



Validation of stratospheric NO₂ profiles from Odin/OSIRIS limb-scattered sunlight measurements

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Number density profiles of NO₂ are retrieved from Odin/OSIRIS limb-scattered sunlight measurements using Optimum Estimation and Differential Optical Absorption Spectroscopy in the 435-451 nm window. Theoretical estimations show that a 2 km vertical resolution is achievable between 15 and 40 km with an uncertainty of about 10%. The coverage is near global except for the winter hemisphere. This work covers the validation of this data set to other space borne measurements.

The mean and standard deviations of the differences between OSIRIS NO₂ profiles and coincident POAM and SAGE solar occultation NO₂ measurements are presented, based on all available data from August 2001 to December 2004. The coincidences are sub-categorized into mid and high latitudes as well as summer fall, winter and spring comparisons.

Deviations in local solar time of the coincident measurements can affect any validation since the NO₂ density is a function of the incoming solar radiation. This is particularly true for OSIRIS comparisons due to Odin's near terminator orbit. To compensate for this, the OSIRIS NO₂ profiles are scaled to the corresponding solar zenith angle of POAM or SAGE using a tabulated chemistry model (PRATMO).