ANALYSIS OF THE FIRST AND SECOND TRIADS OF H_2S FROM 2200 TO 4100 CM^{-1}

L. R. Brown, J. A. Crisp, D. Crisp, *Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Drive, Pasadena, California 91109*; A. Perrin, *Laboratoire de Physique Moléculaire Applications CNRS, Université Pierre et Marie Curie Bte 76, 4 Place Jussieu 75252 Paris Cedex 05, France*; A. D. Bykov, O. V. Naumenko, M. A. Smirnov and L. N. Sinitsa, *Institute of Atmospheric Optics, SB, Russian Academy of Science, 634055, Tomsk, Russia.*

The 1800 - 5400 cm^{-1}region of H_2S was recorded at 0.011 cm^{-1}resolution using the McMath Fourier transform spectrometer located at Kitt Peak National Observatory. The positions of the first triad [$2\nu_2$, ν_1 and ν_3] near 4 μm and the second triad [$3\nu_2$, $\nu_1+\nu_2$ and $\nu_2+\nu_3$] near 2.7 μm were obtained for $H_2{}^{32}S$, $H_2{}^{34}S$ and $H_2{}^{33}S$. The experimental upper states were fitted to the A-reduced Watson Hamiltonian to determine precise sets of rotational constants and Fermi and Coriolis coupling parameters. Line intensities of $H_2{}^{32}S$ up to $J = 17$ and $K_a = 12$ were measured and modelled to $\pm 2.5\%$ using the 564 intensities of the first triad and 526 intensities of the second triad. The coefficients of the transformed moment expansion were obtained, corresponding to band strengths in cm^{-2}/atm at 296 K of: 0.33 for $2\nu_2$, 0.45 for ν_1 and 0.12 for ν_3, 0.03 for $3\nu_2$, 1.82 for $\nu_1+\nu_3$ and 2.87 for $\nu_2+\nu_3$.

Part of the research reported in this paper was performed at the Jet Propulsion Laboratory, California Institute of Technology, under contract with the National Aeronautics and Space Administration.