

## **Near-infrared observations of Titan from ground and space-based observatories**

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By applying spectroscopy and imaging in specific narrow absorption-free windows in the near-infrared, it is possible to probe down to the lower atmosphere and the surface of Titan. We carried out several spectroscopic observations (between 1991 and 2002), between 0.8 and 2.5 micron, with the Fourier Transform Spectrometer (FTS) at the Canada France Hawaii Telescope (CFHT) and the Infrared Spectrometer And Array Camera (ISAAC) at the ESO Very Large Telescope (VLT). This data set allows us to explore six methane windows at 0.83, 0.94, 1.07, 1.28, 1.58 and 2 micron at different longitudes and resolutions. We also used the Short Wave Spectrometer (SWS) and the photo-polarimeter ISOPHOT of ISO (in 1997) to uncover the methane window at 3 micron. Due to the CO<sub>2</sub> telluric feature only part of this window has been observed from the ground. Our data give access to the methane abundance, the haze parameters and the surface composition (Negrão et al., 2004; Coustenis et al., 2005). These observations complement data taken near the 5 micron window (Lellouch et al., 2003) and taken together give a strong insight on Titan's troposphere and surface. In order to characterize the lower atmosphere's profile and detect particular surface composition components, we analysed the data by applying a microphysical and radiative transfer model, with fractal haze particles (Rannou et al., 2003) and varying several atmosphere and surface parameters. Such information from the ground is still very useful for completeness and interpretation of the recent Cassini-Huygens mission's recordings.

## **References**

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