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Gridded vertical tropospheric NO_2 columns from GOME-2/MetOp-A

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This document describes the global gridded monthly vertical tropospheric NO_2 columns retrieved from the GOME-2 instrument onboard the MetOp-A platform, as described in *Hilboll et al. (2013b)*.

1 Version history

Version	*Date*	*User*	*Summary of changes*
4.0	2014-07-31	hilboll	Initial public release

2 Dataset description

This dataset of tropospheric NO_2 columns is based on the retrieval of trop. NO_2 columns which is described in *Richter et al. (2005)*, applied to the measurements by the GOME-2 instrument onboard MetOp-A.

For this version of the tropospheric NO_2 column dataset, the stratospheric correction was performed using the *Bremen 3D CTM* (*Sinnhuber et al. (2003a, 2003b)*), using the interpolation scheme described in *Hilboll et al. (2013a)*.

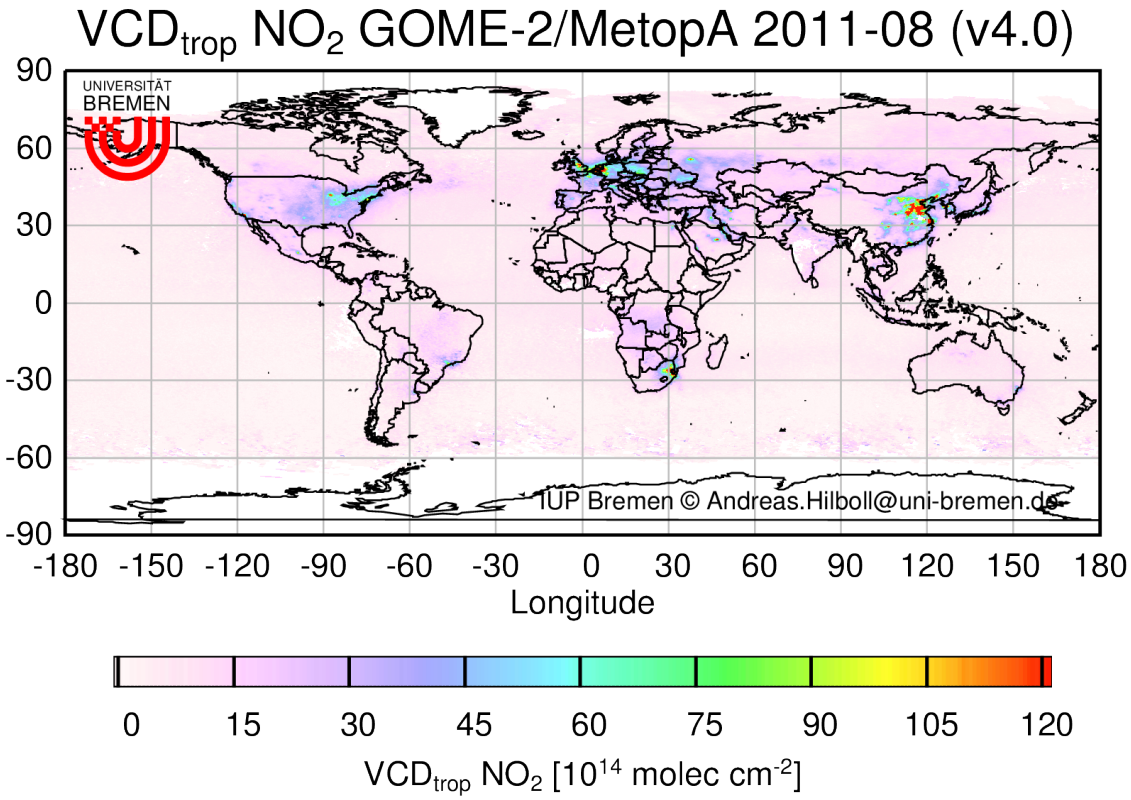
All measurements are aggregated to monthly averaged 0.0625° grids. The conversion to vertical tropospheric column densities has been carried out analogously to *Hilboll et al. (2013b)*:

Tropospheric air mass factors (AMFs) have been calculated with the radiative transfer model SCIATRAN (*Rozanov et al., 2005*). The vertical distribution of tropospheric NO_2 has been taken from a climatology of NO_2 mixing ratios from the MOZART2 model (*Horowitz et al., 2003*), and surface spectral reflectance from GOME measurements (*Koelemeijer et al., 2003*). Both aspects are explained in detail in *Nüß (2005)*. The AMFs have then been spatially interpolated to a 0.125° grid. Measurements with a cloud coverage exceeding 20% have been filtered out using the FRESCO+ algorithm (version 6; *Wang et al., 2008*). Additionally, we applied an intensity filter to discard scenes with very large surface reflectivity. This is necessary as the used albedo or surface spectral reflectance climatology (*Koelemeijer et al., 2003*) does not account for short-term changes in reflectivity for example from snow; in addition, the FRESCO+ cloud fractions have large uncertainties over bright surfaces.

3 Data availability and format

This dataset can be downloaded as monthly aggregated HDF4 files from the DOAS-group @ IUP-UB's website, as annually aggregated `*.zip` files. The HDF4 files can be read, e.g., using the GDAL library.

4 Example



5 Terms of use

These data are produced at the University of Bremen and are not official EUMETSAT data products. We ask people who wish to use our data

- to keep us involved in the project and to discuss relevant findings with us
- not to pass on the data without our approval

- to clearly identify the data source in any presentation using the data by giving reference to *Hilboll et al., 2013b*, and to clearly state the data version *v4.0*.
- should the GOME-2 data be a substantial part of a publication, we would like to be asked to be co-authors. This is of course a matter that needs to be discussed for each individual case.

6 Acknowledgements

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7 References

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