# DETECTION OF INTERSTELLAR UREA WITH CARMA

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Urea, a molecule discovered in human urine by H. M. Rouelle in 1773, has a significant role in prebiotic chemistry. Previous BIMA observations have suggested that interstellar urea [$(NH_2)_2CO$] is a compact hot core molecule such as other large molecules, e.g. methyl formate and acetic acid (2009, 64th OSU Symposium On Molecular Spectroscopy, WI05). We have conducted an extensive search for urea toward the high mass hot molecular core Sgr B2(N-LMH) using CARMA and the IRAM 30 m. Because the spectral lines of heavy molecules like urea tend to be weak and hot cores display lines from a wide range of molecules, a major problem in identifying urea lines is confusion with lines of other molecules. Therefore, it is necessary to detect a number of urea lines and apply sophisticated statistical tests before having confidence in an identification. The 1 mm resolution of CARMA enables favorable coupling of the source size and synthesized beam size, which was found to be essential for the detection of weak signals. The $2.5'' \times 2''$ synthesized beam of CARMA significantly resolves out the contamination by extended emission and reveals the eight weak urea lines that were previously blended with nearby transitions. Our analysis indicates that these lines are likely to be urea since the resulting observed line frequencies are coincident with a set of overlapping connecting urea lines, and the observed line intensities are consistent with the expected line strengths of urea. In addition, we have developed a new statistical approach to examine the spatial correlation between the observed lines by applying the Student T-test to the high resolution channel maps obtained from CARMA. The T-test shows similar spatial distributions from all eight candidate lines, suggesting a common molecular origin, urea. Our T-test method could have a broad impact on the next generation of arrays, such as ALMA, because the new arrays will require a method to systematically determine the credibility of detections of weaker signals from new and larger interstellar molecules.