

CERES

- FILENAME:** CER-NEWS_CCCM_Aqua-FM3-MODIS-CAL-CS_ReIA2_903903.20070430.hdf (ftp link: [here](#)) (Filesize=164.0 MB)

It is a HDF4 file. However, it provides 'coremetadata' and 'archivemetadata'.

It has two V-datasets and 37 other groups such as 'Time and Position', 'Viewing Angles', 'Surface Map' etc.

The data field name, CERES TOT filtered radiance - upwards, contains a special character (hyphen '-') and therefore requires a modification (CERES TOT filtered radiance_upwards) for some software tools to be able to read it. CF conventions require the usage of only underscore of alphanumeric for variable and attribute names.

The 'Latitude' and 'Longitude' are named as 'Colatitude of CERES FOV at surface' and 'Longitude of CERES FOV at surface'. Only one latitude and longitude field pair for the whole file and show under the group 'Time and Position'

The dimension size of 'Latitude' or 'longitude' are same and stored as 1D array
 'Latitude' or 'longitude' needs additional processing if the desired latitude is from -90 to 90 and longitude is from -180 to 180
 'Latitude' Units: degrees; 'Longitude' Units: degrees. It does not follow CF conventions.

A value of 3.4028235E38 is commonly used for '_FillValue.' The file does not have the 'missing_value' attribute.

GROUP1: Time and Position

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Time of observation	units	day	8-bit character	3

DataFieldName	#Dimension (DimList)
Time of observation	1-D (26181)
Colatitude of subsatellite point at surface at observation	1-D (26181)
Longitude of subsatellite point at surface at observation	1-D (26181)
Colatitude of subsolar point at surface at observation	1-D (26181)
Longitude of subsolar point at surface at observation	1-D (26181)
Colatitude of CERES FOV at surface	1-D (26181)
Longitude of CERES FOV at surface	1-D (26181)
...	

GROUP1: Surface Map

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Time of observation	units	N/A	8-bit character	3

DataFieldName	#Dimension (DimList)
Altitude of surface above sea level	2-D (26181*2)
Surface type index	3-D (26181*2*8)

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Other CER_CRS and CER_SSF files have similar structure

2. **FILENAME:** CERES_EBAF_TOA_Terra_Edition1A_200003-200510.nc.hdf (ftp link: [here](#)) (Filesize=198.0 MB)
- It is a HDF4 file.
- It has 65 datasets and no groups.
 - Some of the datasets are provided in the table below (including lon, lat, time).
- There is neither a 'Fill_Value' attribute nor a 'missing value' attribute. A value of 0 is probably used for 'Fill_Value.'

DataFieldName	#Dimension (DimList)
lon	1-D (360)
lat	1-D (180)
time	1-D (68)
ctime	1-D (12)
climatology_bounds	2-D (12*2)
zswup	2-D (68*180)
swup	3-D (68*180*360)
....	

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
lon	long_name	longitude	8-bit character	10
	units	degrees_east	8-bit character	13
lat	long_name	latitude	8-bit character	9
	units	degrees_north	8-bit character	14
time	long_name	time	8-bit character	5
	units	days since 2000-3-1 00:00:0.0	8-bit character	30
ctime	long_name	climatology time	8-bit character	17
	units	days since 2000-3-1 00:00:0.0	8-bit character	30

3. **FILENAME:** CER_AVG_Aqua-FM3-MODIS_Edition2B_007005.200510.hdf (ftp link: [here](#)) (Filesize=632.0 MB)
- It is a HDF4 file. However, it provides 'coremetadata' and 'archivemetadata'.
- It has two groups, several datasets and several V-datasets.
 - The two groups ('Monthly Hourly Averages' and 'Monthly Averages') further contain several sub-groups.
- The group name and data fields name, like Cloud Layer - High, contains a special character (hyphen '-') and therefore requires a modification (Cloud Layer_High) for some software tools to be able to read it. CF conventions require the usage of only underscore of alphanumeric for variable and attribute names.
- Data fields and sub-groups sharing the same name are under different groups.
- The 'Latitude' and 'Longitude' are named as 'Colatitude' and 'Longitude'.
- 'Latitude' or 'longitude' needs additional processing if the desired latitude is from -90 to 90 and longitude is from -180 to 180
- 'Latitude' Units: degrees; 'Longitude' Units: degrees. It does not follow CF conventions.
- Colatitude and longitude along with several other datasets are **mentioned twice** in the dataset list.
- A value of 3.4028235E38 is commonly used for '_FillValue.' The file does not have the 'missing_value' attribute.

Datasets

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
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Colatitude	units	Degree	8-bit character	6
Longitude	units	Degree	8-bit character	6
Surface type	either of 'units,' 'unit' or 'long_name' not there			

DatasetName	#Dimension (DimList)
Colatitude	2-D (180*360)
Longitude	2-D (180*360)
Surface type percent coverage	3-D (20*180*360)
SW TOA Total-Sky	4-D (2*8*180*360)
V-datasetName	#Dimension (DimList)
Surface type	1-D (1)
CERES_metadata	1-D (1)

GROUP1: Monthly Hourly Averages

Time and Position				
DataFieldName	#Dimension (DimList)			
Colatitude	2-D (180*360)			
Longitude	2-D (180*360)			
Surface type percent coverage	3-D (20*180*360)			
DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Colatitude	units	Degree	8-bit character	6
Longitude	units	Degree	8-bit character	6

Observed TOA Fluxes				
DataFieldName	#Dimension (DimList)			
SW TOA Total-Sky	4-D (2*8*180*360)			
DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
SW TOA Total-Sky	units	Watt per square meter	8-bit character	21

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GROUP2: Monthly Averages

Time and Position				
DataFieldName	#Dimension (DimList)			
Colatitude	2-D (180*360)			
Longitude	2-D (180*360)			
Surface type percent coverage	3-D (20*180*360)			
DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Colatitude	units	Degree	8-bit character	6
Longitude	units	Degree	8-bit character	6

Observed TOA Fluxes				
DataFieldName	#Dimension (DimList)			

SW TOA Total-Sky		4-D (2*1*180*360)		
DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
SW TOA Total-Sky	units	Watt per square meter	8-bit character	21

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Other CER_AVG_Aqua and CER_AVG_Terra files have similar structure

4. **FILENAME:** CER_BDS_Aqua-FM3_Edition1-CV_034038.20091101.hdf (ftp link: [here](#)) (Filesize=612.0 MB)
- It is a HDF4 file. However, it provides 'coremetadata' and 'archivemetadata'.
- It has several datasets and several V-datasets.
- The data fields name, like CERES Viewing Zenith at TOA - Geocentric, contains a special character (hyphen '-') and therefore requires a modification (CERES Viewing Zenith at TOA_Geocentric) for some software tools to be able to read it. CF conventions require the usage of only underscore of alphanumeric for variable and attribute names.
- The 'Latitude' and 'Longitude' are named as 'Colatitude of CERES FOV at surface' and 'Longitude of CERES FOV at surface'.
- Latitude and longitude contains 'Fill Value' 3.4028235E38
- 'Latitude' Units: deg; 'Longitude' Units: deg. It does not follow CF conventions.
- A value of 3.4028235E38 is commonly used for '_FillValue.' The file does not have the 'missing_value' attribute.

Datasets

DatasetName	#Dimension (DimList)
Colatitude of CERES FOV at TOA	2-D (12771*660)
Longitude of CERES FOV at TOA	2-D (12771*660)
Colatitude of CERES FOV at Surface	2-D (12771*660)
Longitude of CERES FOV at Surface	2-D (12771*660)
Raw Instrument Status Data	2-D (12771*185)
SW Spaceclamp Values	2-D (12771*2)
....	

V-datasetName	#Dimension (DimList)
Temperature Counts	1-D (12771)
Position Counts	1-D (12771)
CERES_metadata	1-D (1)

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Colatitude of CERES FOV at TOA	long_name	Colatitudes of CERES FOV at TOA	8-bit character	31
	units	deg	8-bit character	3
Longitude of CERES FOV at TOA	long_name	Longitude of CERES FOV at TOA	8-bit character	30
	units	deg	8-bit character	3
Temperature Counts	either of 'units,' 'unit' or 'long_name' not there			

Other CER_BDS_Aqua, CER_BDS_Terra and CER_BDS_TRMM files have similar structure

5. **FILENAME:** CER_ES4_Aqua-FM3_Edition1-CV_024032.200908.hdf (ftp link: [here](#)) (Filesize=8.6 MB)

It is a HDF4 file. However, it provides 'coremetadata' and 'archivemetadata'.

- It has one V-datasets and nine groups.
- Each of the nine groups is further divided into subgroups, which are further divided into subgroups.

Data fields and sub-groups sharing the same name are under different groups.

The group name, like Total - Sky, contains a special character (hyphen '-') and therefore requires a modification (Total_Sky) for some software tools to be able to read it. CF conventions require the usage of only underscore of alphanumeric for variable and attribute names.

The 'Latitude' and 'Longitude' are not named as it is, but are named as 'Longitude' and 'Colatitude'. They are present in all the subgroups.
 'Latitude' and 'longitude' could be condensed from 2D array to 1D array because of redundant latitude and longitude value. It's easy for software tools to generate plots.
 'Latitude' or 'longitude' needs additional processing if the desired latitude is from -90 to 90 and longitude is from -180 to 180.

A value of 3.4028235E38 is commonly used for '_FillValue.' The file does not have the 'missing_value' attribute.

Datasets

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
CERES_metadata		either of 'units,' 'unit' or 'long_name' not there		

V-DatasetName	#Dimension (DimList)
CERES_metadata	1-D (1)

GROUP1: 2.5 Degree Regional

Subgroup1:Monthly (Day) Averages

Sub_subgroup1: Total-Sky

DataFieldName	#Dimension (DimList)			
Longitude	2-D (72*144)			
Colatitude	2-D (72*144)			
Solar incidence	2-D (72*144)			
DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Longitude	long_name	2.5 Degree Regional	8-bit character	19
	units	degrees	8-bit character	7
Colatitude	long_name	2.5 Degree Regional	8-bit character	19
	units	degrees	8-bit character	7

Sub_subgroup1: Clear-Sky

DataFieldName	#Dimension (DimList)			
Longitude	2-D (72*144)			
Colatitude	2-D (72*144)			
Solar incidence	2-D (72*144)			
DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Longitude	long_name	2.5 Degree Regional	8-bit character	19
	units	degrees	8-bit character	7
Colatitude	long_name	2.5 Degree Regional	8-bit character	19

	units	degrees	8-bit character	7
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Subgroup2: Daily Averages

Sub_subgroup1: Total-Sky

DataFieldName	#Dimension (DimList)			
Longitude	2-D (72*144)			
Colatitude	2-D (72*144)			
Solar incidence	3-D (31*72*144)			
DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Longitude	long_name	2.5 Degree Regional	8-bit character	19
	units	degrees	8-bit character	7
Colatitude	long_name	2.5 Degree Regional	8-bit character	19
	units	degrees	8-bit character	7

Sub_subgroup1: Clear-Sky

DataFieldName	#Dimension (DimList)			
Longitude	2-D (72*144)			
Colatitude	2-D (72*144)			
Longwave flux	3-D (31*72*144)			
DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Longitude	long_name	2.5 Degree Regional	8-bit character	19
	units	degrees	8-bit character	7
Colatitude	long_name	2.5 Degree Regional	8-bit character	19
	units	degrees	8-bit character	7

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GROUP2: 10.0 Degree Nested Regional

Subgroup1:Monthly (Day) Averages

Sub_subgroup1: Total-Sky

DataFieldName	#Dimension (DimList)			
Longitude	2-D (18*36)			
Colatitude	2-D (18*36)			
Solar incidence	2-D (18*36)			
DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Longitude	long_name	10.0 Degree Nested Regional	8-bit character	27
	units	degrees	8-bit character	7
Colatitude	long_name	10.0 Degree Nested Regional	8-bit character	19
	units	degrees	8-bit character	7

Sub_subgroup1: Clear-Sky

DataFieldName	#Dimension (DimList)			
Longitude	2-D (18*36)			

Colatitude		2-D (18*36)		
Solar incidence		2-D (18*36)		
DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Longitude	long_name	10.0 Degree Nested Regional	8-bit character	27
	units	degrees	8-bit character	7
Colatitude	long_name	10.0 Degree Nested Regional	8-bit character	19
	units	degrees	8-bit character	7

Subgroup2: Daily Averages				
Sub_subgroup1: Total-Sky				
DataFieldName		#Dimension (DimList)		
Longitude		2-D (72*144)		
Colatitude		2-D (72*144)		
Solar incidence		3-D (31*18*36)		
DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Longitude	long_name	10.0 Degree Nested Regional	8-bit character	27
	units	degrees	8-bit character	7
Colatitude	long_name	10.0 Degree Nested Regional	8-bit character	19
	units	degrees	8-bit character	7

Sub_subgroup1: Clear-Sky				
DataFieldName		#Dimension (DimList)		
Longitude		2-D (72*144)		
Colatitude		2-D (72*144)		
Longwave flux		3-D (31*18*36)		
DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Longitude	long_name	10.0 Degree Nested Regional	8-bit character	27
	units	degrees	8-bit character	7
Colatitude	long_name	10.0 Degree Nested Regional	8-bit character	19
	units	degrees	8-bit character	7

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Other CER_ES4_Aqua, CER_ES4_Terra and CER_ES4_PFM files have similar structure

6. **FILENAME:** CER_ES4_TRMM-PFM_Edition1_009001.199808.hdf (ftp link: [here](#)) (Filesize=25.8 MB)
- It is a grid file with 7 grid and one V-dataset.
The parameter information is wrong in StructMetadata. The value of parameter 'UpperLeftPointMtrs' and 'LowerRightMtrs' are 'default'. This will not generate correct latitude and longitude values if one uses the HDF-

EOS2 library to retrieve the latitude and longitude values.

The group name, like Clear Sky Net Radiant Flux - Monthly By Day (2.5R) contains a special character (hyphen '-' and bracket '(')) and therefore requires a modification (Clear Sky Net Radiant Flux_Monthly By Day_2.5R_) for some software tools to be able to read it. CF conventions require the usage of only underscore of alphanumeric for variable and attribute names.

- It uses the regular XDim and YDim.

GridName	DimensionList	Projection
2.5-degree Regional (2.5R)	Day (31), Hour (24)	GEO
5.0-degree Nested Regional (5NR)	Day (31), Hour (24)	GEO
10.0-degree Nested Regional (10NR)	Day (31), Hour (24)	GEO
2.5-degree Zonal (2.5Z)	Day (31), Hour (24)	GEO
5.0-degree Zonal (5Z)	Day (31), Hour (24)	GEO
10.0-degree Zonal (10Z)	Day (31), Hour (24)	GEO
Global (G)	Day (31), Hour (24)	GEO

There is neither a 'Fill_Value' attribute nor a 'missing value' attribute. A value of 3.4028235E38 is commonly used for 'Fill_Value.'

Datasets

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
CERES_metadata		either of 'units,' 'unit' or 'long_name'	not there	

V-DatasetName	#Dimension (DimList)
CERES_metadata	1-D (1)

GROUP1: 2.5-degree Regional (2.5R)

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Daily Solar Incidence (2.5R)		either of 'units,' 'unit' or 'long_name'	not there	

DataFieldName	#Dimension (DimList)
Solar Incidence For Monthly Averages By Day (2.5R)	2-D (YDim (72), XDim (144))
Daily Solar Incidence (2.5R)	3-D (Day, YDim, XDim)
Hourly Solar Incidence (2.5R)	3-D (Hour, YDim, XDim)

GROUP2: 5.0-degree Nested Regional (5NR)

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Daily Solar Incidence (5NR)		either of 'units,' 'unit' or 'long_name'	not there	

DataFieldName	#Dimension (DimList)
Solar Incidence For Monthly Averages By Day (5NR)	2-D (YDim (36), XDim (72))
Daily Solar Incidence (5NR)	3-D (Day, YDim, XDim)
Hourly Solar Incidence (5NR)	3-D (Hour, YDim, XDim)

GROUP3: 10.0-degree Nested Regional (10NR)

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Daily Solar Incidence (10NR)		either of 'units,' 'unit' or 'long_name' not there		

DataFieldName	#Dimension (DimList)
Solar Incidence For Monthly Averages By Day (10NR)	2-D (YDim (18), XDim (36))
Daily Solar Incidence (10NR)	3-D (Day, YDim, XDim)
Hourly Solar Incidence (10NR)	3-D (Hour, YDim, XDim)

GROUP4: 2.5-degree Zonal (2.5Z)

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Daily Solar Incidence (2.5Z)		either of 'units,' 'unit' or 'long_name' not there		

DataFieldName	#Dimension (DimList)
Solar Incidence For Monthly Averages By Day (2.5Z)	2-D (YDim (72), XDim (1))
Daily Solar Incidence (2.5Z)	3-D (Day, YDim, XDim)
Hourly Solar Incidence (2.5Z)	3-D (Hour, YDim, XDim)

GROUP5: 5.0-degree Zonal (5Z)

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Daily Solar Incidence (5Z)		either of 'units,' 'unit' or 'long_name' not there		

DataFieldName	#Dimension (DimList)
Solar Incidence For Monthly Averages By Day (5Z)	2-D (YDim (36), XDim (1))
Daily Solar Incidence (5Z)	3-D (Day, YDim, XDim)
Hourly Solar Incidence (5Z)	3-D (Hour, YDim, XDim)

GROUP6: 10.0-degree Zonal (10Z)

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Daily Solar Incidence (10Z)		either of 'units,' 'unit' or 'long_name' not there		

DataFieldName	#Dimension (DimList)
Solar Incidence For Monthly Averages By Day (10Z)	2-D (YDim (18), XDim (1))
Daily Solar Incidence (10Z)	3-D (Day, YDim, XDim)
Hourly Solar Incidence (10Z)	3-D (Hour, YDim, XDim)

GROUP7: Global (G)

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Daily Solar Incidence (G)		either of 'units,' 'unit' or 'long_name' not there		

DataFieldName	#Dimension (DimList)
Solar Incidence For Monthly Averages By Day (G)	2-D (YDim (3), XDim (1))
Daily Solar Incidence (G)	3-D (Day, YDim, XDim)
Hourly Solar Incidence (G)	3-D (Hour, YDim, XDim)

7. **FILENAME:** CER_ES8_Aqua-FM3_Edition1-CV_026031.20090831.hdf (ftp link: [here](#)) (Filesize=275.0 MB)
- It is a swath file with one group, two V-datasets and zero dimension map.
- There are 6 different dimension names: GeoXtrack (660), GeoTrack (Unlimited), SatTrack (Unlimited), SatXtrack (660), ScanOp (3), and ScanRad (22).
- The 'Latitude' and 'Longitude' are named as 'Colatitude of CERES FOV at TOA' and 'Longitude of CERES FOV at TOA'.
 'Latitude' and 'Longitude' contains 'Fill Value' 3.4028235E38
 'Latitude' Units: degrees; 'Longitude' Units: degrees. It does not follow CF conventions.
- A value of 3.4028235E38 is commonly used for '_FillValue.' The file does not have the 'missing_value' attribute.

Datasets

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
CERES_metadata		either of 'units,' 'unit' or 'long_name' not there		

V-DatasetName	#Dimension (DimList)
CERES_metadata	1-D (1)

GROUP1: CERES_ES8

Geo Field Name	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Colatitude of CERES FOV at TOA	long_name	Measurement-level Data	8-bit character	22
	units	degrees	8-bit character	7
Longitude of CERES FOV at TOA	long_name	Measurement-level Data	8-bit character	22
	units	Degree	8-bit character	7

Geo Field Name	#Dimension (DimList)
Colatitude of CERES FOV at TOA	2-D (GeoTrack, GeoXtrack)
Longitude of CERES FOV at TOA	2-D (GeoTrack, GeoXtrack)
Time of observation	1-D (SatTrack)

DataFieldName	#Dimension (DimList)
Earth-Sun distance at record start	1-D (SatTrack)
CERES SW filtered radiance	2-D (SatTrack, SatXtrack)
SW channel flag words	2-D (SatTrack, ScanRad)
Scanner operations flag word	1-D (SatTrack, ScanOp)

Other CER_ES8_Aqua and CER_ES8_Terra files have similar structure

8.

FILENAME: CER_ES9_Aqua-FM3_Edition2_024032.200812.hdf (ftp link: [here](#)) (Filesize=68.2 MB)

It is a HDF4 file. However, it provides 'coremetadata' and 'archivemetadata'.

- It has one V-datasets and six groups.
- Four of those six groups are further divided into subgroups.

The group name, like Monthly (Day) Averages contains a special character (bracket '(') and therefore requires a modification (Monthly _Day_ Averages) for some software tools to be able to read it. CF conventions require the usage of only underscore of alphanumeric for variable and attribute names.

Data fields and sub-groups sharing the same name are under different groups.

The 'Latitude' and 'Longitude' are named as 'Colatitude' and 'Longitude'. One latitude and longitude field pair for the whole file and show under the group 'Regional Summary Data'. This pair is shared by most groups. The other latitude and longitude pair is under group 'Hourbox Data' with same name.

The dimension size of 'Latitude' or 'longitude' are same and stored as 1D array

'Latitude' or 'longitude' needs additional processing if the desired latitude is from -90 to 90 and longitude is from -180 to 180

'Latitude' Units: degrees; 'Longitude' Units: degrees. It does not follow CF conventions.

A value of 3.4028235E38 is commonly used for '_FillValue.' The file does not have the 'missing_value' attribute.

Datasets

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
CERES_metadata		either of 'units,' 'unit' or 'long_name' not there		

V-DatasetName	#Dimension (DimList)
CERES_metadata	1-D (1)

GROUP1: Regional Summary Data

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Longitude	long_name	Regional Summary Data	8-bit character	21
	units	degrees	8-bit character	7
Colatitude	long_name	Regional Summary Data	8-bit character	21
	units	degrees	8-bit character	7

DataFieldName	#Dimension (DimList)
Longitude	1-D (10082)
Colatitude	1-D (10082)
Geographic scene type	1-D (10082)

GROUP2: Monthly (Day) Averages

Subgroup1: Total-Sky

DataFieldName	#Dimension (DimList)			
Solar Incidence	1-D (10082)			
DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Solar Incidence	long_name	Monthly (Day), Total-sky	8-bit character	33

		Averages		
	units	Watt hours per square meter	8-bit character	27

Subgroup2: Clear-Sky				
DataFieldName		#Dimension (DimList)		
Solar Incidence		1-D (10082)		
DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Solar Incidence	long_name	Monthly (Day), Clear-sky Averages	8-bit character	33
	units	Watt hours per square meter	8-bit character	27

GROUP3: Hourbox Data

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Longitude	long_name	Hourbox Data	8-bit character	12
	units	degrees	8-bit character	7
Colatitude	long_name	Hourbox Data	8-bit character	12
	units	degrees	8-bit character	7

DataFieldName	#Dimension (DimList)
Longitude	1-D (1424880)
Colatitude	1-D (1424880)
Solar Incidence	1-D (1424880)

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Other CER_ES9_Aqua, CER_ES9_Terra, CER_ES9_FM, CER_ES9_PFM and CER_ES9_TRMM files have similar structure

9. **FILENAME:** CER_FSW_Aqua-FM3-MODIS_Edition2C_020026.200712Z60.hdf (ftp link: [here](#)) (Filesize=60.1 MB)
- It is a HDF4 file. However, it provides 'coremetadata' and 'archivemetadata'.
- It has one V-datasets and 22 groups.
- The data field name, like SW flux - upward - clear-sky - TOA contains a special character (hyphen '-') and therefore requires a modification (SW flux_upward_clear_sky_TOA) for some software tools to be able to read it. CF conventions require the usage of only underscore of alphanumeric for variable and attribute names.
- Name of some groups seems to be incomplete. HDFVIEW may have not been able to read them completely. For example: "TOA Fluxes (mean std num_ob"
- Sub-groups sharing the same name are under different groups.
- The 'Latitude' and 'Longitude' are named as 'Colatitude' and 'Longitude'. Only one latitude and longitude field pair for the whole file and show under the group 'Regional Identification Data'.
 'Latitude' and 'Longitude' contains 'Fill Value' 3.4028235E38
 'Latitude' Units: Degrees; 'Longitude' Units: Degrees. It does not follow CF conventions.
- A value of 3.4028235E38 is commonly used for '_FillValue.' The file does not have the 'missing_value' attribute.

Datasets

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
CERES_metadata		either of 'units,' 'unit' or 'long_name' not there		

V-DatasetName	#Dimension (DimList)
CERES_metadata	1-D (1)

GROUP1: Time and Position Data

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Sun Longitude	long_name	1.0 deg. Colat Zones: 178Time and Position Data	8-bit character	47
	units	Degree	8-bit character	6
Sun Colatitude	long_name	1.0 deg. Colat Zones: 178Time and Position Data	8-bit character	47
	units	Degree	8-bit character	6

DataFieldName	#Dimension (DimList)
Sun Longitude	3-D (447*3*360)
Sun Colatitude	3-D (447*3*360)
Julian Time	3-D (447*3*360)

GROUP2: Regional Identification Data

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Longitude	long_name	1.0 deg. Colat Zones: 178Regional Identification Data	8-bit character	53
	units	degrees	8-bit character	6
Colatitude	long_name	1.0 deg. Colat Zones: 178Regional Identification Data	8-bit character	53
	units	Degree	8-bit character	6

DataFieldName	#Dimension (DimList)
Longitude	3-D (447*3*360)
Colatitude	3-D (447*3*360)
Num. Footprints in Region	3-D (447*3*360)

GROUP3: Surface Map And Clear Area Data

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Snow/Ice Percentage	long_name	1.0 deg. Colat Zones: 178Surface Map And Clear Area Data	8-bit character	56

	units	Percent	8-bit character	7
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DataFieldName	#Dimension (DimList)
Snow/Ice Percentage	3-D (447*3*360)
Surface Type Percentage	4-D (20*447*3*360)

.....

Other CER_FSW_Aqua, CER_FSW_Terra, CER_FSW_TRMM and CER_SFC files have similar structure

10. **FILENAME:** CER_ISCCP-D2like-Day_Aqua-FM3-MODIS_Beta1_023030.200612.hdf (ftp link: [here](#), Filesize=641.0MB)

It is a HDF4 file. However, it provides 'coremetadata' and 'archivemetadata'.

- It has one V-datasets and two groups.
- Each of the two groups is further divided into subgroups, which are further divided into subgroups. **Some of their names is like: "Cumulus (Low, Thin)"**

The group and data field name, like D2-like 9 Cloud Types contains a special character (hyphen '-') and therefore requires a modification (D2_like 9 Cloud Types) for some software tools to be able to read it. CF conventions require the usage of only underscore of alphanumeric for variable and attribute names.

The users are not able to find latitude and longitude information from the file.
The information of latitude and longitude can only be found from:
http://eosweb.larc.nasa.gov/PRODOCS/ceres/SRBAVG/Quality_Summaries/srbavg_ed2d/nestedgrid.html

A value of 3.4028235E38 is commonly used for '_FillValue.' The file does not have the 'missing_value' attribute.

Datasets

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
CERES_metadata		either of 'units,' 'unit' or 'long_name' not there		

V-DatasetName	#Dimension (DimList)
CERES_metadata	1-D (1)

GROUP1: Monthly 3-Hourly Averages

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Ice Water Path – Cumulus - MH	long_name	Cumulus (Low, Thin)	8-bit character	33
	units	Grams per square meter	8-bit character	22
Ice Water Path – Cirrus - MH	long_name	Cirrus (High, Thin)	8-bit character	33
	units	Grams per square meter	8-bit character	22
Ice Cloud Area Fraction – (10-180mb) - MH	long_name	(10-180mb)	8-bit character	10
	units	Percent	8-bit character	7

Subgroup1: D2-like 9 Cloud Types

Sub_subgroup1: Cumulus (Low, Thin)

DataFieldName	#Dimension (DimList)
Ice Water Path – Cumulus - MH	3-D (8*180*360)

Sub_subgroup1: Cirrus (High, Thin)

DataFieldName	#Dimension (DimList)
Ice Water Path – Cirrus - MH	3-D (8*180*360)
.....	

Subgroup2: D1-like 42 Cloud Type Fractions	
Sub_subgroup1: (10-180mb)	
DataFieldName	#Dimension (DimList)
Ice Cloud Area Fraction – (10-180mb) - MH	4-D (8*6*180*360)
.....	

GROUP2: Monthly Averages

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Ice Water Path – Cumulus - M	long_name	Cumulus (Low, Thin)	8-bit character	33
	units	Grams per square meter	8-bit character	22
Ice Water Path – Cirrus - M	long_name	Cirrus (High, Thin)	8-bit character	33
	units	Grams per square meter	8-bit character	22
Ice Cloud Area Fraction – (10-180mb) - M	long_name	(10-180mb)	8-bit character	10
	units	Percent	8-bit character	7

Subgroup1: D2-like 9 Cloud Types	
Sub_subgroup1: Cumulus (Low, Thin)	
DataFieldName	#Dimension (DimList)
Ice Water Path – Cumulus - M	3-D (1*180*360)
Sub_subgroup1: Cirrus (High, Thin)	
DataFieldName	#Dimension (DimList)
Ice Water Path – Cirrus - M	3-D (1*180*360)
.....	

Subgroup2: D1-like 42 Cloud Type Fractions	
Sub_subgroup1: (10-180mb)	
DataFieldName	#Dimension (DimList)
Ice Cloud Area Fraction – (10-180mb) - M	4-D (1*6*180*360)
.....	

Other CER_ISSCCP-D2like_Day_Aqua, CER_ISSCCP-D2like_Day_Terra and CER_ISSCCP-D2like-Nit files have similar structure

11. **FILENAME:** CER_ISSCCP-D2like-GEO_Composite_Beta1_023031.200510.hdf (ftp link: [here](#)) (Filesize=33.4 MB)
- It is a HDF4 file. However, it provides 'coremetadata' and 'archivemetadata'.
- It has one V-datasets and two groups.
 - Each of the two groups is further divided into subgroups.
- The group and data field name, like Monthly 3-Hourly Averages contains a special character (hyphen '-') and therefore requires a modification (Monthly 3_Hourly Averages) for some software tools to be able to read it. CF conventions require the usage of only underscore of alphanumeric for variable and attribute names.
- Sub-groups sharing the same name are under different groups.

Each group has its 'Latitude' and 'Longitude' named as 'Colatitude -MH', 'Longitude-MH' and 'Colatitude -M', 'Longitude-M'.

'Latitude' and 'longitude' could be condensed from 2D array to 1D array because of redundant latitude and longitude value. It's easy for software tools to generate plots.

'Latitude' or 'longitude' needs additional processing if the desired latitude is from -90 to 90 and longitude is from -180 to 180

'Latitude' Units: Degrees; 'Longitude' Units: Degrees. It does not follow CF conventions.

A value of 3.4028235E38 is commonly used for '_FillValue.' The file does not have the 'missing_value' attribute.

Datasets

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
CERES_metadata		either of 'units,' 'unit' or 'long_name' not there		

V-DatasetName	#Dimension (DimList)
CERES_metadata	1-D (1)

GROUP1: Monthly 3-Hourly Averages

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Colatitude – MH	long_name	Regional Identification Parameters	8-bit character	34
	units	Degree	8-bit character	6
Longitude - MH	long_name	Regional Identification Parameters	8-bit character	34
	units	Degree	8-bit character	6
Effective Temperature – MH	long_name	D2-like-GEO Cloud Types	8-bit character	23
	units	Kelvin	8-bit character	6

Subgroup1: Regional Identification Parameters

DataFieldName	#Dimension (DimList)
Colatitude – MH	3-D (8*180*360)
Longitude - MH	3-D (8*180*360)

Subgroup2: D2-like-GEO Cloud Types

DataFieldName	#Dimension (DimList)
Total Cloud Area Fraction - MH	3-D (8*180*360)
Effective Temperature – MH	4-D (8*18*180*360)

GROUP2: Monthly Averages

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Colatitude – MH	long_name	Regional Identification Parameters	8-bit character	34
	units	Degree	8-bit character	6
Longitude - MH	long_name	Regional Identification	8-bit character	34

		Parameters		
	units	Degree	8-bit character	6
Effective Temperature – MH	long_name	D2-like-GEO Cloud Types	8-bit character	23
	units	Kelvin	8-bit character	6

Subgroup1: Regional Identification Parameters	
DataFieldName	#Dimension (DimList)
Colatitude – M	3-D (1*180*360)
Longitude - M	3-D (1*180*360)

Subgroup2: D2-like-GEO Cloud Types	
DataFieldName	#Dimension (DimList)
Total Cloud Area Fraction – M	3-D (1*180*360)
Effective Temperature – M	4-D (1*18*180*360)

12.	<p>FILENAME: CER_SRBAVG3_Aqua-FM3-MODIS_Edition2A_016031.200510.hdf (ftp link: here) (Filesize=491.0 MB)</p> <p>It is a HDF4 file. However, it provides 'coremetadata' and 'archivemetadata'.</p> <ul style="list-style-type: none"> • It has ten V-datasets, 360 datasets and three groups. • Each of the three groups is further divided into subgroups, which are further divided into subgroups, which are further divided into subgroups. <p>The group and data field name, like Cloud Visible Optical Depth - lin contains a special character (hyphen '-') and therefore requires a modification (Cloud Visible Optical Depth _lin) for some software tools to be able to read it. CF conventions require the usage of only underscore of alphanumeric for variable and attribute names.</p> <p>Data fields and Sub-groups sharing the same name are under different groups. There are several datasets with same name but different dimensions. For examples: Cloud Top Pressure.</p> <p>The users are not able to find latitude and longitude information from the file. The information of latitude and longitude can only be found from: http://eosweb.larc.nasa.gov/PRODOCS/ceres/SRBAVG/Quality_Summaries/srbavg_ed2d/nestedgrid.html</p> <p>A value of 3.4028235E38 is commonly used for '_FillValue.' The file does not have the 'missing_value' attribute.</p>
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Datasets

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Cloud Top Pressure	long_name	1.0 Degree Zonal Monthly Hourly CERES Cloud Properties	8-bit character	277
	units	HectoPascals	8-bit character	12
CERES_metadata	either of 'units,' 'unit' or 'long_name' not there			

DatasetName	#Dimension (DimList)
Cloud Top Pressure	4-D (3*24*180*360)
Cloud Effective Temperature	4-D (3*1*180*360)
Cloud Effective Temperature	4-D (3*24*180*1)
Cloud Effective Temperature	4-D (3*1*180*1)
Cloud Effective Temperature	4-D (3*24*1*1)
Cloud Effective Temperature	4-D (3*1*1*1)
.....	

V-DatasetName	#Dimension (DimList)
CERES_metadata	1-D (1)

GROUP1: 1.0 Degree Regional

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Cloud Effective Temperature	long_name	1.0 Degree Regional Monthly Hourly CERES Cloud Properties	8-bit character	277
	units	Kelvin	8-bit character	6

Subgroup1:Monthly Hourly Averages	
Sub_subgroup1: CERES Cloud Properties	
Sub_Sub_subgroup1: High	
DataFieldName	#Dimension (DimList)
Cloud Effective Temperature	4-D (3*24*180*360)
Sub_Sub_subgroup1: Upper Middle	
DataFieldName	#Dimension (DimList)
Cloud Effective Temperature	4-D (3*24*180*360)
.....	

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Cloud Effective Temperature	long_name	1.0 Degree Regional Monthly CERES Cloud Properties	8-bit character	277
	units	Kelvin	8-bit character	6

Subgroup1:Monthly Averages	
Sub_subgroup1: CERES Cloud Properties	
Sub_Sub_subgroup1: High	
DataFieldName	#Dimension (DimList)
Cloud Effective Temperature	4-D (3*1*180*360)
Sub_Sub_subgroup1: Upper Middle	
DataFieldName	#Dimension (DimList)
Cloud Effective Temperature	4-D (3*1*180*360)
.....	

GROUP2: 1.0 Degree Zonal

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Cloud Effective Temperature	long_name	1.0 Degree Zonal Monthly Hourly CERES Cloud Properties	8-bit character	277
	units	Kelvin	8-bit character	6

Subgroup1:Monthly Hourly Averages	
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Sub_subgroup1: CERES Cloud Properties	
Sub_Sub_subgroup1: High	
DataFieldName	#Dimension (DimList)
Cloud Effective Temperature	4-D (3*24*180*1)
Sub_Sub_subgroup1: Upper Middle	
DataFieldName	#Dimension (DimList)
Cloud Effective Temperature	4-D (3*24*180*1)
.....	

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Cloud Effective Temperature	long_name	1.0 Degree Zonal Monthly CERES Cloud Properties	8-bit character	277
	units	Kelvin	8-bit character	6

Subgroup1:Monthly Averages	
Sub_subgroup1: CERES Cloud Properties	
Sub_Sub_subgroup1: High	
DataFieldName	#Dimension (DimList)
Cloud Effective Temperature	4-D (3*1*180*1)
Sub_Sub_subgroup1: Upper Middle	
DataFieldName	#Dimension (DimList)
Cloud Effective Temperature	4-D (3*1*180*1)
.....	

GROUP2: Global

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Cloud Effective Temperature	long_name	Global Monthly Hourly CERES Cloud Properties	8-bit character	277
	units	Kelvin	8-bit character	6

Subgroup1:Monthly Hourly Averages	
Sub_subgroup1: CERES Cloud Properties	
Sub_Sub_subgroup1: High	
DataFieldName	#Dimension (DimList)
Cloud Effective Temperature	4-D (3*24*1*1)
Sub_Sub_subgroup1: Upper Middle	
DataFieldName	#Dimension (DimList)
Cloud Effective Temperature	4-D (3*24*1*1)
.....	

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Cloud Effective Temperature	long_name	Global Monthly CERES Cloud Properties	8-bit character	277
	units	Kelvin	8-bit character	6

Subgroup1:Monthly Averages	
Sub_subgroup1: CERES Cloud Properties	
Sub_Sub_subgroup1: High	
DataFieldName	#Dimension (DimList)
Cloud Effective Temperature	4-D (3*1*1*1)
Sub_Sub_subgroup1: Upper Middle	
DataFieldName	#Dimension (DimList)
Cloud Effective Temperature	4-D (3*1*1*1)
.....	

Other CER_SRBAVG3_Aqua, CER_SRBAVG3_Terra and CER_SRBAVG3_TRMM files have similar structure

13. **FILENAME:** CER_SYN_Aqua-FM3-MODIS_Edition2B_007005.20051031.hdf (ftp link: [here](#)) (Filesize=231.0 MB)
- It is a HDF4 file. However, it provides 'coremetadata' and 'archivemetadata'.
- It has one V-datasets and 24 groups.
- The group and data field name, like Cloud Layer - High contains a special character (hyphen '-') and therefore requires a modification (Cloud Layer_High) for some software tools to be able to read it. CF conventions require the usage of only underscore of alphanumeric for variable and attribute names.
- Data fields sharing the same name are under different groups.
- The 'Latitude' and 'Longitude' are named as 'Colatitude' and 'Longitude'. The only one latitude and longitude field pair for the whole file and show under the group 'Time And Position'.
 'Latitude' or 'longitude' needs additional processing if the desired latitude is from -90 to 90 and longitude is from -180 to 180
 'Latitude' Units: Degrees; 'Longitude' Units: Degrees. It does not follow CF conventions.
- A value of 3.4028235E38 is commonly used for '_FillValue.' The file does not have the 'missing_value' attribute.

Datasets

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
CERES_metadata		either of 'units,' 'unit' or 'long_name'	not there	

V-DatasetName	#Dimension (DimList)
CERES_metadata	1-D (1)

GROUP1: Time and Position

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Colatitude	units	Degree	8-bit character	6
Longitude	units	Degree	8-bit character	6

DataFieldName	#Dimension (DimList)
Colatitude	2-D (180*360)
Longitude	2-D (180*360)
Surface altitude above sea level	3-D (8*180*360)
Surface type percent coverage	4-D (20*8*180*360)

GROUP2: Observed TOA Fluxes

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
SW TOA Total-Sky	units	Watt per square meter	8-bit character	21

DataFieldName	#Dimension (DimList)
SW TOA Total-Sky	3-D (8*180*360)

.....

Other CER_SYN_Aqua and CER_SYN_Terra files have similar structure

14.

FILENAME: CER_ZAVG_Aqua-FM3-MODIS_Edition2B_007005.200510.hdf (ftp link: [here](#)) (Filesize=3.9 MB)

It is a HDF4 file. However, it provides 'coremetadata' and 'archivemetadata'.

- It has two groups, several datasets and several V-datasets.
- Each of the two groups is further divided into subgroups, which are further divided into several subgroups.

The group and data field name, like Cloud Layer - High contains a special character (hyphen '-') and therefore requires a modification (Cloud Layer_High) for some software tools to be able to read it. CF conventions require the usage of only underscore of alphanumeric for variable and attribute names.

Data fields and sub groups sharing the same name are under different groups. There are several datasets with same name but different dimensions. For examples: Effective Temperature.

The users are not able to find latitude and longitude information from the file. The information of latitude and longitude can only be found from Data Products Catalog: http://eosweb.larc.nasa.gov/PRODOCS/ceres/DPC/DPC_ZAVG_R5V1.pdf

A value of 3.4028235E38 is commonly used for '_FillValue.' The file does not have the 'missing_value' attribute.

Datasets

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Effective Temperature	units	Kelvin	8-bit character	6
CERES_metadata	either of 'units,' 'unit' or 'long_name' not there			

DatasetName	#Dimension (DimList)
Effective Temperature	4-D (2*8*180*1)
Effective Temperature	4-D (2*1*180*1)
Effective Temperature	4-D (2*8*1*1)
Tuned Total-Sky_NoAerosol LW Surface Up	4-D (2*1*1*1)
Tuned Clear-Sky LW Up	5-D (5*2*8*180*1)
Mean cloud effective temperature - adjusted	5-D (4*2*1*180*1)
Tuned Total-Sky LW Up	5-D (5*2*1*1*1)
.....	
V-datasetName	#Dimension (DimList)
CERES_metadata	1-D (1)
.....	

GROUP1: 1.0 Degree Zonal

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Effective Temperature	units	Kelvin	8-bit character	6

Subgroup1: Monthly Hourly Averages				
Sub_subgroup1: Cloud Layer – High				
DataFieldName	#Dimension (DimList)			
Effective Temperature	4-D (2*8*180*1)			
.....				

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Effective Temperature	units	Kelvin	8-bit character	6

Subgroup2: Monthly Averages				
Sub_subgroup1: Cloud Layer – High				
DataFieldName	#Dimension (DimList)			
Effective Temperature	4-D (2*1*180*1)			
.....				

GROUP2: Global

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Effective Temperature	units	Kelvin	8-bit character	6

Subgroup1: Monthly Hourly Averages				
Sub_subgroup1: Cloud Layer – High				
DataFieldName	#Dimension (DimList)			
Effective Temperature	4-D (2*8*1*1)			
.....				

DataFieldName	AttributeName	AttributeValue	AttributeType	AttributeArraySize
Effective Temperature	units	Kelvin	8-bit character	6

Subgroup2: Monthly Averages				
Sub_subgroup1: Cloud Layer – High				
DataFieldName	#Dimension (DimList)			
Effective Temperature	4-D (2*1*1*1)			
.....				

Other CER_ZAVG_Aqua and CER_ZAVG_Terra files have similar structure