

INVESTIGATING THE DISTRIBUTION OF COMPLEX MOLECULES AT LOW FREQUENCY USING THE KARL G. JANSKY VERY LARGE ARRAY IN SEARCH OF THE EXCITATION OF HNCNH

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In 2012, McGuire et al. identified carbodiimide (HNCNH), an isomer of the well-known interstellar species cyanamide (NH₂CN) which was first detected in 1975 at millimeter wavelengths by Turner et al. The detection of HNCNH was done using the Robert C. Byrd Green Bank Telescope as part of the PRIMOS survey toward Sgr B2(N). Given the excitation of the detected transitions, it was concluded that HNCNH was a weak astronomical maser and the only way HNCNH could be detected was by those transitions which are amplified by masing. Many other species detected at centimeter wavelengths also have transitions amplified by masing which include, but is not limited to, cyanoacetylene (HC₃N), methyl formate (CH₃OCHO), methanol (CH₃OH) and more recently, formamide (NH₂CHO) and possibly methylamine (CH₃NH₂). The outstanding question remains as to whether the transitions are being enhanced by radiative or collisional processes. To try to ascertain the answer to this question, several low frequency transitions (~4 GHz) were observed with the Karl G. Jansky Very Large Array to determine the overall spatial distribution with respect to the background continuum sources and other sources of molecular emission. This talk will present the results of these observations and discuss the possible time variability of some of these low frequency, large molecule astronomical masers.