

CARMA OBSERVATIONS OF L1157: CHEMICAL COMPLEXITY IN THE SHOCKED OUTFLOW

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L1157, a molecular dark cloud with an embedded Class 0 protostar possessing a bipolar outflow, is an excellent source for studying shock chemistry, including grain-surface chemistry prior to shocks, and post-shock, gas-phase processing. Prior to shock events an estimated ~ 2000 and 4000 years ago, temperatures were too low for most complex organic molecules to undergo thermal desorption. Thus, the shocks should have liberated these molecules from the ice grain-surfaces *en masse*. Here, we present high spatial resolution ($\sim 3''$) maps of CH_3OH , HNCO , HCN , and HCO^+ in the southern portion of the outflow containing B1 and B2, as observed with CARMA. The HNCO maps are the first interferometric observations of this species in L1157. The maps show distinct differences in the chemistry within the various shocked regions in L1157B. This is further supported through constraints of the molecular abundances using the non-LTE code RADEX. We find the east/west chemical differentiation in C2 may be explained by the contrast of the shock's interaction with either cold, pristine material or warm, previously-shocked gas, as seen in enhanced HCN abundances. In addition, the enhancement of HNCO abundance toward the the older shock, B2, suggests the importance of high-temperature O-chemistry in shocked regions.