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Ammonia towards dust clumps in the giant molecular cloud associated with RCW 106

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Abstract. High-mass stars are known to be born within giant molecular clouds (GMCs); However, the exact processes involved in forming a high-mass star are still not well understood. It is clear that high-mass stars do not form in isolation, and that the processes surrounding high-mass star formation may affect the environment of the entire molecular cloud. We are studying the GMC associated with RCW 106 (G333), which is one of the most active massive-star formation regions in the Galactic plane. This GMC, located at $l = 333^\circ$ $b = -0.5^\circ$, has been mapped in over 20 molecular line transitions with the Mopra radio telescope (83-110 GHz), in Australia, and with the Swedish-ESO Submillimeter Telescope (SEST) in the 1.2 mm cool dust continuum. The region is also within the *Spitzer* GLIMPSE infrared survey (3.6, 4.5, 5.8, and 8.0 μm) area. We have decomposed the dust continuum using a clump-finding algorithm (CLUMPFIND), and are using the multiple molecular line traditions from the Mopra radio telescope to classify the type and stage of star formation taking place therein. Having accurate physical temperatures of the star forming clumps is essential to constrain other parameters to within useful limits. To achieve this, we have obtained pointed NH_3 observations from the Tidbinbilla 70-m radio telescope, in Australia, towards these clumps.

Keywords. ISM: clouds — ISM: individual (G333) — ISM: molecules — ISM: structure

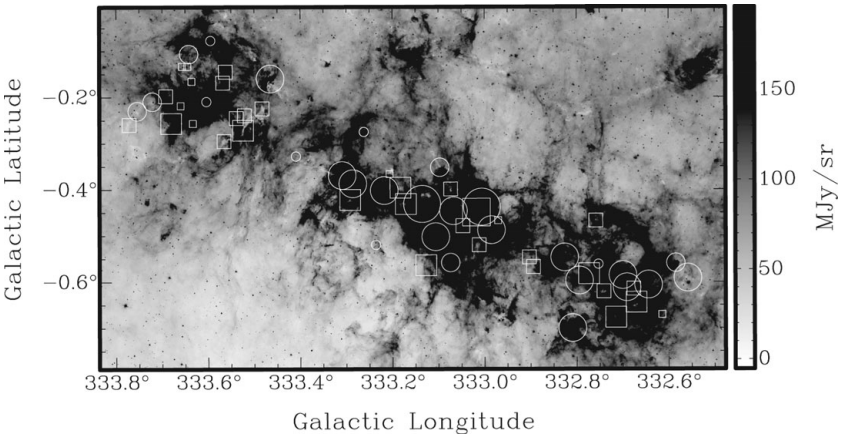

Figure 1. The distribution of kinetic temperature throughout the G333 giant molecular cloud. Each clump was classified as star-forming (circles) or non-star-forming (squares) using the presence of *Spitzer* GLIMPSE 8.0 μm emission (grey-scale image). The larger the shape, the higher the kinetic temperature. The 8.0 μm emission is dominated by polyaromatic hydrocarbon emission that appears near active photo-ionized regions, such as that produced by O and B stars.