

AN 18-26 GHz SEGMENTED CHIRPED PULSE FOURIER TRANSFORM MICROWAVE SPECTROMETER FOR ASTROCHEMICAL APPLICATIONS

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In the past decade, astrochemistry has seen an increase in interest. As higher throughput and increased resolution radio astronomy facilities come online, faster laboratory instrumentation that directly covers the frequency ranges of these facilities is needed. The 18-26 GHz region is of interest astronomically as many cold organic molecules have their peak intensity in this region. We present here a new segmented chirped pulse Fourier transform microwave (CP-FTMW) spectrometer operating between 18-26 GHz. Using state-of-the-art digital electronics and the segmented approach[1], this design has the potential to be faster and cheaper than the previously presented broadband design. Characterization of the instrument using OCS will be presented, along with a comparison to the previously built and optimized 18-26 CP-FTMW built at the University of Virginia. It will be coupled with a discharge nozzle[2], and its applications to astrochemistry will be explored in this talk.

[1] Neill, J.L., Harris, B.J., Steber, A.L., Douglass, K.O., Plusquellic, D.F., Pate, B.H. *Opt. Express*, 21, 19743-19749, **2013**.

[2] McCarthy, M.C., Chen, W., Travers, M.J., Thaddeus, P. *Astrophys. J. Suppl. Ser.*, 129, 611-623, **2000**.