HIGH-RESOLUTION SPECTROSCOPY AND ANALYSIS OF THE $\nu_3/2\nu_4$ DYAD OF CF_4

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CF_4 is a strong greenhouse gas of both anthropogenic and natural origin[a]. However, high-resolution infrared spectroscopy of this molecule has received only a limited interest up to now. The public databases only contain cross-sections for this species, but no detailed line list. We reinvestigate here the strongly absorbing ν_3 region around 7.3 μm. Two new Fourier transform infrared spectra at a 0.003 cm^{-1} resolution have been recorded: i) a room-temperature spectrum in a static cell with a 5 mb pressure and ii) a supersonic expansion jet spectrum at a 15 K estimated temperature. Following the work of Gabard *et al.*[b], we perform a simultaneous analysis of both the ν_3 and $2\nu_4$ bands since a strong Coriolis interaction occurs between them, perturbing the ν_3 R-branch rotational clusters around $J = 20$. As in Ref. **??**, we also include $\nu_3 - \nu_3$ microwave data in the fit. The analysis is performed thanks to the XTDS and SPVIEW programs[c]. Compared to Ref. **??**, the present work extends the analysis up to higher J values (56 instead of 32). Absorption intensities are estimated thanks to the dipole moment derivative value of D. Papoušek *et al.*[d] and compare well with the experiment. The rotational energy surfaces for the $\nu_3/2\nu_4$ dyad are also examined in order to understand the distribution of rovibrational levels.

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