

Product Specification Document

NO₂ vertical profiles

Retrieved from SCIAMACHY limb observations

by HEIDOSCILI



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Product Description

Vertical profiles of NO₂ are retrieved from the SCIAMACHY limb measurements by the two step retrieval HEIDOSCILI (see Algorithm Document). The results are given as number density (molec/cm³) as function of altitude for 10-40 km with a vertical resolution of 3 km. The sensitivity of the measurement is characterized by the averaging kernels. For NO₂, information on the profile can be retrieved from the observations in the altitude range 15-40 km (see Algorithm Document). Thus, for altitudes from 10-15 km, the profile consists mainly of the a priori information.

Product format specification:

For every SCIAMACHY orbit there is one ASCII data file. The file name states the orbit number and the date of the measurement.

The files contain for every limb state the state number, the latitude and longitude, the solar zenith angle, the number density of the respective trace gas and its error as function of altitude from 10 to 40 km.

Software release history / Implementation details

This is the first release, version 0.5

The wavelengths utilized for the retrieval range from 430-450 nm.

As forward model the Monte Carlo RTM Tracy is applied.

For further details refer to the Algorithm Document.

List of known issues

The pointing error of ENVISAT is corrected for according to von Savigny et al. (2005). This method is based on the TRUE tangent height retrieval, which has an offset of about 500 m and does not account for pole to pole variations of the pointing error.

Data quality assessment

In the altitude range 15-40 km, the error of the NO₂ profile is estimated to be 10-50 %.

References

von Savigny et al. (2005): Spatial and temporal characterization of SCIAMACHY limb pointing errors during the first three years of the mission, Atmos. Chem. Phys., 5, 2593-2602.