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New sources and software for submillimeter spectroscopy

Brian James Drouin¹, Edward A. Cohen¹, John C. Pearson¹, Charles E. Miller², and Herbert M. Pickett¹. (1) Microwave, Millimeter and Submillimeter Spectroscopy Laboratory, California Institute of Technology, Jet Propulsion Laboratory, 4800 Oak Grove Dr, M.S. 183-301, Pasadena, CA 91109, Fax: 818-354-8460, bjd@spec.jpl.nasa.gov, (2) Department of Chemistry, Haverford College

Recent modifications to the JPL submillimeter spectrometer have improved data collection and manipulation. Phase-locked BWO's operating between 120-190 and 530-680 GHz have greatly increased the sensitivity in these regions as shown by measurement of isotopic and high vibrational states of halogen monoxides. Complimentarily, multiplier chains incorporating a state-of-the-art antiparallel planar Schottky diode pair odd-harmonic multiplier have been demonstrated to be viable sources for directly synthesized submillimeter radiation in the 500-900 GHz range. This allows unassisted scanning of extended spectral regions (10 GHz/scan) with a greatly simplified experimental design. Software has also been developed for the analysis of large data sets and for interfacing with the JPL Microwave, Millimeter and Submillimeter Spectral Line Catalog. The advantages of these techniques are demonstrated in applications to complex molecular spectra.

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