



Observations and ongoing calibration of the infrared channels of NOMAD on ExoMars Trace Gas Orbiter

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NOMAD is a three-channel spectrometer on the ExoMars 2016 Trace Gas Orbiter, which has been operating around Mars since April 2018 [1]. NOMAD contains two infrared channels: SO, which operates in solar occultation mode; and LNO, which operates primarily in nadir mode, but can also measure limbs, solar occultations, Phobos and Deimos.

In the past four years of science operations, SO has taken over 35 million solar occultation spectra, whilst LNO has taken 2.8 million nadir spectra of Mars. Recently, we have started observing Phobos and Deimos in the infrared, and work is currently ongoing to calibrate the spectra and the geometry [2] of the observations. Work is also ongoing to improve the radiometric calibration of LNO, using the latest data, and also to calibrate the Acousto-Optic Tuneable Filter (AOTF) and diffraction grating in the same manner as was done for SO [3,4]. We are investigating the removal of systematic noise and binning multiple spectra to improve the SNR of the SO channel, which will allow us to improve retrievals of temperature/pressure from CO₂ [5,6], H₂O [7,8], HDO [3] CO [9,10], HCl [11] and the detection limits of trace gases [12] in Mars' atmosphere.

References

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