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Abstract:

HINSA could be an efficient method to detect cold HI mixed with molecular hydrogen. Since the FAST and the Planck satellite have matched angular resolutions, HINSA observation towards PGCCs using the FAST serves as an ideal method to study the cold HI chemistry. In our previous study, we find that PGCCs in Taurus have spatial distributions of HINSA similar to CO emission regions, and their HI abundance ($\sim 1\text{E-}3$) is close to the steady-state value. However, PGCCs with previous HINSA observations are sampled in a limited parameter space. Searching for HINSA towards a large sample could help us to study that if these HINSA properties still hold in other PGCCs. We also aim to find PGCCs truly in transition state with high HI abundances. Thus, we propose FAST observations of HINSA towards 30 PGCCs in the Orion region, the second quadrant and the high Galactic latitude in an extended parameter space.