



The dual UV-near IR spectrometers of SPICAM : overview of scientific results.

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SPICAM, a light-weight (4.8 kg) UV-IR dual spectrometer on board Mars Express orbiter, is dedicated primarily to the study of the atmosphere of Mars. The UV imaging spectrometer (118 - 320 nm, resolution 1 nm, intensified CCD) was designed primarily to atmospheric vertical profiling by stellar occultation. The near-IR channel is a 800-g acousto-optic tunable filter (AOTF)-based spectrometer operating in the spectral range of 1-1.7 μm with resolving power of ~ 1700 for water vapor retrieval at 1.38 μm .

We will review a number of original findings made by SPICAM during 2004:

- vertical profiles of density/temperature of CO_2 (20-150km) by solar and stellar occultations. About 1 or 2 profiles are obtained each day, with the objective of consolidation of climatic models needed for aerocapture, aerobraking, and EDL (Entry, Descent, Landing).
- numerous vertical profiles of ozone (only one was recorded before by Phobos mission) and cloud layers.
- the systematic measurement of total vertical ozone along track on the dayside, from its UV absorption imprinted in the solar light scattered by the ground and atmosphere and from 1.27 μm O_2 $^1\Delta$ emission.
- the first simultaneous measurements of ozone and water vapour (with IR channel) from an orbiter.
- the discovery of a new population of small particles ($r_{eff} < 0.15 \mu\text{m}$) in the atmo-

sphere of Mars, both from occultations and from day side limb emission.

- the discovery of nightglow NO bands in UV and implications for atmospheric transport.

- the first measurement of H₂O and CO₂ ices albedo spectrum

- the detection of an absorption feature in the normal reflectance of Phobos around 220 nm, mimicking the famous organic interstellar dust signature.

- a search for auroral activity near the crustal remnant magnetic field, and thorough study of the ionosphere-upper atmosphere through high-altitude aeronomical observations.