



# JEM/SMILES L2 Products Guide for ver 2.1 (007-08-0310)

## STRUCTURE OF STANDARD SMILES L2 PRODUCTS

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# JEM/SMILES L2 Products Guide

## 1. STANDARD LEVEL 2 PRODUCTS OVERVIEW

There are two types of products. One is “L2Product” and another is “L2Product\_G\_RA”. L2Product has full information (a priori profiles, averaging kernel.). L2Product\_G\_RA has minimum. In details is in Sec. 2 of release notes.

### (1) **FILE NAME**

The file names are defined as follows.

L2Product: SMILES\_L2\_{*product\_name*}\_{*band\_name*}\_{*version\_name*}\_{*date*}.he5

L2Product\_G\_RA: SMILES\_L2\_{*product\_name*}\_{*version\_name*}\_{*date*}.he5

### (2) **A COMBINATION OF PRODUCT\_NAME AND BAND\_NAME**

The combination of a product\_name and band\_name are as follows.

No.	product_name			band_name
1	O3	HCl	CH3CN	A
	HOCl	HNO3	BrO	
	Temperature			
2	O3	O3-sym-17	O3-asym-18	B
	HCl	HO <sub>2</sub>	Temperature	
3	O3	O3-asym-17	O3-asym-18	C
	HNO3	ClO	BrO	

### (3) **VERSION\_NAME**

*version\_name* is represented as follows.

xxx-yy-zzzz :

xxx : Level 1 B version                      yy : Climatological DB version

zzzz : Level 2 Algorithm version

### (4) **DATE**

*date* is represented as follows.

yyyymmdd : (ex. 20091009)

yyyy : Observation year                      mm : Observation month

dd : Observation day



## 2. PRODUCT FORMAT

### 1) STRUCTURE OF HDF5-EOS DATA FILES

We show below the format structure of the HDF5<sup>\*</sup>-EOS data file.

No.	Filed	Attributes
1	<i>FileAttribute</i>	<b>File Level Attributes:</b> <ul style="list-style-type: none"><li>• Instrument Name</li><li>• Processing Level</li><li>• Version</li><li>• Observation day</li><li>• Band name</li><li>• Scan number</li><li>• L1B file name</li></ul>
2	<i>GeolocationField</i>	<b>Geolocation Field Attributes:</b> <ul style="list-style-type: none"><li>• Observation point</li><li>• Time</li><li>• Altitude</li><li>• Solar Zenith Angle</li><li>• Azimuth View</li><li>• Ascending/Descending flag</li></ul>
3	<i>Data Field</i>	<b>Data Field Attributes:</b> <ul style="list-style-type: none"><li>• Data value</li><li>• Estimate error</li><li>• Status</li></ul>

\*: [HTTP://WWW.HDFGROUP.ORG/](http://www.hdfgroup.org/)



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### 2) STRUCTURE OF STANDARD SMILES L2 PRODUCTS

#### ● Standard processing data (HDF5-EOS)

Structure of standard processing data is as follows.

<File Attributes>

No.	HDF-EOS5 Name	Explanation	Dimension	Data type
1	<b><i>LIBID</i></b>	L1B file name	(nTimes)	char
2	<b><i>InstrumentName</i></b>	Instrument Name (SMILES)	-	char
3	<b><i>ProcessLevel</i></b>	Processing level (L2)	-	char
4	<b><i>StartUTC</i></b>	Start time in this file (yyyy-mm-ddT00:00:00.000)	-	char
5	<b><i>EndUTC</i></b>	End time in this file (yyyy-mm-ddT23:59:59.000)	-	char
6	<b><i>GranuleMonth</i></b>	Month (mm)	-	int
7	<b><i>GranuleDay</i></b>	Day (dd)	-	int
8	<b><i>GranuleDayofYear</i></b>	Granule Day of Year	-	int
9	<b><i>GranuleYear</i></b>	Year (yyyy)	-	int
10	<b><i>PGEVersion</i></b>	Processing version (XXX-XX-XXXX)	-	char
11	<b><i>StartScan</i></b>	Scan count of first day in this file	-	char
12	<b><i>EndScan</i></b>	Scan count of end day in this file	-	char
13	<b><i>BandName</i></b>	Band name	-	char

<Swath Attributes>

No.	HDF-EOS5 Name	Explanation	Dimension	Data type	Unit
1	<b><i>Altitude</i></b>	Calculation Altitude	(nLevels)	float	km
2	<b><i>VerticalCoordinate</i></b>	vertical coordinate system name	-	char	



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<Geolocation/Data fields Attributes>: Next information is added to each field item.

No.	HDF-EOS5 Name	Explanation	Dimension	Data type
1	<i>MissingValue</i>	Missing value	-	float
2	<i>Title</i>	Filed name	-	char
3	<i>Units</i>	Unit	-	char
4	<i>UniqueFieldDefinition</i>	Filed Definition	-	char

<Geolocation Fields>

No.	HDF-EOS5 Name	Explanation	Dimension	Data type	Unit
1	<i>Time</i>	Observation time (Total second since 1/1/1958)	(nTimes)	double	* 1
2	<i>TimeUTC</i>	Observation time (UTC) yyyy-mm-dd hh:mm:ss.sss	(nTimes)	char	-
3	<i>Altitude</i>	Representative altitude	(nLevel)	float	km
4	<i>Latitude</i>	Observation Latitude	(nTimes)	float	degrees
5	<i>Longitude</i>	Observation Longitude	(nTimes)	float	degrees
6	<i>SolarZenithAngle</i>	Solar Zenith Angle	(nTimes)	float	degrees
7	<i>LocalTime</i>	Local time (hh:mm:ss)	(nTimes)	char	-
8	<i>LineOfSightAngle</i>	Azimuth View	(nTimes)	float	degrees
9	<i>AscendingDescending</i>	Ascending/Descending flag	(nTimes)	<del>char</del> int	-
10	<i>Reserved</i>	<u>Reserved</u> field	<u>(nTimes)</u>	<u>int</u>	<u>-</u>

\*1: seconds since 1958-1-1



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### <Data Fields>

No.	HDF-EOS5 Name	Explanation	Dimension	Data type	Unit
1	<i>L2Value</i>	Value	(nLevel,nTimes)	float	vmr
2	<i>L2Precision</i>	calculation error	(nLevel,nTimes)	float	vmr
3	<i>MeasurementError</i> <sup>*2</sup>	Measurement error	(nLevel,nTimes)	float	vmr
4	<i>SmoothingError</i> <sup>*2</sup>	Smoothing Error	(nLevel,nTimes)	float	vmr
5	<i>Apriori</i> <sup>*2</sup>	A priori value	(nLevel,nTimes)	float	vmr
6	<i>AprioriError</i> <sup>*2</sup>	A priori error	(nLevel,nTimes)	float	vmr
7	<i>CorrLength</i> <sup>*2</sup>	Correlative length of A priori	(nTimes)	float	km
8	<i>AveragingKernel</i> <sup>*2</sup>	Averaging Kernel	(nLevel,nLevelnTimes)	float	-
9	<i>VerticalResolution</i> <sup>*2</sup>	Vertical Resolution	(nLevel,nTimes)	float	km
10	<i>Information Value</i> <sup>*2</sup>	Information Value	(nLevel,nTimes)	float	-
11	<i>Pressure</i>	Using <del>pressure</del> of retrieval Retrieved pressure	(nLevel,nTimes)	float	hPa
12	<i>Temperature</i>	Retrieved temperature	(nLevel,nTimes)	float	K
12	<i>WaterVapor</i> <sup>*2</sup>	Using Water Vapor of retrieval	(nLevel,nTimes)	float	vmr
13	<i>Baseline0</i> <sup>*2</sup>	Coefficient of Continuum	(nLevel,nTimes)	float	km <sup>-1</sup>
14	<i>Baseline0Precision</i> <sup>*2</sup>	Baseline error of coefficient	(nLevel,nTimes)	float	km <sup>-1</sup>
15	<i>Baseline1</i> <sup>*2</sup>	primary coefficient of Continuum	(nLevel,nTimes)	float	Hz <sup>-1</sup> .km <sup>-1</sup>
16	<i>Baseline1Precision</i> <sup>*2</sup>	Baseline error of primary coefficient.	(nLevel,nTimes)	float	Hz <sup>-1</sup> .km <sup>-1</sup>
17	<i>Baseline2</i> <sup>*2</sup>	2nd coefficient of Continuum	(nLevel,nTimes)	float	Hz <sup>-2</sup> .km <sup>-1</sup>
18	<i>Baseline2Precision</i> <sup>*2</sup>	Baseline error of 2nd coefficient	(nLevel,nTimes)	float	Hz <sup>-2</sup> .km <sup>-1</sup>
19	<i>Baseline3</i> <sup>*2</sup>	3rd coefficient of Continuum	(nLevel,nTimes)	float	Hz <sup>-3</sup> .km <sup>-1</sup>
20	<i>Baseline3Precision</i> <sup>*2</sup>	Baseline error of 3rd coefficient	(nLevel,nTimes)	float	Hz <sup>-3</sup> .km <sup>-1</sup>
21	<i>RadianceResidualMax</i> <sup>*2</sup>	Max. Radiance Residual	(nTimes)	float	K
22	<i>RadianceResidualMean</i> <sup>*2</sup>	Mean Radiance Residual	(nTimes)	float	K
23	<i>RadianceResidualRMS</i> <sup>*2</sup>	RMS Radiance Residual	(nTimes)	float	K
24	<i>RetrievedViewAngleOffset</i> <sup>*2</sup>	Antenna Elevation Angle Offset	(nTimes)	float	degrees
25	<i>RetrievedViewAngleOffsetError</i> <sup>*2</sup>	Antenna Elevation Angle Offset error	(nTimes)	float	degrees
26	<i>NumIterPerform</i> <sup>*2</sup>	Convergence loop number and result	(nTimes)	int	-
27	<i>MaxNumIteration</i> <sup>*2</sup>	Max. convergence number	(nTimes)	int	-
28	<i>Status</i>	Status information*3	(nTimes)	int	-
29	<i>AOSUnitNum</i> <sup>*2</sup>	Number of observed AOS Unit	(nTimes)	int	-
30	<i>Convergence</i> <sup>*2</sup>	Convergence status	(nTimes)	float	-
31	<i>FOVInterference</i> <sup>*2</sup>	Interference flag *4	(nTimes)	int	-



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No.	HDF-EOS5 Name	Explanation	Dimension	Data type	Unit
32	<i>CostfunctionYAll</i> <sup>*2</sup>	Costfunction of spectra	(nTimes)	float	-
33	<i>CostfunctionY</i> <sup>*2</sup>	Costfunction of spectra for each altitude	(nLevel,nTimes)	float	-

\*2: These fields are included in "L2Product" file only.

\*3\_Status field:

value	Explanation
0	No error status
>0	Error status
1	Error flag on FOV interference (see FOVinterference field)
2	Error flag of observation altitude range.
4	Error flag of convergence status

\*4\_FOVInterference field:

value	Explanation
-1	<u>No interference information</u>
0	No FOV interference
>0	<u>Do not use this profile (see the `information`).</u>
1	Information: FOV interference by Sun
2	Information: FOV interference by Moon
4	Information: FOV interference by ISS Solar paddle

<StructMetadata>

No.	HDF-EOS5 Name	Explanation	Dimension
1	<i>StructMetadata.0</i>	Matrix information of swath data	1

< coremetadata >

No.	HDF-EOS5 Name	Explanation	Dimension
1	<i>coremetadata.0</i>	HDF-EOS information	1