3C SUGARS IN INTERSTELLAR HOT CORES? STUDIES OF THE LABORATORY ROTATIONAL SPECTRUM OF DIHYDROXYACETONE.

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Glycolaldehyde ($CHOCH_2OH$), the simplest sugar, was detected in the hot core Sagittarius B2(N-LMH) [1]. Existing theoretical grain surface and hot core gas phase reaction models do not account for the formation of this sugar, and this has led to additional interest in species not yet accounted for by the current hot core models. Analysis of carbonaceous chondrites has led to the detection of a suite of sugars and other polyhydroxylated organic species closely related to glycolaldehyde, including dihydroxyacetone ($CHO(CH_2OH)_2$), the simplest 3C sugar [2]. Recently completed theoretical studies of this molecule indicate that the lowest energy conformer has both hydroxyl groups bonding to the carbonyl. The existence of this conformer has been confirmed by the measurement of the $1_{1,1} \rightarrow 0_{0,0}$ transition with the original Balle-Flygare spectrometer, and further microwave spectroscopic studies are underway with the Flygare instrument for additional low J transitions for this and other conformers. In addition, millimeter data from 100 - 120 GHz and 171 - 207 GHz have been obtained using the Caltech and JPL direct absorption flow cell spectrometers, respectively. Spectroscopic parameters, including standard rotational constants and fourth- and sixth-order centrifugal distortion constants, have been determined for the lowest energy conformer using the SPFit/SPCat program suite. Additional spectral assignments for other conformers are underway. Submillimeter spectroscopic analysis is planned for this spring to support upcoming observational searches with the Caltech Submillimeter Observatory. Additional microwave observational studies have been proposed for the Green Bank Telescope.

[1] Hollis, J.M., Lovas F.J., and Jewell P.R. (2000) *ApJ* **540**, L107-L110.
[2] Cooper, G., Kimmich, N., Beliste, W., Sarinana, J., Brabham, K., and Garrel, L. (2001) *Nature* **414**, 879 - 883.