



Inorganic iodine in the tropical upper troposphere and lower stratosphere as derived from balloon-borne solar occultation observations

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The budget and photochemistry of iodine is assessed in the tropical Upper Troposphere/ Lower Stratosphere (UT/LS) where the halogen source gases enter the stratosphere and supply the stratosphere with halogen species. Two stratospheric balloon flights of the LPMA/DOAS (Limb Profile Monitor of the Atmosphere/Differential Optical Absorption Spectrometer) payload were performed from a tropical station in north-eastern Brazil (5°S, 43°W) in June 2005 and June 2008. The LPMA/DOAS payload conducted spectroscopic direct sun measurements in the UV/visible and infrared spectral range during balloon ascent/descent and in solar occultation geometry. Here we focus on the outcome of the occultation measurements during sunrise and sunset.

The DOAS observations allow for the retrieval of IO and OIO from their absorption features in the visible spectral range. Neither species could be detected unambiguously with detection limits ranging between 0.01 and 0.2 ppt in the UT/LS. Constraining a stratospheric chemistry model by the inferred detection limits for IO and OIO, yields an upper limit for I_y of 0.1 to 0.3 ppt.