

Abstract Submitted
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Recent advances in coherent sub-THz spectroscopy in pulsed molecular beams LIAM DUFFY, University of North Carolina at Greensboro — While sub-THz/THz solid state multipliers afford outstanding resolution, rapid frequency sweeping has been problematic. In order to sweep via FM modulation the microwave synthesizer phase-lock is turned off and hence the frequency calibration is lost. One way around this, as advanced in the FASSST scan technique, is to sweep the frequency rapidly and use post-scan frequency calibration via cavity mode markers. Over the last year, we have implemented a slow version of the FASSST scan method that piecewise sweeps small portions of the spectrum (60 MHz / 100 usec / gas pulse at 300 GHz). Drift and calibration issues are removed by simply using the computer-synthesizer interface to frequently reset the frequency before it has time to change. This method, when combined with the ability to subtract sweeps with and without gas and/or laser photolysis, allows background free spectra. The technique is particularly useful in searching for the absorption features of transient vibrationally and/or electronically excited products that are difficult to observe in gas cell studies. Avoiding drift in this way also allows FM modulation to be used in coherent pulse type experiments where molecules are coherently prepared in rotational superposition states prior to scattering.

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