OMPS Limb Profiler – Ancillary Data Product Description

Matthew DeLand and Philippe Xu

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Introduction

This document describes the content and format of the ancillary data product files created for use with Ozone Mapping and Profiler Suite (OMPS) Limb Profiler (LP) measurements. This product is referred to as LP-L1-ANC throughout this document. It consists of supporting data sets that can be used in the retrieval of ozone profiles and aerosol extinction profiles. These data sets do not represent science products created from LP measurements.

1. LP-L1-ANC Product

The LP-L1-ANC product primarily contains background atmosphere profile data that have been interpolated to the time and geographic location of each OMPS LP measurement. Temperature, pressure, background density, ozone density, and vorticity profiles, as well as tropopause altitude and temperature, are derived from NASA Global Modelling and Assimilation Office (GMAO) gridded data. A single file is provided for each orbit. Further details are given in the Release Notes document.

1.1 File Format

The LP-L1-ANC data files are provided in the HDF5 format. The hdf5 library is required to read the files. This library is available from http://hdfgroup.org. In addition to interfaces in C and FORTRAN which are developed and distributed by the HDF Group, there is a high quality interface for Python called h5py. These options are all open source format. The ability to read HDF5 files is also included in many common commercial data analysis tools, such as Matlab, IDL, TecPlot, and Mathematica. An HDF5 file consists of named groups (which behave like folders or directories in a computer file system) and named datasets. Because the objects are named, they can be accessed by name rather than by file offset.

1.2 Groups and Datasets

The LP-L1-ANC data file contains two primary groups (h5 space): the GEOLOCATION_DATA group, and the GRIDDED_DATA group. Each group contains multiple datasets that correspond to the group category. The contents of these groups are summarized in Tables 1 and 2. Note that all profile data covers the altitude range 0.5-80.5 km at 1 km intervals. During each orbit, there are *ntime* observations for each of the three LP slits.

Dataset name	**Description**	**Unit**	**Dimension**
Altitude	Geometric altitude	km	(81)
Date	Date [YYYYMMDD]	–	(ntime, 3)
Latitude	Latitude at tangent point	degrees	(ntime, 3)
Longitude	Longitude at tangent point	degrees	(ntime, 3)
Time	Time [seconds UT since midnight]	seconds	(ntime, 3)

Table 1. The GEOLOCATION_DATA group contents: Dataset name, description, unit and dimension.

Dataset name	**Description**	**Unit**	**Dimension**
AirDensity	Background atmosphere density	cm^{-3}	(ntime, 3, 81)
O3Density	Ozone density	cm^{-3}	(ntime, 3, 81)
Pressure	Background atmosphere pressure	hPa	(ntime, 3, 81)
SurfacePressure	Surface pressure at tangent point	hPa	(ntime, 3)
Temperature	Background atmosphere temperature	K	(ntime, 3, 81)
TropopauseAltitude	Tropopause altitude	km	(ntime, 3)
TropopauseTemperature	Tropopause temperature	K	(ntime, 3)
Vorticity	Calculated vorticity	sec^{-1}	(ntime, 3, 81)

Table 2. The GRIDDED_DATA group contents: Dataset name, description, unit and dimension.

1.3. Product Filenames

The product file name follows the pattern of the sample below for data corresponding to orbit 2225 on April 2, 2012:

OMPS-NPP_LP-L1-ANC_v2.0_2012m0402t040634_o02225_2014m0415t075914.h5

---Product name--- ---Date---- ---Orbit--- ---Processing Time---