MULTI-ANTENNAE DETECTION IN A CP-FTMW SPECTROMETER

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Recent experiments in the Grubbs research group at the Missouri University of Science and Technology have shown that it is possible to detect rotational spectra of molecules in a CP-FTMW using multiple horn antennae. This allows for increased sensitivity by sampling a free induction decay twice, each at a separate point. Utilizing the traditional CP-FTMW design of two horns – one for transmitting and one for receiving – it was shown that it is possible to use the transmitting horn to also receive spectra. This is achieved by adding a circulator, switch, and low noise amplifier in the circuit between the transmitting horn and power amplifier. This has been demonstrated on OCS, 1,3-Difluorobenzene, and Chloroacetone in the 6-18 GHz region of the electromagnetic spectrum utilizing a variety of experimental setups. Results of these experiments as well as issues with implementing this setup, such as FID phasing issues and data analysis, will be discussed.