GLYCOLALDEHYDE REVISITED: CAN LARGE ORGANIC MOLECULES BE ACCURATELY IDENTIFIED IN THE INTERSTELLAR MEDIUM?

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Recent observations have indicated the existence of several large organic molecules in the interstellar medium, such as acetone [$(CH_3)_2CO$], acetic acid (CH_3COOH), ethylene glycol ($HOCH_2CH_2OH$), vinyl alcohol (CH_2CHOH), and glycolaldehyde ($CHOCH_2OH$). However, some of these identifications are based on measurements of only a few transitions, even though these species exhibit complicated asymmetric top spectra. One such case is glycolaldehyde, whose detection in Sagittarius B2(N) was based on only six observed emission features, two of which were contaminated by other spectral lines. Using the Kitt Peak 12m telescope, we have been measuring confirming transitions of this molecule at 2mm. Curiously, several favorable lines appear to be missing. Another interesting case is illustrated by isocyanopropyne ($HCCCH_2NC$). We have observed eight lines in Orion-KL that are coincident with favorable transitions of this compound, based on a common line catalog. After further study, however, these frequencies were found to be inaccurately extrapolated from microwave data. Hence, it is very easy to misidentify large organic molecules in the interstellar medium. More thorough and consistent observations are needed to properly detect these species, as well as a careful evaluation of the spectroscopy of any given molecule.