Proposal Abstract:

We propose for 60 hours observation (12 night sessions with 5 hour each) with FAST, to complete our proposed drift scan survey of about 280 square degrees, which so far a half area has been covered. The survey is to be done in drift scan mode to ensure good stability in instrument response, and the scanned regions are interleaved to ensure uniform coverage. We have refined our data processing procedure in the past few years, made careful analysis of the data, and completed two research papers based on the data collected so far. With the high sensitivity of the FAST, and given the survey area and integration time, there is a good prospect that the HI auto-correlation could be positively detected, which would be a major breakthrough in 21cm cosmology. For the 1320-1420 MHz band, we expect that the HI auto-power spectrum could be measured with a 3% error, and for the 1050-1150 MHz the projected relative error is at 10% level. The cross-correlation with the SDSS optical galaxies could be measured with even more confidence. In addition, we expect to detect about 8000 HI galaxies. These results would bring useful information on HI distribution and evolution.