

## TERAHERTZ ROTATIONAL SPECTROSCOPY OF THE SO RADICAL

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We have recorded pure rotational transitions of SO in the THz spectral range using synchrotron-based Fourier-Transform (FT) FIR and continuous wave (CW) THz techniques.

A FT-FIR spectrum of SO has been recorded at the AILES beamline of SOLEIL synchrotron in the spectral range 44–93  $\text{cm}^{-1}$  using a resolution of 0.001  $\text{cm}^{-1}$  allowing an accuracy on line position of 0.00007  $\text{cm}^{-1}$  ( $\sim 2$  MHz). A multipass absorption discharge cell aligned to an absorption path length of 24 m has been used<sup>a</sup>. A continuous electrical discharge (1 A / 980 V) in a flowing mixture of H<sub>2</sub>S, He, H<sub>2</sub> and air (respectively at pressure of 0.01, 1.15, 0.14 and 0.06 mbar) was used to produce SO. On this spectrum, 102 transitions of SO have been identified with  $N = 31$  to 65. Among the observed lines, 99 are detected for the first time (22 new transitions belong to the HIFI spectral windows). Due to our limited instrumental resolution, transitions involving  $N$  ranging from 31 to 43 show unresolved fine structure triplets.

Recently, in order to observe all fine structure components in the HIFI spectral windows, we have recorded a high resolution CW-THz spectrum of SO<sup>b</sup>. At the time of the writing, this spectrum was under analysis.

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<sup>a</sup>M. A. Martin-Drumel *et al.*, *Rev. Sci. Instrum.* 82, 113106 (2011)

<sup>b</sup>S. Eliet *et al.*, *J. Mol. Struct.* 1006, 13 (2011)