CloudSat Project

A NASA Earth System Science Pathfinder Mission

ECMWF-AUX Interface Control Document

Algorithm Version: 5.2 (18 July 2007)
ECMWF-AUX Product Version: 008 (18 July 2007)

Developer:

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1. I/O Lists

1.1 Algorithm Inputs

	Source	Field
(1)	1B-CPR 008	Seconds since the start of the granule.
(2)	1B-CPR 008	TAI time for the first profile.
(3)	1B-CPR 008	Spacecraft Latitude
(4)	1B-CPR 008	Spacecraft Longitude
(5)	1B-CPR 008	Ray status range bin size
(6)	AN-ECMWF 001	Temperature
(7)	AN-ECMWF 001	Specific humidity
(8)	AN-ECMWF 001	Ozone mass mixing ratio
(9)	AN-ECMWF 001	Surface pressure
(10)	AN-ECMWF 001	Skin temperature
(11)	AN-ECMWF 001	Two-meter temperature

1.2 Products

1.2.1 ECMWF-AUX 008 Fields

	Source	Field
(1)	ECMWF-AUX 008	Height of the ECMWF data bins
(2)	1B-CPR 008	Seconds since the start of the granule.
(3)	1B-CPR 008	UTC seconds since 00:00 Z of the first profile
(4)	1B-CPR 008	TAI time for the first profile.
(5)	1B-CPR 008	Spacecraft Latitude
(6)	1B-CPR 008	Spacecraft Longitude
(7)	1B-CPR 008	Digital Elevation Map
(8)	ECMWF-AUX 008	ECMWF data extrapolation flag
(9)	ECMWF-AUX 008	Atmospheric pressure
(10)	ECMWF-AUX 008	Temperature
(11)	ECMWF-AUX 008	Specific humidity
(12)	ECMWF-AUX 008	Ozone
(13)	ECMWF-AUX 008	Surface pressure
(14)	ECMWF-AUX 008	Skin temperature
(15)	ECMWF-AUX 008	Two-meter temperature

2. Input Field Specifications

(1) Seconds since the start of the granule.

Name in file: Profile_time
Source: 1B-CPR 008
Field type (in file): REAL(4)
Field type (in algorithm): REAL(4)
Dimensions: nray
Units: seconds
Range: 0 to 6000
Missing value:
Missing value operator:
Factor: 1
Offset: 0
MB: 0.139

Seconds since the start of the granule for each profile. The first profile is 0.

(2) TAI time for the first profile.

Name in file: TAI_start
Source: 1B-CPR 008
Field type (in file): REAL(8)
Field type (in algorithm): REAL(8)
Dimensions: <scalar>
Units: seconds
Range: 0 to 6e+008
Missing value:
Missing value operator:
Factor: 1
Offset: 0
MB: 0

The TAI timestamp for the first profile in the data file. TAI is International Atomic Time: seconds since 00:00:00 Jan 1 1993.

(3) Spacecraft Latitude

Name in file: Latitude
Source: 1B-CPR 008
Field type (in file): REAL(4)
Field type (in algorithm): REAL(4)
Dimensions: nray
Units: degrees
Range: -90 to 90
Missing value:
Missing value operator:
Factor: 1
Offset: 0
MB: 0.139

Spacecraft Geodetic Latitude.

(4) Spacecraft Longitude

Name in file: Longitude
Source: 1B-CPR 008
Field type (in file): REAL(4)
Field type (in algorithm): REAL(4)
Dimensions: nray
Units: degrees
Range: -180 to 180
Missing value:
Missing value operator:
Factor: 1
Offset: 0
MB: 0.139

Spacecraft geodetic longitude

(5) Ray status range bin size

Name in file: RayHeader_RangeBinSize
Source: 1B-CPR 008
Range: 239.8 to 239.8
Missing value: -9999

Field type (in file): REAL(4)
Field type (in algorithm): REAL(4)
Dimensions: <scalar>
Units: meters

Missing value operator: ==
Factor: 1
Offset: 0
MB: 0

spacing between samples in range in meters

(6) Temperature

Name in file: T
Source: AN-ECMWF 001
Field type (in file): REAL(4)
Field type (in algorithm): REAL(4)
Dimensions:
Units: K

Range: to
Missing value:
Missing value operator:
Factor: 1
Offset: 0
MB: 0

(7) Specific humidity

Name in file: Q
Source: AN-ECMWF 001
Field type (in file): REAL(4)
Field type (in algorithm): REAL(4)
Dimensions:
Units: kg/kg

Range: to
Missing value:
Missing value operator:
Factor: 1
Offset: 0
MB: 0

(8) Ozone mass mixing ratio

Name in file: O3
Source: AN-ECMWF 001
Field type (in file): REAL(4)
Field type (in algorithm): REAL(4)
Dimensions:
Units: kg/kg

Range: to
Missing value:
Missing value operator:
Factor: 1
Offset: 0
MB: 0

(9) Surface pressure

Name in file: SP
Source: AN-ECMWF 001
Field type (in file): REAL(4)
Field type (in algorithm): REAL(4)
Dimensions:

Range: to
Missing value:
Missing value operator:
Factor: 1
Offset: 0

Units: Pa **MB:** 0

(10) Skin temperature

Name in file: SKT **Range:** to
Source: AN-ECMWF 001 **Missing value:**
Field type (in file): REAL(4) **Missing value operator:**
Field type (in algorithm): REAL(4) **Factor:** 1
Dimensions: **Offset:** 0
Units: K **MB:** 0

(11) Two-meter temperature

Name in file: 2T **Range:** to
Source: AN-ECMWF 001 **Missing value:**
Field type (in file): REAL(4) **Missing value operator:**
Field type (in algorithm): REAL(4) **Factor:** 1
Dimensions: **Offset:** 0
Units: K **MB:** 0

3. Product Field Specifications

3.1 ECMWF-AUX 008 Fields

(1) Height of the ECMWF data bins

Name in file: EC_height **Range:** -5000 to 30000
Source: ECMWF-AUX 008 **Missing value:** -9999
Field type (in file): INT(2) **Missing value operator:** ==
Field type (in algorithm): INT(2) **Factor:** 1
Dimensions: nbin **Offset:** 0
Units: m **MB:** 0

Idealized height of the ECMWF data bins where bin 105 is at 0 m MSL. Each profile uses the same height information.

(2) Seconds since the start of the granule.

Name in file: Profile_time **Range:** 0 to 6000

Source: 1B-CPR 008
Field type (in file): REAL(4)
Field type (in algorithm): REAL(4)
Dimensions: nray
Units: seconds
Missing value:
Missing value operator:
Factor: 1
Offset: 0
MB: 0.139

Seconds since the start of the granule for each profile. The first profile is 0.

(3) UTC seconds since 00:00 Z of the first profile

Name in file: UTC_start
Source: 1B-CPR 008
Field type (in file): REAL(4)
Field type (in algorithm): REAL(4)
Dimensions: <scalar>
Units: seconds
Range: 0 to 86400
Missing value:
Missing value operator:
Factor: 1
Offset: 0
MB: 0

The UTC seconds since 00:00 Z of the first profile in the data file.

(4) TAI time for the first profile.

Name in file: TAI_start
Source: 1B-CPR 008
Field type (in file): REAL(8)
Field type (in algorithm): REAL(8)
Dimensions: <scalar>
Units: seconds
Range: 0 to 6e+008
Missing value:
Missing value operator:
Factor: 1
Offset: 0
MB: 0

The TAI timestamp for the first profile in the data file. TAI is International Atomic Time: seconds since 00:00:00 Jan 1 1993.

(5) Spacecraft Latitude

Name in file: Latitude
Source: 1B-CPR 008
Field type (in file): REAL(4)
Field type (in algorithm): REAL(4)
Dimensions: nray
Units: degrees
Range: -90 to 90
Missing value:
Missing value operator:
Factor: 1
Offset: 0
MB: 0.139

Spacecraft Geodetic Latitude.

(6) Spacecraft Longitude

Name in file: Longitude
Source: 1B-CPR 008
Field type (in file): REAL(4)
Range: -180 to 180
Missing value:
Missing value operator:

Field type (in algorithm): REAL(4) **Factor:** 1
Dimensions: nray **Offset:** 0
Units: degrees **MB:** 0.139

Spacecraft geodetic longitude

(7) Digital Elevation Map

Name in file: DEM_elevation **Range:** -9999 to 8850
Source: 1B-CPR 008 **Missing value:** 9999
Field type (in file): INT(2) **Missing value operator:** ==
Field type (in algorithm): INT(2) **Factor:** 1
Dimensions: nray **Offset:** 0
Units: meters **MB:** 0.069

Elevation in meters above Mean Sea Level. A value of -9999 indicates ocean. A value of 9999 indicates an error in calculation of the elevation.

(8) ECMWF data extrapolation flag

Name in file: Extrapolation_flag **Range:** to
Source: ECMWF-AUX 008 **Missing value:**
Field type (in file): INT(1) **Missing value operator:**
Field type (in algorithm): INT(1) **Factor:** 1
Dimensions: nbin,nray **Offset:** 0
Units: **MB:** 4.337

The extrapolation flag is a bit field that indicates areas where ECMWF data are extrapolated to fill in CPR bins that occur below the lowest ECMWF layers between grid points.

Bit 0: CPR bin below ground
Bit 1: Data from Northeast grid point missing
Bit 2: Data from Northwest grid point missing
Bit 3: Data from Southwest grid point missing
Bit 4: Data from Southeast grid point missing

(9) Atmospheric pressure

Name in file: Pressure **Range:** to
Source: ECMWF-AUX 008 **Missing value:** -999
Field type (in file): REAL(4) **Missing value operator:** ==
Field type (in algorithm): REAL(4) **Factor:** 1
Dimensions: nbin,nray **Offset:** 0
Units: Pa **MB:** 17.349

(10) Temperature

Name in file: Temperature
Source: ECMWF-AUX 008
Field type (in file): REAL(4)
Field type (in algorithm): REAL(4)
Dimensions: nbin,nray
Units: K
Range: to
Missing value: -999
Missing value operator: ==
Factor: 1
Offset: 0
MB: 17.349

(11) Specific humidity

Name in file: Specific_humidity
Source: ECMWF-AUX 008
Field type (in file): REAL(4)
Field type (in algorithm): REAL(4)
Dimensions: nbin,nray
Units: kg/kg
Range: to
Missing value: -999
Missing value operator: ==
Factor: 1
Offset: 0
MB: 17.349

(12) Ozone

Name in file: Ozone
Source: ECMWF-AUX 008
Field type (in file): REAL(4)
Field type (in algorithm): REAL(4)
Dimensions: nbin,nray
Units: kg/kg
Range: to
Missing value: -999
Missing value operator: ==
Factor: 1
Offset: 0
MB: 17.349

(13) Surface pressure

Name in file: Surface_pressure
Source: ECMWF-AUX 008
Field type (in file): REAL(4)
Field type (in algorithm): REAL(4)
Dimensions: nray
Units: Pa
Range: to
Missing value: -999
Missing value operator: ==
Factor: 1
Offset: 0
MB: 0.139

(14) Skin temperature

Name in file: Skin_temperature
Source: ECMWF-AUX 008
Range: to
Missing value: -999

Field type (in file): REAL(4) **Missing value operator:** ==
Field type (in algorithm): REAL(4) **Factor:** 1
Dimensions: nray **Offset:** 0
Units: K **MB:** 0.139

Skin temperature.

(15) Two-meter temperature

Name in file: Temperature_2m **Range:** to
Source: ECMWF-AUX 008 **Missing value:** -999
Field type (in file): REAL(4) **Missing value operator:** ==
Field type (in algorithm): REAL(4) **Factor:** 1
Dimensions: nray **Offset:** 0
Units: K **MB:** 0.139

Two-meter temperature.

4. Changes Since the Last Product Version

4.1 ECMWF-AUX 008

General product changes
None.

Field changes
EC_height:
None.
Profile_time (source: 1B-CPR 008):
None.
UTC_start (source: 1B-CPR 008):
None.
TAI_start (source: 1B-CPR 008):
None.
Latitude (source: 1B-CPR 008):
None.
Longitude (source: 1B-CPR 008):
None.
DEM_elevation (source: 1B-CPR 008):
None.
Extrapolation_flag:
None.
Pressure:
None.
Temperature:
None.
Specific_humidity:

None.

Ozone:

None.

Surface_pressure:

None.

Skin_temperature:

None.

Temperature_2m:

None.