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NOMAD/UVIS Sensitivity investigation for Mars observations

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The UVIS instrument is part of NOMAD, the "Nadir and Occultation for MArs Discovery" spectrometer suite has been selected by ESA and NASA to be part of the payload of the ExoMars Trace Gas Orbiter mission 2016. This instrument suite will conduct a spectroscopic survey of Mars' atmosphere in the UV, visible and IR regions. UVIS's observation modes include solar occultation, nadir and limb observations. The nadir mode will provide detailed trace gas mapping

UVIS is an ultraviolet and visible spectrometer (200 – 650 nm) whose main objective is to detect and quantify trace gases' concentrations but also to study aerosols present in the Martian atmosphere.

The main absorbing trace gas in the wavelength range of UVIS is ozone which has already been extensively studied but for which there are still significant discrepancies in present day observations. The high signal-to-noise ratio of the instrument will allow us to measure ozone more precisely. Moreover the instrument could also detect other minor constituents that absorb in this wavelength range, such as SO_2 if present. Because aerosols play a major role in the radiative transfer on the red planet, we also plan to investigate the different characteristics of the interaction between aerosols and UV-visible light.

The UVIS instrument and its capabilities will be presented. The results of a sensitivity study on the detectability of minor constituents will be shown and discussed.

NOMAD is being built by a European consortium led by IASB-BIRA (Belgium) and IAA (Spain), with contributions from OU (UK) and IFSI (Italy).