



SPICAV/SOIR investigation of the upper atmosphere of Venus

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SPICAV (**S**pectroscopy for the **I**nteraction of the **C**haracteristics of the **A**tmosphere of **V**enus) is a suite of three spectrometers in the UV and IR range with a total mass of 12.3 kg flying on Venus Express orbiter, dedicated to the study of the atmosphere of Venus from ground level to the outermost hydrogen corona at more than 40,000 km. The UV spectrometer (118 - 320 nm, resolution 1.5 nm) has detected on the night side, the γ and δ bands of NO. In the stellar occultation mode the UV sensor is measuring the vertical profiles of CO₂, temperature, SO₂, SO, clouds and aerosols. So far, star occultations on the night side indicates a higher temperature than predicted by the VIRA model and an aerosol horizontal opacity of 1 at 90 km altitude, with a haze extending up to 104 km.

The SPICAV VIS-IR sensor (0.7-1.7 μ m, resolution 0.5-1.2 nm) employs a pioneering technology: acousto-optical tunable filter (AOTF). On the night side, it measures the thermal emission peeping through the clouds. In solar occultation mode this channel permits to study the vertical structure of H₂O, CO₂, and aerosols.

The SOIR spectrometer is a new **S**olar **O**ccultation **I**R spectrometer in the range $\lambda=2.2-4.3 \mu$ m, with a spectral resolution $\lambda/\Delta\lambda >15,000$, the highest on board Venus Express (VEX). This new concept includes a combination of an echelle grating and an AOTF crystal to sort out one order at a time. A number of solar occultations were performed in various wavelength domains, allowing the measurement of HDO,

H₂O, HCl and CO₂ vertical profiles. It should allow to derive the escape of D atoms from the upper atmosphere and give more insight about the evolution of water on Venus.