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Retrieval of stratospheric aerosol distributions from SCIAMACHY limb measurements: methodology, sensitivity studies and results

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Stratospheric aerosols play an important role for the global radiation budget and may significantly affect the retrieval of trace gases from satellite observations.
SAGE I – III provided a 25-year record of stratospheric aerosols by means of solar occultation technique. Since the demise of SAGE II and III in 2005/2006, the long-term stratospheric aerosol satellite record is jeopardized.
The main goal of this work is to demonstrate that aerosol extinction profiles can be retrieved from SCIAMACHY limb scatter measurements to sustain the time series.
Since the eruption of Pinatubo in 1991 was the last large source of volcanic aerosols in the stratosphere, we have now the opportunity to retrieve background aerosol profiles.
The radiative transfer model and retrieval package SCIATRAN is used to derive aerosol extinction profiles from SCIAMACHY limb data. The algorithm is based on a color-index ratio using limb radiance profiles at 470 nm and 750 nm wavelength.
The algorithm, sensitivity studies and results are presented here.