



## **Estimation of stratospheric NO<sub>2</sub> from nadir-viewing satellites: The MPI-C TROPOMI verification algorithm**

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The retrieval of tropospheric column densities of NO<sub>2</sub> requires the subtraction of the stratospheric fraction from the total columns derived by DOAS. Here we present a modified reference sector method, which estimates the stratosphere over "clean" regions, as well as over clouded scenarios in which the tropospheric column is shielded. The selection of "clean" pixels is realized gradually by assigning weighting factors to the individual ground pixels, instead of applying binary flags. Global stratospheric fields are then compiled by "weighted convolution". In a second iteration, unphysical negative tropospheric residues are suppressed by adjusting the weights respectively. This algorithm is foreseen as "verification algorithm" for the upcoming TROPOMI on S5p.

We show the resulting stratospheric estimates and tropospheric residues for a test data set based on OMI observations. The dependencies on the a-priori settings (definition of weighting factors and convolution kernels) are discussed, and the results are compared to other products, in particular to DOMINO v.2 (based on assimilation, similar to the TROPOMI prototype algorithm) and the NASA standard product (based on a similar reference-region-type approach).