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Abstract (CP-FTMW)

Chirped pulse Fourier transform microwave spectroscopy (CP-FTMW) is an instrumental technique for determining the structure (I.e., three dimensional geometries) of molecules. Furthermore, unlike other popular instrumental techniques, CP-FTMW requires molecules be in the gas phase, which is a necessary principal for understanding formation of biologically relevant molecules in certain aspects of life. Preliminary data for predicting the structure of aggregates of N-ethylformamide, a pro-typical amino acid, have been measured using CP-FTMW. Using preliminary data, further measurements will be made using CP-FTMW to determine the structure of aggregates of gas phase N-ethylformamide, which to date have not been determined experimentally. Aggregates can be connected to many biological roles. Such aggregates are believed to play key roles in formation of proteins, carbohydrates, and other biologically relevant molecules. Additionally, popular theories on the origin of life incorporate gas phase aggregates of amino acids. It is the goal of the experiment to further determine and understand how such molecules form into unique aggregates and the quantum mechanical laws that allow specific conformations.