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Abstract:

We propose mosaicing the HI observations in a 4 degree * 4 degree area covering Serpens molecular cloud (including Serpens Main, Serpens South, and Serpens NE) using FAST. We plan to decompose the HI emission into cold and warm neutral medium components and obtain the cold HI from the HI absorption feature, which is tightly associated with molecular components. Combining the proposed data with molecular gas tracers (e.g., CO and dust), we will shed light on turbulence characteristics in the multi-phase medium via spatial power spectrum, velocity structure functions, and density structure functions. Especially, we will study how is the transition from atomic gas to molecular gas influenced by turbulence in different environments.