

PID:PT2022_0157

Abstract:

We propose to use FAST to observe three equatorial regions of the Galaxy And Mass Assembly (GAMA) survey of each 12×5 sq. deg with a drift scan mode in one passage, corresponding to a total integration time of 43.2 hr (12 hr per field per passage) including 20% overhead. This project aims for a better understanding of the relationship between neutral atomic hydrogen (HI) and dark matter halo mass (the HIHM relation) and its physical drivers using single-dish and interferometric data from FAST and ASKAP, respectively. HI stacking techniques maximise the synergy of the two HI datasets to address the discrepancy of the HIMH relation between observations and simulations, as found in recent studies. HI group stacking and individual galaxy stacking will be applied to FAST and ASKAP data, respectively, to constrain the average total HI mass of galaxy groups and individual galaxies as a function of group halo mass. In addition, direct HI detections from both data are also beneficial for examining single-dish and interferometric data combination techniques. The combined data can also be used for a detailed study of galaxy group environments.