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Abstract:

Feedback from dynamic processes (e.g., shocks, outflows) is crucial to the evolution of star formation and galaxy evolution. The Galactic center is a unique laboratory to investigate the feedback of Galactic nuclear activities on the evolution of atomic/molecular clouds in the thick disk. Based on the MWISP survey, Su et al. (2022) have identified 47 extremely high scale-height molecular clouds (EHMCs), which coincide with the edge of the HI void and roughly outline the boundary of Galactic wind (crater-wall structure). Particularly, 30% of these sources show the cometary structure and are supposed to be under-interact with the Galactic wind. However, limited by both the spatial and velocity resolution of all-sky HI surveys (e.g., HI4PI), and the unreachable sky coverage of Arecibo, the HI-to-H<sub>2</sub> transition and the co-evolution of the multi-phase gas are still unclear. In this proposal, we propose to map these EHMCs (spatially resolved) with high sensitivity and high-velocity resolution FAST observations. We aim to answer: 1) The extended HI crater-wall structure to high latitude; 2) The kinematic (e.g., gas flow, shock) along the crater-wall; 3) The HI-to-H<sub>2</sub> transition threshold; 4) Quantifying the evolution age of these EHMCs.