PID:PT2022_0171

Abstract:

The 21 cm absorption traces the cool component of the neutral gas, which is the constituent material for star formation. Up to now, nearly all the detections of 21 cm absorbers rely on existing DLA catalogs, which introduce biases. We have developed a blind searching technique to look for 21 cm absorbers directly from the radio data. We detected 3 known and 2 new absorption systems in the CRAFTS data at 1300 – 1450 MHz, which were verified by a follow-up observation using FAST last year. We then applied our technique in the CRAFTS data at 1050 – 1300 MHz and detected 12 candidates (2 known and 10 new absorption systems). We request a total of 30 hours allocation at 1050 – 1450 MHz band with on-off mode for observation. The confirmation enabled by a follow-up observation would demonstrate the validity of our blind searching technique and the power of FAST in HI absorption searching. This technique could then be applied to future survey data to search for more 21 cm absorbers, potentially well into the epoch of reionization in the future, build an un-biased HI absorber catalog for the first time and then dig new sciences in DLAs.