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Total glyoxal column retrievals from GOME-2 backscattered light measurements

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Glyoxal (CHOCHO) is the smallest dicarbonyl compound. Although mainly formed as an intermediate product in the oxidation of anthropogenic, pyrogenic and biogenic non-methane volatile organic compounds (NMVOCs), it is also directly emitted from fossil fuel and biofuel combustion and during fire events. Recent laboratory studies suggest that the uptake of glyoxal by clouds and aqueous aerosols leads to the formation of secondary organic aerosols (SOA) and could possibly account for part of the large SOA source missing from the current models.

Launched in October 2006 on board of METOP-A platform, the GOME-2 instrument measures the sunlight backscattered by the Earth's atmosphere between 240 nm and 790 nm. Compared to its predecessor ERS-2 GOME, GOME-2 is characterized by an improved spatial resolution (80 km x 40 km) and by a larger scan-width of 1920 km allowing for daily quasi-global coverage. Glyoxal presents structured absorption bands in the visible region between 400 nm and 460 nm, which can be used for total column retrieval using the Differential Optical Absorption Spectroscopy (DOAS) technique.

In this work, we present preliminary results of glyoxal slant and vertical columns from GOME-2. Slant columns are converted into vertical columns by means of the radiative transfer model LIDORT, which is used for the air mass factor calculation. The inputs needed for this calculation are, in addition to the geometry, the surface albedo, the surface elevation, the cloud parameters and the glyoxal vertical profile shape provided by the global CTM IMAGES v2. Based on the complete GOME-2 data set, seasonal variations in the observed glyoxal columns are highlighted. These measurements are expected to provide better estimates of "top-down" glyoxal sources using inverse modeling techniques.