Water vapour trends from GOME/ SCIAMACHY satellite data and global radiosonde measurements (GUAN) – An intercomparison –

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An analysis and intercomparison of trends from column integrated water vapour data, retrieved by satellite observations and radiosonde measurements, has been performed.

The global satellite water vapour time series are provided by the GOME instrument on ERS-2 (European Remote-Sensing satellite) from January 1996 to December 2002 and are extended by measurements of SCIAMACHY onboard ENVISAT (ENVironmental SATellite) up to December 2007. The combination of the two sets of data results in a long-term time series of 12 years on the basis of monthly means covering the Earth on a $0.5° \times 0.5°$ grid.

The global radiosonde data are supplied by the German Weather Service/Deutscher Wetterdienst (DWD) under the framework of the Global Climate Observing System (GCOS) and meet the high quality standards within the GCOS Upper Air Network (GUAN). Monthly mean radiosonde water vapour column data from January 1996 to December 2007 have been selected for the comparison with the satellite observations.

For the detection of trends or changes in the water vapour column over the time period of 12 years we use the same linear least square regression algorithm for all sets of data. Special emphasis is placed on the estimation of the errors and therefore the significance of the trends, which also includes the consideration of autocorrelations in

the data.