

**Seminar on Physics and Chemistry
of the Atmosphere
23.02.2018, WiSe 2017-2018, IUP Bremen**

**Global maps of water vapor trends and correlation of the
water vapor distribution to different teleconnection
indices derived from 20 years of combined GOME-
SCIAMACHY-GOME-2 observations**

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Abstract

A consistent time series of the total water vapor column from 1995 to 2015 obtained from UV/vis satellite instruments is presented (GOME-1: 1995–2003, SCIAMACHY: 2002–2012, and GOME-2: 2006–present). Although exactly the same analysis settings are used for the three instruments, still systematic differences between the different satellite instruments remain, mainly due to different ground pixel sizes, swath widths, and overpass times. To correct for these differences, we developed and applied different strategies. After validation of the derived time series the new data set is used for trend studies and comparison with model results.