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Abstract:

Feedback from dynamic processes (e.g., supernova, stellar winds) are crucial to the evolution of star formation and galaxy evolution. It has long been proposed that the Galactic HI super-bubbles could be the positive feedback of triggering the formation of molecular clouds. At a distance of 300 pc, the HI super bubble was driven by Per OB2 Association and is under interaction with the largest giant molecular cloud complex in the solar vicinity. However, limited by both the spatial and velocity resolution of all-sky HI surveys (e.g., HI4PI), and the incomplete coverage of the northern portion of the bubble in the GALFA-HI survey, the HI-to-H₂ transition, and the faint HI loop structures are still unclear. In this proposal, we propose to map the northern portion of the super-bubble with high sensitivity and high-velocity resolution. We aim to answer: 1) The HI distribution and the internal structure of the bubble; 2) The HI-to-H₂ transition threshold in the internal and external of the supper-bubble; 3) The HINSA signature and the HI fraction associated with the surrounding molecular gas; 4) The dark gas fraction and its variation in different environments.