ACETALDEHYDE: INTO THE SUBMILLIMETER

BRIAN J. DROUIN, HERBERT M. PICKETT, *Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109-8099*.

Acetaldehyde is an abundant interstellar species with a rich and complex rotational/torsional spectrum. Kleiner[a] produced an analysis of predominantly cm and mm wavelength data that has provided comprehensive predictions for ground-based astronomy. The relatively untapped potential of submillimeter astronomy will soon be realized through airborne and space platforms, and thus an extension of the spectroscopic knowledge for known interstellar species is required. The submillimeter spectrum of acetaldehyde (420 - 640 GHz, 770-930 GHz) has been measured at room-temperature using the JPL mm/submm spectrometer, the spectra contain more than 18000 transitions with S/N > 10. An Internal Axis System (IAS) constructed with IAMCALC for SPFIT has reproduced the analysis (gs and 1st two torsions) of Kleiner, and further assignment of new spectra has begun. The IAMCALC/SPFIT programs allow extensions of the torsion-rotation Hamiltonian in all of the fundamental operators P^2, P_c^2, $\frac{1}{2}(P_+^2 + P_-^2)$, P_aP_b, P_ap_α, p_α^2 and $1 - cos(3\alpha)$ and traces the dipole vector through the IAS producing Fourier coefficients of the dipole function that may lead to improved intensity predictions in the millimeter and submillimeter spectra.

[a] I. Kleiner, F. J. Lovas, M. Godefroid *J. Phys. Chem. Ref. Data*, **25(4)** p. 1113, 1996