



A search for SO₂ on Mars from ground-based infrared spectroscopy

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In spite of the discovery of sulfur-bearing molecules at the surface of Mars by the Viking lander and the Opportunity rover, no gaseous sulfur-bearing species have ever been detected in the Martian atmosphere. Recently, stringent upper limits of 1 ppb (Krasnopolsky, 2005) and 2 ppb (Nakagawa et al. 2009) have been reported using infrared spectroscopy and heterodyne submillimeter spectroscopy respectively. We have performed a search for SO₂ in the Martian atmosphere in October 2009 ($L_s = 352^\circ$) using the TEXES imaging spectrometer at the Infrared Telescope Facility in the 7.3-7.4 micron spectral range. This instrument has the advantage of combining a high spectral resolving power ($R=80000$) and a good spatial resolution (about 1 arcsec after convolution). Strong SO₂ transitions are present in the 1350–1375 cm⁻¹. No individual transition could be identified. A preliminary analysis shows that co-adding the spectra on ten strong transitions allows us to reach an upper limit of 1 ppb or better on selected areas of the Martian disk. These results will be analysed and their implications will be discussed.