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New tropospheric ozone dataset from OMPS/NPP

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The Ozone Mapping and Profiler Suite, on board of Suomi National Polar-orbiting Partnership (OMPS/NPP) since 2012, features a combination of limb and nadir sensors. This feature allows the use of the limb-nadir matching technique to retrieve tropospheric ozone columns on a global scale, with a single satellite. Using a single instrument avoids additional calibrations and interpolations of the input data for the retrieval. The limb-nadir matching method subtracts the stratospheric ozone column from limb observations (OMPS-LP) from the nadir derived total ozone column (OMPS-NM), using the tropopause height to define the troposphere. Most of the other satellite's retrievals methods are limited either geographically or to a certain altitude range, as e.g. the Convective Cloud Differential method (CCD). In the case of TROPOMI/S5P, the CCD method is used to retrieve tropospheric ozone columns in the tropics, up to 270 hPa.

The single instrument limb-nadir matching was applied for the first time with SCIAMACHY/Envisat (2002-2012). OMPS/NPP provides thus a unique opportunity to extend the time series from SCIAMACHY, in generating a consistent long-term dataset for trend analysis.

Here, we present the new OMPS tropospheric ozone dataset, generated by the limb-nadir matching technique. The dataset is validated using ozonesondes, and compared with the CCD tropospheric ozone product from TROPOMI/S5P, which flies a few minutes apart in the same orbit as OMPS.