ICON Data Product 2.3: MIGHTI Retrieved Temperatures and Brightnesses

This document describes the data product for ICON MIGHTI-A Level 2.3 Retrieved Temperature File, which is in NetCDF4 format.

NetCDF files contain **variables** and the **dimensions** over which those variables are defined. First, the dimensions are defined, then all variables in the file are described.

Dimensions

The dimensions used by the variables in this file are given below, along with nominal sizes. Note that the size may vary from file to file. For example, the "Epoch" dimension, which describes the number of time samples contained in this file, will likely have a varying size.

Dimension Name	Nominal Size
ICON_L2_MIGHTI_A_TANGENT_ALTITUDES	18
Epoch	1
ICON_L2_MIGHTI_A_FILTER_WAVELENGTHS	5

Variables

Variables in this file are listed below. First, the most important variables (the "data" variables) are described, followed by the "support_data" variables, and finally the "metadata" variables. The variables classified as "ignore_data" are not shown.

data

Variable Name	Description	Units	Dimensions
ICON_L2_MIGHTI_A_TEMP ERATURES	Derived temperatures from A-band by altitude Derived temperatures from A-band by altitude	С	Epoch, ICON_L2_ MIGHTI_A_TANGEN T_ALTITUDES
ICON_L2_MIGHTI_A_TEMP _STATISTICAL_UNCERTAI NTIES	Statistical uncertainties in derived temperatures by altitude Statistical uncertainties in derived temperatures by altitude	С	Epoch, ICON_L2_ MIGHTI_A_TANGEN T_ALTITUDES
ICON_L2_MIGHTI_A_TEMP _BIAS_UNCERTAINTIES	Bias uncertainties in derived temperatures by altitude Bias uncertainties in derived temperatures by altitude	С	Epoch, ICON_L2_ MIGHTI_A_TANGEN T_ALTITUDES
ICON_L2_MIGHTI_A_TEMP _TOTAL_UNCERTAINTIES	Total uncertainties in derived temperatures by altitude Total uncertainties in derived temperatures by altitude	С	Epoch, ICON_L2_ MIGHTI_A_TANGEN T_ALTITUDES
ICON_L2_MIGHTI_A_FILT ER_WAVELENGTH_SHIFT	Shift of all filter center wavelengths due to temperature by altitude Shift of all filter center wavelengths due to temperature by altitude	nm	Epoch, ICON_L2_ MIGHTI_A_TANGEN T_ALTITUDES
ICON_L2_MIGHTI_A_FILT ER_WAVELENGTH_SHIFT_U NCERTAINTIES	Uncertainty in the shift of all filter center wavelengths due to temperature by altitude Uncertainty in the shift of all filter center wavelengths due to temperature by altitude	nm	Epoch, ICON_L2_ MIGHTI_A_TANGEN T_ALTITUDES
ICON_L2_MIGHTI_A_RELA TIVE_RADIANCE	Relative radiance by filter by altitude Relative radiance by filter by altitude		Epoch, ICON_L2_ MIGHTI_A_FILTER _WAVELENGTHS, I CON_L2_MIGHTI_A _TANGENT_ALTITU DES
ICON_L2_MIGHTI_A_RELA TIVE_RADIANCE_UNCERTA INTIES	Uncertainties in relative radiance by filter by altitude and filter Uncertainties in relative radiance by filter by altitude and filter		Epoch, ICON_L2_ MIGHTI_A_FILTER _WAVELENGTHS, I CON_L2_MIGHTI_A _TANGENT_ALTITU DES

Support_Data

Variable Name	Description	Units	Dimensions
ICON_L0_MIGHTI_A_Time _UTC	ISO 9601 formatted UTC timestamp (at middle of image integration).		Epoch
	ISO 9601 formatted UTC timestamp (at middle of image integration).		
	Derived from original GPS values reported from spacecraft (Time_GPS_Seconds and Time_GPS_Subseconds).		
	Time calculation is offset by 615ms (flush time) for the first image in the series and for all other images are adjusted by subtracting (integration time + 308 milliseconds) from the reported GPS time then adding the difference between the readout FRT and the header FRT.		
	Time may be delayed by up to 10 ms due to FSW polling delay.		
	Maximum time is ~2150 UTC and minimum time is ~1970 UTC.		
	All character arrays are NULL terminated (size includes NULL).		
ICON_L0_MIGHTI_A_Time _GPS	Milliseconds since 1980-01-06 00:00:00 TAI (coincident with UTC) at middle of image integration.	millisec onds	Epoch
	Milliseconds since 1980-01-06 00:00:00 TAI (coincident with UTC) at middle of image integration.		
	Derived from original GPS values reported from spacecraft (Time_GPS_Seconds and Time_GPS_Subseconds).		
	Time calculation is offset by 615ms (flush time) for the first image in the series and for all other images are adjusted by subtracting (integration time + 308 milliseconds) from the reported GPS time then adding the difference between the readout FRT and the header FRT.		
	Time may be delayed by up to 10 ms due to FSW polling delay.		
	Maximum time is ~2150 UTC and minimum time is ~1970 UTC.		
ICON_L0_MIGHTI_A_Time _Integration	Time to integrate MIGHTI-A region of interest (ROI) image.	millisec onds	Epoch
ICON_L0_MIGHTI_A_MTA_	MIGHTI-A camera aperture 1 position sense flag.	Flag	Epoch
Aperture1_Position	0=OPEN, 1=CLOSED, 2=15% OPEN, 3=UNKNOWN		
ICON_L0_MIGHTI_A_MTA_	MIGHTI-A camera aperture 2 position sense flag.	Flag	Epoch
Aperture2_Position	0=OPEN, 1=CLOSED, 2=15% OPEN, 3=UNKNOWN		

support_data

Variable Name	Description	Units	Dimensions
Epoch	Milliseconds since 1970-01-01 00:00:00 UTC at middle of image integration	ms	Epoch
	Milliseconds since 1970-01-01 00:00:00 UTC at middle of image integration		
ICON_L2_MIGHTI_A_TANG	Tangent point solar scattering angles by altitude	degree	Epoch, ICON_L2_
ENT_SOLAR_SCATTERING_ ANGLE	Tangent point solar scattering angles by altitude	S	MIGHTI_A_TANGEN T_ALTITUDES
ICON_L2_MIGHTI_A_TANG	Tangent point latitudes by altitude	degree	Epoch, ICON_L2_
ENT_LATITUDES	Tangent point latitudes by altitude	s North	MIGHTI_A_TANGEN T_ALTITUDES
ICON_L2_MIGHTI_A_TANG	Tangent point longitudes by altitude	degree	Epoch, ICON_L2_
ENT_LONGITUDES	Tangent point longitudes by altitude	s East	MIGHTI_A_TANGEN T_ALTITUDES
ICON_L2_MIGHTI_A_TANG	Tangent point altitudes	km	Epoch, ICON_L2_
ENT_ALTITUDES	Tangent point altitudes		MIGHTI_A_TANGEN T_ALTITUDES
ICON_L2_MIGHTI_A_DIST	Distance to tangent points	km	Epoch, ICON_L2_
ANCE_TO_TANGENT_POINT	Distance to tangent points		MIGHTI_A_TANGEN T_ALTITUDES
ICON_L2_MIGHTI_A_TANG	Local sidereal time at tangent point	hour	Epoch, ICON_L2_
ENT_LST	Local sidereal time at tangent point		MIGHTI_A_TANGEN T_ALTITUDES
ICON_L2_MIGHTI_A_TANG	Solar zenith angle at tangent point	degree	Epoch, ICON_L2_
ENT_SZA	Solar zenith angle at tangent point	S	MIGHTI_A_TANGEN T_ALTITUDES
ICON_L2_MIGHTI_A_FOV_	Field of view azimuth angle	degree	Epoch, ICON_L2_
AZIMUTH_ANGLE	Field of view azimuth angle	S	MIGHTI_A_TANGEN T_ALTITUDES
ICON_L2_MIGHTI_A_BORE	Total boresight to sun angle	degree	Epoch
SIGHT_SUN_ANGLE	Total boresight to sun angle	S	
ICON_L2_MIGHTI_A_TEC_ COLD_TEMPERATURE	Cold-side temperature of the thermoelectric cooler attached to the camera head	С	Epoch
	Cold-side temperature of the thermoelectric cooler attached to the camera head		
ICON_L2_ANCILLARY_ORB	Integer orbit number at middle of exposure		Epoch
IT_NUMBER	Integer orbit number at middle of exposure		
ICON_L2_ANCILLARY_SC_	Spacecraft latitude at middle of exposure	degree	Epoch
LATITUDE	Spacecraft latitude at middle of exposure	s North	
ICON_L2_ANCILLARY_SC_ LONGITUDE	Spacecraft longitude at middle of exposure	degree	Epoch
	Spacecraft longitude at middle of exposure	s East	
ICON_L2_ANCILLARY_SC_ ALTITUDE	Spacecraft altitude at middle of exposure	km	Epoch
	Spacecraft altitude at middle of exposure		
ICON_L2_ANCILLARY_SC_	Spacecraft local sidereal time at middle of exposure	hour	Epoch
LST	Spacecraft local sidereal time at middle of exposure		

Variable Name	Description	Units	Dimensions
ICON_L2_ANCILLARY_SC_ SZA	Spacecraft solar zenith angle at middle of exposure Spacecraft solar zenith angle at middle of exposure	degree s	Epoch
ICON_L1_MIGHTI_A_QUAL ITY_FLAG_NEAR_TERMINA TOR	Quality Flag indicating that terminator is within field of view Quality Flag indicating that terminator is within field of view		Epoch
ICON_L1_MIGHTI_A_QUAL ITY_FLAG_LOW_SIGNAL_T O_NOISE	Quality Flag indicating low signal to noise Quality Flag indicating low signal to noise		Epoch
ICON_L1_MIGHTI_A_QUAL ITY_FLAG_SAA	Quality Flag indicating that the spacecraft is within the South Atlantic Anomoly Quality Flag indicating that the spacecraft is within the South Atlantic Anomoly		Epoch
ICON_L1_MIGHTI_A_QUAL ITY_FLAG_BAD_CALIBRAT ION	Quality Flag indicating an inappropriate calibration file has been used or was missing Quality Flag indicating an inappropriate calibration file has been used or was missing		Epoch

metadata

Variable Name	Description	Units	Dimensions
ICON_L2_MIGHTI_A_FILT ER_WAVELENGTHS	Wavelength labels corresponding to the five filters Wavelength labels corresponding to the five filters		ICON_L2_MIGHTI_ A_FILTER_WAVELE NGTHS

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