



Global trends in tropospheric water vapor from 1995 to 2003: The GOME water vapor climatology

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We present trend analysis of total column tropospheric water vapor (WV) measured by the Global Ozone Monitoring Experiment (GOME) between August 1995 and August 2003. The GOME instrument measures WV in the visible region of the spectrum and provides total column values over all surface types in cloud free situations. Monthly mean values from GOME are therefore suitable for model evaluations of General Circulation and Chemical Transport Models (GCMs and CTMs) and for the analysis of climate change. We compare trend analysis from the GOME Water Vapor Climatology (GWC) Project (http://www1.mpch-mainz.mpg.de/~sapphire/gome_igam/) to data compiled from other satellite based sensors, like the Special Sensor Microwave Imager (SSM/I), to in situ radiosonde data from the operational network, to re-analysis data from the European Center for Medium-range Weather Forecast (ECMWF) and to model output of CTMs and GCMs. A special focus is put on the recent strong increase of water vapor above Central Europe and Scandinavia and the impact of the 1997 to 1998 ENSO event on the observed trends in different regions of the globe. The comparisons demonstrate the potential of GOME WV data to be used as a benchmark for model evaluations of the hydrological cycle.