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Abstract:

The FAST Ultra-Deep Survey (FUDS) is a deep blind H I survey, which aims to detect HI of faint and distant galaxies. Six 0.72 deg2 regions will be mapped with a sensitivity of 50 μJy beam-1 at redshifts up to 0.4 by using the 19-beam receiver. It will be the most sensitive HI blind survey to date. FUDS will produce a catalogue of ~1000 HI galaxies with a wide redshift coverage. This allows us to study the evolution of the HI mass function (HIMF), and the cosmic HI density (ΩHI). The comparison between high- and low-redshift HI galaxies will refine our knowledge of the evolution of galaxies. The pilot survey (FUDS0) has already proved the feasibility of FUDS with 128 detections, including six with record-high redshift (z > 0.38). Evolutionary trend in the HIMF is detected with a large error. Further confirmation with more galaxies in the higher redshift range is needed. Here we propose 114.5 hours to image a single 0.72 deg2 field. Combined with 55 hours approved last year, these observations will complete the FUDS4 field, and add approximately ~200 HI detections to the existing sample.