MEASUREMENT OF NITROGEN HYPERFINE STRUCTURE ON THE 53 CM (562 MHz) BUTYRONITRILE LINE

CHRISTOPHER T. DEWBERRY, GARRY S. GRUBBS II, ANDREW RAPHELT[a] and STEPHEN A. COOKE, *The Department of Chemistry, University of North Texas, P.O. Box 305070, Denton, TX, 76203-5070*.

Recent improvements to our cavity-based Fourier transform radiofrequency spectrometer will be presented. Amongst other improvements use of Miteq amp, model AMF-6F-00100400-10-10P (0.1 GHz to 4 GHz, 65 dB gain minimum, 1 dB noise figure maximum) together with shielding from an improved Faraday cage have significantly helped us in this regard. Electromagnetic fields within our near-spherical cavity have been modeled and results will be presented. We have been able to easily resolve the nitrogen hyperfine structure on the ${}^{a}Q_{0,-1}$ transition $1_{1,0} \leftarrow 1_{1,1}$ located at 562 MHz. This result will be discussed.

[a]NSF-REU student from Concordia University, Nebraska