

Venus chemical composition from Venus Express observations

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I will try to summarize the new findings about the composition of the atmosphere of Venus derived from Venus Express observations, mainly from VIRTIS and SPICAV/SOIR instruments. These findings will be confronted with other sources of recent ground based measurements, i.e. microwave data and high resolution spectroscopy in the middle infrared.

The natural emissions of NO and O₂ detected respectively by SPICAV in the UV and at 1.27 μm will only be covered briefly. A new emission of OH radical is reported by VIRTIS, while ozone has been identified by SPICAV for the first time in the atmosphere of Venus, using solar occultations.

The new measurements of water vapor from the lower atmosphere (both from VIRTIS and SPICAV/NIR) will be discussed. Other measurements of H₂O are made in nadir viewing near the cloud top at 1.38 μm, while SOIR recorded H₂O and HDO vertical profiles from 80 to 100 km. These are showing low variations, at contrast with microwave measurements of HDO, which reported strong variations at a month-year time scale. New measurements of HDO from ground based spectroscopy (Krasnopolsky) will be reported.

New measurements of CO in the mesosphere in solar occultations provided by SOIR will be discussed; CO is an excellent tracer of the dynamics from thermosphere to mesosphere and below, since it is produced in the thermosphere.

The case of OCS will be reviewed shortly; measurements of SO₂ are coming from SPICAV UV nadir viewing on the dayside, and from solar occultations both on the IR with SOIR and with SPICAV UV, which revealed a new layer of SO₂ at high altitude (around 100 km); The possible origin of this layer will be discussed. In nadir viewing, there are important variations with time and latitude. There is also a pronounced variation with local time, with more SO₂ in the morning than in the afternoon, as a consequence of photo-dissociation. There seem to be more SO₂ than at the end of PVO results in 1988; a possible indication of some variations in the atmospheric regime of Venus with time scales of months years.