INTERACTION BETWEEN VIBRATIONS AND INTERNAL ROTATION IN S_1 M-FLUOROTOLUENE AS SEEN IN THE S_1-S_0 SPECTROSCOPY

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In support of IVR studies in m-fluorotoluene, a detailed picture is being constructed of the vibrational and internal rotation level structure for the lower 430 cm^{-1} of the S1 state. Particular emphasis is given to Fermi resonances involving interactions between internal rotation and vibration. The information is derived from cold jet S_1-S_0 spectroscopy with abundant use of dispersed single vibronic level fluorescence (SVLF). Seventy-five levels involving internal rotation as well as eight modes occurring as fundamentals, overtones and combinations occur with known zero order identities in the energy region. Of these, twenty-six have been pumped for examination by SVLF spectroscopy. Clear evidence for numerous level interactions appears in the spectra. The details are now being worked out.