

THE SOLEIL VIEW ON SULFUR OXIDES: THE S₂O BENDING MODE ν_2 AT 380 cm⁻¹ AND ITS ANALYSIS USING AN AUTOMATED SPECTRAL ASSIGNMENT PROCEDURE (ASAP)

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The fundamental vibrational bending mode ν_2 of disulfur monoxide, S₂O, and the associated hot band $2\nu_2 - \nu_2$ have been observed at high spectral resolution for the first time at the SOLEIL synchrotron facility using Fourier-transform far-infrared spectroscopy. This transient species has been produced using a radio-frequency discharge by flowing SO₂ over elemental sulfur. The spectroscopic analysis has been performed using an Automated Spectral Assignment Procedure (ASAP) which has enabled the accurate determination of more than 3500 energy levels of the $\nu_2 = 1$ and $\nu_2 = 2$ vibrational states. In addition to the high-resolution synchrotron study, pure rotational spectra of S₂O in the $\nu_2 = 1$ and 2 vibrational states were observed in the frequency range 250 – 500 GHz in a long-path absorption cell.