



Stratospheric aerosol retrieved from SCIAMACHY measurements in limb geometry

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Satellite borne measurements improved the knowledge about the global distribution of stratospheric aerosol and its influence on the global radiation budget and the stratospheric chemistry. In addition to the ongoing debate about the effects of stratospheric aerosol on Earth's climate, details on the formation of sulphuric acid droplets are not yet understood (i.e. formation time ranges from several weeks to some hours). Although there is a variety of satellite instruments capable of retrieving aerosol abundances in the stratosphere (e.g. SAGE, OSIRIS, CALIOP), the observations are often limited to certain regions or low temporal resolutions.

Measurements in limb geometry by SCIAMACHY on EnviSat (2002 to 2012) can be used to retrieve stratospheric aerosol extinction profiles. With a resolution of 3km in altitude this data set provides information on events like the formation of Polar Stratospheric Clouds, volcanic eruptions or other highly convective processes that transport particles into the stratosphere. SCIAMACHY's unique method of alternating measurements in limb and nadir geometry provides profile and column information respectively that can be used to account for plumes with a small horizontal extent. In this work we introduce our retrieval method and show first comparison results. In two case studies we investigated a) aerosol extinction profiles of the sulphur dioxide rich eruption of the Nabro volcano during the first days after the eruption and b) aerosol extinction profiles of the stratospheric background aerosol in the polar region and how they compare to SAGE III results.