



Satellite observations of tropospheric formaldehyde combining GOME-2 and OMI measurements.

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This work addresses the observation of tropospheric formaldehyde (H_2CO) at the global scale using multiple nadir UV sensors, in an attempt to characterize the variability and long-term changes in NMVOC emissions, related to pollution, climate and land use changes.

We present an updated version (v13) of the TEMIS formaldehyde data products retrieved from GOME-2 on METOP-A and B at mid-morning, and from OMI on AURA in the early afternoon. Consistent retrieval settings are used for all sensors following an algorithm baseline described in De Smedt et al. (2012), which is also the reference algorithm for the future TROPOMI/Sentinel-5 Precursor instrument to be launched in 2015. The satellite columns are validated using MAX-DOAS measurements in Eastern China (Xiang He), Europe (Uccle and OHP) and Equatorial Africa (Bujumbura). We show that the diurnal variation of the formaldehyde column as measured by the MAX-DOAS instruments is well reproduced by the morning and afternoon satellite measurements. This suggests that a good level of inter-sensor consistency has been achieved for H_2CO column measurements from GOME-2 and OMI. Furthermore, regional trends in the formaldehyde columns are estimated from the different satellite datasets. Common features are observed such as a decrease of the formaldehyde columns in the Amazonian forest during the last decade, or lower 2009-2011 levels of pollution-related H_2CO columns in industrialized regions.