The WSRT BUDHIES Survey

The HI Mass Function and $\Omega_{\rm HI}$ at z = 0.2 from direct HI detections

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faculty of science and engineering



The HI Mass Function

Local Universe



$Φ(M_{HI}) = In(10) Φ_* (M_{HI}/M_{HI})^* α^{+1} exp[-(M_{HI}/M_{HI})^*]$

& Beyond

Hoppmann et al 2015

BUDHIES: Blind Ultra Deep HI Environmental Survey



Redshift range. : 0.164 < z < 0.224 (325 Mpc deep) Total survey volume: 73000 Mpc³ Detection limit : 2 x 10⁹ Msun Total no. galaxies. : 166





The BUDHIES HI Mass Function



The BUDHIES HI mass function



	BUDHIES	ALFA100
α	-1.49 ± 0.48	-1.25 ± 0.02
log (M _{HI} */M₀)	9.78 ± 0.16	9.94 ± 0.01
φ* (X10-3)	7.75 ± 5.0	4.5 ± 0.2

Hypothesis 1: M_{HI} * does not evolve

- **3.9** σ tension between the α derived by ALFA100 and BUDHIES.
- Very steep α leads to an unrealistic $\Omega_{\rm HI} = (17 \pm 9) \times 10^{-4}$



Hypothesis 2: α does not evolve

- 4.7 σ tension between the M_{HI}* derived by ALFA100 and BUDHIES.
- Since α is poorly constrained and consistent with the ALFA100 value, we assume it does not evolve



EXTRA...

Influence of environment?

