

NEW DATA AND ANALYSIS FOR SF₆ ABSORPTION MODELLING IN THE 10 MICRON ATMOSPHERIC WINDOW

MBAYE FAYE, , *LISA CNRS et Universités Paris Est et Paris Diderot , Creteil, France*; VINCENT BOUDON, MICHEL LOETE, CYRIL RICHARD, *Laboratoire ICB, CNRS/Université de Bourgogne, DIJON, France*; P. ROY, *AILES beamline, Synchrotron SOLEIL, Saint Aubin, France*; LAURENT MANCERON, *AILES Beamline, Synchrotron SOLEIL, Saint-Aubin, France*.

Modelling correctly the SF₆ atmospheric absorption requires the knowledge of the spectroscopic parameters of all states involved in the many hot bands in the 10 μm atmospheric window used for remote sensing. Since a direct analysis of the hot bands near the ν₃ absorption of SF₆ in this atmospheric window is not possible, due to their overlapping, we use another strategy, gathering information in the far and mid infrared regions on initial and final states to compute the relevant total absorption. In this talk, we present new results of an analysis of spectra recorded at the AILES beam line at the SOLEIL Synchrotron facility. For these measurements, we used an IFS125HR interferometer in the 100 to 3200 cm⁻¹ range, coupled to a cryogenic multiple pass cell. The optical path length was varied from 45 to 141 m with 223 and 153 K temperatures. New information has been obtained on the ν₃ + ν₅ band which, combined with improved parameters for ν₅, is used to model the important ν₃+ν₅ - ν₅ hot band contribution [1]. Also, data have been obtained on the ν₃ band of the ³⁶SF₆ isotopic species present in very low abundance (0.0002) [2]. These new parameters will be included in the XTDS model [3] and VAMDC/SheCaSDa database [4], thus improving the previous SF₆ parameters.

[1] M. Faye, L. Manceron, P. Roy, V. Boudon, M. Loete, "First analysis of the ν₃+ν₅ combination band of SF₆ observed at Doppler-limited resolution and effective model for the ν₃+ν₅-ν₅ hot band" *J. Mol. Spectrosc.*, in press.

[2] M. Faye, L. Manceron, P. Roy, V. Boudon, M. Loete, "First high resolution analysis of the ν₃ band of the ³⁶SF₆ isotopologue", *J. Mol. Spectrosc.*, in press.

[3] C. Wenger, V. Boudon, M. Rotger, M. Sanzharov, and J.-P. Champion, "XTDS and SPVIEW: Graphical tools for Analysis and Simulation of High Resolution Molecular Spectra", *J. Mol. Spectrosc.* 251, 102 (2008).

[4] <http://vamdc.icb.cnrs.fr/PHP/shecasda.php>