



Inter-comparison of glyoxal retrievals from MAX-DOAS during the MAD-CAT campaign

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Over the past few years the smallest α -dicarbonyl compound glyoxal (CHOCHO) has received attention in order to inform relevant atmospheric chemistry processes such as oxidative capacity and secondary organic aerosol (SOA) formation. A method to detect glyoxal in the atmosphere is through the Differential Optical Absorption Spectroscopy (DOAS) applied to solar scattered light passive remote sensing measurements on different platforms, including ground based, aircrafts, and satellites. Although these measurements are often described still many questions about DOAS fitting parameters need to be investigated. We present results from a comprehensive Multi-AXis Differential Optical Absorption Spectroscopy (MAX-DOAS) comparison effort during the Multi Axis DOAS-Comparison campaign for Aerosols and Trace gases (MAD-CAT) held at the Max Planck institute for Chemistry in Mainz, Germany with an intensive operation period from June to August 2013. We evaluate the comparison for glyoxal differential Slant Column Densities (dSCD) from 6 different research groups during the MAD-CAT campaign. The data analysis is performed following three retrieval common settings. In general, good agreement between different groups is found, especially for days with low cloud coverage. Based on the diurnal variability of the glyoxal-to-formaldehyde ratio we identified that Mainz is influenced mostly by anthropogenic volatile organic compounds (AVOC) emission type. Also, for most of the days glyoxal was often clearly above the respective detection limits. We will present results of sensitivity studies in order to know influence of the wavelength window, dependence of the NO₂ air mass factor, cross correlation with H₂O, among others. Finally, synthetic spectra created with the SCIATRAN radiative transfer model using measurement related inputs are analysed and first results are presented.