



Quantitative analysis of SCIAMACHY CO variability and its implication

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Carbon Monoxide is an important atmospheric trace gas. It plays a key role in the global OH budget and thus in the cleansing capacity of the atmosphere and often is also used as a tracer for pollutant transport. The satellite instrument SCIAMACHY has been measuring CO total columns for several years now, allowing to study its inter and intra-annual variability. We present a quantitative and systematic analysis of SCIAMACHY CO total column measurements for the years 2003 and 2004. SCIAMACHY CO retrievals are hampered by the presence of an ice layer on the detector. However, a detailed correction scheme has been included in the retrieval algorithm, resulting in CO total columns with a precision of 1% for monthly means under ideal circumstances (cloud free pixels, high surface albedo, spatial averaging). For lower surface albedos a precision of less than 10% is obtained. Thus, SCIAMACHY CO total column measurements are of sufficient quality to provide useful new information. Comparisons with a chemistry-transport model simulation show similar spatial patterns for the global distribution of modeled and measured CO. Quantitative comparisons of modeled and measured seasonal variations show a good agreement for very different types of seasonal cycles. Differences do occur but can be attributed to an inaccurate representation of model emissions as is e.g. confirmed by recent updates of biomass burning emission data bases.