

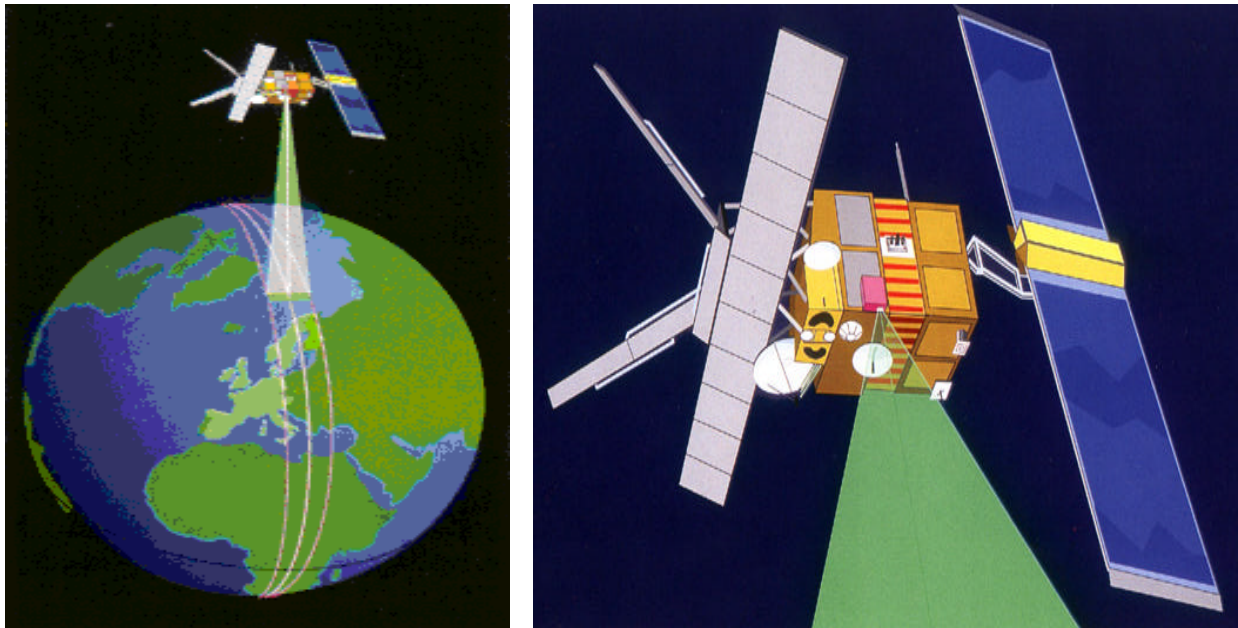
World-wide testing of SCIAMACHY data quality

Global check of atmospheric data products from the new satellite instrument SCIAMACHY with independent satellite measurements

With the new atmospheric satellite instrument SCIAMACHY (Scanning Imaging Absorption Spectrometer for Atmospheric Chartography) world wide phenomena such as the stratospheric ozone hole and the emission of greenhouse gases into the atmosphere can be investigated from space. Also the extent of anthropogenic and natural air pollution like emissions from industry, traffic, forest fires, volcano eruptions, and lightnings can be examined. SCIAMACHY is together with 9 other sensors on-board of the European environmental satellite ENVISAT, which was successfully launched by an Ariane-5 rocket at the beginning of March 2002.

The measurements of atmospheric trace gases determined from scientific space-based instruments such as SCIAMACHY require a quality control, the so-called validation. The data quality is determined by comparisons with measurements of the same trace gas products by independent techniques such as ground-based, balloon-borne, airborne or satellite instrumentation. At the Institute of Environmental Physics of the University of Bremen SCIAMACHY data products like ozone, water vapour, methane and NO₂ are globally validated by comparisons with data of the long time operating satellite instruments GOME (the Global Ozone Monitoring Experiment,

Information from the German SCIAMACHY Validation



Satellite instrument GOME (pink) on-board of ERS-2 (European Remote Sensing Satellite II)

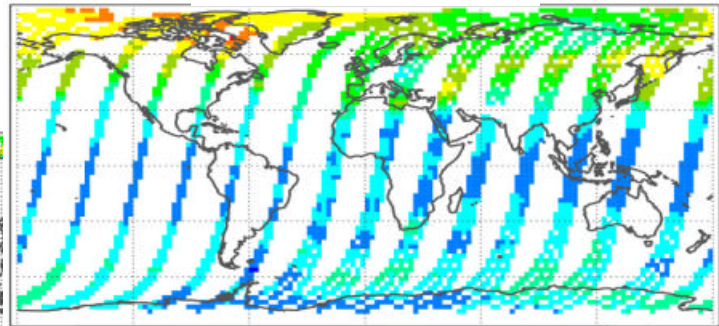
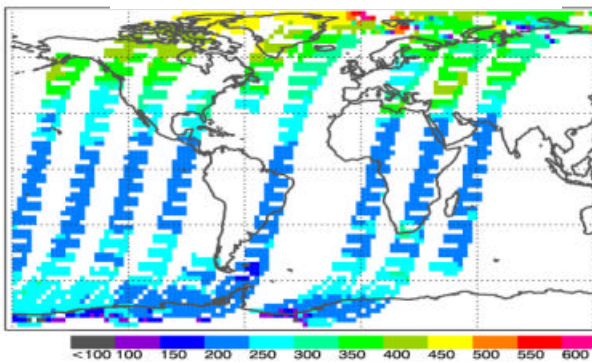
ESA) and HALOE (Halogen Occultation Experiment, NASA), POAM III (The Polar Ozone and Aerosol III Instrument, NASA), SAGE II and Gas Experiment II, NASA) and TOMS (Total Ozone Mapping Spectrometer, NASA).

The use of independent satellite measurements to validate SCIAMACHY trace gas products has the great advantage that a pole-to-pole coverage for all seasons is available and that the validation activities are not limited to a certain period and location.

Information from the German SCIAMACHY Validation

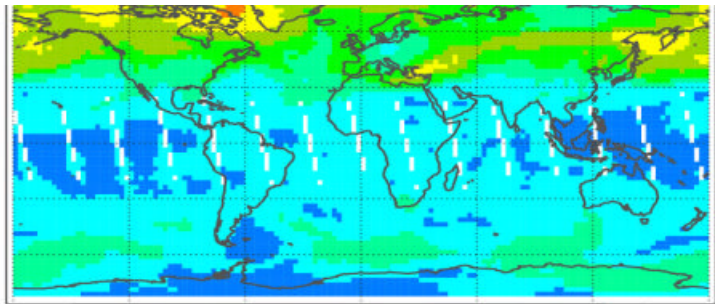
GOME 3.0

SCIAMACHY 4.0



<100 100 150 200 250 300 350 400 450 500 550 600 >650 DU

TOMS 7.0



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Ozone columns measured at 24rh of March 2003 by satellite instruments SCIAMACHY, GOME and TOMS

Within 6 days SCIAMACHY can measure everywhere in the world (if there is light) the thickness of the ozone layer. Comparisons of SCIAMACHY ozone columns measured at one day to ozone columns measured at the same time period by the satellite instruments GOME and TOMS are showing good agreement within 5%. Also comparisons to ozone and NO₂ profiles retrieved at the Institute of Environmental Physics (University of Bremen) from SCIAMACHY raw data are showing good results compared to equal measurements of the satellite sensors HALOE, POAM III and SAGE II. More information can be found at <http://www.iup.physik.uni-bremen.de/sciamachy>.