

Cloud detection in the upper troposphere – lower stratosphere region via ACE and GOMOS: intercomparison and analysis of the years 2004 and 2005.

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Recently, two major space occultation instruments have been put into orbit. The GOMOS (Global Ozone Monitoring by Occultation of Stars) experiment aboard the European environmental satellite Envisat is a spectrometer operating in the UV/Visible/near IR wavelength range. The Atmospheric Chemistry Experiment (ACE) was launched in August 2003 aboard the Canadian scientific satellite SCISAT-I. The main instrument on board is a Fourier Transform Spectrometer (FTS) operating from 2 to 13 micron. Aerosols and clouds are being monitored using the extinction of solar radiation at 1.02 and 0.525 micron as measured by two filtered imagers. A UV/VIS spectrometer MAESTRO (Measurement of Aerosol Extinction in the Stratosphere and Troposphere Retrieved by Occultation), was also added to the ACE mission.

Polar stratospheric clouds (PSCs) are of fundamental importance for the formation of the Antarctic ozone hole that occurs every year since the early 1980s in Southern Hemisphere spring. Despite progress in the observation, modeling and understanding of PSCs in recent years, there are still important questions which remain to be resolved e.g. PSC microphysics, composition, formation mechanisms and long-term changes in occurrence.

In addition, it has recently become clear that cirrus clouds significantly affect the global energy balance and climate, due to their influence on atmospheric thermal structure.

A PSC/cirrus detection method has been implemented for GOMOS and ACE and is validated with respect to other space born occultation measurements. We will present the results of an intercomparison between aerosol extinction, PSCs and cirrus clouds, obtained from both instruments. The cloud data are also used to examine the evolution of PSCs and cirrus clouds throughout the Arctic and Antarctic polar vortex (PSCs) and over several years (PSCs + cirrus clouds).