POLDER HDF ATMOSPHERE PRODUCT DATA FORMAT

Latest update : 20 October 2005

Corresponding Polder Atmosphere software version : 10.05

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with the collaboration of CNES Project Team

The Atmosphere HDF data file contains a selective synthesis of data products derived from POLDER (Polarization and Directionality of the Earth's Reflectances) onboard ADEOS (Advanced Earth Observation System).

These data include a set of atmospheric parameters relative to clouds (cloud cover, optical thickness, spherical albedo, thermodynamical phase, cloud pressure, ..), water vapour content, shortwave reflected energy flux and aerosols parameters (optical thickness, Angström coefficient, …). All these parameters are collected from POLDER Standard levels 2 and 3 products (Earth Radiation and Clouds, Aerosols over ocean, aerosols over lands) . The physical values of the parameter undergo no transformation while generating the present product. Therefore, any detail on the parameters calculation algorithms can be obtained on the " Earth Radiation and Budget, Water Vapor and Clouds Polder 2 advanced algorithms" (http://smsc.cnes.fr/POLDER/SCIEPROD/rbwvc.htm) and on "Tropospheric Aerosol Characterization" (http://smsc.cnes.fr/POLDER/SCIEPROD/aep2algo.htm).

Details on the synthesis :

Some Polder standard Products are reformatted and re-projected to generate the Polder Atmosphere product in HDF format. The versions of each input product are given as global attributes (see table 2).

Daily synthesis: There is one HDF file per parameter and per month. The file is composed of 28, 29, 30 or 31 SDS (Scientific DataSets). Each SDS is the world map of the parameter for the corresponding local day in the month (at roughly 10:30 local time). All observations of the 15 orbits of the corresponding day are used. When orbits overlap at high latitudes (positive or negative), the closest occurrence to 10:30 AM (local time) is retained. The Universal Time (date and time) of the observation is given in an independent file (two SDS). Note that this Universal Time parameter is accessible through the "ERB, WV AND CLOUDS" field on the POLDER WEB.

Monthly synthesis: There is one HDF file per parameter and per month. The values of the parameter are copied from the Polder level 3 Standard Products and projected on a lat-lon grid.

Note that some aerosol parameters are derived from two independent processing algorithms, in separate processing. These parameters from the two products are merged into the same HDF SDS.

Format information

The file format version is HDF 2.6. For further information concerning this format see http://hdfeos.gsfc.nasa.gov/hdfeos/index.cfm or http://hdf.ncsa.uiuc.edu/ .

Note that users of the NETDCF Data Format can easily convert any Polder HDF Product into Netcdf Format. The conversion software (NCGENPOL) is available on the POLDER WEB (software tools rubric): http://polder.cnes.fr. The "Software Tools" rubric is accessible in "Products" menu after having selected a scientific theme (Aerosols, Ocean color, Land surfaces, …).

Projection information :

The data have been re-projected on a Rectangular Equidistant grid (1080x2160, 6 pixels per degree of latitude or longitude). The resolution is thus of about 18 km at the equator.

Data encoding:

The data are 8 or 16-bits encoded. To retrieve the floating point physical value, the scaling equation parameters detailed in SDS attribute (see table 3) should be applied to each pixel.

For each geophysical parameter:

Param Physical value = scale_factor*(encoded data - add_offset)**Name convention:**

The generic name of POLDER Atmospheric HDF products is :

ATM_***IDENT_X_YYMM***.hdf

Where:

IDENT identifies the geophysical parameter stored in the file (see Tables 1a and 1b)

X is for the period of synthesis with:
X = D for a daily synthesis
X = M for a monthly synthesis

YYMM is for the date of the synthesis (YY = year, MM = month)

Contact:

For any questions or remarks regarding these data, please contact **polder@cst.cnes.fr**

Table 1a: List of Polder Atmospheric Global Parameters (clouds parameters)

IDENT	Parameter description	Synthesis	
		Daily	Monthly
UT	Universal Time		
MASK	Coastline		
CC	Cloud Cover	X	X
QCC	Cloud Cover Confidence Index	X	
WV	Total precipitable Water Vapor	X	X
SDWV	Standard Deviation of Water Vapor	X	
PHASE	Cloud thermodynamic Phase	X	
TAU	Cloud Optical Thickness	X	
PRAY	Cloud Rayleigh Pressure	X	X
POXY	Cloud Oxygen Pressure	X	X
AVIS	Albedo at 670/865 nm	X	X
QAVIS	Albedo Quality index	X	
AVISCL	Clear-sky Albedo at 670/865 nm		X
ASW	Shortwave Albedo	X	X
ASWCL	Clear-sky Shortwave Albedo		X
TOTFRE	Percentage of successful Phase retrievals		X
LIQFRE	Liquid Phase Frequency		X
ICEFRE	Ice Phase Frequency		X
MIXFRE	Mixed Phase Frequency		X
LIQTAU	Liquid Water Cloud Optical Thickness		X
ICETAU	Ice Cloud Optical Thickness		X
MIXTAU	Mixed-phase Cloud Optical Thickness		X
FINC	Shortwave Incident flux		X
FREFL	Shortwave Reflected flux		X
FCLEAR	Clear-sky Shortwave Reflected Flux		X

Table 1b: List of Polder Atmospheric Global Parameters (Aerosols parameters)

IDENT	Parameter description	Synthesis	
		Daily	Monthly
TAUA	Aerosol Optical Thickness at 865 nm	X	X
TAUAFM	Aerosol Opt. Thickness (865nm Fine Mode)	X	X
ANG	Angstrom Coefficient	X	X
ANGFM	Angstrom Coefficient for Fine Mode	X	X
IQAI	Aerosol Inversion Quality Index	X	
REF	Aerosol Effective Radius	X	
REFFM	Fine Mode Aerosol Effective Radius	X	
TAUCNM	Aerosol Optical Thickness of the Coarse Non-Spherical Mode at 865 nm	X	X
TAUCSM	Aerosol Optical Thickness of The Coarse Spherical Mode at 865 nm	X	X
NSICM	Non-Sphericity index of the coarse Mode		X
F1REF	Aerosol Frequency of Effective Radius =< 0.7 micron		X
F2REF	Aerosol Frequency of Effective Radius in]0.7;1.1] micron		X
F3REF	Aerosol Frequency of Effective Radius in]1.1;1.75] micron		X
F4REF	Aerosol Frequency of Effective Radius > 1.75 micron		X
F1REFM	Aerosol Frequency of Fine Mode Effective Radius =< 0.1 micron		X
F2REFM	Aerosol Frequency of Fine Mode Effective Radius in]0.1;0.15] micron		X
F3REFM	Aerosol Frequency of Fine Mode Effective Radius in]0.15;0.2] micron		X
F4REFM	Aerosol Frequency of Fine Mode Effective Radius >0.2 micron		X

Example of file and SDS attributes : Cloud Cover synthesis on the 1rst of June 2003

Table2: GLOBAL Attributes

Attribute name	Content (example)
User defined	
Title	POLDER ATMOSPHERE GLOBAL PRODUCTS
Platform	ADEOS 2
Instrument	POLDER 2
Processing Agency	CNES
Processing Country	France
email	polder@cst.cnes.fr
Product Level	Level 3
File creation date	Mon Dec 2 16 :00 :45 2002
Product identification	ATM_CC_D_0306.hdf
revision	06.03
Revision_BR2	02.02
Revision_TE2	02.02
Revision_OC2	02.02
Revision_BR3	02.03
Revision_AC3	03.03
Revision_OC3	02.02
History	
Pre-defined	
HDFEOSVersion	HDFEOS_V2.6
Gridname (StructMetadata.0)	“LatLon 6 pixels per degree”
XDim(StructMetadata.0)	2160
Ydim (StructMetadata.0)	1080
UpperLeftPointMtrs (StructMetadata.0)	(10007554.6777000,-20015109.354000)
LowerRightMtrs (StructMetadata.0)	(-10007554.6777000,20015109.354000)
Projection (StructMetadata.0)	GCTP_EQRECT
ProjParams (StructMetadata.0)	(6371007.180000,0,0,0,0,0,0,0,0,0,0,0,0)
SphereCode (StructMetadata.0)	0
DimensionName (StructMetadata.0)	“longitude”
Size (StructMetadata.0)	2160
DimensionName (StructMetadata.0)	“latitude”
Size (StructMetadata.0)	1080
DataFieldName (StructMetadata.0)	“CC”
DataType (StructMetadata.0)	DFNT_UINT8
DimList (StructMetadata.0)	(“latitude”,”longitude”)

Table 3 : SDS Attributes

Attribute name	Content (example)
Pre-defined	
_FillValue	255
Long_name	CC1
Units	NONE
coordsys	cartesian
Scale_factor	0.005
Scale_factor_err	0
Add_offset	0
Add_offset_err	0
Calibrated_nt	6
Valid range	[0, 250]
User defined	
Data description	« Cloud Cover »