Identification of HCHO sources due to Isoprene or/and biomass burning emissions using combined HCHO and NO_2 satellite observations

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We present case studies for combined HCHO and NO_2 satellite observations, derived from GOME measurements. Launched on the ERS-2 satellite in April 1995, GOME has already performed continuous operations over 10 years providing global observations of the different trace gases. In this way, satellite observations provide unique opportunities for the identifications of trace gas sources. The satellite HCHO observations provide information concerning the localization of biogenic isoprene emissions and biomass burning (intense source of HCHO over the Amazon basin region and in central Africa). The HCHO data can be compared with NO_2 results to identify more precisely the tropospheric sources (biogenic isoprene emissions, biomass burning events, human activities). For example the HCHO emissions situated in the northern part of the Amazon basin region are not correlated with forest fires. Only the southern part of the HCHO emissions correlates with the measured forest fires and also with the NO_2 concentrations. The northern part of the Amazon basin HCHO concentrations can be attributed to biogenic isoprene emissions over the rain forest. In this case study the NO_2 emissions are mostly due to the biomass burning. We propose to use this NO_2-fires correlation through NO_2/HCHO ratios to discriminate the HCHO due to biogenic isoprene emissions from the HCHO due to biomass burning. The SCIAMACHY dataset (lauched onboard ENVISAT in 2002) complete the more than 10 year GOME dataset. The work is in progress to obtain a consistent retrieval for both instruments (e.g. same fit windows, fit parameters) in order to investigate the same case study area of the Amazon basin and over other rainforests. There seems also to be a dependence between the NO_2 emissions during biomass burning and the vegetation type: NO_2 correlate with HCHO over Africa (grassland fires) but not over Indonesia (forest fires). In south America, an augmentation of the NO_2 concentrations can be observed with the fire shift from the forest to grassland vegetation.