

# **RETRIEVAL OF TRACE GAS CONCENTRATIONS FROM LUNAR OCCULTATION MEASUREMENTS WITH SCIAMACHY ON ENVISAT**

L. K. Amekudzi\*(1), K. Bramstedt (1), A. Rozanov (1), H. Bovensmann (1), and J. P Burrows (1)

(1) Institute of Environmental Physics/Remote Sensing (IUP/IFE), University of Bremen, Bremen, Germany

The Scanning Imaging Absorption Spectrometer for Atmospheric Chartography (SCIAMACHY) on board the ENVISAT (Environmental Satellite) measures solar irradiance and Earthshine radiance from the UV to the NIR spectral region in nadir, limb, and lunar/solar occultation geometries. Lunar occultation measurements are performed by SCIAMACHY during local nighttime in the Southern hemisphere between 40°S to 90°S, when the phase of the moon is greater than 0.6° and end shortly after full moon. A global spectra fitting method by the differential optical depth which is part of SCIATRAN version 2.1 radiative transfer and retrieval code is used to fit NO<sub>2</sub>, ozone and NO<sub>3</sub> within the visible lunar spectral region of 430-460 nm, 520-580 nm and 615- 670 nm respectively. The stratospheric concentrations of NO<sub>2</sub>, ozone and NO<sub>3</sub> are retrieved employing the optimal estimation method. The quality of the retrieved data products have been verified by comparisons with other satellite instruments and photochemical model outputs. Very good agreements are obtained. The relative mean deviations for ozone and NO<sub>2</sub> comparisons are within -15% to +15% with the standard deviations of the relative deviations (rms) values less than 20%. The retrieved NO<sub>3</sub> profiles compared with model constrained with retrieved lunar occultation ozone and NO<sub>2</sub> show promising results with accuracy less than 30%.