

# First results from VIRTIS on Venus Express

## 2. Radiative transfer and atmospheric modelling

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The VIRTIS observations of Venus will provide information on various levels into the atmosphere. The atmosphere above the cloud will be observed by Venus Express both on day and night side, in solar reflection and thermal emission, with different type of radiative transfer models adapted to the different atmospheric domains.

Limb observations are expected to give access to mesospheric CO<sub>2</sub> and CO emissions, through fluorescence observations : non-LTE modelling of CO<sub>2</sub> and CO bands will constrain the physical parameters of these layers.

Spectroscopy of the 4-5 micron range with VIRTIS-M and -H channels will give access to thermal structure retrieval, and cloud structure at the 60-90 km altitude levels.

Finally, the deeper atmospheric windows, limited by CO<sub>2</sub> and H<sub>2</sub>O bands are accessible only in thermal emission on the night side. The sounded levels at 2.3, 1.7  $\mu\text{m}$  are limited respectively to 30-20 km altitude, when at shorter wavelength (1.18, 1.10, 1.01, 0.9 and 0.85  $\mu\text{m}$ ), the hot surface of Venus is seen through the scattering clouds. Atmospheric modelling is therefore the key to decrypt the mysteries of Venus, by ultimately removing atmospheric contributions to search for possible variations of surface emissivity.

Results on the different types of atmospheric contributions observed by VIRTIS will be shown, if the Venus Express mission permits.