COMPARISON OF THE COMPOSITION OF THE W3(OH) AND W3(H2O) STAR-FORMING CORES AND THEIR OUTFLOWS

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Studying molecular complexity in the early stages of star formation is crucial to further our understanding of the formation pathways of planetary systems. We previously characterized the neighboring star-forming cores W3(H_2O) and W3(OH), revealing extended emission from the cores that trace bipolar outflows. While the original study focused on imaging the molecular inventory in these cores, the current work focuses on characterizing these outflows. Using NOEMA interferometric observations of the cores, molecular spectra were extracted from the datacubes and molecular inventory identified in the outflows. The Global Optimization and Broadband Analysis Software for Interstellar Chemistry (GOBASIC) developed by previous members of the Widicus Weaver Group was used to conduct spectral analysis. By running GOBASIC using the previously obtained NOEMA observations of the cores and fitting molecular spectra known to exist in the cores within the outflow regions, we can compare the chemical composition of the W3 cores to their outflows. By comparing the W3 cores and their outflows, we can better understand the formation processes of prebiotic molecules and planetary systems, and the evolutionary processes of star-forming regions.