

Proposal Abstract:

Planck catalog of Galactic Cold Clumps (PGCCs) characterize with lowest dust temperature (10 to 15 K) and nominal column densities (0.1 to 1.6×10^{22} cm^{-2}). They host pristine conditions for the earliest stages of star formation. Since B-field is one of the essential constituents of the interstellar medium and crucial ingredients for the star formation processes, we initiate an observing campaign to measure B-field strengths in PGCCs with relatively strong HI narrow self-absorption (HINSA) features. We have conducted HINSA Zeeman experiment towards four PGCCs at L-band using FAST in the previous observing cycle as a pilot study. The ongoing analyses on the data acquired from previous observing cycles resulted a definite Zeeman splitting. The draft writing based on the results based on one such detection is under progress. Another target show conspicuously a clear Zeeman splitting and other two targets show nominal detection. However, the signal-to-noise ratios of line-of-sight B-field strengths are to be < 3 . Here we propose to conduct relatively deeper observations towards three PGCCs to measure Blos with $\text{SNR} > 5$. Estimated mass-to-flux ratio criticality and Alfvénic Mac number can shed a light on the relative importance of magnetic field in comparison to turbulence and gravity.