Climatology from SOIR measurements in the upper atmosphere of Venus

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Previous measurements of the Venus atmosphere were performed essentially in the mesosphere below 100 km and below the clouds. Information about minor atmospheric constituents, their concentrations, reactions, sources and sinks is incomplete, as for example only scarce measurements have been performed above 100 km altitude. The SOIR instrument is designed to measure atmospheric transmission at high resolution (0.12 cm^{-1}) in the IR (2.2–4.3 μm) using solar occultation. It therefore allows the derivation of unique information about the vertical structure and composition of the Venus mesosphere.

The primary source of CO in the atmosphere of Venus is the photo-dissociation of CO_2 by solar ultraviolet radiation at altitudes higher than 120 km. It has been shown that CO exhibits a significant diurnal variation and strong year to year variation, but also latitudinal variations.

CO concentration and volume mixing ratio between 80 and 120 km have been retrieved from SOIR data for both terminators. We will present an overview of the CO measurements obtained by the SOIR instrument over the last 4 years in order to complete the climatology of CO above the clouds in the atmosphere of Venus.

Halogen acids, such as HCl and HF, are also present in the Venus atmosphere, and are routinely derived from the SOIR spectra. A compilation of the data will be presented.