SCIAMACHY IN ORBIT: AN OVERVIEW OF ITS OBJECTIVES, THE FIRST YEAR AND SOME RESULTS.

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SCIAMACHY (Scanning Imaging Absorption spectroMeter for Atmospheric Char- tographY) was selected to be part of the ESA ENVISAT mission through an announce- ment of opportunity and its development is a national contribution to this mission, sup- ported by Germany, The Netherlands and Belgium. ENVISAT was launched aboard the ESA ENVISAT at the end of February 2002.

SCIAMACHY is a passive remote sensing instrument, which measures the extra ter- restrial solar radiation and light scattered, reflected and emitted from the atmosphere at different viewing geometries. It has eight spectral channels, which observe contiguously from 220 to 1750 nm, as well as in the bands 1940-2040 nm and 2265-2380 nm. These measurements are made at channel dependent spectral resolutions between 0.2 and 1.4 nm. It also has seven polarisation monitoring devices, which measure the up-welling radiation at selected wavelengths and instrument defined planes of polarisation. The combination of the PMD and channel measurements enable the instrument polarisation characteristics to be accounted for and provides some information at higher spatial resolution, which is used for the interpretation of the cloud and aerosol in the field of view.

The orbit of ENVISAT is sun synchronous, having an equator at 10.00 a.m. in a de- scending node. The measurement modes of SCIAMACHY comprise alternate limb and nadir measurements with solar and lunar occultation being, performed at the ter- minator in the northern and southern hemisphere respectively. The occultation and limb measurements extend from 0 to around 100 km, having vertical sampling at 1.5
or 3 km. The horizontal resolution of the limb and occultation measurements is approximately 240kmx400km and 30kmx400km respectively. The spatial resolution of the nadir measurements is between 30kmx30km and 30kmx240km dependent on the spectral region.

The measurements of SCIAMACHY yield directly the extra terrestrial solar irradiance and the earth shine radiance. The targets in different parts of the atmosphere include the emissions of OH, NO, and the excited states of O2, and the absorptions of O3, O2/O4, NO2, HCHO, OClO, BrO, CO, CH4, and H2O. Inversion of these observations yields the distributions and amounts of trace atmospheric constituents (trace gases, clouds and aerosol). The occultation and limb measurements yield vertical profiles, whereas the nadir observations yield total column amounts. The combination of limb and nadir observations yields the tropospheric columns.

This talk will describe the objectives of SCIAMACHY, some highlights of its first year in orbit and some results. For more details, please look at the sites http://www.iup.physik.uni-bremen.de/SCIAMACHY/ and http://www.SCIAMACHY.de