

EUMETSAT Data Centre Proposed CF Standard Names and Units

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1 INTRODUCTION

1.1 Purpose

The purpose of this document is to list the Standard Names and Units used in the development of the NetCDF formats as the common delivery format from the EUMETSAT Data Centre Archive.

Listing these Standard Names and Units will allow them to be discussed and agreed within EUMETSAT, its partners and interested parties such as target user groups, National Meteorological Services, etc.

Some of these Standard Names and Units can then be considered for submission to the Climate and Forecast (CF) governance committee for inclusion into the CF Standard Names Table.

1.2 Scope

The list of Standard Names and Units are to be used in Data Centre Archive developments. Its scope will be updated once a wider acceptance of their use has been established.

1.3 Applicable Documents

AD-1 NetCDF Climate and Forecast (CF) Metadata Version 1.6
Conventions

1.4 Document Structure

Section 1 General information

Section 2 Overview

Section 3 Proposed CF Standard Name List

2 OVERVIEW

The Data Centre is implementing the NetCDF format as the common delivery format for all level 1 and level 2 products in its Archive which are available for user ordering. During this development, it was identified that the CF Standard Names and Units do not provide sufficient cover for satellite data. Due to this limitation, Standard Names and Units were defined by the Data Centre in the NetCDF formats and these have been presented to the instrument engineers and the user community for discussion and feedback.

In addition to this development, EUMETSAT has been working with its international partners in the creation of calibration correction products to support a WMO project called GSICS¹. The GSICS products were also developed in NetCDF with ‘proposed’ Standard Names and Units. At the time of writing this document, the GSICS Data Management Working Group is in the process of submitting these names and units to the CF governance committee for inclusion into the CF Standard Names Table. The proposed names and units are also recorded in this document for information.

A few ‘official’ CF Standard Names and Units were found to be applicable for the Data Centre NetCDF formats development and these are listed in this document for information.

The following table shows the types of Standard Names and Units listed in section 3 of this document. They are categorised into 4 types and colour coded for readability.

Official CF Standard Names and Units that were found to be useful for describing Data Centre NetCDF variables.
Standard Names and Units defined by the Data Centre for NetCDF variables that can be considered for inclusion into the CF Standard Names and Units table.
Standard Names and Units defined by GSICS and have been proposed for inclusion into the CF Standard Names and Units table.
Standard Names and Units specific to the Data Centre use. These names and units are recommended for use in Data Centre developments of similar NetCDF products and NOT considered for inclusion into the CF Standard Names and Units table.

Glossary

PFS Field – **P**roduct **F**ormat **S**pecification **F**ield. All EPS products have been defined by its own PFS document. In the instrument sections, the PFS Field column exists to tracked standard names back to the original field name in the PFS document.

L1B – Level 1B processed product; calibrated, Earth located and quality controlled product, in the original pixel location, and packaged with needed ancillary, engineering and auxiliary data.

L1C - Level 1C processed product; in case of the IASI spectra, level 1b data after application of the apodization function.

¹ See <http://gsics.wmo.int>

- L2 -** Level 2 processed product; earth located values converted to geophysical parameters, at the same spatial and temporal sampling as the level 1b and 1c data.

3 PROPOSED STANDARD NAMES AND UNITS LIST

3.1 General Standard Names and Units

Definition	Proposed Standard Name - General	Proposed Unit	Proposed by
Any electromagnetic wave, such as light, heat radiation and radio waves.	radiation_wavelength	m	CF convention
Zenith angle is the angle to the local vertical; a value of zero is directly overhead.	zenith_angle	degrees	CF convention
Solar zenith angle is the angle between the line of sight to the sun and the local vertical.	solar_zenith_angle	degrees	CF convention
Solar azimuth angle is the horizontal angle between the line of sight to the sun and a reference direction which is often due north. The angle is measured clockwise.	solar_azimuth_angle	degrees	CF convention
Azimuth angle is the angle measured towards the east, from north, along the astronomical horizon to the intersection of the great circle passing through the point and the astronomical zenith with the astronomical horizon	azimuth_angle	degrees	EUMETSAT
Latitude of the satellite or aircraft	platform_latitude	degrees	EUMETSAT
Longitude of the satellite or aircraft	platform_longitude	degrees	EUMETSAT
Altitude of the satellite or aircraft	platform_altitude	degrees	EUMETSAT
Angle between the direction of incident light and the direction of scattered light	single_scattering_angle	degrees	EUMETSAT
Bandwidth of the channel	sensor_band_spectral_width	cm-1	EUMETSAT
Alphanumeric identifier of a sensor band.	sensor_band_identifier	N/A	JPL/NOAA
The central wavelength of a sensor's band, calculated as the first moment of the band's normalized spectral response function.	sensor_band_central_wavelength	m	JPL/NOAA
The central wavenumber of a sensor's band,	sensor_band_central_wavenumber	m-1	JPL/NOAA

EUMETSAT Data Centre Proposed CF Standard Names and Units

Definition	Proposed Standard Name - General	Proposed Unit	Proposed by
calculated as the first moment of the band's normalized spectral response function.			
The central frequency of a sensor's band, calculated as the first moment of the band's normalized spectral response function.	central_frequency	Hz	JPL/NOAA
An interval of time.	time_interval	s	JPL/NOAA
String containing date-time information in one of the ISO 8601 formats. Variables with this standard name cannot serve as coordinate variables.	datetime_iso8601	N/A	JPL/NOAA
The angle between the line of sight to the platform and the local zenith.	platform_zenith_angle	degrees	JPL/NOAA
The angle between the line of sight to the sensor and the local zenith.	sensor_zenith_angle	degrees	JPL/NOAA
The angle between the line of sight from the platform and the nadir line. Nadir is the direction given by the vertical from the platform looking towards the centre of the Earth.	platform_scan_angle	degrees	JPL/NOAA
The angle between the line of sight from the sensor and the nadir line. Nadir is the direction given by the vertical from the sensor looking towards the centre of the Earth.	sensor_scan_angle	degrees	JPL/NOAA
The horizontal angle between the line of sight to the platform and a reference direction which is often due north. The angle is measured clockwise.	platform_azimuth_angle	degrees	JPL/NOAA
The horizontal angle between the line of sight to the sensor and a reference direction which is often due north. The angle is measured clockwise.	sensor_azimuth_angle	degrees	JPL/NOAA
Difference between two <i>sensor_azimuth_angle</i> values.	relative_sensor_azimuth_angle	degrees	JPL/NOAA
"toa" means top of atmosphere; "outgoing" means	toa_outgoing_spectral_radiance	mW m ⁻² sr ⁻¹	JPL/NOAA

EUMETSAT Data Centre Proposed CF Standard Names and Units

Definition	Proposed Standard Name - General	Proposed Unit	Proposed by
emitted toward outer space; "spectral" means per unit wavenumber or as a function of wavenumber. Radiance is the radiant power per unit area in a particular direction per unit of solid angle.		(cm-1)-1	
Standard deviation of <i>toa_outgoing_spectral_radiance</i> observations from sensor's adjacent field of views within a collocation target. Collocation target is an area on the Earth's surface at which observations from at least two sensors are collected. Its size is defined by the sensor with the largest field of view footprint.	toa_outgoing_spectral_radiance_mean_within_collocation_target	mW m-2 sr-1 (cm-1)-1	JPL/NOAA
An average of <i>toa_outgoing_spectral_radiance</i> observations within a collocation scene. Collocation scene is a grouping of sensor's adjacent field of views (FOVs) centered on a collocation target. Collocation target is an area on the Earth's surface at which observations from at least two sensors are collected. Its size is defined by the sensor with the largest FOV footprint. Collocation scene's size is typically about twice the size of its collocation target.	toa_outgoing_spectral_radiance_mean_within_collocation_scene	mW m-2 sr-1 (cm-1)-1	JPL/NOAA
Standard deviation of <i>toa_outgoing_spectral_radiance</i> observations within a collocation scene. Collocation scene is a grouping of sensor's adjacent field of views (FOVs) centered on a collocation target. Collocation target is an area on the Earth's surface at which observations from at least two sensors	toa_outgoing_spectral_radiance_stdev_within_collocation_scene	mW m-2 sr-1 (cm-1)-1	JPL/NOAA

EUMETSAT Data Centre Proposed CF Standard Names and Units

Definition	Proposed Standard Name - General	Proposed Unit	Proposed by
<p>are collected. Its size is defined by the sensor with the largest FOV footprint. Collocation scene's size is typically about twice the size of its collocation target.</p>			
<p>Linear term (slope) of the formula for correcting measured spectral radiance. The correction is derived from intercalibration between the monitored and the reference sensor. The resulting corrected spectral radiance of the monitored sensor becomes comparable to measured spectral radiance of the reference sensor. "Spectral" means per unit wavenumber or as a function of wavenumber. Radiance is the radiant power per unit area in a particular direction per unit of solid angle.</p>	<p>linear_term_of_spectral_radiance_correction_due_to_intercalibration</p>	<p>1</p>	<p>JPL/NOAA</p>
<p>Constant term (offset) of the formula for correcting measured spectral radiance. The correction is derived from intercalibration between the monitored and the reference sensor. The resulting corrected spectral radiance of the monitored sensor becomes comparable with measured spectral radiance of the reference sensor. "Spectral" means per unit wavenumber or as a function of wavenumber. Radiance is the radiant power per unit area in a particular direction per unit of solid angle.</p>	<p>constant_term_of_spectral_radiance_correction_due_to_intercalibration</p>	<p>mW m⁻² sr⁻¹ (cm⁻¹)⁻¹</p>	<p>JPL/NOAA</p>
<p>Covariance between <i>constant_term_of_spectral_radiance_correction_due_to_intercalibration</i> and <i>linear_term_of_</i></p>	<p>covariance_between_constant_and_linear_terms_of_spectral_radiance_correction</p>	<p>mW m⁻² sr⁻¹ (cm⁻¹)⁻¹</p>	<p>JPL/NOAA</p>

EUMETSAT Data Centre Proposed CF Standard Names and Units

Definition	Proposed Standard Name - General	Proposed Unit	Proposed by
<p><i>spectral_radiance_correction_due_to_intercalibration</i> values.</p>			
<p>"toa" means top of atmosphere. Brightness temperature of a body is the temperature of a black body which radiates the same power per unit solid angle per unit area at a given wavenumber. Standard scene is a target area with typical Earth surface and atmospheric conditions that is accepted as a reference. The top-of-atmosphere radiance of the standard scene is calculated using a radiative transfer model for a given viewing geometry. The resultant top-of-atmosphere spectral radiance is then integrated with a sensor's spectral response function and converted to equivalent brightness temperature.</p>	<p>toa_brightness_temperature_of_standard_scene</p>	<p>K</p>	<p>JPL/NOAA</p>
<p>The difference between top-of-atmosphere (TOA) brightness temperature of the reference sensor and TOA brightness temperature of the monitored sensor. This TOA brightness temperature difference is a measure of the calibration difference between the monitored and reference sensors. Standard scene is a target area with typical Earth surface and atmospheric conditions that is accepted as a reference. Brightness temperature of a body is the temperature of a black body which radiates the same power per unit solid angle per unit area at a given wavenumber. TOA brightness temperature of the standard scene is calculated using a radiative transfer simulation for a given viewing geometry. The resultant top-</p>	<p>toa_brightness_temperature_bias_at_standard_scene_wrt_intercalibration</p>	<p>K</p>	<p>JPL/NOAA</p>

EUMETSAT Data Centre Proposed CF Standard Names and Units

Definition	Proposed Standard Name - General	Proposed Unit	Proposed by
of-atmosphere spectral radiance is then integrated with each sensor's spectral response function and converted to equivalent brightness temperature.			
"toa" means top of atmosphere; irradiance which is relevant for any sensor measuring in the UV-VIS and NIR. This parameter is reported by integrating over the whole sphere.	toa_spectral_irradiance	mW m ⁻² (cm ⁻¹)-1	EUMETSAT
Ratio of radiance to irradiance I/I ₀ , reflection from a thick layer where the layer, here the atmosphere, is part of the reflection's property.	toa_spectral_reflectance	sr ⁻¹	EUMETSAT
"toa" means top of atmosphere; "outgoing" means emitted toward outer space; the radiance is integrated over a discrete band.	toa_outgoing_inband_radiance	mW m ⁻² sr ⁻¹	EUMETSAT
Ratio of the energy of reflected to incident light at the top of atmosphere.	toa_reflectance	percent	EUMETSAT

3.2 Advanced SCATterometer (ASCAT) Standard Names and Units

3.2.1 ASCAT L1B Standard Names and Units

Definition	PFS Field	Standard Name – ASCAT L1B	Proposed Unit	Proposed by
Height of atmosphere used	ATMOSPHERIC_H EIGHT	atmosphere_height	km	EUMETSAT
Atmospheric loss per unit length of atmosphere	ATMOSPHERIC_L OSS	atmosphere_loss	dB km ⁻¹	EUMETSAT

EUMETSAT Data Centre Proposed CF Standard Names and Units

Definition	PFS Field	Standard Name – ASCAT L1B	Proposed Unit	Proposed by
Sigma0 triplet, re-sampled to swath grid, for 3 beams (fore, mid, aft)	SIGMA0_TRIP	normalized_radar_cross_section	dB	EUMETSAT
Kp for re-sampled sigma0 triplet. Values between 0 and 1	KP	normalized_radar_cross_section_standard_error_percentage	1	EUMETSAT
Incidence angle for re-sampled sigma0 triplet.	INC_ANGLE_TRIP	across_track_incidence_angle	degrees	EUMETSAT
Incidence angle for re-sampled sigma0 triplet. Values range from -180 to +180, where minus is west and plus is east.	AZI_ANGLE_TRIP	beam_azimuth_angle	degrees	EUMETSAT
Flag related to the quality of the Kp estimate (0=NOMINAL, 1=NON-NOMINAL)	F_KP	normalized_radar_cross_section_standard_error_flag	1	EUMETSAT
Flag related to the usability of the sigma0 triplet (0=GOOD, 1=USABLE, 2=NOT USABLE)	F_USABLE	normalized_radar_cross_section_usability_flag	1	EUMETSAT
Flag related to non-nominal amount of input raw data to calculate echo corrections (value between 0 and 1 shows the fraction of original samples affected)	F_F	non_nominal_raw_data_for_echo_correction_flag	1	EUMETSAT
Flag related to non enough amount of input raw data to calculate echo corrections (value between 0 and 1 shows the fraction of original samples affected)	F_V	non_enough_raw_data_for_echo_correction_flag	1	EUMETSAT
Flag related to lack of accuracy of	F_OA	lack_of_accuracy_of_attitude_flag	1	EUMETSAT

EUMETSAT Data Centre Proposed CF Standard Names and Units

Definition	PFS Field	Standard Name – ASCAT L1B	Proposed Unit	Proposed by
orbit/attitude knowledge (value between 0 and 1 shows the fraction of original samples affected)				
Flag related to solar array reflection contamination (value between 0 and 1 shows the fraction of original samples affected)	F_SA	solar_array_reflection_contamination_flag	1	EUMETSAT
Flag related to non-nominal telemetry check results (value between 0 and 1 shows the fraction of original samples affected)	F_TEL	non_nominal_telemetry_check_results_flag	1	EUMETSAT
Flag related to the presence of extrapolated reference functions in the generation of averaged value	F_EXT_FIL	presence_of_extrapolated_reference_on_averaged_value_flag	1	EUMETSAT
Flag related to presence of land in the re-sampled sigma0 triplet (value between 0 and 1 shows the fraction of original samples affected)	F_LAND	presence_of_land_flag	1	EUMETSAT

Table 3-1. ASCAT L1B Standard Names and Units

Definition	PFS Field	Standard Name – ASCAT L2	Proposed Unit	Proposed by
Height of atmosphere used	ATMOSPHERIC_HEIGHT	atmosphere_height	km	EUMETSAT
Atmospheric loss per unit length of atmosphere	ATMOSPHERIC_LOSS	atmosphere_loss	dB km-1	EUMETSAT

EUMETSAT Data Centre Proposed CF Standard Names and Units

Definition	PFS Field	Standard Name – ASCAT L2	Proposed Unit	Proposed by
Smoothed to 50 km spatial resolution triplet (fore, mid, aft) sigma zero values	SIGMA0_TRIP	normalized_radar_cross_section	dB	EUMETSAT
Smoothed to 50 km spatial resolution triplet (fore, mid, aft) kp values (values between 0 and 1)	KP	normalized_radar_cross_section_standard_error	1	EUMETSAT
Smoothed to 50 km spatial resolution triplet (fore, mid, aft) incidence angle values	INC_ANGLE_TRIP	across_track_incidence_angle	degrees	EUMETSAT
Smoothed to 50 km spatial resolution triplet (fore, mid, aft) azimuth angle values	AZI_ANGLE_TRIP	beam_azimuth_angle	degrees	EUMETSAT
Flag related to the quality of the Kp estimate.	F_KP	normalized_radar_cross_section_standard_error_flag	1	EUMETSAT
Flag related to the usability of the averaged value	F_USABLE	normalized_radar_cross_section_usability_flag	1	EUMETSAT
Flag related to the use of synthetic data in the generation of averaged value (value between 0 and 1)	F_F	non_nominal_raw_data_for_echo_correction_flag	1	EUMETSAT
Flag related to the quality of the used of synthetic data in the generation of averaged value (value between 0 and 1)	F_V	non_enough_raw_data_for_echo_correction_flag	1	EUMETSAT
Flag related to orbit/attitude quality in the generation of averaged value (value between 0 and 1)	F_OA	lack_of_accuracy_of_attitude_flag	1	EUMETSAT
Flag related to solar array reflection contamination in the generation of averaged value (value between 0 and 1)	F_SA	solar_array_reflection_contamination_flag	1	EUMETSAT
Flag related to telemetry quality in the	F_TEL	non_nominal_telemetry_check_results_flag	1	EUMETSAT

EUMETSAT Data Centre Proposed CF Standard Names and Units

Definition	PFS Field	Standard Name – ASCAT L2	Proposed Unit	Proposed by
generation of averaged value (value between 0 and 1)				
Flag related to the presence of extrapolated reference functions in the generation of averaged value (value between 0 and 1)	F_EXT_FIL	presence_of_extrapolated_reference_on_averaged_value_flag	1	EUMETSAT
Flag related to the use of measurements over land in the generation of averaged value (value between 0 and 1)	F_LAND	presence_of_land_flag	1	EUMETSAT
Soil Moisture (0 to 100%)	SOIL_MOISTURE	soil_moisture_percentage	percent	EUMETSAT
Estimated Soil Moisture Error %	SOIL_MOISTURE_ERROR	soil_moisture_error_percentage	percent	EUMETSAT
Extrapolated Sigma0 backscatter at 40 degrees incidence angle	SIGMA40	extrapolated_sigma0_backscatter_at40_degrees	dB	EUMETSAT
Estimated Error in Extrapolated Sigma Zero backscatter at 40 degrees incidence angle	SIGMA40_ERROR	extrapolated_sigma0_backscatter_at40_degrees_error	dB	EUMETSAT
Slope at 40 degrees incidence angle	SLOPE40	slope_at_40_degrees_incidence_angle	dB	EUMETSAT
Estimated error in the slope at 40 degrees incidence angle	SLOPE40_ERROR	slope_at_40_degrees_incidence_angle_error	dB	EUMETSAT
Soil Moisture sensitivity	SOIL_MOISTURE_SENSITIVITY	soil_moisture_sensitivity	dB	EUMETSAT
Dry backscatter	DRY_BACKSCATTER	dry_backscatter	dB	EUMETSAT
Wet backscatter	WET_BACKSCATTER	wet_backscatter	dB	EUMETSAT
Mean surface soil moisture (0 to 100%)	MEAN_SURF_SO	mean_soil_moisture	percent	EUMETSAT

EUMETSAT Data Centre Proposed CF Standard Names and Units

Definition	PFS Field	Standard Name – ASCAT L2	Proposed Unit	Proposed by
	IL_MOISTURE			
Rainfall contamination flag (0 to 100, zero meaning no rain contamination, 100 meaning full rain contamination)	RAINFALL_FLAG	rainfall_flag	1	EUMETSAT
Correction flags	CORRECTION_FLAGS	correction_flag	1	EUMETSAT
Processing flags	PROCESSING_FLAGS	processing_flag	1	EUMETSAT
Aggregated quality flag. Equal to the maximum value of fields 36,37,38 & 39	AGGREGATED_QUALITY_FLAG	aggregated_quality_flag	1	EUMETSAT
Flag indicating probability of presence of snow cover	SNOW_COVER_PROBABILITY	snow_cover_probability	1	EUMETSAT
Flag indicating probability of frozen soil	FROZEN_SOIL_PROBABILITY	frozen_soil_probability	1	EUMETSAT
Flag indicating the fraction of inundation and wetland areas. Zero means no inundation or wetland areas present	INUNDATION_OR_WETLAND	inundation_or_wetland	1	EUMETSAT
Flag indicating the topographical complexity (equal to the normalised standard deviation of the elevation). Zero values mean flat, higher values mean complex topography	TOPOGRAPHICAL_COMPLEXITY	topographical_complexity	1	EUMETSAT

Table 3-2. ASCAT L2 Standard Names and Units

3.3 Infrared Atmospheric Sounding Interferometer (IASI) Standard Names and Units

3.3.1 IASI L1C Standard Names and Units

Definition	PFS Field	Standard Name – IASI L1C	Proposed Unit	Proposed by
GEPSIasiMode: not_used field of the instrument mode field.	GEPSIasiMode	sensor_mode_not_used	1	EUMETSAT
GEPSIasiMode: scan_position_SP field of the instrument mode field. During external calibration mode, scan position SP (see word 12 of instrument packet). 00 if not during external calibration mode	GEPSIasiMode	sensor_mode_scan_position_sp	1	EUMETSAT
GEPSIasiMode: instrument_mode field of the instrument mode field. Word 19 of instrument packet.	GEPSIasiMode	sensor_mode	1	EUMETSAT
Date of IASI measure (on board UTC): Number of seconds since 1 January 2000 00:00	OnboardUTC	time	s	EUMETSAT
Detailed quality flag for the system	GQisFlagQualDetailed	detailed_flag_quality	1	EUMETSAT
Measurement zenith angles for each sounder pixel	GGeoSondAnglesMETOP	zenith_angle	degrees	EUMETSAT
Measurement azimuth angles for each sounder pixel	GGeoSondAnglesMETOP	azimuth_angle	degrees	EUMETSAT
Measurement solar zenith angles for each sounder pixel	GGeoSondAnglesSUN	solar_zenith_angle	degrees	EUMETSAT
Measurement solar azimuth angles for each sounder pixel	GGeoSondAnglesSUN	solar_azimuth_angle	degrees	EUMETSAT

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Definition	PFS Field	Standard Name – IASI L1C	Proposed Unit	Proposed by
Sample width of IASI 1C spectra (same as 1B)	IDefSpectDWN1b	sensor_band_spectral_width	cm-1	EUMETSAT
Number of the first sample of IASI 1C spectra (same as 1B)	IDefNsfirst1b	number_of_first_sample_of_iasil1c_spectra	1	EUMETSAT
Number of the last sample of IASI 1C spectra (same as 1B)	IDefNsfirst1b	number_of_last_sample_of_iasil1c_spectra	1	EUMETSAT
Level 1C spectra measurements	GS1cSpect	toa_outgoing_spectral_radiance	mW m-2 sr-1 (cm-1)-1	JPL/NOAA
Cloud fraction is the percentage of each pixel in satellite imagery or each gridbox in a weather or climate model that is covered with clouds. “avhrr1” means the measurement is from AVHRR 1B in IASI FOV.	GEUMAvhrr1BCldFr ac	cloud_area_fraction	percent	CF Convention
Land and Coast fraction. “avhrr1b” means is a measure in IASI FOV from AVHRR 1B	GEUMAvhrr1BLandF rac	land_area_fraction	percent	CF Convention
Quality indicator for cloud and Land and Coast fraction	GEUMAvhrr1BQual	quality_indicator_for_cloud_land_coast_fraction	1	EUMETSAT

Table 3-3. IASI L1-C Standard Names and Units

3.3.2 IASI L2 Standard Names and Units

Definition	PFS Field	Standard Name – IASI L2	Proposed Unit	Proposed by
Atmospheric temperature for a specific vertical pressure level	ATMOSPHERIC_TEMPERATURE	air_temperature	K	CF convention
Atmospheric water vapour for a specific vertical pressure level	ATMOSPHERIC_WATER_VAPOUR	atmospheric_water_vapor_at_pressure_levels_humidity	kg/kg	EUMETSAT
Atmospheric ozone for a specific vertical pressure layer	ATMOSPHERIC_OZONE	mass_concentration_of_ozone_in_air	kg m ⁻²	CF convention
Pressure levels on which retrieved temperature profiles are given	PRESSURE_LEVELS_TEMP	air_pressure	Pa	CF convention
Pressure levels on which retrieved humidity profiles are given	PRESSURE_LEVELS_HUMIDITY	air_pressure	Pa	CF convention
Pressure layers on which retrieved ozone profiles are given	PRESSURE_LEVELS_OZONE	air_pressure	Pa	CF convention
Any electromagnetic wave, such as light, heat radiation and radio waves.	SURFACE_EMISSIVITY_WAVELENGTHS	radiation_wavelength	M	CF convention
Ozone per unit area referred to the vertical integral from the surface to the top of the atmosphere. The chemical formula for ozone is O ₃ .	INTEGRATED_OZONE	atmosphere_mass_content_of_ozone	kg m ⁻²	CF Convention
Nitrous oxide per unit area referred to the vertical integral from the surface to the top of the atmosphere. The chemical formula for nitrous oxide is N ₂ O.	INTEGRATED_N2O	atmosphere_mass_content_of_nitrous_oxide	kg m ⁻²	CF Convention

EUMETSAT Data Centre Proposed CF Standard Names and Units

Definition	PFS Field	Standard Name – IASI L2	Proposed Unit	Proposed by
Carbon monoxide per unit area referred to the vertical integral from the surface to the top of the atmosphere. The chemical formula for carbon dioxide is CO.	INTEGRATED_CO	atmosphere_mass_content_of_carbon_monoxide	kg m ⁻²	CF Convention
Methane per unit area referred to the vertical integral from the surface to the top of the atmosphere. The chemical formula for methane is CH ₄ .	INTEGRATED_CH4	atmosphere_mass_content_of_methane	kg m ⁻²	CF Convention
Carbon dioxide per unit area referred to the vertical integral from the surface to the top of the atmosphere. The chemical formula for carbon dioxide is CO ₂ .	INTEGRATED_CO2	atmosphere_mass_content_of_carbon_dioxide	kg m ⁻²	CF Convention
Temperature of the lower boundary of the atmosphere.	SURFACE_TEMPERATURE	surface_temperature	K	CF Convention
Emissivity of the lower boundary of the atmosphere measured at coordinate radiation_wavelength.	SURFACE_EMISSIVITY	surface_longwave_emissivity	1	CF Convention
Cloud fraction is the percentage of each pixel in satellite imagery or each gridbox in a weather or climate model that is covered with clouds.	FRACTIONAL_CLOUD_COVER	cloud_area_fraction	percent	CF Convention
Bulk temperature of the air at the top of the highest cloud	CLOUD_TOP_TEMPERATURE	air_temperature_at_cloud_top	K	CF Convention
Air pressure at the top of the highest cloud	CLOUD_TOP_PRESSURE	air_pressure_at_cloud_top	Pa	CF Convention
Pressure of the lower boundary of the atmosphere	SURFACE_PRESSURE	surface_air_pressure	Pa	CF Convention

EUMETSAT Data Centre Proposed CF Standard Names and Units

Definition	PFS Field	Standard Name – IASI L2	Proposed Unit	Proposed by
Cloud phase estimated for cloudy IASI IFOVs by evaluation of the infrared window regions between 8 - 9 and 11 - 12 μm	CLOUD_PHASE	cloud_phase_flag	1	EUMETSAT

Table 3-4. IASI L2 Standard Names and Units

3.4 Advanced Very High Resolution Radiometer (AVHRR) Standard Names and Units

3.4.1 AVHRR L1B Standard Names and Units

Definition	PFS Field	Standard Name – AVHRR L1B	Proposed Unit	Proposed by
Collocation scene is a grouping of sensor's adjacent field of views (FOVs) centred on a collocation target. (AVHRR L1B band 3b, 4, 5)	SCENE_RADIANCES	toa_outgoing_spectral_radiance	mW m ⁻² sr ⁻¹ (cm ⁻¹)-1	JPL/NOAA
Collocation scene is a grouping of sensor's adjacent field of views (FOVs) centred on a collocation target. (AVHRR L1B band 1, 2, 3a)	SCENE_RADIANCES	toa_outgoing_inband_radiance	mW m ⁻² sr ⁻¹	EUMETSAT

Table 3-5. AVHRR L1B Standard Names and Units

3.4.2 AVHRR L2 AMV Standard Names and Units

Definition	PFS Field	Standard Name – AVHRR L2 AMV	Proposed Unit	Proposed by
Spectral channel identifier	CHANNEL_IDENTIFIER	sensor_band_identifier	1	JPL/NOAA
Flag indicating use of a triplet of images	IMAGE_TRIPLET_FLAG	image_triplet_flag	1	EUMETSAT
Flag indicating use of first guess for wind speed and direction	FIRST_GUESS_FLAG	first_guess_flag	1	EUMETSAT
Base time of the used forecast data	FORECAST_BASE_TIME	forecast_reference_time	s	CF Convention
Interval between forecast base time and validity time	VALIDITY_TIME_OFFSET	validity_time_offset	minutes	EUMETSAT
Target matching method	MATCHING_METHOD	matching_method	1	EUMETSAT
Matching value, e.g. peak value in cross-correlation surface	MATCHING_VALUE	matching_value	1	EUMETSAT
Wind derivation method	WIND_METHOD	wind_method	1	EUMETSAT
Number of cloud pixels in cluster	CLUSTER_SIZE	cluster_size	count	EUMETSAT
Flag to indicate whether and which method of image enhancement was applied	IMAGE_ENHANCEMENT	image_enhancement	1	EUMETSAT
Best match row offset	BEST_MATCH_ROW	best_match_row	1	EUMETSAT
Best match column offset	BEST_MATCH_COLUMN	best_match_column	1	EUMETSAT
AMV longitude	LONGITUDE	longitude	degrees_east	CF Convention
AMV latitude	LATITUDE	latitude	degrees_north	CF Convention

EUMETSAT Data Centre Proposed CF Standard Names and Units

Definition	PFS Field	Standard Name – AVHRR L2 AMV	Proposed Unit	Proposed by
Surface type (land, sea, or coast)	SURFACE_TYPE	surface_type	1	EUMETSAT
Target type	TARGET_TYPE	target_type	F1	EUMETSAT
Satellite zenith angle	SAT_ZENITH_ANGLE	platform_zenith_angle	degrees	EUMETSAT
AMV speed	SPEED	speed	m s-1	EUMETSAT
AMV direction	DIRECTION	course	degrees	EUMETSAT
AMV direction in stereographic projection	DIRECTION_STEREO	course_stereographic_projection	degrees	EUMETSAT
First guess for AMV speed	FIRST_GUESS_SPEED	first_guess_speed	m s-1	EUMETSAT
First guess for AMV direction	FIRST_GUESS_DIRECTION	first_guess_course	degrees	EUMETSAT
AMV temperature	TEMPERATURE	temperature	K	EUMETSAT
AMV pressure	PRESSURE	pressure	hPa	EUMETSAT
Uncorrected AMV temperature	TEMPERATURE_UNCORRECTED	uncorrected_temperature	K	EUMETSAT
Uncorrected AMV pressure	PRESSURE_UNCORRECTED	uncorrected_pressure	hPa	EUMETSAT
Pressure standard deviation	PRESSURE_SD	pressure_stdev	hPa	EUMETSAT
Temperature standard deviation	TEMPERATURE_SD	temperature_stdev	K	EUMETSAT
Method that was applied to correct the AMV height	CORRECTION_METHOD	correction_method	flag	EUMETSAT
Overall quality mark	OVERALL_QUALITY	overall_quality	percent	EUMETSAT
Overall quality mark. “excl” means excluding. “fc” means forecast consistency check	OVERALL_QUALITY_EXCL_FC	overall_quality_excl_fc	percent	EUMETSAT
Consistency values for individual quality checks	QUALITY_VALUES	quality_values	percent	EUMETSAT

EUMETSAT Data Centre Proposed CF Standard Names and Units

Definition	PFS Field	Standard Name – AVHRR L2 AMV	Proposed Unit	Proposed by
Start time associated to the derived winds	START_TIME_PDU	start_time_pdu	s	EUMETSAT
End time associated to the derived winds	END_TIME_PDU	end_time_pdu	s	EUMETSAT
Start time of forward component in triplet	START_TIME_1	start_time_forward_component	s	EUMETSAT
End time of forward component in triplet	END_TIME_1	end_time_forward_component	s	EUMETSAT
AMV speed, forward component in triplet	SPEED_1	speed_forward_component	m s-1	EUMETSAT
AMV direction, forward component in triplet	DIRECTION_1	course_forward_component	degrees	EUMETSAT
Start time of backward component in triplet	START_TIME_2	start_time_backward_component	s	EUMETSAT
End time of backward component in triplet	END_TIME_2	end_time_backward_component	s	EUMETSAT
AMV speed, backward component in triplet	SPEED_2	speed_backward_component	m s-1	EUMETSAT
AMV direction, backward component in triplet	DIRECTION_2	course_backward_component	degrees	EUMETSAT
First Guess AMV speed, forward component in triplet	FIRST_GUESS_SPEED_1	first_guess_speed_forward_component	m s-1	EUMETSAT
First Guess AMV direction, forward component in triplet	FIRST_GUESS_DIRECTION_1	first_guess_course_forward_component	degrees	EUMETSAT
First Guess AMV speed, backward component in triplet	FIRST_GUESS_SPEED_2	first_guess_speed_backward_component	m s-1	EUMETSAT
First Guess AMV direction, backward component in triplet	FIRST_GUESS_DIRECTION_2	first_guess_course_backward_component	degrees	EUMETSAT
Speed corresponding to tracking in the opposite direction	SPEED_OPPOSITE	speed_opposite	m s-1	EUMETSAT

EUMETSAT Data Centre Proposed CF Standard Names and Units

Definition	PFS Field	Standard Name – AVHRR L2 AMV	Proposed Unit	Proposed by
Direction corresponding to tracking in the opposite direction	DIRECTION_OPPOSITE	course_opposite	degrees	EUMETSAT
Deviation in location after backward and forward tracking	TRACKING_DEVIATION	tracking_deviation	km	EUMETSAT
Method that was used for height assignment	HEIGHT_ASSIGNMENT_METHOD	height_assignment_method	1	EUMETSAT
Method that was used for height assignment (to BUFR)	BUFR_HEIGHT_METHOD	bufr_height_method	1	EUMETSAT
Flag to indicate success of individual height assignment method	HEIGHT_ASSIGNMENT_FLAG	height_assignment_flag	1	EUMETSAT
Individual height assignment method	HA_BUFR_HEIGHT_METHOD	ha_bufr_height_method	1	EUMETSAT
Pressure according to individual height assignment method	HA_PRESSURE	air_pressure	hPa	CF Convention
Temperature according to individual height assignment method	HA_TEMPERATURE	air_temperature	K	CF Convention
Uncorrected pressure according to individual height assignment method	HA_PRESSURE_UNCORR	pressure_uncorrected	K	EUMETSAT
Uncorrected temperature according to individual height assignment method	HA_TEMPERATURE_UNCORR	temperature_uncorrected	K	EUMETSAT
Pressure standard deviation according to individual height assignment method	HA_PRESSURE_SD	pressure_stdev	hPa	EUMETSAT

EUMETSAT Data Centre Proposed CF Standard Names and Units

Definition	PFS Field	Standard Name – AVHRR L2 AMV	Proposed Unit	Proposed by
Temperature standard deviation according to individual height assignment method	HA_TEMPERATURE_SD	temperature_stdev	K	EUMETSAT
Forecast consistency according to individual height assignment method	HA_FORECAST_CONSISTENCY	forecast_consistency	percent	EUMETSAT
Pressure according to individual height assignment method (extracted from adjacent orbit)	HA_2ND_PRESSURE	adjacent_orbit_pressure	hPa	EUMETSAT
Temperature according to individual height assignment method (extracted from adjacent orbit)	HA_2ND_TEMPERATURE	adjacent_orbit_temperature	K	EUMETSAT
Uncorrected pressure according to individual height assignment method (extracted from adjacent orbit)	HA_2ND_PRESSURE_UNCORR	adjacent_orbit_pressure_uncorrected	K	EUMETSAT
Uncorrected temperature according to individual height assignment method (extracted from adjacent orbit)	HA_2ND_TEMPERATURE_UNCORR	adjacent_orbit_temperature_uncorrected	K	EUMETSAT
Pressure standard deviation according to individual height assignment method (extracted from adjacent orbit)	HA_2ND_PRESSURE_SD	adjacent_orbit_pressure_stdev	hPa	EUMETSAT
Temperature standard deviation according to individual height assignment method (extracted from adjacent orbit)	HA_2ND_TEMPERATURE_SD	adjacent_orbit_temperature_stdev	K	EUMETSAT
Forecast consistency according to individual height assignment method (extracted from adjacent orbit)	HA_2ND_FORECAST_CONSISTENCY	adjacent_orbit_forecast_consistency	percent	EUMETSAT

Table 3-6. AVHRR L2 AMV Standard Names and Units

3.5 High-resolution Infrared Radiation Sounder (HIRS) Standard Names and Units

3.5.1 HIRS L1B Standard Names and Units

Definition	PFS Field	Standard Name – HIRS L1B	Proposed Unit	Proposed by
Infra-Red Radiances – (HIRS band 1 – 19)	RAD_DATA	toa_outgoing_spectral_radiance	mW m ⁻² sr ⁻¹ (cm ⁻¹) ⁻¹	JPL/NOAA
Visible Radiance reflectance Percentage – (HIRS band 20)	RAD_DATA	toa_reflectance	percent	EUMETSAT
The surface called "surface" means the lower boundary of the atmosphere. Altitude is the (geometric) height above the geoid, which is the reference geopotential surface. The geoid is similar to mean sea level.	TERRAIN_ELEVATION	surface_altitude	m	CF Convention

Table 3-7. HIRS L1B Standard Names and Units

3.6 Advanced Microwave Sounding Unit-A (AMSU-A) Standard Names and Units

3.6.1 AMSU-A L1B Standard Names and Units

Definition	PFS Field	Standard Name – AMSU-A L1B	Proposed Unit	Proposed by
Scene radiances	SCENE_RADIANCES	toa_outgoing_spectral_radiance	mW m ⁻² sr ⁻¹ (cm ⁻¹) ⁻¹	JPL/NOAA
The surface called "surface" means the lower boundary of the atmosphere. Altitude is the (geometric) height above the geoid, which is the reference geopotential surface. The geoid is similar to mean sea level.	TERRAIN_ELEVATION	surface_altitude	m	CF Convention

Table 3-8. AMSU-A L1B Standard Names and Units

3.7 Microwave Humidity Sounder (MHS) Standard Names and Units

3.7.1 MHS L1B Standard Names and Units

Definition	PFS Field	Standard Name – MHS L1B	Proposed Unit	Proposed by
Scene radiances	SCENE_RADIANCES	toa_outgoing_spectral_radiance	mW m ⁻² sr ⁻¹ (cm ⁻¹) ⁻¹	JPL/NOAA
The surface called "surface" means the lower boundary of the atmosphere. Altitude is the (geometric) height above the geoid, which is the reference geopotential surface. The geoid is similar to mean sea level.	TERRAIN_ELEVATION	surface_altitude	m	CF Convention

Table 3-9. MHS L1B Standard Names and Units

3.8 Advanced TIROS Operational Sounder (ATOVS) Standard Names and Units

3.8.1 ATOVS L2 Standard Names and Units

Definition	PFS Field	Standard Name – ATOVS L2	Proposed Unit	Proposed by
Pressure levels on which retrieved temperature profiles are given	T_PRESSURE_LEVELS	pressure	Pa	CF Convention
Pressure levels on which retrieved humidity profiles are given	Q_PRESSURE_LEVELS	pressure	Pa	CF Convention
Pressure layers on which retrieved CLW (Cloud liquid water content) profiles are given	CLW_PRESSURE_LEVELS	pressure	Pa	CF Convention
Any electromagnetic wave, such as light, heat radiation and radio waves.	EMISSIVITY_WAVELENGTHS	radiation_wavelength	M	CF convention
Atmospheric temperature for a specific vertical pressure level	ATMOSPHERIC_TEMPERATURE	air_temperature	K	CF Convention
Atmospheric water vapour for a specific vertical pressure level	ATMOSPHERIC_WATER_VAPOUR	atmospheric_water_vapor_at_pressure_level s_humidity	kg kg-1	EUMETSAT
Temperature of the lower boundary of the atmosphere.	SURFACE_TEMPERATURE	surface_temperature	K	CF Convention
Emissivity of the lower boundary of the atmosphere measured at coordinate radiation_wavelength.	SURFACE_EMISSIVITY	surface_longwave_emissivity	1	CF Convention
Cloud fraction is the percentage of each pixel in satellite imagery or each gridbox in a weather or climate model that is covered with clouds.	FRACTIONAL_CLOUD_COVER	cloud_area_fraction	percent	CF Convention

EUMETSAT Data Centre Proposed CF Standard Names and Units

Definition	PFS Field	Standard Name – ATOVS L2	Proposed Unit	Proposed by
Pressure of the lower boundary of the atmosphere	SURFACE_PRESSURE	surface_air_pressure	Pa	CF Convention
Bulk temperature of the air at the top of the highest cloud	CLOUD_TOP_TEMPERATURE	air_temperature_at_cloud_top	K	CF Convention
Air pressure at the top of the highest cloud	CLOUD_TOP_PRESSURE	air_pressure_at_cloud_top	Pa	CF Convention
Altitude is the (geometric) height above the geoid, which is the reference geopotential surface. The geoid is similar to mean sea level.	TROPOPAUSE_HEIGHT	tropopause_altitude	m	CF Convention
"Content" indicates a quantity per unit area. The "atmosphere content" of a quantity refers to the vertical integral from the surface to the top of the atmosphere.	CLW	atmosphere_mass_content_of_cloud_liquid_water	kg m ⁻²	CF Convention
"Content" indicates a quantity per unit area. The "atmosphere content" of a quantity refers to the vertical integral from the surface to the top of the atmosphere. For the content between specified levels in the atmosphere, standard names including content_of_atmosphere_layer are used. Atmosphere water vapor content is sometimes referred to as "precipitable water", although this term does not imply the water could all be precipitated.	TOTAL_COLUMN_PRECIPITABLE_WATER	atmosphere_mass_content_of_water_vapor	kg m ⁻²	CF Convention
The surface called "surface" means the lower boundary of the atmosphere. Altitude is the (geometric) height above the geoid, which is the reference geopotential surface. The geoid is similar to mean sea level.	TERRAIN_ELEVATION	surface_altitude	m	CF Convention

EUMETSAT Data Centre Proposed CF Standard Names and Units

Definition	PFS Field	Standard Name – ATOVS L2	Proposed Unit	Proposed by
Brightness temperature is defined as the temperature a blackbody would be in order to produce the radiance perceived by the sensor. “hirs” means the HIRS channels.	HIRS_IR_BT	brightness_temperature	K	CF Convention
Radiance is the radiant power per unit area in a particular direction per unit of solid angle.	HIRS_VIS_RAD	toa_outgoing_spectral_radiance	mW m ⁻² sr ⁻¹ (cm ⁻¹)-1	JPL/NOAA
Brightness temperature is defined as the temperature a blackbody would be in order to produce the radiance perceived by the sensor. “amsu” means the AMSU-A channels.	AMSU_BT	brightness_temperature	K	CF Convention
Brightness temperature is defined as the temperature a blackbody would be in order to produce the radiance perceived by the sensor. “mhs” means the MHS channels.	MHS_BT	brightness_temperature	K	CF Convention
Brightness temperature is defined as the temperature a blackbody would be in order to produce the radiance perceived by the sensor. HIRS means the HIRS channels.	HIRS_IR_BT	brightness_temperature	K	CF Convention

Table 3-10. ATOV L2 Standard Names and Units

3.9 Global Ozone Monitoring Experiment (GOME) - 2 Standard Names and Units

3.9.1 GOME-2 L1 Standard Names and Units

Definition	PFS Field	Standard Name – PMAp	Proposed Unit	Proposed by
Geodetic latitude at ground-footprint corner points ABCD (earth-fixed coordinate system)	CORNER_LAT	corner_latitude	degrees	EUMETSAT
Geodetic longitude at ground- footprint corner points ABCD (earth-fixed coordinate system)	CORNER_LON	corner_longitude	degrees	EUMETSAT
Geodetic latitude at ground- footprint center point (earth-fixed coordinate system)	CENTRE_LAT	center_latitude	degrees	EUMETSAT
Geodetic longitude at ground- footprint center point (earth-fixed coordinate system)	CENTRE_LON	center_longitude	degrees	EUMETSAT
Radiometric fraction of the outgoing radiance interacting with a cloud integrated over the field-of-view	FIT_2	radiometric_cloud_area_fraction	1	EUMETSAT

3.10 Multi-Mission Products Standard Names and Units

3.10.1 Polar Multi-sensor Aerosol optical properties (PMAp) L2 - Standard Names and Units

Definition	PFS Field	Standard Name – PMAp	Proposed Unit	Proposed by
Integrated extinction of the light by aerosols at a given wavelength from the surface to the TOA	AOD	aerosol_optical_depth	1	EUMETSAT
Flag indicating the retrieval algorithm used (specifies also whether the retrieval is on Land or Sea)	RETRIEVAL_ALGORIT HM	retrieval_algorithm_type	1	
Aerosol classification according to a pre-described set of aerosol classes and types	AEROSOL_CLASS	aerosol_class	1	
Geometric fraction over the ground-footprint covered by a cloud as derived from AVHRR cloud flags	AVHRR_CLOUDFRAC	avhrr_geometric_cloud_fraction	1	
Averaged difference between the measured AVHRR TOA radiance in channel 4 and 5	AVHRR_AVT4T5DIFF	avhrr_channel4_5_toa_radiance_difference	K	
Chlorophyll load of the sea surface	CHLOROPHYLL_LOAD	chlorophyll_load	mg m ⁻³	EUMETSAT
10 meter wind speed, taken from ECMWF forecast databases	WIND_SPEED	wind_speed	m/s	EUMETSAT
Height of aerosol plumes	AEROSOL_PLUMEHEIG HT	aerosol_plume_height	m	EUMETSAT
Land fraction within the ground-footprint	LAND_FRACT	land_fraction	1	EUMETSAT
Geometric standard deviation of radiance values from AVHRR channel 1 over ground-footprint weighted by the mean	RAD_INHOMOGENEIT Y	avhrr_geometric_radiance_inhomogeneity	1	EUMETSAT
Product quality flags related to aerosol optical properties retrieval	QUALITY_FLAGS	quality_flags	1	
UTC time associated with the read-out of	READOUT_STARTTIME	sensor_readout_starttime	s	EUMETSAT

EUMETSAT Data Centre Proposed CF Standard Names and Units

Definition	PFS Field	Standard Name – PMAp	Proposed Unit	Proposed by
the sensor detector pixel (Number of seconds since 1 January 2000 00:00)				
Altitude between the surface and the cloud-top averaged over the field of view	Cloud_top_height	cloud_top_height	1	EUMETSAT
Integrated extinction of the light by clouds at a given wavelength from the surface to TOA and averaged over the field of view	COD	cloud_optical_depth	1	EUMETSAT