



Mesospheric composition of Venus from SOIR/VEX observations

Ann Carine Vandaele (1), Arnaud Mahieux (1), Rachel Drummond (1), Séverine Robert (1), Valérie Wilquet (1), and Jean-Loup Bertaux (2)

(1) Belgian Inst. for Space Aeronomy, Planetary Aeronomy, Bruxelles, Belgium (a-c.vandaele@aeronomie.be), (2) LATMOS, 11 Bd d'Alembert, 78280 Guyancourt, France

The wavelength range probed by SOIR/VEX allows a detailed chemical inventory of the Venus atmosphere. Several trace gases, such as H₂O/HDO, HF, HCl, CO, or SO₂, are observed together with CO₂, leading to the derivation of their vertical density profiles. Temperature and total density profiles are deduced from the CO₂ density profiles and VMR are obtained for all trace gases.

The measurements all occur at the Venus terminator, morning and evening sides, covering all latitudes from the North Pole to the South Pole. The vertical resolution is between 100 and 500 m in the Northern hemisphere, and is poorer at southern latitudes (between 1 and 2.5 km). The typical vertical extent of the profiles ranges from 70 to 120 km (for CO₂ : from 70 to 170 km), encompassing thus the mesosphere and the lower thermosphere of the planet. The Venus atmospheric region probed by SOIR is very special as it acts as a transition region between two distinct dynamical regimes characterized by different flow patterns: the zonal retrograde flow below 70 km and the subsolar to antisolar circulation above 100 km. Some of the detected trace gases play important roles in the chemistry of the atmosphere. The study of CO, being mainly produced through the photodissociation of CO₂ at high altitudes by solar ultraviolet radiation, can lead to significant information on the dynamics taking place in this region.

Results from SOIR observations of trace gases will be presented and discussed. We will report and analyze short and long term time variations. The latitudinal dependency will also be investigated.