FAST SCAN SUBMILLIMETER SPECTROSCOPIC TECHNIQUE (FASSST)

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The Fast Scan Submillimeter Spectroscopic Technique (FASSST)[a,b] takes advantage of the strong maximum in the interaction strength between electromagnetic radiation and molecular systems in the millimeter and sub-millimeter wave range. This system allows the user to access unprecedented amounts of high resolution spectral data in a very short time. The wealth of information contained in a rotational spectrum in this spectral range calls for new approaches to recording and handling the spectroscopic data. The exploitation of current computer hardware allows previously unfeasible modes of both data acquisition and data reduction. High sensitivity, broad spectral coverage, rapid data acquisition, high accuracy of frequency calibration and simplicity of the system make FASSST the technique of choice for a wide variety of spectroscopic and analytical applications. The technological simplicity of the FASSST spectrometer is complemented by an extensive suite of programs developed for calibration and handling of the spectroscopic data. The simultaneous assignment and analysis package CAAARS (Computer Aided Assignment of Asymmetric Rotor Spectra) provides an integrated procedure to simplify and speed up spectral analysis. CAAARS combines visual, interactive, mouse-assisted line assignment with real-time fitting of the assigned transitions to the spectroscopic constants of a standard or customized ro-vibrational Hamiltonian. The system architecture of the FASSST spectrometer as well as the CAAARS package will be discussed.

[a] D.T., Petkie, T.M. Goyette, R.P.A. Bettens, S.P. Belov, S. Albert, P. Helminger, and F.C. De Lucia,Review of Scientific Instruments, 1997. 68: p. 1675-1683.

[b] I., Medvedev, M. Winnewisser, F.C. De Lucia, E. Herbst, E. Bialkowska-Jaworska, L. Pszczolkowski, and Z. Kisiel, Journal of Molecular Spectroscopy, 2004. 228 (2): p. 314-328.