	Centre de Gestion et de Traitement de Données	Ref. : 0605004-NT-UDEV-V01-R06 Ed. : 1 Date : 11/04/06 Rev. : 6 Date : 31/08/09 Software version : 0.6.5 Number of pages : 30

CALXTRACT project :
extraction of multi-sensors data in coincidence with CALIPSO

CALXtract User Guide

	Name	***Date***	***Signature***
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Approved by			
For Application			

MODIFICATIONS

Edition	***Revision***	***Date***	***Revision Purpose***
1	0	11/04/06	Creation
1	1	31/05/07	- The “philosophy” of the project has also been changed. At the beginning, calxtract was supposed to be a tool that can be run by any user. At this time, the focus points more on the products, which are built by the Icare exploitation team. Update to reflect changes in the calxtract software v0.3.3 : - New variables have been added in the caltrack products. This document includes those addings. The unit of the Optical Thickness variables has been set as none. In previous revision, it was set as “km”
1	2	27/07/07	- New variables have been added in the caltrack products. This document includes those addings. The MODIS Modis_Rad_#XX which were ignored and the PARASOL water vapour collum. - The generated file does not contain all the products as before. The new version generates scientific data files issued from only two different products. One of which is caliop 05kmclay. The second one is configured in the pcf configuration.
1	3	14/01/08	CALIOP Cloud is not the only possible sub track. It is possible to have a CALIOP level 1 sub track.
1	4	27/06/08	Insert new variables names.
1	6	31/08/09	Insert new variables names to reflect software updates

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1. ABBREVIATIONS AND GLOSSARY

CALIOP	Cloud Aerosol LIdar with Orthogonal Polarization
CALIPSO	Cloud Aerosol LIdar Infrared Pathfinder Satellite Observations
CALTRACK	The name of the products that constructs the calxtract application
CALXTRACT	The application that produces the caltrack files
CVS	Concurrent Versions System
DPC	Data Product Catalog
HDF	Hierarchical Data Format
IIR	Imaging Infrared Radiometer
OMI	Ozone Monitoring Instrument
PCF	Process Control File. It is an ascii file that contains all the parameters required for a run.
WFC	Wide Field Camera

2. INTRODUCTION

This document focused mainly on the usage of the **calxtract** application. It also describes the content and the structure of the caltrack files, but if your need is only to use those files, you could prefer the document entitled “caltrack product catalog” that focuses more on the files produced by the calxtract software. This application does the extraction of parameters issued of different sensors (CALIOP, IIR, MODIS, PARASOL, CERES, ECMWF analysis, CLOUDSAT, and more in the future) under the CALIPSO's LIDAR subtrack or under the CALIOP level one subtrack.

This software is mainly the result of a project that has been submitted to ICARE by :

- Geneviève Sèze
- Frédéric Parol
- Jacques Pelon

3. INSTALLATION AND CONFIGURATION

3.1. PREREQUISITES APPLICATIONS

Name	***Version***	***Description***
gcc	>3.2.3	Needed to build the application
autoconf	>2.5	Needed to configure the build
automake	>1.6	Needed to build the application
python	>2.4.1	[OPTIONAL] Needed to use the “high level” run script

3.2. PREREQUISITES LIBRARIES

Libraries external to ICARE :

Name	***Version***	***Description***	***Lien***
HDF	>=4.2r1	Used to read and write hdf files.	http://hdf.ncsa.uiuc.edu/

ICARE libraries :

Name	***Version***	***Description***	***Lien***
hdfcpp	1.1.0	This library encapsulates the hdf one to offer a higher level access in C++	
filedata	0.2.0	Contains modules that permit to read the data of different types of sensors	

3.3. INSTALLATION

1) Download and extract the package, using the command ***tar xzf calxtract_X_X.tgz***

2) Go in the extraction directory (***cd calxtract***), and use the usual tryptic :

3) ***./configure prefix=<the_directory_where_you_want_to_install_the_software>***

REM : If you do not give a prefix argument to the configure script (by typing only ***./configure***) the software will be installed in the default install directory on your system (*/usr/bin* or */usr/local/bin*), and will be accessible to all users on your system, but you will need the root access to execute the ***make install*** command.

4) make

5) make install

4. USAGE

The basic principle of calxtract is to take as only argument a Process Control File (PCF) that contains all the parameters needed for the run (like the input files). But the drawback is that the user is responsible of the determination of the input files that contain some potential coincidences.

So, to make the usage of calxtract easier, a high-level script in python, that encapsulates the build of the PCF file and the call to the executable has been developed. This method is the “easy to use” one, and should be better for users external to the Icare Team.

4.1. COMMAND LINE (LOW LEVEL USAGE)

```
usage: <path-to-the-install-directory>/bin/calxtract <pcf_file>
```

4.2. PCF FILE CONTENT

The file given as a command line argument is an ascii file that contains the following parameters.

<path> must be replaced by a directory path. <product> designs the product to output in addition to CALIOP cloud 5km.

```
##############################################
#                                            #
#  --- CONFIGURATION FILE - CALXTRACT ---    #
#                                            #
##############################################

################################################
#   CALXTRACT CONFIGURATION PARAMETERS (FIXED)
################################################

# Wether the output file must use the HDF compression or not
UseHDFCompression=0

# Print out process information
Verbose=1

# Overwrite the existing files
Overwrite=1

# The radix that will start the output file name
OutputFileRadix=calxtract_

# Name of the log file
LogName=calxtract.log

# Set the acceptable colocation frame between a CALIOP shot and a sensor
measurement : if the distance between the position of a sensor's measurement and
the position of a CALIOP shot is less than the ColocationTolerance set, those 2
measurements are considered as colocated. The ColocationTolerance value is in °
in a plane approximation
```

```
IIRColocationTolerance=0.005
MODISColocationTolerance=0.005
PARASOLColocationTolerance=0.05
CLOUDSATColocationTolerance=0.01
CERESColocationTolerance=0.1

############################
###         OUTPUTS        ###
############################

# The output file directory
OutputDirectory=<path>/

# The log file output directory
LogDirectory=<path>/

############################
###         INPUTS         ###
############################

# The input CAL_LID_L2_05kmCLay file. This file is the "master" one and is
MANDATORY
CAL_LID_L2_05kmCLay=(<path>/CAL_LID_L2_05kmCLay-Prov-V1-10.2006-08-28T12-38-
52ZD.hdf)

# The input CAL_LID_L2_05kmALay file. Same half orbit than the
CAL_LID_L2_05kmCLay one
CAL_LID_L2_05kmALay=(<path>/CAL_LID_L2_05kmALay-Prov-V1-10.2006-08-28T12-38-
52ZD.hdf)

# The input CAL_IIR_L2_Track file. Same half orbit than the CAL_LID_L2_05kmCLay
one
CAL_IIR_L2_Track=(<path>/CAL_IIR_L2_Track-Prov-V1-01.2006-08-28T12-38-52ZD.hdf)

# The input CAL_LID_L1 file. Same half orbit than the CAL_LID_L2_05kmCLay one
CAL_LID_L1=(<path>/CAL_LID_L1-Prov-V1-10.2006-08-28T12-38-52ZD.hdf)

# The input PARASOL_RB2 file that has potential coincidences with the
CAL_LID_L2_05kmCLay orbit
PARASOL_RB2=(<path>/P3L2TRGB040110JL)

# The MODIS_MYD06 files that have potential coincidences with the
CAL_LID_L2_05kmCLay orbit
MODIS_MYD06=(<path>/MYD06_L2.A2006240.1230.005.2006245102737.hdf,
             <path>/MYD06_L2.A2006240.1235.005.2006245103716.hdf,
             <path>/MYD06_L2.A2006240.1240.005.2006245110928.hdf,
             <path>/MYD06_L2.A2006240.1245.005.2006245105911.hdf,
             <path>/MYD06_L2.A2006240.1250.005.2006245105512.hdf,
             <path>/MYD06_L2.A2006240.1255.005.2006245105605.hdf,
             <path>/MYD06_L2.A2006240.1300.005.2006245110258.hdf,
             <path>/MYD06_L2.A2006240.1305.005.2006245103408.hdf,
             <path>/MYD06_L2.A2006240.1310.005.2006245104705.hdf,
             <path>/MYD06_L2.A2006240.1315.005.2006245110133.hdf,
             <path>/MYD06_L2.A2006240.1320.005.2006245105636.hdf,
             <path>/MYD06_L2.A2006240.1325.005.2006245112225.hdf,
             <path>/MYD06_L2.A2006240.1330.005.2006245104432.hdf,
             <path>/MYD06_L2.A2006240.1335.005.2006245104758.hdf)

# The MODIS_MYD021KM files that have potential coincidences with the
```

```
CAL_LID_L2_05kmCLay orbit
MODIS_MYD021KM=(<path>/MYD021KM.A2006240.1230.005.2006242023728.hdf,
                <path>/MYD021KM.A2006240.1235.005.2006242023628.hdf,
                <path>/MYD021KM.A2006240.1240.005.2006242025311.hdf,
                <path>/MYD021KM.A2006240.1245.005.2006242030306.hdf,
                <path>/MYD021KM.A2006240.1250.005.2006242030010.hdf,
                <path>/MYD021KM.A2006240.1255.005.2006242025504.hdf,
                <path>/MYD021KM.A2006240.1300.005.2006242030023.hdf,
                <path>/MYD021KM.A2006240.1305.005.2006242025804.hdf,
                <path>/MYD021KM.A2006240.1310.005.2006242031142.hdf,
                <path>/MYD021KM.A2006240.1315.005.2006242031511.hdf,
                <path>/MYD021KM.A2006240.1320.005.2006242033440.hdf,
                <path>/MYD021KM.A2006240.1325.005.2006242032723.hdf,
                <path>/MYD021KM.A2006240.1330.005.2006242032225.hdf,
                <path>/MYD021KM.A2006240.1335.005.2006242031317.hdf)

# The CLOUDSAT files that have potential coincidences with the
CAL_LID_L2_05kmCLay orbit
CLOUDSAT_GEOPROF=(<path>/2006240121122_01779_CS_2B-
GEOPROF_GRANULE_P_R03_E02.hdf)

CLOUDSAT_CLDCLASS=(<path>/2006240121122_01779_CS_2B-
CLDCLASS_GRANULE_P_R03_E02.hdf)

# The GMAO meteo files
GMAO_mis_x=(<path>/DAS.llk.asm.tsyn2d_mis_x.GEOS403.2006082800.2006082821.V01)

GMAO_mis_p=(<path>/DAS.llk.asm.tsyn3d_mis_p.GEOS403.2006082800.2006082818.V01)

##########################

###  SENSOR FILTERS   ###

##########################


#Select the product to extract in addition to caliop 05mclay (all others are
filtered out)

SensorFilters=<product>

#Select the main sub track ether caliop_05kmclay or caliop_lid_l1

MainSubTrack=<main subtrack>
```

4.2.1. Product Sensor Filters

The extraction of data take in account only two products, one of which is CALIOP cloud 5km. A filter must be set in order to ignore all other files. The syntax of this command is SensorFilters=<product>. The <product> token is one of the following:

Product	***<product> token syntax***	***Misc***
CALIOP aerosol 5km	caliop_05kmalay	

Product	***<product> token syntax***	***Misc***
CALIOP cloud 5km		Will be filtered to the output in any case.
CALIOP L1	caliop_lid_l1	
CLOUDSAT Cloud geometrical profile	cloudsat_2b_geoprof	
CLOUDSAT Cloud Class	cloudsat_2b_cldclass	
IIR L2 track	iir_l2	
MODIS L1B	modis_myd021km	
MODIS cloud	modis_myd06_l2	
MYD04	MODIS_MYD04	
MYD05	MODIS_MYD05	
PARASOL BR2	parasol_rb2	
PARASOL OC2	PARASOL_OC2	
PARASOL LS2	PARASOL_LS2	
PARASOL L1	PARASOL_L1	
CERES CRS	ceres	
OMI CLDO2	omi_cldo2	
OMI NO2	omi_no2	
OMI CLDRR	omi_cldrr	

4.2.2. Main subtrack

Select the main subtrack and its variables.

Product	***<product> token syntax***	***Misc***
CALIOP cloud 5km	caliop_05kmclay	
CALIOP L1	caliop_lid_l1	

4.3. EXECUTION SCRIPT (HIGH LEVEL USAGE)

The another way to run the application is to use a python script which is situed in the “tools” directory.

```
Usage: production_calxtract.py [options]


Options:
  -h, --help            show this help message and exit
```

```
  -t TIMESTAMP, --timestamp=TIMESTAMP
                        Timestamp of the master CAL_LID_L2 (or CAL_LID_L1)
                        input file (format YYYY-MM-DDTHH-MM-SS) [MANDATORY]
  -i INPUT_DIR, --input_directory=INPUT_DIR
                        Root of the CALIPSO data directory
                        (default:/DATA/LIENS)
  -o OUTPUT_DIR, --output_directory=OUTPUT_DIR
                        CALXTRACT output directory
                        (default:/home/pascal/calxtract/data)
  -c CALXTRACT_CFG_FILE, --calxtract_cfg=CALXTRACT_CFG_FILE
                        Path to the calxtract configuration file. It contains
                        the calxtract "fixed" parameters
  -v, --verbose         Print out processing informations
  -x, --overwrite       Overwrite existing files
  -k, --keep_pcf_file   Keep the output PCF file at the end of the script
  -s MAIN_SUBTRACK, --main_subtrack=MAIN_SUBTRACK
                        Sets the main subtrack product, either caliop_05kmclay
                        or caliop_l1.
```

In most cases, the basic usage of this script is :

```
python <path-to-install-dir>/tools/production_calxtract.py -t  -o <output-dirs-root>
```

where :

- *<path-to-install-dir>* : the directory where calxtract has been installed
- *<calipso-orbit-timestamp>* : the timestamp of a CALIPSO half-orbit start, having the format <YYYY-MM-DDTHH-MM-SS>, with YYYY, MM and DD are respectively the year (on 4 digits), the month (on 2 digits), and HH, MM, SS are the hours, minutes and seconds on 2 digits
- *<output-dirs-root>* : must be an existing directory where you are allowed to write. The subdirectories <YYYY>/<YYYY_MM_DD> will be created to store the output files, with YYYY, MM and DD are respectively the year, the month and the day of the input CALIPSO half-orbit

4.4. INPUT FILES

kind : o stands for optional, m stand for mandatory and u stands for unused.

Capteur	***Produit***	***Type de fichier***	***Centre distributeur***	***Résolution (lat * lon) ou le long de la trace***	***Fréquence***	***type***
CALIOP	L1	CAL_LID_L1	LARC	333m	2 par orbite : 1 jour + 1 nuit	m
	cloud 5km	CAL_LID_L2_05kmCLay	LARC	5km	2 par orbite : 1 jour + 1 nuit	m
	aerosol 5km	CAL_LID_L2_05kmALay	LARC	5km	2 par orbite : 1 jour + 1 nuit	o
IIR	L2 track	CAL_IIR_L2_Track	LARC	1km*1km	2 par orbite : 1 jour + 1 nuit	o
MODIS	L1B	MYD021KM	DAAC	21km*21km	1 par 5 min.	o
	cloud	MYD06_L2	DAAC	5km*5km	1 par 5 min.	o
	MYD04	MODIS_MYD04	DAAC		1 par 5 min.	o
	MYD05	MODIS_MYD05	DAAC		1 par 5 min.	o
PARASOL	cloud BR2	PARASOL_RB2	ICARE	20km*20km	1 per orbit : 1 jour	o
	OC2	PARASOL_OC2	ICARE	20km*20km	1 per orbit : 1 jour	o
	LS2	PARASOL_LS2	ICARE	20km*20km	1 per orbit : 1 jour	o
	L1	PARASOL_L1	ICARE	3km*3km	1 per orbit : 1 jour	o
CERES	CRS	CER_CRS_Aqua-FM4-MODIS	LARC		1 par heure	u
ECMWF	analysis		ECMWF	1km*1,25km	1 par jour	u

Capteur	***Produit***	***Type de fichier***	***Centre distributeur***	***Résolution (lat * lon) ou le long de la trace***	***Fréquence***	***type***
CLOUDSAT	Cloud geometrical profile	2B-GEOPROF	CIRA	1,1km	1 per orbit	o
	Cloud Class	2B-CLDCLASS	CIRA	1,1km	1 per orbit	o
	Liquid Water Content RADAR	2B-LWC-RO	CIRA	1,1km	1 per orbit	u
	Liquid Water Content RADAR+LIDAR	2B-LWC	CIRA	1,1km	1 per orbit	u
	Ice Water Content method RADAR	2B-IWC-RO	CIRA	1,1km	1 per orbit	u
	Ice Water Content RADAR+LIDAR	2B-IWC	CIRA	1,1km	1 per orbit	u
	Optical Thickness	2B-TAU	CIRA	1,1km	1 per orbit	u
OMI	CLDO2	OMI-Aura_L2-OMCLDO2	GSFC - GES DISC	Nadir pixels 13x24 km	1 per orbit	o
	NO2	OMI-Aura_L2-OMNO2	GSFC - GES DISC	Nadir pixels 13x24 km	1 per orbit	o
	CLDRR	OMI-Aura_L2-OMCLDRR	GSFC - GES DISC	Nadir pixels 13x24 km	1 per orbit	o

4.5. OUTPUT PRODUCT DESCRIPTION

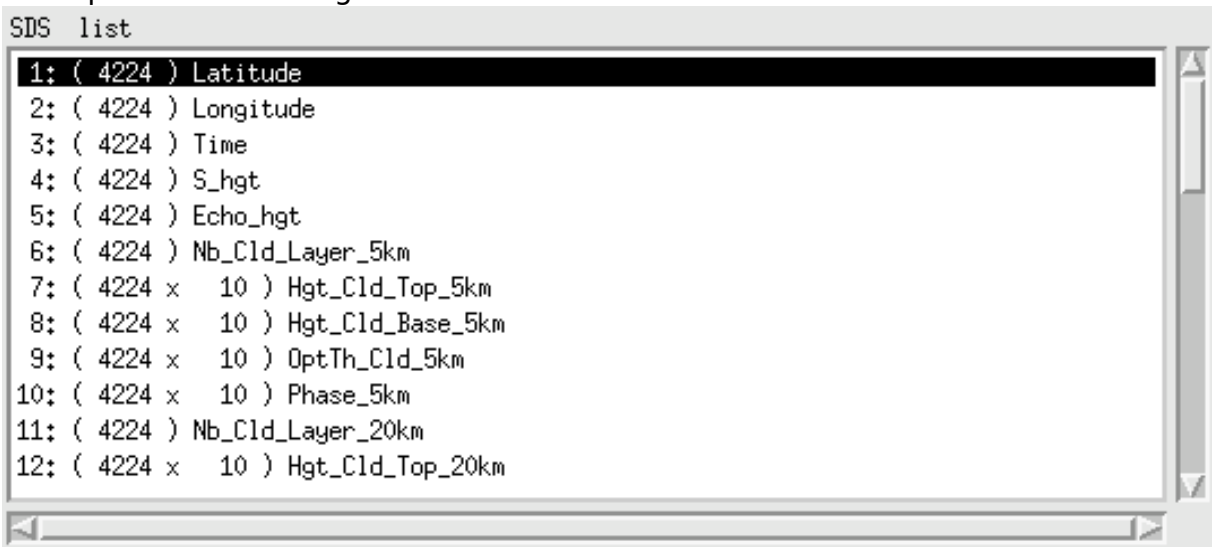
4.5.1. File format

The output products will be in a HDF4 format, where each sds will contain the values of an physical variable along the CALIPSO subtrack.

The output files will have a name that has been defined in the configuration file:

For more details on the HDF4 format (link to the official page, reading tools and more), you may refer to the ICARE hdf description page : http://www.icare.univ-lille1.fr/howto_hdf/

The output file will be organised like this :



4.5.2. Variables

Here is an exhaustive list of the variables extracted from the input files. Not all variables are present, it depends on the products filtered.

Name	*Description*	*Unit*	*Type*
	Common to all caltrack unit products		
Latitude	Latitude	°north [-90,90]	float32
Longitude	Longitude	°east [-180,180]	float32
Time	Time, using the TAI 93 convention	seconds	float64
	CALIOP L1		
CAL_LID_L1_Total_Attenuated_Backscatter_532	The Total Attenuated Backscatter signal at 532nm	km-1.sr-1	float32[583]
CAL_LID_L1_Perpendicular_Attenuated_Backscatter_532	The perpendicular component of the attenuated backscatter at 532nm	km-1.sr-1	float32[583]
CAL_LID_L1_Attenuated_Backscatter_1064	The Attenuated Backscatter signal at 1064nm	km-1.sr-1	float32[583]
CAL_LID_L1_Molecular_Number_Density	The Molecular Number Density	molecules.m^-3	float32[33]
CAL_LID_L1_Temperature	The Temperature for each meteo level	°C	float32[33]
CAL_LID_L1_Pressure	The Pressure for each meteo level	mb	float32[33]
CAL_LID_L1_Ozone_Number_Density	The Ozone Number Density	molecules.m^-3	float32[33]
CAL_LID_L1_Relative_Humidity	The relative humidity for each meteo level	%	float32[33]
CAL_LID_L1_Land_Water_Mask	The Land Water Mask	unitless	int8
CAL_LID_L1_Tropopause_Height	The height of the tropopause	Km	float32
CAL_LID_L1_Tropopause_Temperature	The temperature of the tropopause	°C	float32
	PARASOL L1		
P3L1_Input_Index	Index [i_row,icol] of the coincident Pixel in the input product. See in the file attribute to know which is this file	unitless	int16[2]

Name	***Description***	***Unit***	***Type***
P3L1_Number_Available_Viewing_Direction	Number of available viewing directions Ndir in the following 1<=id<=Ndir	unitless	uint8
P3L1_Solar_Azimuth_Angle	Solar Azimuth Angle	°	uint8
P3L1_Pixel_Quality_Index	Pixel Data Quality Index for each direction. Also known as DQX	unitless	uint16
P3L1_Solar_Zenith_Angle	Solar Zenith Angle for each direction	°	uint16
P3L1_View_Zenith_Angle_670P2	View Zenith Angle for filter 670P2, for each direction	°	uint16[16]
P3L1_Relative_Azimuth_Angle_670P2	Relative Azimuth Angle for filter 670P2, for each direction	°	uint16[16]
P3L1_Delta_Thetav_Cosphi	Relative variation of viewing geometry between the filters, for each direction. See the appendix C of the PARASOL Level-1 Product Data Format and User Manual for details	°	int8[16]
P3L1_Delta_Thetav_Sinphi	Relative variation of viewing geometry between the filters, for each direction. See the appendix C of the PARASOL Level-1 Product Data Format and User Manual for details	°	int8[16]
P3L1_Normalized_Radiance_443NP	Normalized Radiance for Channel 443NP, for each direction	unitless	int16[16]
P3L1_Normalized_Radiance_490P	Normalized Radiance for Channel 490P, for each direction	unitless	int16[16]
P3L1_Normalized_Radiance_1020NP	Normalized Radiance for Channel 1020NP, for each direction	unitless	int16[16]
P3L1_Normalized_Radiance_565NP	Normalized Radiance for Channel 565NP, for each direction	unitless	int16[16]
P3L1_Normalized_Radiance_670P	Normalized Radiance for Channel 670P, for each direction	unitless	int16[16]
P3L1_Normalized_Radiance_763NP	Normalized Radiance for Channel 763NP, for each direction	unitless	int16[16]
P3L1_Normalized_Radiance_765NP	Normalized Radiance for Channel 765NP, for each direction	unitless	int16[16]
P3L1_Normalized_Radiance_865P	Normalized Radiance for Channel 865P, for each direction	unitless	int16[16]
P3L1_Normalized_Radiance_910NP	Normalized Radiance for Channel 910NP, for each direction	unitless	int16[16]

Name	Description	Unit	Type
P3L1_Q_Stokes_490P	Second component of Stokes vector (Q) for Channel 490P, for each direction	unitless	int16[16]
P3L1_Q_Stokes_670P	Second component of Stokes vector (Q) for Channel 670P, for each direction	unitless	int16[16]
P3L1_Q_Stokes_865P	Second component of Stokes vector (Q) for Channel 865P, for each direction	unitless	int16[16]
P3L1_U_Stokes_490P	Third component of Stokes vector (U) for Channel 490P, for each direction	unitless	int16[16]
P3L1_U_Stokes_670P	Third component of Stokes vector (U) for Channel 670P, for each direction	unitless	int16[16]
P3L1_U_Stokes_865P	Third component of Stokes vector (U) for Channel 865P, for each direction	unitless	int16[16]
	MODIS MYD021KM		
MYD021KM_Input_File_Index	Index of the input file where the coincidence has been found. See in the file attributes to see the list of files	unitless	int16[2]
MYD021KM_Input_Pixel_Index	Index [i_row,icol] of the coincident Pixel in the input granule	unitless	int16
MYD021KM_EV_250_Aggr1km_RefSB_Band1	Earth View 250M Aggregated 1km Reflective Solar Bands Scaled Integers of channel n°1 (0.645µm)	W/m²/µm/sr	uint16
MYD021KM_EV_250_Aggr1km_RefSB_Band2	Earth View 250M Aggregated 1km Reflective Solar Bands Scaled Integers of channel n°2 (0.865µm)	W/m²/µm/sr	uint16
MYD021KM_EV_500_Aggr1km_RefSB_Band3	Earth View 500M Aggregated 1km Reflective Solar Bands Scaled Integers of channel n°3 (0.469µm)	W/m²/µm/sr	uint16
MYD021KM_EV_500_Aggr1km_RefSB_Band4	Earth View 500M Aggregated 1km Reflective Solar Bands Scaled Integers of channel n°4 (0.555µm)	W/m²/µm/sr	uint16

Name	***Description***	***Unit***	***Type***
MYD021KM_EV_500_Aggr1km_RefSB_Band5	Earth View 500M Aggregated 1km Reflective Solar Bands Scaled Integers of channel n°5 (1.240µm)	W/m²/µm/sr	uint16
MYD021KM_EV_500_Aggr1km_RefSB_Band6	Earth View 500M Aggregated 1km Reflective Solar Bands Scaled Integers of channel n°6 (1.640µm)	W/m²/µm/sr	uint16
MYD021KM_EV_500_Aggr1km_RefSB_Band7	Earth View 500M Aggregated 1km Reflective Solar Bands Scaled Integers of channel n°7 (2.130µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_RefSB_Band8	Earth View 1KM Reflective Solar Bands Scaled Integers of channel n°8 (0.4125µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_RefSB_Band9	Earth View 1KM Reflective Solar Bands Scaled Integers of channel n°9 (0.443µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_RefSB_Band10	Earth View 1KM Reflective Solar Bands Scaled Integers of channel n°10 (0.488µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_RefSB_Band11	Earth View 1KM Reflective Solar Bands Scaled Integers of channel n°11 (0.541µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_RefSB_Band12	Earth View 1KM Reflective Solar Bands Scaled Integers of channel n°12 (0.551µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_RefSB_Band13LO	Earth View 1KM Reflective Solar Bands Scaled Integers of channel n°13LO (0.667µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_RefSB_Band13HI	Earth View 1KM Reflective Solar Bands Scaled Integers of channel n°13HI (0.667µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_RefSB_Band14LO	Earth View 1KM Reflective Solar Bands Scaled Integers of channel n°14LO (0.678µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_RefSB_Band14HI	Earth View 1KM Reflective Solar Bands Scaled Integers of channel n°14HI (0.678µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_RefSB_Band15	Earth View 1KM Reflective Solar Bands Scaled Integers of channel n°15 (0.748µm)	W/m²/µm/sr	uint16

Name	Description	Unit	Type
MYD021KM_EV_1KM_RefSB_Band16	Earth View 1KM Reflective Solar Bands Scaled Integers of channel n°16 (1.3005µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_RefSB_Band17	Earth View 1KM Reflective Solar Bands Scaled Integers of channel n°17 (0.905µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_RefSB_Band18	Earth View 1KM Reflective Solar Bands Scaled Integers of channel n°18 (0.936µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_RefSB_Band19	Earth View 1KM Reflective Solar Bands Scaled Integers of channel n°19 (0.940µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_RefSB_Band26	Earth View 1KM Reflective Solar Bands Scaled Integers of channel n°26 (1.375µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_Emissive_Band20	Earth View 1KM Emissive Bands Scaled Integers of channel n°20 (3.750µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_Emissive_Band21	Earth View 1KM Emissive Bands Scaled Integers of channel n°21 (3.959µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_Emissive_Band22	Earth View 1KM Emissive Bands Scaled Integers of channel n°22 (3.959µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_Emissive_Band23	Earth View 1KM Emissive Bands Scaled Integers of channel n°23 (4.050µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_Emissive_Band24	Earth View 1KM Emissive Bands Scaled Integers of channel n°24 (4.465µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_Emissive_Band25	Earth View 1KM Emissive Bands Scaled Integers of channel n°25 (4.515µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_Emissive_Band27	Earth View 1KM Emissive Bands Scaled Integers of channel n°27 (6.715µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_Emissive_Band28	Earth View 1KM Emissive Bands Scaled Integers of channel n°28 (7.325µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_Emissive_Band29	Earth View 1KM Emissive Bands Scaled Integers of channel n°29 (8.550µm)	W/m²/µm/sr	uint16

Name	***Description***	***Unit***	***Type***
MYD021KM_EV_1KM_Emissive_Band30	Earth View 1KM Emissive Bands Scaled Integers of channel n°30 (9.730µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_Emissive_Band31	Earth View 1KM Emissive Bands Scaled Integers of channel n°31 (11.030µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_Emissive_Band32	Earth View 1KM Emissive Bands Scaled Integers of channel n°32 (12.020µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_Emissive_Band33	Earth View 1KM Emissive Bands Scaled Integers of channel n°33 (13.335µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_Emissive_Band34	Earth View 1KM Emissive Bands Scaled Integers of channel n°34 (13.635µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_Emissive_Band35	Earth View 1KM Emissive Bands Scaled Integers of channel n°35 (13.935µm)	W/m²/µm/sr	uint16
MYD021KM_EV_1KM_Emissive_Band36	Earth View 1KM Emissive Bands Scaled Integers of channel n°36 (14.235µm)	W/m²/µm/sr	uint16
	CLOUDSAT 1B-CPR		
CS_1B_CPR_Input_File_Index	Index of the input file where the coincidence has been found. See in the file attributes to see the list of files	unitless	int16
CS_1B_CPR_Input_Profile_Index	Index of the coincident profile	unitless	int16
CS_1B_CPR_Range_to_intercept	Range to the CPR boresight intercept with the geoid	Km	float32
CS_1B_CPR_Range_to_first_bin	Range to first bin is the distance between the satellite and the starting bin number of the ray in meters	m	float32
CS_1B_CPR_ReceivedEchoPowers	Echo Power is the calibrated range gate power in watts, made in-flight and averaged	W	float32[125]
CALIOP L2 05kmCLay			
CAL_LID_L2_05KMCLAY_DEM_Surface_Elevation	Surface Elevation read from the Digital Elevation Model (DEM)	Km	float32
CAL_LID_L2_05KMCLAY_Lidar_Surface_Elevation	Lidar Echo Ground Elevation	Km	float32

Name	Description	Unit	Type
CAL_LID_L2_05KMCLAY_Surface_Elevation_Detection_Frequency	Lidar Echo Surface Detection Frequency	unitless	uint8
CAL_LID_L2_05KMCLAY_Number_Layers_Found	Number of Cloud Layers Found	Layer	int8
CAL_LID_L2_05KMCLAY_Layer_Top_Altitude	Cloud Layer Top Altitude	Km	float32[10]
CAL_LID_L2_05KMCLAY_Layer_Base_Altitude	Cloud Layer Base Altitude	Km	float32[10]
CAL_LID_L2_05KMCLAY_Feature_Classification_Flags	Cloud Layer feature classification flags	unitless	uint16[10]
CAL_LID_L2_05KMCLAY_Feature_Optical_Depth_532	Cloud Layer Optical Depth at 532nm	unitless	float32[10]
CAL_LID_L2_05KMCLAY_Phase	Cloud Layer Thermodynamic Phase, as read in the feature classification flags 0=undefined 1=ice 2=water 3=mixed	unitless	uint8
CALIOP L2 05kmALay			
CAL_LID_L2_05KMALAY_Number_Layers_Found	Number of Aerosol Layers Found	Layer	int8
CAL_LID_L2_05KMALAY_Layer_Top_Altitude	Aerosol Layer Top Altitude	Km	float32[8]
CAL_LID_L2_05KMALAY_Layer_Base_Altitude	Aerosol Layer Base Altitude	Km	float32[8]
CAL_LID_L2_05KMALAY_Feature_Classification_Flags	Aerosol layer feature classification flags	unitless	uint16[8]
CAL_LID_L2_05KMALAY_Layer_Top_Temperature	Aerosol Layer Top Temperature	°C	float32[8]
CAL_LID_L2_05KMALAY_Layer_Base_Temperature	Aerosol Layer Base Temperature	°C	float32[8]
CAL_LID_L2_05KMALAY_Layer_Top_Pressure	Aerosol Layer Top Pressure	hPa	float32[8]
CAL_LID_L2_05KMALAY_Layer_Base_Pressure	Aerosol Layer Base Pressure	hPa	float32[8]
CAL_LID_L2_05KMALAY_Feature_Optical_Depth_532	Aerosol Layer Optical Depth at 532nm	unitless	float32[8]
CALIPSO IIR L2 Track			
CAL_IIR_L2_Brightness_Temperature_12_05	Brightness Temperature at 12µm	K	float32

Name	Description	Unit	Type
CAL_IIR_L2_Brightness_Temperature_10_60	Brightness Temperature at 10,6µm	K	float32
CAL_IIR_L2_Brightness_Temperature_08_65	Brightness Temperature at 8,65µm	K	float32
CAL_IIR_L2_Effective_Particle_Size	Size of the Particles at 5km Resolution	µm	float32
CAL_IIR_L2_Particle_Shape_Index	Particle Shape Index	unitless	int8
CAL_IIR_L2_Ice_Water_Path	Ice Water Path	%	float32
	PARASOL OC2		
P3L2TOGC_Input_Index	Index [i_row,icol] of the coincident Pixel in the input product. See in the file attribute to know which is this file	unitless	int16[2]
P3L2TOGC_Pixel_Confidence_Data	Pixel confidence data indicator	unitless	uint32
P3L2TOGC_Fit_Quality	Quality of the fit : IQ = (1 - DLmoy/2E-3) > 0	unitless	uint8
P3L2TOGC_Solar_Zenith_Angle	Solar Zenith Angle	°	uint16
P3L2TOGC_Aerosol_OD_865	Aerosol Optical Thickness at 865nm	unitless	uint16
P3L2TOGC_Aerosol_OD_670	Aerosol Optical Thickness at 670nm	unitless	uint16
P3L2TOGC_Aerosol_Angstrom_Coefficient	Aerosol Angström Coefficient	unitless	uint16
P3L2TOGC_Single_Scattering_Albedo_865	Single Scattering Albedo at 865nm	unitless	uint8
P3L2TOGC_Aerosol_Scattering_Asymmetry_Factor	Aerosol Scattering Asymmetry Factor	unitless	uint8
P3L2TOGC_Aerosol_Index	Aerosol Index	unitless	uint16
P3L2TOGC_Aerosol_Effective_Radius	Aerosol Effective Radius	µm	uint8
P3L2TOGC_Fine_Mode_Effective_Radius	Fine Mode Effective Radius	µm	uint8
P3L2TOGC_Large_Mode_Effective_Radius	Large Mode Effective Radius	µm	uint8
P3L2TOGC_Fine_Mode_OD_865	Fine Mode Optical Thickness at 865nm	unitless	uint16
P3L2TOGC_Fine_Mode_OD_670	Fine Mode Optical Thickness at 670nm	unitless	uint16

Name	Description	Unit	Type
P3L2TOGC_Fine_Mode_Angstrom_Exponent	Fine Mode Angström Exponent	unitless	uint16
P3L2TOGC_Spherical_Coarse_Mode_OD_865	Optical Thickness of Spherical Coarse Mode at 865nm	unitless	uint16
P3L2TOGC_Non_Spherical_Coarse_Mode_OD_865	Optical Thickness of Non-Spherical Coarse Mode at 865nm	unitless	uint16
P3L2TOGC_Relative_Contrib_Non_Spherical_Part_Coarse_Mode	Relative Contribution of Non-Spherical Particles in Coarse Mode	unitless	uint8
P3L2TOGC_Refractive_Index_Fine_Mode	Refractive Index of Fine Mode, only for Fine Mode Optical Thickness at 865nm > 0.02	unitless	uint8
P3L2TOGC_Refractive_Index_Coarse_Mode	Refractive Index of Coarse Mode, only for Spherical Coarse Mode at 865nm > 0.02	unitless	uint8
P3L2TOGC_Log_Backscattering_Coefficient_565	Logarithm of the Backscattering Coefficient at 565nm	unitless	uint16
P3L2TOGC_Log_Backscattering_Coefficient_1020	Logarithm of the Backscattering Coefficient at 1020nm	unitless	uint16
	PARASOL LS2		
P3L2TLGC_Input_Index	Index [i_row,icol] of the coincident Pixel in the input product. See in the file attribute to know which is this file	unitless	int16[2]
P3L2TLGC_Land_Water_Indicator	Land (100), Water (0) or Mixed (50) Indicator	unitless	uint8
P3L2TLGC_Pixel_Confidence_Data	Pixel confidence data indicator	unitless	uint32
P3L2TLGC_Aerosol_OD_865	Aerosol Optical Thickness at 865nm	unitless	uint16
P3L2TLGC_Aerosol_Model_Refractive_Index	Aerosol Model Refractive Index (Real Part)	unitless	uint8
P3L2TLGC_Aerosol_Model_Angstrom_Coefficient	Aerosol Model Angström Coefficient	unitless	uint8
P3L2TLGC_Aerosol_Index	Aerosol Index	unitless	uint16
P3L2TLGC_Fixed_Model_OD_865	Fixed Model Optical Thickness at 865nm	unitless	uint16
P3L2TLGC_Quality_Index_Viewing_Geometry	Quality Index for Viewing Geometry (0:bad ; 1:excellent)	unitless	uint16
P3L2TLGC_Quality_Index_Polarized_Reflectance_Fit	Quality Index for Polarized Reflectance Fit (0:bad ; 1:excellent)	unitless	uint8

Name	***Description***	***Unit***	***Type***
	PARASOL RB2		
P3L2TRGB_Input_Index	Index [i_row,icol] of the coincident Pixel in the input product. See in the file attribute to know which is this file	unitless	int16[2]
P3L2TRGB_Cloud_Cover	cloud cover, defined as the number of cloudy pixels divided by the total number of pixels	unitless	uint8
P3L2TRGB_Directional_Cloud_Cover	Directional Apparent Cloud Cover	unitless	uint8
P3L2TRGB_Cloud_Oxygen_Pressure	mean cloud oxygen pressure (expected to be close of the cloud middle pressure)	hPa	uint8
P3L2TRGB_Cloud_Oxygen_Pressure_Angular_Stddev	Angular Standard Deviation of the Cloud Oxygen Pressure	hPa	uint8
P3L2TRGB_Cloud_Rayleigh_Pressure	mean cloud Rayleigh pressure (expected to be close of the cloud top pressure)	hPa	uint8
P3L2TRGB_Cloud_Rayleigh_Pressure_Angular_Stddev	Angular Standard Deviation of the Cloud Rayleigh Pressure	hPa	uint8
P3L2TRGB_Cloud_Optical_Thickness	linear mean cloud optical thickness (670 nm over land and 865 nm over ocean)	unitless	uint16
P3L2TRGB_Cloud_Optical_Thickness_Stddev	Relative Spatial Standard Deviation of Cloud Optical Thickness	%	uint8
P3L2TRGB_Cloud_Phase	Cloud Phase	unitless	uint8
P3L2TRGB_Water_Vapor_Column	Water Vapor Column, based on clear pixel measurements	g/cm²	uint8
P3L2TRGB_Mean_Albedo	Mean albedo at 670 nm over land and 865 nm over ocean, aka avis	unitless	uint16
P3L2TRGB_Albedo_Spatial_Stddev	Relative spatial standard deviation of the albedos (based on the direction-means), aka rsd_avis	%	uint8
P3L2TRGB_Albedo_Angular_Stddev	Relative angular standard deviation of the albedos (based on the spatial-means), aka rad_avis	%	uint8

Name	Description	Unit	Type
P3L2TRGB_Surface_Type_Index	Surface type indicator, aka tmc [0] : 100% water [10] : > 90% water [50] : mixed [90] : > 90% Land [100] : 100% Land	%	uint8
P3L2TRGB_Cos_Solar_Zenith_Angle	Cosine of the Solar Zenith Angle for central pixel, aka mus	unitless	uint8
P3L2TRGB_Scene_Albedo_Angular_Stddev	Relative Angular standard deviation of the Scene Albedo, aka rad_ascvis	%	uint8
P3L2TRGB_Optical_Thickness_Homegeneity_Coef	Homogeneity coefficient of the optical thickness : τ^*/τ where τ is the scene mean optical thickness, and τ^* is the optical thickness derived from the scene mean reflectance, aka eps_tau	unitless	uint8
	MODIS MYD04_L2		
MYD04_Input_File_Index	Index of the input file where the coincidence has been found. See in the file attributes to see the list of files	unitless	int16
MYD04_Input_Pixel_Index	Index [i_row,icol] of the coincident Pixel in the input granule	unitless	int16
MYD04_Optical_Depth_Land_And_Ocean	Aerosol Optical Thickness at 0.55 micron for both ocean (best) and land (corrected) with best quality data(Quality flag=3)	unitless	int16
MYD04_Optical_Depth_Ratio_Small_Land_And_Ocean	Ratio of small mode optical depth at 0.55 micron	unitless	int16
MYD04_Effective_Optical_Depth_Best_Ocean	Aerosol Optical Thickness at 7 bands for best solution for 0.47, 0.55, 0.66, 0.86, 1.24, 1.63, 2.13 um	unitless	int16[7]
MYD04_Angstrom_Exponent_1_Ocean	Angstrom Exponent for 0.55 and 0.86 micron	unitless	int16[2]
	MODIS MYD05_L2		
MYD05_Input_File_Index	Index of the input file where the coincidence has been found. See in the file attributes to see the list of files	unitless	int16[2]

Name	***Description***	***Unit***	***Type***
MYD05_Input_Pixel_Index	Index [i_row,icol] of the coincident Pixel in the input granule	unitless	int16
MYD05_Water_Vapor_Near_Infrared	Total Column Precipitable Water Vapor - Near Infrared Retrieval	cm	int16
MYD05_Water_Vapor_Infrared	Total Column Precipitable Water Vapor - Infrared Retrieval	cm	int16
MYD05_Water_Vapor_Correction_Factors	Aerosol Correction Factor for Water Vapor - Near Infrared Retrieval	unitless	int16
MYD05_Quality_Assurance_Infrared	Run time QA flags	unitless	int8[5]
MYD05_Quality_Assurance_Near_Infrared	Run time QA flags	unitless	int8
MYD05_Cloud_Mask	MODIS Cloud Mask, First Byte	unitless	int8
	MODIS MYD06_L2		
MYD06_Input_File_Index	Index of the input file where the coincidence has been found. See in the file attributes to see the list of files	unitless	int16[2]
MYD06_Input_Pixel_Index	Index [i_row,icol] of the coincident Pixel in the input granule	unitless	int16
MYD06_Brightness_Temperature_Band_29	Brightness Temperature of Channel n°29 (8.550µm)	K	int16
MYD06_Brightness_Temperature_Band_31	Brightness Temperature of Channel n°31 (11.030µm)	K	int16
MYD06_Brightness_Temperature_Band_32	Brightness Temperature of Channel n°32. (12.020µm)	K	int16
MYD06_Brightness_Temperature_Band_33	Brightness Temperature of Channel n°33 (13.335µm)	K	int16
MYD06_Brightness_Temperature_Band_34	Brightness Temperature of Channel n°34 (13.635µm)	K	int16
MYD06_Brightness_Temperature_Band_35	Brightness Temperature of Channel n°35 (13.935µm)	K	int16
MYD06_Brightness_Temperature_Band_36	Brightness Temperature of Channel n°36 (14.235µm)	K	int16
MYD06_Cloud_Optical_Thickness	Cloud Optical Thickness two-channel retrieval using band 7 and either band 1, 2, or 5	unitless	int16

Name	Description	Unit	Type
MYD06_Cloud_Water_Path	Column Water Path two-band retrieval using band 7 and either band 1, 2, or 5	g/m²	int16
MYD06_Cloud_Top_Pressure	Cloud Top Pressure	hPa	int16
MYD06_Number_Clear_Pixel	Number of Clear Pixels (of 1km) at 5km resolution. Read in the Cloud_Mask_1km dataset	nb_pixels	int8
MYD06_Number_Cloudy_Pixel	Number of Cloudy Pixels (of 1km) at 5km resolution. Read in the Cloud_Mask_1km dataset	nb_pixels	int8
MYD06_Number_Indetermined_Pixel	Number of Indetermined Pixels (of 1km) at 5km resolution. Read in the Cloud_Mask_1km dataset	nb_pixels	int8
MYD06_Cloud_Effective_Radius	Cloud Particle Effective Radius two-channel retrieval using band 7 and either band 1, 2, or 5 (specified in Quality_Assurance_1km)	µm	int8
MYD06_Cloud_Phase_Optical_Properties	Cloud Phase Determination Used in Optical Thickness/Effective Radius Retrieval		int16
MYD06_Cloud_Multi_Layer_Flag	Cloud Multi Layer Identification From MODIS Shortwave Observations		int16
MYD06_Cloud_Fraction	Cloud Fraction		int8
MYD06_Cloud_Mask_5km	MODIS Cloud Mask at 5km, First Byte		int8
MYD06_Cloud_Mask_1km	MODIS Cloud Mask at 1km, L2 MOD06 QA Plan		int8
MYD06_Quality_Assurance_5km	Quality Assurance at 5x5 Resolution		int8
MYD06_Quality_Assurance_1km	Quality Assurance at 1x1 Resolution		int8
	CLOUDSAT 2B-GEOPROF		
CS_2B_GEOPROF_Input_File_Index	Index of the input file where the coincidence has been found. See in the file attributes to see the list of files	unitless	int16
CS_2B_GEOPROF_Input_Profile_Index	Index of the coincident profile	unitless	int16

Name	Description	Unit	Type
CS_2B_GEOPROF_Height	Height of range bin in Reflectivity/Cloud Mask above reference surface (~ mean sea level)	m	int16[125]
CS_2B_GEOPROF_CPR_Cloud_mask	Each CPR resolution volume is assigned 1 bit mask value: 0 = No cloud detected 1 = likely bad data 5 = likely ground clutter 5-10 = week detection found using along track integration 20 to 40 = Cloud detected .. increasing values represents clouds with lower chance of a being a false detection	unitless	int8[125]
CS_2B_GEOPROF_Gaseous_Attenuation	Gaseous attenuation	dBZe	int16[125]
CS_2B_GEOPROF_Radar_Reflectivity	Radar reflectivity factor Ze is calculated with the echo power and other input data as described in Li and Durden (2001)	dBZe	int16[125]
	CLOUDSAT 2B-CLDCLASS		
CS_2B_CLDCLASS_Input_File_Index	Index of the input file where the coincidence has been found. See in the file attributes to see the list of files	unitless	int16
CS_2B_CLDCLASS_Input_Profile_Index	Index of the coincident profile	unitless	int16
CS_2B_CLDCLASS_Height	Height of range bin in Reflectivity/Cloud Mask above reference surface (~ mean sea level)	m	int16[125]
CS_2B_CLDCLASS_cloud_scenario	Algorithm outputs (cloud type and different flags) are combined into a 16 bit cloud_scenario	unitless	int16[125]
	OMI-CLDO2		
omi_cldo2_cloud_fraction	Effective cloud fraction clipped between 0.0 and 1.0	unitless	float32
omi_cldo2_cloud_pressure	Effective cloud pressure	hPa	int16
	OMI-NO2		
omi_no2_cloud_fraction	Effective cloud fraction	unitless	int16
omi_no2_cloud_pressure	Effective cloud pressure	hPa	int16

Name	Description	Unit	Type
omi_no2_ColumnAmountNO2Trop	NO2 tropospheric column density	molec/cm^2	float32
omi_no2_ColumnAmountNO2TropStd	Precision of the NO2 tropospheric column density	molec/cm^2	float32
	OMI-CLDRR		
omi_cldrr_cloud_fraction	Cloud Fraction for O3	unitless	float32
omi_cldrr_cloud_pressure	Cloud Pressure for O3	hPa	float32
omi_cldrr_rad_cloud_fraction	Radiative Cloud Fraction	unitless	float32

The values used to represents absent or dummy ones (also called Fill Values) depend of the type of the variable.

Type	Fill Value
float32	-inf
float64	-inf
int8	-128
uint8	255

5. REFERENCES

Title	***Version***	***Link***
HDF 4 reference manual	4.2r1	http://hdf.ncsa.uiuc.edu/doc.html
HDF 4 user guide	4.2r1	http://hdf.ncsa.uiuc.edu/doc.html
CALIPSO DPC	3.0	http://eosweb.larc.nasa.gov/PRODOCS/calipso/DPC/
MODIS file specifications		http://modis-atmos.gsfc.nasa.gov/MOD06_L2/spec.html
CERES DPC	R4V1	http://earth-www.larc.nasa.gov/ceresdoc/DPC/DPC_current/DPC.html
PARASOL Level 2 Product. Data Format and User Manual	Ed1Rev1	http://www-icare.univ-lille1.fr/fr/parasol.php
Cloudsat Data Products Handbook		http://www.cloudsat.cira.colostate.edu/cloudsat_documentation/
OMI Data description website		http://disc.sci.gsfc.nasa.gov/Aura/data-holdings/OMI/