

# MEASUREMENTS OF GAS-PHASE H<sub>2</sub>SO<sub>4</sub>, OH, SO<sub>2</sub> AND AEROSOL SIZE DISTRIBUTION ON MOUNT ZUGSPITZE AT THE SCHNEEFERNERHAUS: ESTIMATION OF SOURCES AND SINKS OF SULFURIC ACID

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Gas-phase sulfuric acid and OH have been measured by the novel MPI-K ULTRA-CIMS (ultra-trace gas detection by CIMS technique) at the Schneefernerhaus (2750 m asl; below the summit of Mount Zugspitze, Germany) in October 2001. These measurements were accompanied by measurements of SO<sub>2</sub> with another MPI-K CIMS instrument and aerosol size distribution measurements by DMPS (differential mobility particle sizer) operated by the Institut fuer Wasserchemie (Technische Universitaet Muenchen). In that way a data set was obtained which allows investigating major sources and sinks of sulfuric acid under relative clean conditions. H<sub>2</sub>SO<sub>4</sub> and especially OH concentrations are relatively well correlated to solar flux. Noon maximum concentrations of OH and H<sub>2</sub>SO<sub>4</sub> of  $6.5 \cdot 10^6$  and  $2 \cdot 10^6$  cm<sup>-3</sup>, respectively, were observed. The average SO<sub>2</sub> concentrations were below 20 ppt. The aerosol size distribution was obtained in 39 size ranges from 10 to 1056 nm. Typical aerosol concentrations are in the range of 400 to 1800 cm<sup>-3</sup> during the discussed period of time. An estimation of the production rate of H<sub>2</sub>SO<sub>4</sub> was inferred building on the reaction of SO<sub>2</sub> and OH, while the loss rate was calculated by considering the condensation of H<sub>2</sub>SO<sub>4</sub> on aerosol particles (Fuchs and Sutugin approach). Results of the measurements and calculations will be discussed.