ESA MesosphEO

**Na profiles retrieved from SCIAMACHY
Na D-line nightglow observations**

MesosphEO Data File Description

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1. General information

The numeric results are stored in NetCDF file format. This format contains descriptive information about the data it stores, the units used and provides further information. This data was created using the IDL software suite. Detailed description about the retrieval procedure is given in [1].

A separate data file is provided for each year. The files are named in a self describing way where only the year number changes: Na_nightglow_retrieval_SCIAMACHY_2008.nc

2. Stored Data

The data contains monthly mean values of Sodium nightglow retrievals for the years 2003 – 2009 and 2011. Data for the year 2010 is not provided due to remaining retrieval issues. For the mean value computation only measurements from the 30S – 30N latitude band were taken into account. All data is given for an altitude range between 73 and 110 km.

Additional information is also provides as summarized in the list:

- Sodium concentration [atoms / cm³]
- Propagated random error [Percent]
- Sodium vertical column density [atoms / cm²]

It should be noted, that there are missing values in the data set as summarized in the table. Missing values are set to zero in the corresponding data fields.

Year	Missing [Month]	Reason
2003	5,6,7	No SCIAMACHY nightglow data available
2004	-	
2005	2,3,4,5,6	No GOMOS ozone data available
2006	-	
2007	-	
2008	-	
2009	-	
2010	1-12	Retrieval issues still present, data not provided.
2011	11	No GOMOS ozone data available

3. Data structure

To store data into the NetCDF format, first the indexing Values (dimensions) are to be defined. On those values the variables do depend on. Additional information in clear text is provided within the data file.

The dimensions are the time, altitude and iteration number. The time is given in form of a month number 01-12 for a given year starting with number 1 (not zero). The altitude consists of 12 values between 73 and 110 km and the iteration number, 10 values, is the iteration step computing the variable. Three variables as named above are indexed by those dimensions. This information is summarized in the following table.

What	Name	Short Name	Units	Comment
Dimension	Time	[Time]	[Month]	12 values, begins with 1 (not 0)
Dimension	Altitude	[Z]	[km]	12 values
Dimension	Iteration step	[ITER]	[Number]	10 values
Variable	Sodium concentration	[Na_c]	[atoms/cm3]	Depends on (Time,Z,ITER)
Variable	Propagated random error	[Na_err]	[Percent]	Depends on (Time,Z,ITER)
Variable	Sodium vertical column density	[Na_vc]	[atoms/cm^2]	Depends on (Time,Z)

4. Literature

[1] von Savigny, C., M. P. Langowski, B. Zilker, J. P. Burrows, D. Fussen, and V. F. Sofieva, First mesopause Na retrievals from satellite Na D-line nightglow observations, Geophys. Res. Lett., DOI: 10.1002/2016GL071313, 2016.