-to-band registration (for band 1, out-of-band stray light correction)	
21	CAI-2	CAI2_Band_registration_CT_B6.csv	The table of CT direction band-to-band registration (for band 6, out-of-band stray light correction)	
22	CAI-2	CAI2_Band_registration_AT_B6.csv	The table of AT direction band-to-band registration (for band 6, out-of-band stray light correction)	
23	CAI-2	CAI2_Saturation_correction.csv	The parameter for saturation correction.	
24	CAI-2	CAI2_Stray_light_correction_B1.txt	The parameter for band 1 stray light correction.	
25	CAI-2	CAI2_Stray_light_correction_B6.txt	The parameter for band 6 stray light correction.	
26	CAI-2	CAI2_Stray_light_correction_A_B1.csv	The coefficient A_1 for band 1 stray light correction	
27	CAI-2	CAI2_Stray_light_correction_A_B6.csv	The coefficient A_6 for band 6 stray light correction	
28	CAI-2	CAI2_Ch_crosstalk_correction_B5.csv	The coefficient for band 5 inter-channel crosstalk correction	

Table 2-1 List of the GTK's parameter files (3/4)

No	Sensor	File name	Description	
29	CAI-2	CAI2_Ch_crosstalk_correction_B10.csv	The coefficient for band 10 inter-channel crosstalk correction	
30	CAI-2	CAI2_Stray_light_correction_B5.txt	The parameter for band 5 stray light correction.	
31	CAI-2	CAI2_Stray_light_correction_B10.txt	The parameter for band 10 stray light correction.	
32	CAI-2	CAI2_Stray_light_correction_A_B5.csv	The coefficient A_5 for band 5 stray light correction	
33	CAI-2	CAI2_Stray_light_correction_A_B10.csv	The coefficient A_{10} for band 10 stray light correction	
34	CAI-2	CAI2_ImageProcessSetting.txt	The setting of image processing on/off	
35	CAI-2	CAI2_B1_STRAY_PSF_H1.tif	The band 1 stray light PSF $H_{1,1}$	
36	CAI-2	CAI2_B1_STRAY_PSF_H2.tif	The band 1 stray light PSF $H_{1,2}$	
37	CAI-2	CAI2_B1_STRAY_PSF_H3.tif	The band 1 stray light PSF $H_{1,3}$	
38	CAI-2	CAI2_B1_STRAY_PSF_H4.tif	The band 1 stray light PSF $H_{1,4}$	
39	CAI-2	CAI2_B1_STRAY_PSF_H5.tif	The band 1 stray light PSF $H_{1,5}$	
40	CAI-2	CAI2_B1_OUTBAND_PSF_H2.tif	The band 1 out-of-band stray light PSF $H_{1,2}$	
41	CAI-2	CAI2_B1_OUTBAND_PSF_H3.tif	The band 1 out-of-band stray light PSF $H_{1,3}$	
42	CAI-2	CAI2_B1_OUTBAND_PSF_H4.tif	The band 1 out-of-band stray light PSF $H_{1,4}$	
43	CAI-2	CAI2_B6_STRAY_PSF_H1.tif	The band 6 stray light PSF $H_{6,1}$	
44	CAI-2	CAI2_B6_STRAY_PSF_H2.tif	The band 6 stray light PSF $H_{6,2}$	
45	CAI-2	CAI2_B6_STRAY_PSF_H3.tif	The band 6 stray light PSF $H_{6,3}$	
46	CAI-2	CAI2_B6_STRAY_PSF_H4.tif	The band 6 stray light PSF $H_{6,4}$	
47	CAI-2	CAI2_B6_STRAY_PSF_H5.tif	The band 6 stray light PSF $H_{6,5}$	
48	CAI-2	CAI2_B6_OUTBAND_PSF_H7.tif	The band 6 out-of-band stray light PSF $H_{6,7}$	
49	CAI-2	CAI2_B6_OUTBAND_PSF_H8.tif	The band 6 out-of-band stray light PSF $H_{6,8}$	
50	CAI-2	CAI2_B6_OUTBAND_PSF_H9.tif	The band 1 out-of-band stray light PSF $H_{6,9}$	
51	CAI-2	CAI2_B1B6_CROSSTALK_PSF_H6.tif	The band 1 and 6 crosstalk PSF H_6	
52	CAI-2	CAI2_B1B6_CROSSTALK_PSF_H1.tif	The band 6 and 1 crosstalk PSF H_1	
53	CAI-2	CAI2_B5_STRAY_PSF_H1.tif	The band 5 stray light PSF $H_{5,1}$	
54	CAI-2	CAI2_B5_STRAY_PSF_H2.tif	The band 5 stray light PSF $H_{5,2}$	
55	CAI-2	CAI2_B5_STRAY_PSF_H3.tif	The band 5 stray light PSF $H_{5,3}$	
56	CAI-2	CAI2_B5_STRAY_PSF_H4.tif	The band 5 stray light PSF $H_{5,4}$	
57	CAI-2	CAI2_B5_STRAY_PSF_H5.tif	The band 5 stray light PSF $H_{5,5}$	
58	CAI-2	CAI2_B10_STRAY_PSF_H1.tif	The band 10 stray light PSF $H_{10,1}$	
59	CAI-2	CAI2_B10_STRAY_PSF_H2.tif	The band 10 stray light PSF $H_{10,2}$	
60	CAI-2	CAI2_B10_STRAY_PSF_H3.tif	The band 10 stray light PSF $H_{10,3}$	

Table 2-1 List of the GTK's parameter files (4/4)

No	Sensor	File name	Description	
61	CAI-2	CAI2_B10_STRAY_PSF_H4.tif	The band 10 stray light PSF $H_{10,4}$	
62	CAI-2	CAI2_B10_STRAY_PSF_H5.tif	The band 10 stray light PSF $H_{10,5}$	

* There are no parameter file for FTS-1/FTS-2

2. 1   About expressions in this document

・The parameter with type "Real" is the floating point formatted string. By default, The number of significant digits is 15.

Example: -1.2345e-4, 1234567890.12345

・The parameter with type "Integer" means the signed integer. By default, the range is -2,147,483,648 to 2,147,483,647

2．2　　CAI-1
2．2．1　*YYYY_MM_*dark.csv

*YYYY_MM_*dark.csv is the file which contains the the night calibration data. The YYYY and MM in file name means the observation year/date.　User need to download corresponding file from JAXA download site described in footnote on this page and store it in the parameter folder.

Table 2.2-1 shows the file format.

Format	:	CSV with a header in the first line
Character code	:	UTF-8
New line code	:	CR+LF

Table 2.2-1 *YYYY_MM_*dark.csv

No	Column name	Description	Type/Range	Unit	Note
1	pixel	Pixel number n	Integer, 0 to 2055	—	zero-based
2	band1	The night calibration data of pixel number n、 band 1	Real	—	
3	band2	The night calibration data of pixel number n、 band 2	Real	—	
4	band3	The night calibration data of pixel number n、 band 3	Real	—	
5	band4	The night calibration data of pixel number n、 band 4	Real	—	

Download site for the night calibration data : http://www.eorc.jaxa.jp/GOSAT/calibration_1_1_j.html

2. 2. 2 msec_090408.csv

msec_090408.csv is the file which contains the integration time table. Table 2.2-2 shows the file format.

Format   :   CSV with a header in the first line
Character code   :   UTF-8
New line code   :   CR+LF

Table 2.2-2 msec_09408.csv

No	Column name	Description	Type/Range	Unit	Note
1	(empty)	The level of integration time	Integer, 1 to 32	Pixel number	one-based
2	band1	The integration time of band 1	Real	ms	
3	band2	The integration time of band 2	Real	ms	
4	band3	The integration time of band 3	Real	ms	
5	band4	The integration time of band 4	Real	ms	

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2. 2. 3　response_20100803a.csv

response_20100803a.csv is the file which contains the radiance conversion coefficients. Table 2.2-3 shows the file format.

Format　　　　　　　：　CSV with a header in the first line
Character code　　　：　UTF-8
New line code　　　：　CR+LF

Table 2.2-3 response_2010803a.csv

No	Column name	Description	Type/Range	Unit	Note
1	(empty)	The pixel number n	Integer, 1 to 2056	Pixel number	one-based
2	band1	The radiance conversion coefficient for band 1 pixel n.	Real	—	
3	band2	The radiance conversion coefficient for band 2 pixel n.	Real	—	
4	band3	The radiance conversion coefficient for band 3 pixel n.	Real	—	
5	band4	The radiance conversion coefficient for band 4 pixel n.	Real	—	

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2．3　CAI-2

2．3．1　CAI2_Image_Parameter.csv

CAI2_Image_Parameter.csv is the file which defines the number of pixels and the dark pixel position.

Table 2.3-1 shows the file format.

Format	:	CSV with a header in the first line
Character code	:	UTF-8
New line code	:	CR+LF

Table 2.3-1 CAI2_Image_Parameter.csv (1/2)

No	Column name	Description	Type/Range	Unit	Note
1	BandNumber	Band number m	Integer, 1 to 10	Band number	
2	PixelNumber	The number of pixels per line of band m	Integer, Band 1 to 4, 6 to 9 : 2056 Band 5, 10 : 1024	—	
3	StartDarkPixelNo	The start pixel number of dark pixel of band m	Integer, Band 1 to 4、6 to 9 : 1 to 2056 Band 5 , 10 : 1 to 1024	Pixel number	one-based
4	EndDarkPixelNo	The end pixel number of dark pixel of band m			
5	StartValidPixelNo	The start pixel number of valid pixel of band m			
6	EndValidPixelNo	The end pixel number of valid pixel of band m			

Table 2.3-1 CAI2_Image_Parameter.csv (2/2)

No	Column name	Description	Type/Range	Unit	Note
7	Xdk1Pixel1～ Xdk1Pixel8	The pixel number to calculate the average of dark pixel X_{dk1_ODD}, X_{dk1_EVEN} or X_{dk1} for band m	Integer, Band 1 to 4, 6 to 9 : 1 to 2056 Band 5 , 10 : 1 to 1024	Pixel number	Band1 to 4, 6 to 9: Up to 8 pixel numbers are available. The unused column need to be filled by zero. Example : 1,2,3,0,5,6,7,0 Band 5, 10: Up to 6 pixel numbers are available. The unused column need to be filled by zero. Example : 1,0,0,4,5,6,0,0
8	Xdk1Pw	The neighbor line number pw to calculate the average of dark pixel X_{dk1_ODD}, X_{dk1_EVEN} X_{dk1} for band m	Integer	Line	
9	Xdk3Pixel1～ Xdk3Pixel8	The pixel number to calculate the average of dark pixel $X_{dk3\_ODD,}$ $X_{dk3\_EVEN,}$ X_{dk3}.	Integer, Band 1 to 4, 6 to 9 : 1 to 2056 Band 5 , 10 : 1 to 1024	Pixel number	Band1 to 4, 6 to 9: Up to 8 pixel numbers are available. For unused column set need to be zero. Example : 1,2,3,0,5,6,7,0 Band 5, 10: Up to 6 pixel numbers are available. For unused column set need to be zero. Example : 1,0,0,4,5,6,0,0

2. 3. 2 CAI2_Night_Observation.csv

CAI2_Night_Observation.csv is the file which contains the the average of night calibration data Xdk2 for radiometric correction. Table 2.3-2 show the file format.

Format   : CSV with a header in the first line
Character code   : UTF-8
New line code   : CR+LF

Table 2.3-2   CAI2_NightObservation.csv

No	Column name	Description	Type/Range	Unit	Note
1	PixelNo	Pixel number n	Integer, 1 to 2056	Pixel number	
2	Band1	X_{dk2} (1, n) the average of night observation pixel of band 1 pixel n .	Integer, 0 to 4095 (Invalid: -999)	Digital number (12bit observation data)	
3	Band2	X_{dk2} (2, n) the average of night observation pixel of band 2 pixel n			
4	Band3	X_{dk2} (3, n) the average of night observation pixel of band 3 pixel n			
5	Band4	X_{dk2} (4, n) the average of night observation pixel of band 4 pixel n			
6	Band5	X_{dk2} (5, n) the average of night observation pixel of band 5 pixel n			If dark pixel and invalid pixel is -999
7	Band6	X_{dk2} (6, n) the average of night observation pixel of band 6 pixel n			
8	Band7	X_{dk2} (7, n) the average of night observation pixel of band 7 pixel n			
9	Band8	X_{dk2} (8, n) the average of night observation pixel of band 8 pixel n			
10	Band9	X_{dk2} (9, n) the average of night observation pixel of band 9 pixel n			
11	Band10	X_{dk2} (10, n) the average of night observation pixel of band 10 pixel n			If dark pixel and invalid pixel is -999

2．3．3　CAI2_Night_ObservationCondition.csv

CAI2_Night_ObservationCondition.csv is the file which contains the the temperatures and integration times at the night observation X_{dk2} was observed. Table 2.3-3 show the file format.

Format　　　　　　：　CSV with a header in the first line
Character code　　：　UTF-8
New line code　　　：　CR+LF

Table 2.3-3　CAI2_NightObservationCondition.csv

No	Column name	Description	Type/Range	Unit	Note
1	BandNumber	Band number m	Integer, 1 to 10	Band number	
2	PreAmpTemp	The pre-amprefier temperature at X_{dk2} of band m was observed $T'_1(m)$	Real	℃	
3	AmpTemp	The amprefier temperature at X_{dk2} of band m was observed $T'_2(m)$	Real	℃	
4	SensorTemp	The sensor temperature at X_{dk2} of band m was observed $T'_2(m)$	Real	℃	
5	tInt	The integration time at X_{dk2} of band m was observed $t'_{int}(m)$	Real	ms	

2. 3. 4　CAI2_Coefficient_A.csv

CAI2_Coefficient_A.csv is the file which contains the polynomial coefficient "a" of radiometric correction, to specify the pre-amplifier temperature characteristics. Table 2.3-4 shows the file format.

Format　　　　　　:　CSV with a header in the first line
Character code　　:　UTF-8
New line code　　　:　CR+LF

Table 2.3-4 CAI2_Coefficient_A.csv

No	Column name	Description	Type/Range	Unit	Note
1	BandNumber	Band number m	Integer, 1 to 10	Band number	
2	a0	$a(m,0)$ the 0th-order polynomial coefficient of pre-amprefier temperature of band m	Real	℃	
3	a1	$a(m,1)$ the 1st-order polynomial coefficient of pre-amprefier temperature of band m	Real	℃$^{-1}$	
4	a2	$a(m,2)$ the 2nd-order polynomial coefficient of pre-amprefier temperature of band	Real	℃$^{-2}$	
5	a3	$a(m,3)$ the 3rd-order polynomial coefficient of pre-amprefier temperature of band	Real	℃$^{-3}$	

2．3．5　CAI2_Coefficient_B.csv

CAI2_Coefficient_B.csv is the file which contains the polynomial coefficient "*b*" of radiometric correction, to specify the amplifier temperature characteristics. Table 2.3-5 shows the file format.

Format　　　　　　：　CSV with a header in the first line
Character code　　：　UTF-8
New line code　　　：　CR+LF

Table 2.3-5 CAI2_Coefficient_B.csv

No	Column name	Description	Type/Range	Unit	Note
1	BandNumber	Band number *m*	Integer, 1～10	Band number	
2	b0	$b(m,0)$ the 0th-order polynomial coefficient of amprefier temperature of band *m*	Real	℃	
3	b1	$b(m,1)$ the 1st-order polynomial coefficient of amprefier temperature of band *m*	Real	℃$^{-1}$	
4	b2	$b(m,2)$ the 2nd-order polynomial coefficient of amprefier temperature of band *m*	Real	℃$^{-2}$	
5	b3	$b(m,3)$ the 3rd order polynomial coefficient of amprefier temperature of band *m*	Real	℃$^{-3}$	

2. 3. 6　CAI2_Coefficient_C.csv

CAI2_Coefficient_C.csv is the file which contains the polynomial coefficient "c" of radiometric correction, to specify the sensor temperature characteristics. Table 2.3-6 shows the file format.

Format　　　　　　　　:　CSV with a header in the first line
Character code　　　　:　UTF-8
New line code　　　　　:　CR+LF

Table 2.3-6　CAI2_Coefficient_C.csv

No	Column name	Description	Type/Range	Unit	Note
1	BandNumber	Band number m	Integer, 1 to 10	Band number	
2	PixelNumber	Pixel Number n	Integer, Band 1 to 4, 6 to 9: 　1 to 2056 Band 5 to 10: 　1 to 1024	Pixel number	one-based
3	c0	$c(m,n,0)$　the 0th-order polynomial coefficient of sensor temperature of band m, pixel n	Real	℃	
4	c1	$c(m,n,1)$　the 1st-order polynomial coefficient of sensor temperature of band m, pixel n	Real	℃$^{-1}$	
5	c2	$c(m,n,2)$　the 2nd order polynomial coefficient of sensor temperature of band m, pixel n	Real	℃$^{-2}$	
6	c3	$c(m,n,3)$　the 3rd order polynomial coefficient of sensor temperature of band m, pixel n	Real	℃$^{-3}$	

2．3．7　CAI2_Coefficient_D.csv

CAI2_Coefficient_D.csv is the file which contains the polynomial coefficient "*d*" of radiometric correction, to specify the integration time characteristics. Table 2.3-7 shows the file format.

Format　　　　　　　：　CSV with a header in the first line
Character code　　　：　UTF-8
New line code　　　：　CR+LF

Table 2.3-7　CAI2_Coefficient_D.csv

No	Column name	Description	Type/Range	Unit	Note
1	BandNumber	Band number m	Integer, 1 to 10	Band number	
2	d0	$d(m,0)$　the 0th-order polynomial coefficient of integration time of band m	Real	—	
3	d1	$d(m,1)$　the 1st-order polynomial coefficient of integration time of band m	Real	—	
4	d2	$d(m,2)$　the 2nd-order polynomial coefficient of integration time of band m	Real	—	
5	d3	$d(m,3)$　the 3rd-order polynomial coefficient of integration time of band m	Real	—	

2. 3. 8　CAI2_Coefficient_E.csv

CAI2_Coefficient_D.csv is the file which contains the polynomial coefficient "*e*" of radiometric correction, to specify the integration time characteristics. Table 2.3-8 shows the file format.

Format　　　　　　　:　CSV with a header in the first line
Character code　　　:　UTF-8
New line code　　　　:　CR+LF

Table 2.3-8　CAI2_Coefficient_E.csv

No	Column name	Description	Type/Range	Unit	Note
1	BandNumber	Band number *m*	Integer, 1 to 10	Band number	
2	e0	$e(m,0)$ the 0th-order polynomial coefficient of integration time of band *m*	Real	msec	
3	e1	$e(m,1)$ the 1st-order polynomial coefficient of integration time of band *m*	Real	$msec^{-1}$	
4	e2	$e(m,2)$ the 2nd-order polynomial coefficient of integration time of band *m*	Real	$msec^{-2}$	
5	e3	$e(m,3)$ the 3rd-order polynomial coefficient of integration time of band *m*	Real	$msec^{-3}$	

2. 3. 9　CAI2_Coefficient_F.csv

CAI2_Coefficient_F.csv is the file which contains the polynomial coefficient "f" of radiometric correction, to specify the sensor temperature characteristics. Table 2.3-9 shows the file format.

Format　　　　　　:　CSV with a header in the first line
Character code　　　:　UTF-8
New line code　　　:　CR+LF

Table 2.3-9　CAI2_Coefficient_F.csv

No	Column name	Description	Type/Range	Unit	Note
1	BandNumber	Band number m	Integer, 1 to 10	Band number	
2	f0	$f(m,0)$ the 0th-order polynomial coefficient of sensor temperature of band m	Real	℃	
3	f1	$f(m,1)$ the 1st-order polynomial coefficient of sensor temperature of band m	Real	℃$^{-1}$	
4	f2	$f(m,2)$ the 2nd-order polynomial coefficient of sensor temperature of band m	Real	℃$^{-2}$	
5	f3	$f(m,3)$ the 3rd-order polynomial coefficient of sensor temperature of band m	Real	℃$^{-3}$	

2. 3. 10 CAI2_Brightness_conversion.csv

CAI2_Brightness_conversion.csv is the file which contains the radiance conversion coefficient " R " in radiometric correction.
Table 2.3-10 shows the file format.

Format　　　　　　：　CSV with a header in the first line
Character code　　　：　UTF-8
New line code　　　 ：　CR+LF

Table 2.3-10　CAI2_Brightness_conversion.csv

No	Column name	Description	Type/Range	Unit	Note
1	BandNumber	Band number m	Integer, 1 to 10	Band number	
2	PixelNumber	Pixel number n	Integer, Band 1 to 4、6 to 9： 　1 to 2056 Band 5, 10： 　1 to 1024	Pixel number	one-based
3	R0	$R(m,n,0)$　the　0th-order　radiance conversion coefficient of of band m, pixel n	Real	W/m²/μ m/str	
4	R1	$R(m,n,1)$　the　1st　order　radiance conversion coefficient of of band m, pixel n	Real	(W/m²/μ m/str)$^{-1}$	
5	R2	$R(m,n,2)$　the　2nd　order　radiance conversion coefficient of of band m, pixel n	Real	(W/m²/μ m/str)$^{-2}$	
6	R3	$R(m,n,3)$　the　3rd　order　radiance conversion coefficient of of band m, pixel n	Real	(W/m²/μ m/str)$^{-3}$	

2. 3. 11　CAI2_Sensor_Alignment.csv

　CAI2_Sensor_Alignment.csv is the file which contains the alignment parameter to convert view vector from CAI-2 coordinate system to satellite coordinate system. Table 2.3-11 shows the file format.

Format	:	CSV with a header in the first line
Character code	:	UTF-8
New line code	:	CR+LF

Table 2.3-11　CAI2_Sensor_Alignment.csv

No	Column name	Description	Type/Range	Unit	Note
1	X	CAI-2 X-axis in the satellite coordinate system.	Real, -1.0 to 1.0	—	
2	Y	CAI-2 Y-axis in the satellite coordinate system.	Real, -1.0 to 1.0	—	
3	Z	CAI-2 Z-axis in the satellite coordinate system.	Real, -1.0 to 1.0	—	

1st Row : X component in the satellite coordinate system.

2nd Row : Y component in the satellite coordinate system.

3rd Row : Z component in the satellite coordinate system.

2. 3. 12　CAI2_VectorParameter.csv

　　CAI2_VectorParameter.csv is the file which contains the polynomial coefficient to express view vector (x,y,z) in CAI-2 coordinate system. Table 2.3-12 shows the file format.

Format　　　　　　　:　CSV with a header in the first line
Character code　　　:　UTF-8
New line code　　　　:　CR+LF

Table 2.3-12　　CAI2_VectorParameter.csv

No	Column name	Description	Type/Range	Unit	Note
1	BandNumber	Band number m	Integer, 1 to 10	Band number	
2	g0x .. g10x	$g_{jx}(m)$: Band m, J^{th} order coefficient of X component of view vector (j=1..10)	Real	—	
3	g0y .. g10y	$g_{jy}(m)$: Band m, J^{th} order coefficient of Y component of view vector (j=1..10)	Real	—	
4	g0z .. g10z	$g_{jz}(m)$: Band m, J^{th} order coefficient of Z component of view vector (j=1..10)	Real	—	

2. 3. 13 CAI2_Pixel_Parameter.csv

CAI2_Pixel_Parameter.csv is the file which defines the base pixel number Pc and the pixel pitch Pdet to calculate view vector.

Table 2.3-13 shows the file format.

Format   :   CSV with a header in the first line
Character code   :   UTF-8
New line code   :   CR+LF

Table 2.3-13   CAI2_Pixel_Parameter.csv

No	Column name	Description	Type/Range	Unit	Note
1	BandNumber	Band number m	Integer, 1 to 10	Band number	
2	Pc	$p_c(m)$ the base pixel of band m	Real Band 1 to 4, 6 to 9: 0. to 2056. Band 5, 10: 0. to 1024.	Pixel number	
3	Pdet	$p_{\det}(m)$ the pixel pitch of band m	Positive real number	mm	

2. 3. 14　CAI2_Band_registration_CT.csv

CAI2_Band_registration_CT.csv is the file which contains table of CT direction band-to-band registration. The table defines the relationship between the pixel number on the base band and the corresponding pixel number of the reference band. Table 2.3-14 shows the file format. For the band 1 to 6, the pixel number is corresponding to the forward looking base band. For the band 5 to 10, the pixel number is corresponding to the backward looking base band.

Format　　　　　　　:　CSV with a header in the first line
Character code　　　:　UTF-8
New line code　　　　:　CR+LF

Table 2.3-14　　CAI2_Band_registration_CT.csv

No	Column name	Description	Type/ Range	Unit	Note
1	No	Pixel number n of the base band	Integer, 1 to 2056	Pixel number	one-based
2	Band1	$n'(1, n)$ the pixel number of band 1 corresponding to the pixel number n of the base band.	Integer (*)	Pixel number	one-based
3	Band2	$n'(2, n)$ the pixel number of band 2 corresponding to the pixel number n of the base band.	Integer (*)	Pixel number	one-based
4	Band3	$n'(3, n)$ the pixel number of band 3 corresponding to the pixel number n of the base band.	Integer (*)	Pixel number	one-based
5	Band4	$n'(4, n)$ the pixel number of band 4 corresponding to the pixel number n of the base band.	Integer (*)	Pixel number	one-based
6	Band5	$n'(5, n)$ the pixel number of band 5 corresponding to the pixel number n of the base band.	Integer (*)	Pixel number	one-based
7	Band6	$n'(6, n)$ the pixel number of band 6 corresponding to the pixel number n of the base band.	Integer (*)	Pixel number	one-based
8	Band7	$n'(7, n)$ the pixel number of band 7 corresponding to the pixel number n of the base band.	Integer (*)	Pixel number	one-based
9	Band8	$n'(8, n)$ the pixel number of band 8 corresponding to the pixel number n of the base band.	Integer (*)	Pixel number	one-based
10	Band9	$n'(9, n)$ the pixel number of band 9 corresponding to the pixel number n of the base band.	Integer (*)	Pixel number	one-based
11	Band10	$n'(10, n)$ the pixel number of band 10 corresponding to the pixel number n of the base band.	Integer (*)	Pixel number	one-based

* The pixel number may be out of image border.

2. 3. 15 CAI2_Band_registration_AT.csv

CAI2_Band_registration_AT.csv is the file which contains table of AT direction band-to-band registration. The table defines the relationship between the pixel number on the base band and the error line number $\Delta l_B(i,n)$ of the reference band. Table 2.3-15 shows the file format.

$\Delta l_B(i,n)$ is defined as follows.

$$l'_B(i,n,l) = l_{sB}(i,l) + \Delta l_B(i,n)$$

Where

$l'_B(i,n,l)$: The line number of band i corresponding to line number of the base band B, at pixel n.

$l_{sB}(i,l)$: The line number of band i which was observed at the nearest time to the line l of the base band B.

Figure 1 shows the relationship between band B and band i.

For the band 1 to 6, the pixel number is corresponding to the forward looking base band. For the band 5 to 10, the pixel number is corresponding to the backward looking base band.

Format   :   CSV with a header in the first line
Character code   :   UTF-8
New line code   :   CR+LF

Table 2.3-15   CAI2_Band_registration_AT.csv

No	Column name	Description	Type/ Range	Unit	Note
1	No	Pixel number n of the base band	Integer, 1 to 2056	Pixel number	one-based
2	Band1	$\Delta l(1, n)$ the line number error between the base band and band 1.	Integer	Line	
3	Band2	$\Delta l(2, n)$ the line number error between the base band and band 2.	Integer	Line	
4	Band3	$\Delta l(3, n)$ the line number error between the base band and band 3.	Integer	Line	
5	Band4	$\Delta l(4, n)$ the line number error between the base band and band 4.	Integer	Line	
6	Band5	$\Delta l(5, n)$ the line number error between the base band and band 5.	Integer	Line	
7	Band6	$\Delta l(6, n)$ the line number error between the base band and band 6.	Integer	Line	
8	Band7	$\Delta l(7, n)$ the line number error between the base band and band 7.	Integer	Line	
9	Band8	$\Delta l(8, n)$ the line number error between the base band and band 8.	Integer	Line	
10	Band9	$\Delta l(9, n)$ the line number error between the base band and band 9.	Integer	Line	
11	Band10	$\Delta l(10, n)$ the line number error between the base band and band 10.	Integer	Line	

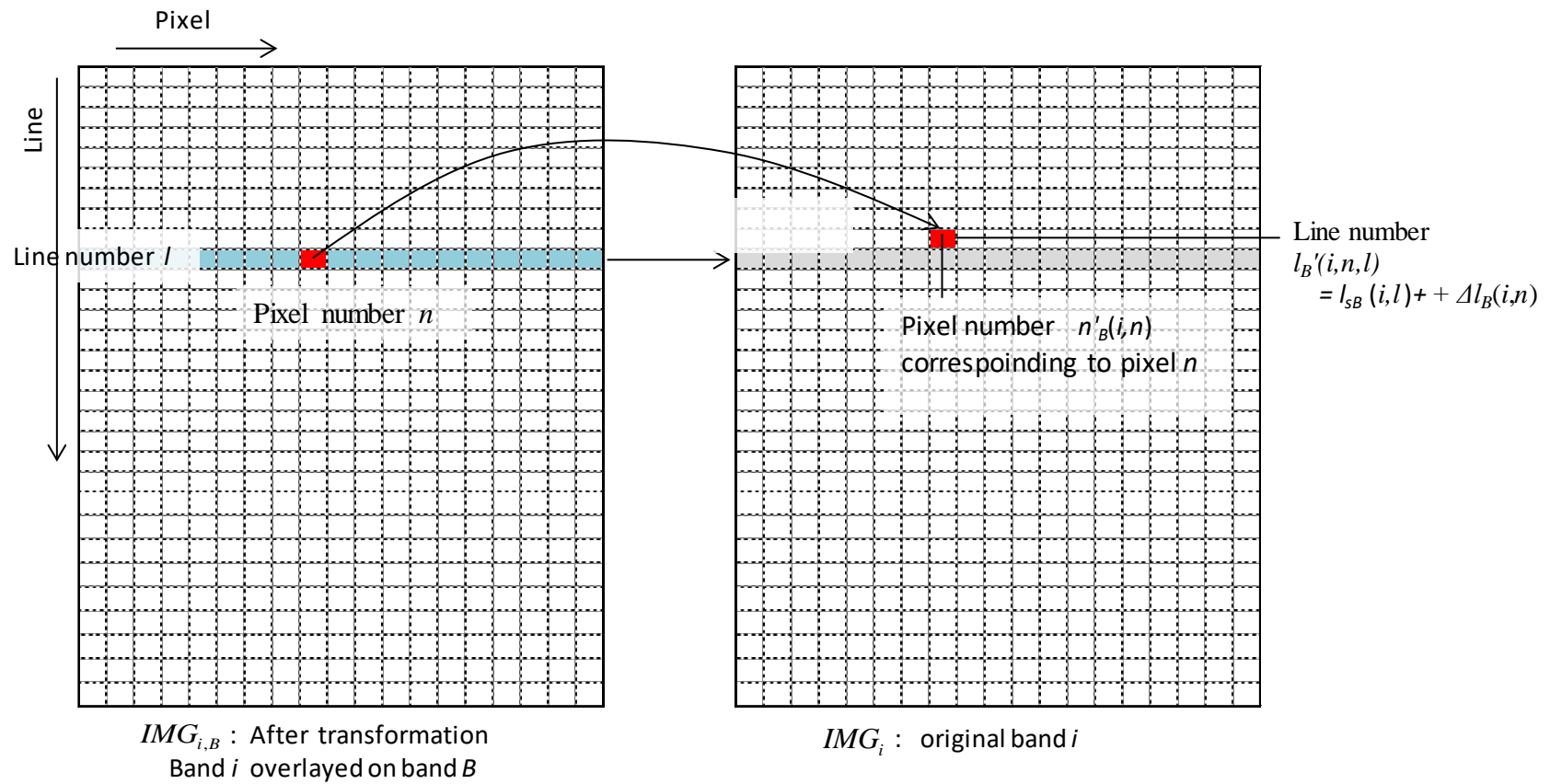The lines beginning with # are a comment lines and ignored.

Figure 1 the definition of the base band B and band i , error $\Delta l_B(i,n)$

2. 3. 16 CAI2_Band_registration_CT_B1.csv

CAI2_Band_registration_CT_B1.csv is the file which contains table of CT direction band-to-band registration, in case of the base band is band 1. The table defines the relationship between the pixel number on the band 1 and the corresponding pixel number of the reference band. Table 2.3-16 shows the file format.

Format   :   CSV with a header in the first line
Character code   :   UTF-8
New line code   :   CR+LF

Table 2.3-16   CAI2_Band_registration_CT_B1.csv

No	Column name	Description	Type/ Range	Unit	Note
1	No	Pixel number n of the base band	Integer, 1 to 2056	Pixel number	one-based
2	Band1	$n'(1, n)$ the pixel number of band 1 corresponding to the pixel number n of the band 1	Integer(*)	Pixel number	one-based
3	Band2	$n'(2, n)$ the pixel number of band 2 corresponding to the pixel number n of the band 1	Integer(*)	Pixel number	one-based
4	Band3	$n'(3, n)$ the pixel number of band 3 corresponding to the pixel number n of the band 1	Integer(*)	Pixel number	one-based
5	Band4	$n'(4, n)$ the pixel number of band 4 corresponding to the pixel number n of the band 1	Integer(*)	Pixel number	one-based
6	Band5	$n'(5, n)$ the pixel number of band 5 corresponding to the pixel number n of the band 1	Integer	Pixel number	All 0
7	Band6	$n'(6, n)$ the pixel number of band 6 corresponding to the pixel number n of the band 1	Integer	Pixel number	All 0
8	Band7	$n'(7, n)$ the pixel number of band 7 corresponding to the pixel number n of the band 1	Integer	Pixel number	All 0
9	Band8	$n'(8, n)$ the pixel number of band 8 corresponding to the pixel number n of the band 1	Integer	Pixel number	All 0
10	Band9	$n'(9, n)$ the pixel number of band 9 corresponding to the pixel number n of the band 1	Integer	Pixel number	All 0
11	Band10	$n'(10, n)$ the pixel number of band 10 corresponding to the pixel number n the band 1	Integer	Pixel number	All 0

* The pixel number may be out of image border.

2. 3. 17 CAI2_Band_registration_AT_B1.csv

CAI2_Band_registration_AT_B1.csv is the file which contains table of AT direction band-to-band registration in case of the base band is band 1. Table 2.3-17 shows the file format.

Format : CSV with a header in the first line
Character code : UTF-8
New line code : CR+LF

Table 2.3-17 CAI2_Band_registration_AT_B1.csv

No	Column name	Description	Type/ Range	Unit	Note
1	No	Pixel number n of the base band	1 to 2056	Pixel Number	one-based
2	Band1	$\Delta l(1, n)$ the line number error between the base band and band 1.	Integer	Line	
3	Band2	$\Delta l(2, n)$ the line number error between the base band and band 2.	Integer	Line	
4	Band3	$\Delta l(3, n)$ the line number error between the base band and band 3.	Integer	Line	
5	Band4	$\Delta l(4, n)$ the line number error between the base band and band 4.	Integer	Line	
6	Band5	$\Delta l(5, n)$ the line number error between the base band and band 5.	Integer	Line	All 0
7	Band6	$\Delta l(6, n)$ the line number error between the base band and band 6.	Integer	Line	All 0
8	Band7	$\Delta l(7, n)$ the line number error between the base band and band 7.	Integer	Line	All 0
9	Band8	$\Delta l(8, n)$ the line number error between the base band and band 8.	Integer	Line	All 0
10	Band9	$\Delta l(9, n)$ the line number error between the base band and band 9.	Integer	Line	All 0
11	Band10	$\Delta l(10, n)$ the line number error between the base band and band 10.	Integer	Line	All 0

* The lines beginning with # are a comment lines and ignored.

2. 3. 18 CAI2_Band_registration_CT_B6.csv

CAI2_Band_registration_CT_B6.csv is the file which contains table of CT direction band-to-band registration, in case of the base band is band 6. The table defines the relationship between the pixel number on the band 6 and the corresponding pixel number of the reference band. Table 2.3-18 shows the file format.

Format　　　　　　：　CSV with a header in the first line
Character code　　：　UTF-8
New line code　　 ：　CR+LF

Table 2.3-18 CAI2_Band_registration_CT_B6.csv

No	Column name	Description	Type/Range	Unit	Note
1	No	Pixel number n of the base band	Integer, 1 to 2056	Pixel Number	one-based
2	Band1	$n'(1, n)$: The pixel number of band 1 corresponding to the pixel number n of the band 1	Integer	Pixel number	All 0
3	Band2	$n'(2, n)$: The pixel number of band 2 corresponding to the pixel number n of the band 1	Integer	Pixel number	All 0
4	Band3	$n'(3, n)$: The pixel number of band 3 corresponding to the pixel number n of the band 1	Integer	Pixel number	All 0
5	Band4	$n'(4, n)$: The pixel number of band 4 corresponding to the pixel number n of the band 1	Integer	Pixel number	All 0
6	Band5	$n'(5, n)$: The pixel number of band 5 corresponding to the pixel number n of the band 1	Integer	Pixel number	All 0
7	Band6	$n'(6, n)$: The pixel number of band 6 corresponding to the pixel number n of the band 1	Integer(*)	Pixel number	
8	Band7	$n'(7, n)$: The pixel number of band 7 corresponding to the pixel number n of the band 1	Integer(*)	Pixel number	
9	Band8	$n'(8, n)$: The pixel number of band 8 corresponding to the pixel number n of the band 1	Integer(*)	Pixel number	
10	Band9	$n'(9, n)$: The pixel number of band 9 corresponding to the pixel number n of the band 1	Integer(*)	Pixel number	
11	Band10	$n'(10, n)$: The pixel number of band 10 corresponding to the pixel number n the band 1	Integer(*)	Pixel number	

* The pixel number may be out of image border.

2. 3. 19 CAI2_Band_registration_AT_B6.csv

CAI2_Band_registration_AT_B6.csv is the file which contains table of AT direction band-to-band registration in case of the base band is band 6. Table 2.3-19 shows the file format.

Format　　　　　　　:　CSV with a header in the first line
Character code　　　:　UTF-8
New line code　　　　:　CR+LF

Table 2.3-19　　CAI2_Band_registration_AT_B6.csv

No	Column name	Description	Type/ Range	Unit	Note
1	No	Pixel number n of the base band	Integer, 1 to 2056	Pixel Number	one-based
2	Band1	$\Delta l(1, n)$ the line number error between the base band and band 1.	Integer	Line	All 0
3	Band2	$\Delta l(2, n)$ the line number error between the base band and band 2.	Integer	Line	All 0
4	Band3	$\Delta l(3, n)$ the line number error between the base band and band 3.	Integer	Line	All 0
5	Band4	$\Delta l(4, n)$ the line number error between the base band and band 4.	Integer	Line	All 0
6	Band5	$\Delta l(5, n)$ the line number error between the base band and band 5.	Integer	Line	All 0
7	Band6	$\Delta l(6, n)$ the line number error between the base band and band 6.	Integer	Line	All 0
8	Band7	$\Delta l(7, n)$ the line number error between the base band and band 7.	Integer	Line	one-based
9	Band8	$\Delta l(8, n)$ the line number error between the base band and band 8.	Integer	Line	one-based
10	Band9	$\Delta l(9, n)$ the line number error between the base band and band 9.	Integer	Line	one-based
11	Band10	$\Delta l(10, n)$ the line number error between the base band and band 10.	Integer	Line	one-based

* The lines beginning with # are a comment lines and ignored.

2．3．20　CAI2_Saturation_correction.csv

CAI2_Saturation_correction.csv is the parameter file which defines the threshold for saturation correction. Table 2.3-20 shows the format.

Format　　　　　　：　CSV with a header in the first line
Character code　　：　UTF-8
New line code　　　：　CR+LF

Table 2.3-20　　CAI2_Saturation_correction.csv

No	Column name	Description	Type/ Range	Unit	Note
1	No	Pixel number n	Integer 1 to 2056	Pixel number	one-based
2	Band1	The saturation threshold for band 1 pixel number n	0 to 4095	(DN)	
3	Band2	The saturation threshold for band 2 pixel number n	0 to 4095	(DN)	
4	Band3	The saturation threshold for band 3 pixel number n	0 to 4095	(DN)	
5	Band4	The saturation threshold for band 4 pixel number n	0 to 4095	(DN)	
6	Band5	The saturation threshold for band 5 pixel number n .	0 to 4095	(DN)	
7	Band6	The saturation threshold for band 6 pixel number n	0 to 4095	(DN)	
8	Band7	The saturation threshold for band 7 pixel number n	0 to 4095	(DN)	
9	Band8	The saturation threshold for band 8 pixel number n	0 to 4095	(DN)	
10	Band9	The saturation threshold for band 9 pixel number n	0 to 4095	(DN)	
11	Band10	The saturation threshold for band 10 pixel number n	0 to 4095	(DN)	

2．3．21　CAI2_Stray_light_correction_B1.txt

CAI2_Stray_light_correction_B1.txt is the text file which defines the parameters to correct stray light in band 1.

Table 2.3-21 shows the parameters. The parameter is defined in a "Key=value" formatted line in the file.

Example:

```
saturationCorrection.refBandNo=2
saturationCorrection.refBand.refPixelMargin=0
saturationCorrection.refBand.refLineMargin=0
strayLightCorrection.H_11=B1_H1.tif
:
```

Format　　　　　　　：　Text
　　　　　　　　　　　　　("Key=value" format)
Character code　　　：　UTF-8
New line code　　　：　CR+LF

Table 2.3-21 CAI2_Stray_light_correction_B1.txt (1/4)

No	Column name	Description	Type/Range	Unit	Note
1	saturationCorrection.refBandNo	The reference band number to predict non-saturated value.	Integer, 2 to 4	Band number	
2	saturationCorrection.refBand.refPixelMargin	The number of additional reference pixels to predict non-saturated value. If the value is "N" , the N pixels in both side around the nearest unsaturated pixel will be used. If only the nearest pixel needs be used, the value should be zero.	Integer, $\geqq$ 0	Pixel number	

Table 2.3-21 CAI2_Stray_light_correction_B1.txt (1/4)

No	Column name	Description	Type/Range	Unit	Note
3	saturationCorrection.refBand.refLineMargin	The number of additional reference lines to predict non-saturated value. If the value is "N", the N pre/post lines will be used. If only the line which contains the saturated pixel need to be used, the value should be zero.	Integer, $\geqq 0$	Line	
4	filtering.startPixelNo	The start pixel number to apply the PSF. The image border processing will be applied the out of region.	Integer, 1 to 2056	Pixel number	one-based
5	filtering.endPixelNo	The end pixel number to apply the PSF. The image border processing will be applied the out of region.	Integer, 1 to 2056	Pixel number	one-based
6	filtering.Woutside	The pixel margins filled by edge value.	Integer, $\geqq 0$	Pixel number	
7	strayLightCorrection.H_1	The TIFF file name of band 1 stray light PSF ($H_{1,1}$).	String, File name	—	
8	strayLightCorrection.H_1.startPixelNo	The start pixel number to apply $H_{1,1}$	Integer, 1 to 2056	Pixel number	one-based
9	strayLightCorrection.H_1.endPixelNo	The end pixel number to apply $H_{1,1}$	Integer, 1 to 2056	Pixel number	one-based
10	strayLightCorrection.H_2	The TIFF file name of band 1 stray light PSF ($H_{1,2}$).	String, File name	—	
11	strayLightCorrection.H_2.startPixelNo	The start pixel number to apply $H_{1,2}$	Integer,1 to 2056	Pixel number	one-based
12	strayLightCorrection.H_2.endPixelNo	The end pixel number to apply $H_{1,2}$	Integer,1 to 2056	Pixel number	one-based
13	strayLightCorrection.H_3	The TIFF file name of band 1 stray light PSF ($H_{1,3}$).	String, File name	—	
14	strayLightCorrection.H_3.startPixelNo	The start pixel number to apply $H_{1,3}$	Integer,1 to 2056	Pixel number	one-based
15	strayLightCorrection.H_3.endPixelNo	The end pixel number to apply $H_{1,3}$	Integer, 1 to 2056	Pixel number	one-based
16	strayLightCorrection.H_4	The TIFF file name of band 1 stray light PSF ($H_{1,4}$).	String, File name	—	
17	strayLightCorrection.H_4.startPixelNo	The start pixel number to apply $H_{1,4}$	Integer, 1 to 2056	Pixel number	one-based
18	strayLightCorrection.H_4.endPixelNo	The end pixel number to apply $H_{1,4}$	Integer, 1 to 2056	Pixel number	one-based

Table 2.3-21 CAI2_Stray_light_correction_B1.txt (3/4)

No	Column name	Description	Type/Range	Unit	Note
19	strayLightCorrection.H_5	The TIFF file name of band 1 stray light PSF ($H_{1,5}$).	String, File name	—	
20	strayLightCorrection.H_5.startPixelNo	The start pixel number to apply $H_{1,5}$	Integer, 1 to 2056	Pixel number	one-based
21	strayLightCorrection.H_5.endPixelNo	The end pixel number to apply $H_{1,5}$	Integer, 1 to 2056	Pixel number	one-based
22	strayLightCorrection.A	The file name of coefficient A_1 for band 1, to correct reduce of signal level caused by subtraction of stray light.	String, File name	—	
23	outbandCorrection.refBand	The reference bands for out-of-band correction. The bands need to be specified by comma-separated value. Example: outbandCorrection.refBand=2,3,4 If out-of-band stray light correction is not necessary, set right hand side empty. outbandCorrection.refBand=	Integer, 2 to 4, or empty	Band number	ignore space
24	outbandCorrection.H2	The TIFF file name of band 1 out-of-band stray light PSF ($H_{1,2}$). If out-of-band stray light correction is not necessary, set right hand side empty.	String, File name	—	
25	outbandCorrection.H3	The TIFF file name of band 1 out-of-band stray light PSF ($H_{1,3}$). If out-of-band stray light correction is not necessary, set right hand side empty.	String, File name	—	
26	outbandCorrection.H4	The TIFF file name of band 1 out-of-band stray light PSF ($H_{1,4}$). If out-of-band stray light correction is not necessary, set right hand side empty.	String, File name	—	

Table 2.3-21   CAI2_Stray_light_correction_B1.txt (4/4)

No	Column name	Description	Type/Range	Unit	Note
27	crossTalkCorrection.H	The TIFF file name of band 1 inter-band crosstalk stray light (H_θ).	String, File name	—	

* The lines beginning with # are a comment lines and ignored.

2．3．22　CAI2_Stray_light_correction_B6.txt

CAI2_Stray_light_correction_B6.txt is the text file which defines the parameters to correct stray light in band 6.

Table 2.3-22 shows the parameters. The format is same as 2.3.21. The parameter is defined in a "Key=value" formatted line in the file.

```
Format            :    Text
                       ("Key=value" format)
Character code    :    UTF-8
New line code     :    CR+LF
```

Table 2.3-22 CAI2_Stray_light_correction_B6.txt (1/4)

No	Column name	Description	Type/Range	Unit	Note
1	saturationCorrection.refBandNo	The reference band number to predict non-saturated value.	Integer, 7 to 9	Band number	
2	saturationCorrection.refBand.refPixelMargin	The number of additional reference pixels to predict non-saturated value. If the value is "N" , the N pixels in both side around the nearest unsaturated pixel will be used. If only the nearest pixel needs be used, the value should be zero.	Integer, $\geqq$ 0	Pixel number	

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Table 2.3-22 CAI2_Stray_light_correction_B6.txt (2/4)

No	Column name	Description	Type/Range	Unit	Note
3	saturationCorrection.refBand.refLineMargin	The number of additional reference lines to predict non-saturated value. If the value is "N" , the N pre/post lines will be used. If only the line which contains the saturated pixel need to be used, the value should be zero.	Integer, $\geqq$ 0	Line	
4	filtering.startPixelNo	The start pixel number to apply the PSF. The image border processing will be applied the out of region.	Integer, 1 to 2056	Pixel number	one-based
5	filtering.endPixelNo	The end pixel number to apply the PSF. The image border processing will be applied the out of region.	Integer, 1 to 2056	Pixel number	one-based
6	filtering.Woutside	The pixel margins filled by edge value.	Integer, $\geqq$ 0	—	
7	strayLightCorrection.H_1	The TIFF file name of band 6 stray light PSF ($H_{6,1}$).	String, File name	—	
8	strayLightCorrection.H_1.startPixelNo	The start pixel number to apply $H_{6,1}$	Integer, 1 to 2056	Pixel number	one-based
9	strayLightCorrection.H_1.endPixelNo	The end pixel number to apply $H_{6,1}$	Integer, 1 to 2056	Pixel number	one-based
10	strayLightCorrection.H_2	The TIFF file name of band 6 stray light PSF ($H_{6,2}$).	String, File name	—	
11	strayLightCorrection.H_2.startPixelNo	The start pixel number to apply $H_{6,2}$	Integer, 1 to 2056	Pixel number	one-based
12	strayLightCorrection.H_2.endPixelNo	The end pixel number to apply $H_{6,2}$	Integer, 1 to 2056	Pixel number	one-based
13	strayLightCorrection.H_3	The TIFF file name of band 6 stray light PSF ($H_{6,3}$).	String, File name	—	
14	strayLightCorrection.H_3.startPixelNo	The start pixel number to apply $H_{6,3}$	Integer, 1 to 2056	Pixel number	one-based
15	strayLightCorrection.H_3.endPixelNo	The end pixel number to apply $H_{6,3}$	Integer, 1 to 2056	Pixel number	one-based
16	strayLightCorrection.H_4	The TIFF file name of band 6 stray light PSF ($H_{1,4}$).	String, File name	—	
17	strayLightCorrection.H_4.startPixelNo	The start pixel number to apply $H_{6,4}$	Integer, 1 to 2056	Pixel number	one-based
18	strayLightCorrection.H_4.endPixelNo	The end pixel number to apply $H_{6,4}$	Integer, 1 to 2056	Pixel number	one-based

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Table 2.3-22　CAI2_Stray_light_correction_B6.txt (3/4)

No	Column name	Description	Type/Range	Unit	Note
19	strayLightCorrection.H_5	The TIFF file name of band 6 stray light PSF ($H_{6,4}$).	String, File name	—	
20	strayLightCorrection.H_5.startPixelNo	The start pixel number to apply $H_{6,4}$	Integer, 1 to 2056	Pixel number	one-based
21	strayLightCorrection.H_5.endPixelNo	The end pixel number to apply $H_{6,4}$	Integer, 1 to 2056	Pixel number	one-based
22	strayLightCorrection.A	The file name of coefficient A_6 for band 6, to correct reduce of signal level caused by subtraction of stray light.	String, File name	—	
23	outbandCorrection.refBand	The reference bands for out-of-band correction. The bands need to be specified by comma-separated value. Example: outbandCorrection.refBand=7,8,9 If out-of-band stray light correction is not necessary, set right hand side　empty. outbandCorrection.refBand=	Integer, 7 to 9, or empty	Band number	ignore space
24	outbandCorrection.H7	The TIFF file name of band 6 out-of-band stray light PSF ($H_{6,7}$). If out-of-band stray light correction is not necessary, set right hand side　empty.	String, File name	—	
25	outbandCorrection.H8	The TIFF file name of band 6 out-of-band stray light PSF ($H_{6,8}$). If out-of-band stray light correction is not necessary, set right hand side　empty.	String, File name	—	
26	outbandCorrection.H9	The TIFF file name of band 6 out-of-band stray light PSF ($H_{6,9}$). If out-of-band stray light correction is not necessary, set right hand side　empty.	String, File name	—	

Table 2.3-22　　CAI2_Stray_light_correction_B6.txt (4/4)

No	Column name	Description	Type/Range	Unit	Note
27	crossTalkCorrection.H	The TIFF file name of band 6 inter-band crosstalk stray light (H_1).	String, File name	—	

* The lines beginning with # are a comment lines and ignored.

2. 3. 23 CAI2_Stray_light_correction_A_B1.csv

CAI2_Stray_light_correction_A_B1.csv is the file which contains coefficient $A_1(n)$ for band 1, to correct reduce of signal level

caused by subtraction of the stray light. Table 2.3-23 shows the file format.

Format   :   CSV with a header in the first line
Character code   :   UTF-8
New line code   :   CR+LF

Table 2.3-23   CAI2_Stray_light_correction_A_B1.csv

No	Column name	Description	Type/Range	Unit	Note
1	No	Pixel number n	Integer, 1 to 2056	Pixel Number	one-based
2	A(n)	$A_1(n)$ for pixel number n	Real	—	

* The lines beginning with # are a comment lines and ignored.

2. 3. 24 CAI2_Stray_light_correction_A_B6.csv

CAI2_Stray_light_correction_A_B6.csv is the file which contains coefficient $A_6(n)$ for band 6, to correct reduce of signal level caused by subtraction of the stray light. Table 2.3-24 shows the file format.

Format   :   CSV with a header in the first line
Character code   :   UTF-8
New line code   :   CR+LF

Table 2.3-24   CAI2_Stray_light_correction_A_B6.csv

No	Column name	Description	Type/Range	Unit	Note
1	No	Pixel number n	Integer, 1 to 2056	Pixel number	one-based
2	A(n)	$A_6(n)$ for pixel number n	Real	—	

* The lines beginning with # are a comment lines and ignored.

2．3．25　CAI2_Ch_crosstalk_correction_B5.csv

CAI2_Ch_crosstalk_correction_B5.csv is the file which contains the parameter for band 5 inter-channel crosstalk correction. The file is CSV format and the defines the coefficient formatted in Table 2.3-25. All a,b,c,d and eare defined in real number. The next page shows the example.

Format　　　　　　　 :　CSV with a header in the first and 10th line
Character code　　　 :　UTF-8
New line code　　　　 :　CR+LF

Table 2.3-25　CAI2_Ch_crosstalk_correction_B5.csv

"CH1"(Column header)	"CH3" (Column header)	"CH5" (Column header)	"CH7" (Column header)
a11 (*)	a13	a15	a17
a31	a33(*)	a35	a37
a51	a53	a55(*)	a57
a71	a73	a75	a77(*)
c11 (*)	c13	c15	c17
c31	c33(*)	c35	c37
c51	c53	c55(*)	c57
c71	c73	c75	c77(*)
d11 (*)	d13	d15	d17
d31	d33(*)	d35	d37
d51	d53	d55(*)	d57
d71	d73	d75	d77(*)
e11 (*)	c13	c15	c17
e31	e33(*)	e35	e37
e51	e53	e55(*)	e57
e71	e73	e75	e77(*)
b11 (*)	e13	e15	e17
b31	b33 (*)	b35	b37
b51	b53	b55(*)	b57
b71	b73	b75	b77(*)
"CH2"(Column header)	"CH4" (Column header)	"CH6" (Column header)	"CH8" (Column header)
a22 (*)	a24	a26	a28
a42	a44 (*)	a46	a48
a62	a64	a66(*)	a68
a81	a84	a86	a88(*)
c22 (*)	c24	c26	c28
c42	c44 (*)	c46	c48
c62	c64	c66(*)	c68
c81	c84	c86	c88(*)
d22 (*)	d24	d26	d28
d42	d44 (*)	d46	d48
d62	d64	d66(*)	d68
d81	d84	d86	d88(*)
e22 (*)	d24	d26	d28
e42	e44 (*)	e46	e48
e62	e64	e66(*)	e68
e81	e84	e86	e88(*)
b22 (*)	e24	e26	e28
b42	b44(*)	b46	b48
b62	b64	b66(*)	b68
b81	b84	b86	b88(*)

Column headers are the strings in bracket "".　The cells with (*) will be zero.

The lines beginning with # are a comment lines and ignored.

Example:

```
CH1, CH3, CH5,   CH7
0.0, 1.0, 1.0,   1.0
3.0, 0.0, 3.0,   3.0
5.0, 5.0, 0.0,   5.0
7.0, 7.0, 7.0,   0.0
0.0, 1.0, 1.0,   1.0
3.0, 0.0, 3.0,   3.0
5.0, 5.0, 0.0,   5.0
7.0, 7.0, 7.0,   0.0
0.0, 1.0, 1.0,   1.0
3.0, 0.0, 3.0,   3.0
5.0, 5.0, 0.0,   5.0
7.0, 7.0, 7.0,   0.0
0.0, 1.0, 1.0,   1.0
3.0, 0.0, 3.0,   3.0
5.0, 5.0, 0.0,   5.0
7.0, 7.0, 7.0,   0.0
0.0, 1.0, 1.0,   1.0
3.0, 0.0, 3.0,   3.0
5.0, 5.0, 0.0,   5.0
7.0, 7.0, 7.0,   0.0
CH2, CH4, CH6,   CH8
0.0, 2.0, 2.0,   2.0
4.0, 0.0, 4.0,   4.0
6.0, 6.0, 0.0,   6.0
8.0, 8.0, 8.0,   0.0
0.0, 2.0, 2.0,   2.0
4.0, 0.0, 4.0,   4.0
6.0, 6.0, 0.0,   6.0
8.0, 8.0, 8.0,   0.0
0.0, 2.0, 2.0,   2.0
4.0, 0.0, 4.0,   4.0
6.0, 6.0, 0.0,   6.0
8.0, 8.0, 8.0,   0.0
0.0, 2.0, 2.0,   2.0
4.0, 0.0, 4.0,   4.0
6.0, 6.0, 0.0,   6.0
8.0, 8.0, 8.0,   0.0
0.0, 2.0, 2.0,   2.0
4.0, 0.0, 4.0,   4.0
6.0, 6.0, 0.0,   6.0
8.0, 8.0, 8.0,   0.0
```

2．3．26　CAI2_Ch_crosstalk_correction_B10.csv

CAI2_Ch_crosstalk_correction_B10.csv is the file which contains the parameter for band 10 inter-channel crosstalk correction. The file format is same as 2.3.25. The file is CSV format and the defines the coefficient formatted in Table 2.3-26. All a,b,c,d and e are defined in real number.

Format	:	CSV with a header in the first and 10th line
Character code	:	UTF-8
New line code	:	CR+LF

Table 2.3-26 CAI2_Ch_crosstalk_correction_B10.csv

"CH1"(Column header)	"CH3" (Column header)	"CH5" (Column header)	"CH7" (Column header)
a11 (*)	a13	a15	a17
a31	a33(*)	a35	a37
a51	a53	a55(*)	a57
a71	a73	a75	a77(*)
c11 (*)	c13	c15	c17
c31	c33(*)	c35	c37
c51	c53	c55(*)	c57
c71	c73	c75	c77(*)
d11 (*)	d13	d15	d17
d31	d33(*)	d35	d37
d51	d53	d55(*)	d57
d71	d73	d75	d77(*)
e11 (*)	c13	c15	c17
e31	e33(*)	e35	e37
e51	e53	e55(*)	e57
e71	e73	e75	e77(*)
b11 (*)	e13	e15	e17
b31	b33 (*)	b35	b37
b51	b53	b55(*)	b57
b71	b73	b75	b77(*)
"CH2"(Column header)	"CH4" (Column header)	"CH6" (Column header)	"CH8" (Column header)
a22 (*)	a24	a26	a28
a42	a44 (*)	a46	a48
a62	a64	a66(*)	a68
a81	a84	a86	a88(*)
c22 (*)	c24	c26	c28
c42	c44 (*)	c46	c48
c62	c64	c66(*)	c68
c81	c84	c86	c88(*)
d22 (*)	d24	d26	d28
d42	d44 (*)	d46	d48
d62	d64	d66(*)	d68
d81	d84	d86	d88(*)
e22 (*)	d24	d26	d28
e42	e44 (*)	e46	e48
e62	e64	e66(*)	e68
e81	e84	e86	e88(*)
b22 (*)	e24	e26	e28
b42	b44(*)	b46	b48
b62	b64	b66(*)	b68
b81	b84	b86	b88(*)

Column headers are the strings in bracket "". The cells with (*) will be zero.

The lines beginning with # are a comment lines and ignored.

2．3．27 CAI2_Stray_light_correction_B5.txt

CAI2_Stray_light_correction_B5.txt is the text file which defines the parameters to correct stray light in band 5.

Table 2.3-27 shows the parameters. The parameter is defined in a "Key=value" formatted line in the file.

Example:

| filtering.startPixelNo=66 |
| filtering.endPixelNo=1024 |
| : |

Format   :   Text
                     ("Key=value" format)
Character code   :   UTF-8
New line code   :   CR+LF

Table 2.3-27   CAI2_Stray_light_correction_B5.txt (1/2)

No	Column name	Description	Type/Range	Unit	Note
1	filtering.startPixelNo	The start pixel number to apply the PSF. The image border processing will be applied the out of region.	Integer, 1 to 1024	Pixel number	one-based
2	filtering.endPixelNo	The end pixel number to apply the PSF. The image border processing will be applied the out of region.	Integer, 1 to 1024	Pixel number	one-based
3	filtering.Woutside	The pixel margins filled by edge value.	Integer, $\geqq 0$	—	
4	strayLightCorrection.H_1	The TIFF file name of band 5 stray light PSF ($H_{5,1}$).	String, File name	—	

Table 2.3-27　CAI2_Stray_light_correction_B5.txt (2/2)

No	Column name	Description	Type/Range	Unit	Note
5	strayLightCorrection.H_1.startPixelNo	The start pixel number to apply $H_{5,1}$	Integer, 1 to 1024	Pixel number	one-based
6	strayLightCorrection.H_1.endPixelNo	The end pixel number to apply $H_{5,1}$	Integer, 1 to 1024	Pixel number	one-based
7	strayLightCorrection.H_2	The TIFF file name of band 5 stray light PSF ($H_{5,2}$).	String, File name	—	
8	strayLightCorrection.H_2.startPixelNo	The start pixel number to apply $H_{5,2}$	Integer, 1 to 1024	Pixel number	one-based
9	strayLightCorrection.H_2.endPixelNo	The end pixel number to apply $H_{5,2}$	Integer, 1 to 1024	Pixel number	one-based
10	strayLightCorrection.H_3	The TIFF file name of band 5 stray light PSF ($H_{5,3}$).	String, File name	—	
11	strayLightCorrection.H_3.startPixelNo	The start pixel number to apply $H_{5,3}$	Integer, 1 to 1024	Pixel number	one-based
12	strayLightCorrection.H_3.endPixelNo	The end pixel number to apply $H_{5,3}$	Integer, 1 to 1024	Pixel number	one-based
13	strayLightCorrection.H_4	The TIFF file name of band 5 stray light PSF ($H_{5,4}$).	String, File name	—	
14	strayLightCorrection.H_4.startPixelNo	The start pixel number to apply $H_{5,4}$	Integer, 1 to 1024	Pixel number	one-based
15	strayLightCorrection.H_4.endPixelNo	The end pixel number to apply $H_{5,4}$	Integer, 1 to 1024	Pixel number	one-based
16	strayLightCorrection.H_5	The TIFF file name of band 5 stray light PSF ($H_{5,5}$).	String, File name	—	
17	strayLightCorrection.H_5.startPixelNo	The start pixel number to apply $H_{5,5}$	Integer, 1 to 1024	Pixel number	one-based
18	strayLightCorrection.H_5.endPixelNo	The end pixel number to apply $H_{5,5}$	Integer, 1 to 1024	Pixel number	one-based
19	strayLightCorrection.A	The file name of coefficient A_5 for band 5, to correct reduce of signal level caused by subtraction of stray light.	String, File name	—	

* The lines beginning with # are a comment lines and ignored.

2．3．28　CAI2_Stray_light_correction_B10.txt

CAI2_Stray_light_correction_B10.txt is the text file which defines the parameters to correct stray light in band 10.

Table 2.3-28 shows the parameters. The file format is same as 2.3.27. The parameter is defined in a "Key=value" formatted line in the file.

```
Format              :   Text
                        ("Key=value" format)
Character code      :   UTF-8
New line code       :   CR+LF
```

Table 2.3-28　　CAI2_Stray_light_correction_B10.txt (1/2)

No	Column name	Description	Type/Range	Unit	Note
1	filtering.startPixelNo	The start pixel number to apply the PSF. The image border processing will be applied the out of region.	Integer, 1 to 1024	Pixel number	one-based
2	filtering.endPixelNo	The end pixel number to apply the PSF. The image border processing will be applied the out of region.	Integer, 1 to 1024	Pixel number	one-based
3	filtering.Woutside	The pixel margins filled by edge value.	Integer, $\geqq$ 0	Pixel number	
4	strayLightCorrection.H_1	The TIFF file name of band 10 stray light PSF ($H_{10,1}$).	String, File name	—	
5	strayLightCorrection.H_1.startPixelNo	The start pixel number to apply $H_{10,1}$	Integer, 1 to 1024	Pixel number	one-based
6	strayLightCorrection.H_1.endPixelNo	The end pixel number to apply $H_{10,1}$	Integer, 1 to 1024	Pixel number	one-based
7	strayLightCorrection.H_2	The TIFF file name of band 10 stray light PSF ($H_{10,2}$).	String, File name	—	
8	strayLightCorrection.H_2.startPixelNo	The start pixel number to apply $H_{10,2}$	Integer, 1 to 1024	Pixel number	one-based
9	strayLightCorrection.H_2.endPixelNo	The end pixel number to apply $H_{10,2}$	Integer, 1 to 1024	Pixel number	one-based
10	strayLightCorrection.H_3	The TIFF file name of band 10 stray light PSF ($H_{10,3}$).	String, File name	—	

Table 2.3-28 CAI2_Stray_light_correction_B10.txt (2/2)

No	Column name	Description	Type/Range	Unit	Note
11	strayLightCorrection.H_3.startPixelNo	The start pixel number to apply $H_{10,3}$	Integer, 1 to 1024	Pixel number	one-based
12	strayLightCorrection.H_3.endPixelNo	The end pixel number to apply $H_{10,3}$	Integer, 1 to 1024	Pixel number	one-based
13	strayLightCorrection.H_4	The TIFF file name of band 10 stray light PSF ($H_{10,4}$).	String, File name	—	
14	strayLightCorrection.H_4.startPixelNo	The start pixel number to apply $H_{10,4}$	Integer, 1 to 1024	Pixel number	one-based
15	strayLightCorrection.H_4.endPixelNo	The end pixel number to apply $H_{10,4}$	Integer, 1 to 1024	Pixel number	one-based
16	strayLightCorrection.H_5	The TIFF file name of band 10 stray light PSF ($H_{10,5}$).	String, File name	—	
17	strayLightCorrection.H_5.startPixelNo	The start pixel number to apply $H_{10,5}$	Integer, 1 to 1024	Pixel number	one-based
18	strayLightCorrection.H_5.endPixelNo	The end pixel number to apply $H_{10,5}$	Integer, 1 to 1024	Pixel number	one-based
19	strayLightCorrection.A	The file name of coefficient A_{10} for band 10, to correct reduce of signal level caused by subtraction of stray light.	String, File name	—	

* The lines beginning with # are a comment lines and ignored.

2.　3.　29　CAI2_Stray_light_correction_A_B5.csv

CAI2_Stray_light_correction_A_B5.csv is the file which contains coefficient $A_5(n)$ for band 5, to correct reduce of signal level

caused by subtraction of stray light. Table 2.3-29 shows the file format.

Format　　　　　　　：　CSV with a header in the first line
Character code　　　：　UTF-8
New line code　　　：　CR+LF

Table 2.3-29　CAI2_Stray_light_correction_A_B5.csv

No	Column name	Description	Type/Range	Unit	Note
1	No	Pixel number n	Integer, 1 to 1024	Pixel number	one-based
2	A(n)	$A_5(n)$ for pixel n	Real	—	

* The lines beginning with # are a comment lines and ignored.

2. 3. 30　CAI2_Stray_light_correction_A_B10.csv

CAI2_Stray_light_correction_A_B10.csv is the file which contains coefficient $A_{10}(n)$ for band 10, to correct reduce of signal

level caused by subtraction of stray light. Table 2.3-30 shows the file format.

Format　　　　　　　：　CSV with a header in the first line
Character code　　　：　UTF-8
New line code　　　　：　CR+LF

Table 2.3-30　CAI2_Stray_light_correction_A_B10.csv

No	Column name	Description	Type/Range	Unit	Note
1	No	Pixel number n	Integer, 1 to 1024	Pixel number	one-based
2	A(n)	$A_{10}(n)$ for pixel n	Real	—	

* The lines beginning with # are a comment lines and ignored.

2．3．31　CAI2_ImageProcessSetting.txt

CAI2_ImageProcessSetting.txt is the text file which configure the image processing on/off.

Table 2.3-31 shows the parameters. The parameter is defined in a "Key=value" formatted line in the file.

Example:

```
B1.saturationCorrection=On
B1.strayLightCorrection=On
B1.outbandStrayLightCorrection=On
B1.B1B6crossTalkCorrectoion=On
:
```

Format   :   Text
                       ("Key=value" format)
Character code   :   UTF-8
New line code   :   CR+LF

Table 2.3-31　　CAI2_ImageProcessSetting.txt (1/2)

No	Column name	Description	Type/Range	Unit	Note
1	B1.saturationCorrection	Specify the saturation correction for band 1 On or Off	String, "On" or "Off"	—	
2	B1.strayLightCorrection	Specify the stray light correction for band 1 On or Off	String, "On" or "Off"	—	
3	B1.outbandStrayLightCorrection	Specify the out-of-band stray light correction for band 1 On or Off	String, "On" or "Off"		
4	B1.B1B6crossTalkCorrectoion	Specify the band 1 and 6 inter-band stray light correction for band 1 On or Off	String, "On" or "Off"	—	

Table 2.3-31　CAI2_ImageProcessSetting.txt (2/2)

No	Column name	Description	Type/Range	Unit	Note
5	B6.saturationCorrection	Specify the saturation correction for band 6 On or Off.	String "On" or "Off"	—	
6	B6.strayLightCorrection	Specify the stray light correction for band 6 On or Off.	String "On" or "Off"	—	
7	B6.outbandStrayLightCorrection	Specify the out-of-band stray light correction for band 6 On or Off.	String "On" or "Off"	—	
8	B6.B1B6crossTalkCorrectoion	Specify the band 1 and 6 inter-band stray light correction for band 6 On or Off.	String "On" or "Off"	—	
9	B5.chCrossTalkCorrection	Specify the band 5 inter-channel crosstalk correction On or Off.	String "On" or "Off"	—	
10	B5.strayLightCorrection	Specify the stray light correction for band 5 On or Off.	String "On" or "Off"	—	
11	B10.chCrossTalkCorrection	Specify the band 10 inter-channel crosstalk correction On or Off.	String "On" or "Off"	—	
12	B10.strayLightCorrection	Specify the stray light correction for band 10 On or Off	String "On" or "Off"	—	

* The lines beginning with # are a comment lines and ignored.

2. 3. 32　PSF File (.tif)

PSF file is TIFF file like below.

Format　　　　　　：　TIFF
Image data　　　　　floating point 32bit

（END）