Exploitation of the Mesosphere (MesosphEO)

ESA MesosphEO

Product specification document: vertical profiles of Mg, Mg^+ and Na from SCIAMACHY limb measurements

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1. Introduction

This document explains the NetCDF4 format used for monthly zonal mean climatologies of vertical distributions of metals (Mg, Mg^+ and Na) generated in the framework of the ESA's MesosphEO project. The climatologies are provided for two measurement modes of the SCIAMACHY instrument: standard limb observations (SL) and Mesosphere-Lower-Thermosphere (MLT) mode. The files are labeled with "Limb" and "MLT" respectively.

2. Source data

The L3 data result directly from the retrieval which is performed using the averaged SCIAMACHY L1 limb data.

3. Data selection

Non-converging data are rejected. For Mg retrievals from SCIAMACHY SL measurements an additional filtering on fit residual is done. The RMS of the fit residual must not exceed 2.4E-5.

4. Data gridding

Original metal profiles are linearly interpolated to a geometric altitude grid with 1 km spacing. Data are collected to a latitude grid from 90°S to 90°N with 5 degree latitude zones and averaged zonally and monthly. The data for SCIMACHY SL measurements are given as yearly data for 2002-2012 while for MLT data all years (2008 - 2012) are averaged and formaly assigned to the year 2010. The basic unit of SCIAMACHY climatologies is number densities in molecules/cm^3. The sub-cell description of the measurements are provided by the same variables as in the SPARC-DI project: mean day of month, mean latitude.

5. NetCDF4 format for SCIAMACHY climatology

Variable	Unit	Dimension	Attribute
time	days since 0h Jan 1, 1900	132 for SL, 12 for MLT	Mid-month time since 01.01.1900
latitude_grid	degrees_north	37	Latitude grid, -90:5:90
altitude_grid	km	23 for SL, 80 for MLT	Data are interpolated to this altitude grid
density_mean	cm^{-3}	23x37x132 for SL, 80x37x12 for MLT	Number density monthly zonal mean
title	string		Gridded monthly zonal mean vertical profiles of Na/Mg/Mg^{+} from SCIAMACHY limb/MLT measurements
constituent	string		Constituent name
data filtering	string		non-converging profiles are rejected
data version	string		version of L3 data
file_creation_date	date		Date in format YYYYYMMDD followed by "T" and therafter the time in format HHMMSS of file creation
file_created_by	string		Person responsible name
file_created_by_email	string		Person responsible email
project	string		Project
institute	string		Institute
value_for_nodata	string		NaNf
platform	string		Satellite name
instrument	string		Instrument name