



## **Time Resolved Profiling of Stratospheric Radical Species by Balloon-borne Skylight Limb Observations**

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A newly developed balloon-borne spectrometer performing skylight observations in limb geometry was deployed for the first time at low latitudes in north-eastern Brazil (5° S, 43° W) in June 2005. Absorption spectra of UV/vis absorbing trace gases were measured from different balloon platforms (LPMA/DOAS, MIPAS, LPMA/IASI) in the upper troposphere and lower stratosphere. The instrument provides time-resolved profile information of atmospheric trace gas species such as O<sub>3</sub>, NO<sub>2</sub>, BrO, OCIO, IO, and OIO by limb scanning through the atmosphere in cycles of typically 15 minutes duration. The measured spectra are analysed applying the differential optical absorption spectroscopy (DOAS) method. When combined with 3D-radiative transfer modeling and an optimal estimation inversion technique, stratospheric concentration profiles of the targeted trace gases can be inferred for each limb scan [Weidner *et al.*, 2005].

From different balloon flights we have measurements covering the whole day from sunrise to sunset, hence we use the observed increase in daytime NO<sub>2</sub> profiles in the stratosphere to study the photolytic lifetime of N<sub>2</sub>O<sub>5</sub> which is the major NO<sub>y</sub> species in the tropical stratosphere (> 25 km) at night time.