CO2 catalogue from SOIR on board Venus Express

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The SOIR instrument performs solar occultation measurements in the IR region (2.2 - 4.3 \(\mu\)m) at a resolution of 0.12 cm\(^{-1}\), the highest on board Venus Express. It combines an echelle spectrometer and an AOTF (Acousto-Optical Tunable Filter) for the order selection.

The wavelength range probed by SOIR allows a detailed chemical inventory of the Venus atmosphere above the cloud layer (65 to 150 km) with an emphasis on vertical distribution of the gases. In particular, measurements of CO2 vertical profiles have been routinely performed. Its isotopologues have also been studied. The detection of the up to then unobserved 01111-00001 absorption band of 12C16O18O \([1, 2]\) initiated a extensive and systematic search of other such unobserved CO2 bands.

Here we report the detection of several new absorption bands of different isotopologues of CO2 as observed by SOIR on board the Venus Express mission.