ICON Data Product 2.5: FUV Nighttime O+ profile

This document describes the data product for ICON FUV Nighttime O+ profiles (DP 2.5), which is in NetCDF4 format.

((TODO: Insert reference to Kamalabadi et al [2017] paper))

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
`Epoch`	5
`Vector`	3
`Horizontal`	6
`Vertical`	132

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_FUVA_SWP_VER_ALTITUDE_PROFILE	VER of 135.6-nm emission at each observing angle	ph/cm^3/s	Epoch, Vertical, Horizontal
ICON_L2_FUVA_SWP_VER_ERROR_ALTITUDE_PROFILE	Error in VER of 135.6-nm emission at each observing angle	ph/cm^3/s	Epoch, Vertical, Horizontal
ICON_L2_FUVA_SWP_ELECTRON_DENSITY_ALTITUDE_PROFILE	Electron density at each observing angle	1/cm^3	Epoch, Vertical, Horizontal
ICON_L2_FUVA_SWP_ELECTRON_DENSITY_ERROR_ALTITUDE_PROFILE	Error in electron density at each observing angle	1/cm^3	Epoch, Vertical, Horizontal
ICON_L2_FUVA_SWP_HMF2	FUV F2-peak height estimate	km	Epoch, Horizontal
ICON_L2_FUVA_SWP_HMF2_ERROR	FUV F2-peak height estimate	km	Epoch, Horizontal
ICON_L2_FUVA_SWP_NMF2	FUV F2-peak density estimate	1/cm^3	Epoch, Horizontal
ICON_L2_FUVA_SWP_NMF2_ERROR	FUV F2-peak density estimate	1/cm^3	Epoch, Horizontal
ICON_L2_FUVA_QUALITY	FUV inversion quality flag Flag is 0 if the inversion is valid.		Epoch, Horizontal

support_data

Variable Name	Description	Units	Dimensions
EPOCH	Milliseconds since 1970-01-01 00:00:00 UTC at middle of measurement integration. Center time of the exposure, milliseconds after 1970-01-01/00:00:00 UT	ms	Epoch
ICON_L2_FUVA_SWP_CENTER_TIMES	Center time of 12-second profile integration Center time of the exposure, UT	s	Epoch
ICON_L2_FUVA_SWP_START_TIMES	Start time of 12-second profile integration Start time of the exposure, UT	s	Epoch

Variable Name	Description	Units	Dimensions
ICON_L2_FUVA_SWP_STOP_TIMES	Stop time of 12-second profile integration Stop time of the exposure, UT	s	Epoch
ICON_L2_FUV_SC_LAT	Spacecraft WGS84 latitude. Geodetic Latitude of Spacecraft using WGS84	degrees North	Epoch
ICON_L2_FUV_SC_LON	Spacecraft WGS84 longitude. Geodetic Longitude of Spacecraft using WGS84	degrees East	Epoch
ICON_L2_FUV_SC_ALT	Spacecraft WGS84 altitude. Geodetic Altitude of Spacecraft using WGS84	km	Epoch
ICON_L2_ORBIT_NUMBER	ICON Orbit Number Integer Orbit Number		Epoch
ICON_L2_FUVA_TANGENT_LAT	Tangent latitude in WGS84.	degrees North	Epoch, Vertical, Horizontal
ICON_L2_FUVA_TANGENT_LON	Tangent longitude in WGS84.	degrees East	Epoch, Vertical, Horizontal
ICON_L2_FUVA_TANGENT_ALT	Tangent altitude in WGS84.	km	Epoch, Vertical, Horizontal
ICON_L2_FUVA_FOV_AZIMUTH_ANGLE	FOV Celestial Azimuth This array [HORIZONTAL, VERTICAL, EPOCH] is organized with the VERTICAL dimension being the most rapidly changing (inner dimension) and EPOCH being the least rapidly changing (outer dimension)", "The HORIZONTAL dimension represents the 6 horizontal positions (from left to right?) as described in the ??? document", "The VERTICAL dimension represents the 256 vertical positions (from bottom to top) as described in the ??? document", "The EPOCH dimension represents the time of the measurment integration", "Whether the dimensions are read forward or backwards may be platform dependent.	degrees	Epoch, Vertical, Horizontal
ICON_L2_FUVA_FOV_ZENITH_ANGLE	FOV Celestial Zenith This array [HORIZONTAL, VERTICAL, EPOCH] is organized with the VERTICAL dimension being the most rapidly changing (inner dimension) and EPOCH being the least rapidly changing (outer dimension)", "The HORIZONTAL dimension represents the 6 horizontal positions (from left to right?) as described in the ??? document", "The VERTICAL dimension represents the 256 vertical positions (from bottom to top) as described in the ??? document", "The EPOCH dimension represents the time of the measurment integration", "Whether the dimensions are read forward or backwards may be platform dependent.	degrees	Epoch, Vertical, Horizontal

metadata

Variable Name	Description	Units	Dimensions
ICON_L2_REGULARIZATION_METHOD	Regularization method: Tikhonov or MAP		
ICON_L2_REGULARIZATION_ORDER	Regularization order		
ICON_L2_1356_CONTRIBUTION	Chemestry considered in 135.6-nm emission: RR or RRMN		
ICON_L2_INVERSION_LIMB	Limb altitude used in inversion		

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