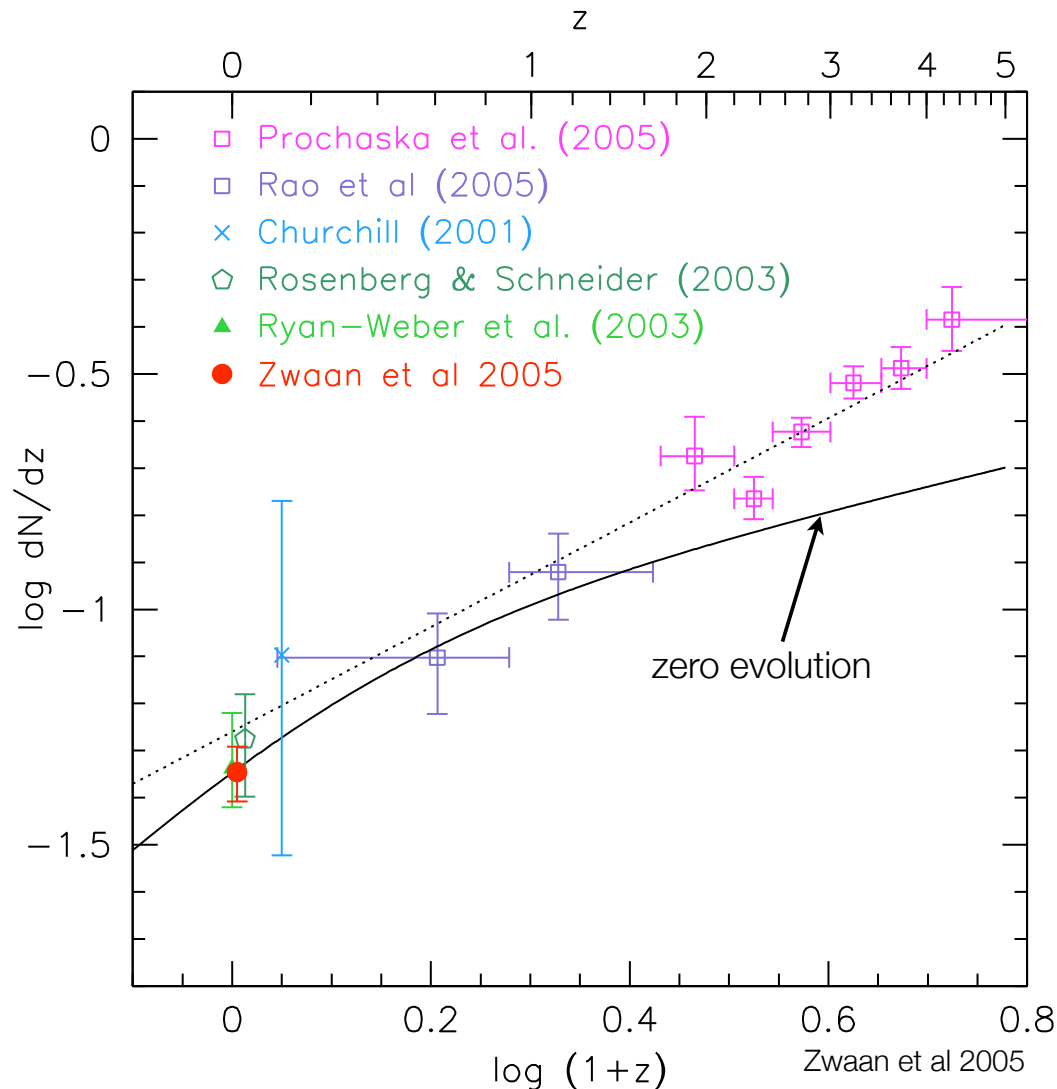


Comparing Galaxies and QSO Absorption Lines

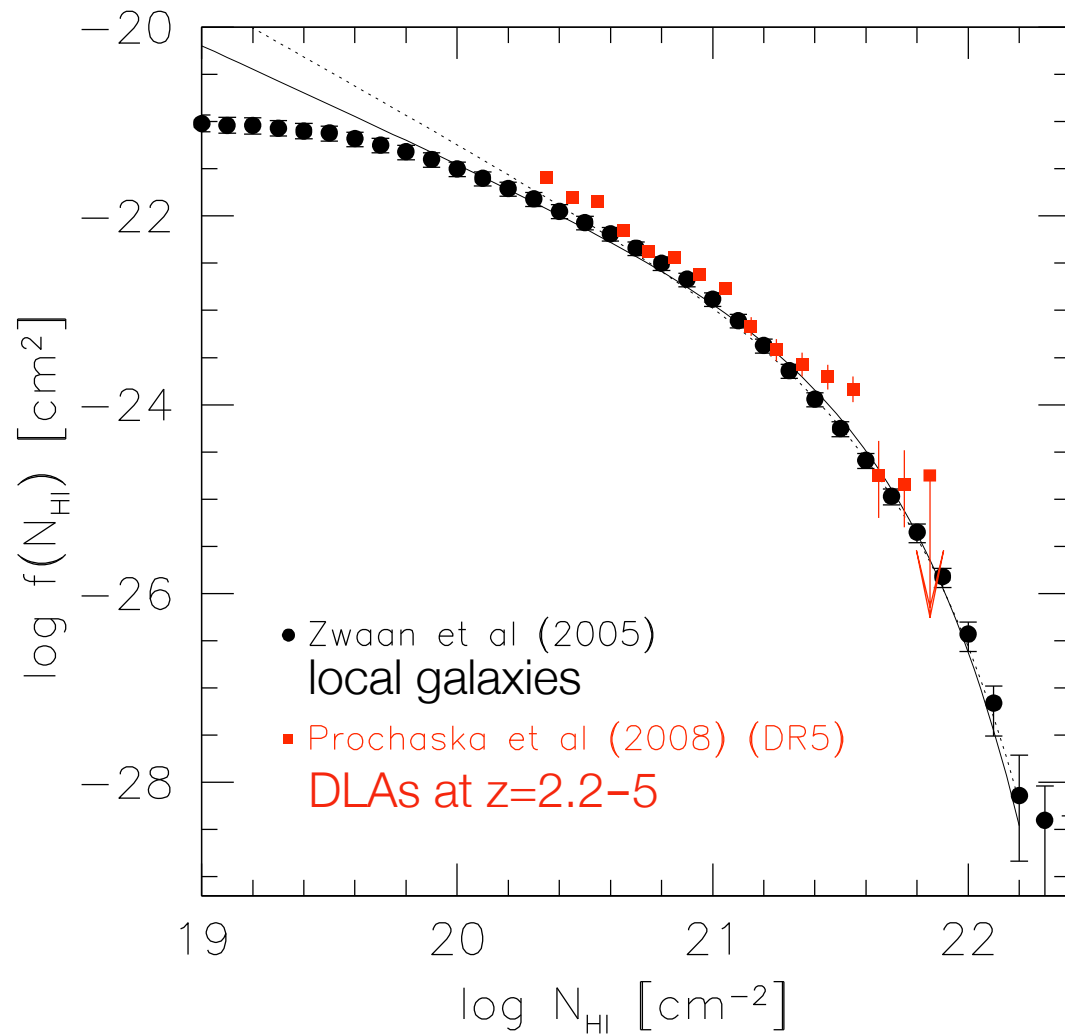
Martin Zwaan (ESO)

At $z=0$, galaxies are **DLAs seen in emission**



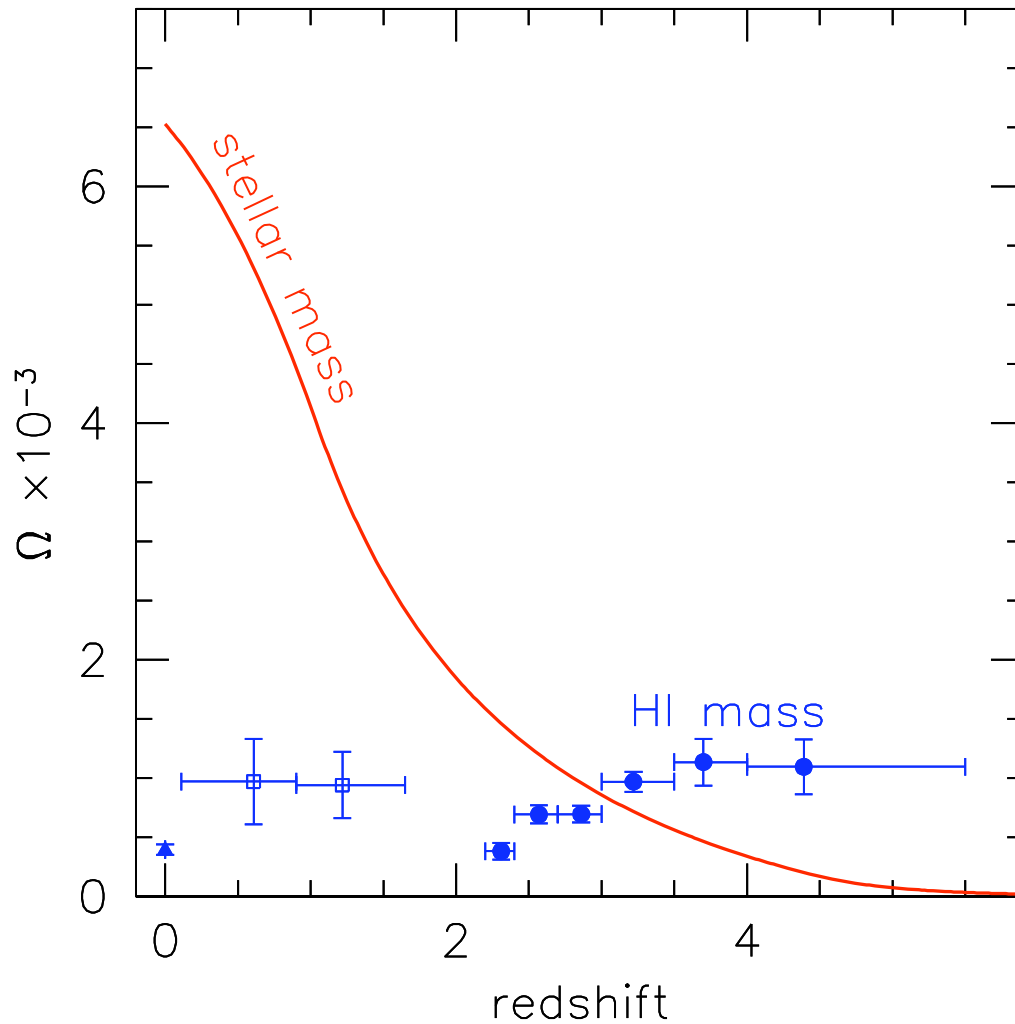
- Local galaxies can account for low z **DLA incidence rate**
- ... and explain DLA **metallicities**
- ... and other properties: impact parameters, luminosities

The shape of $f(N)$ does not evolve



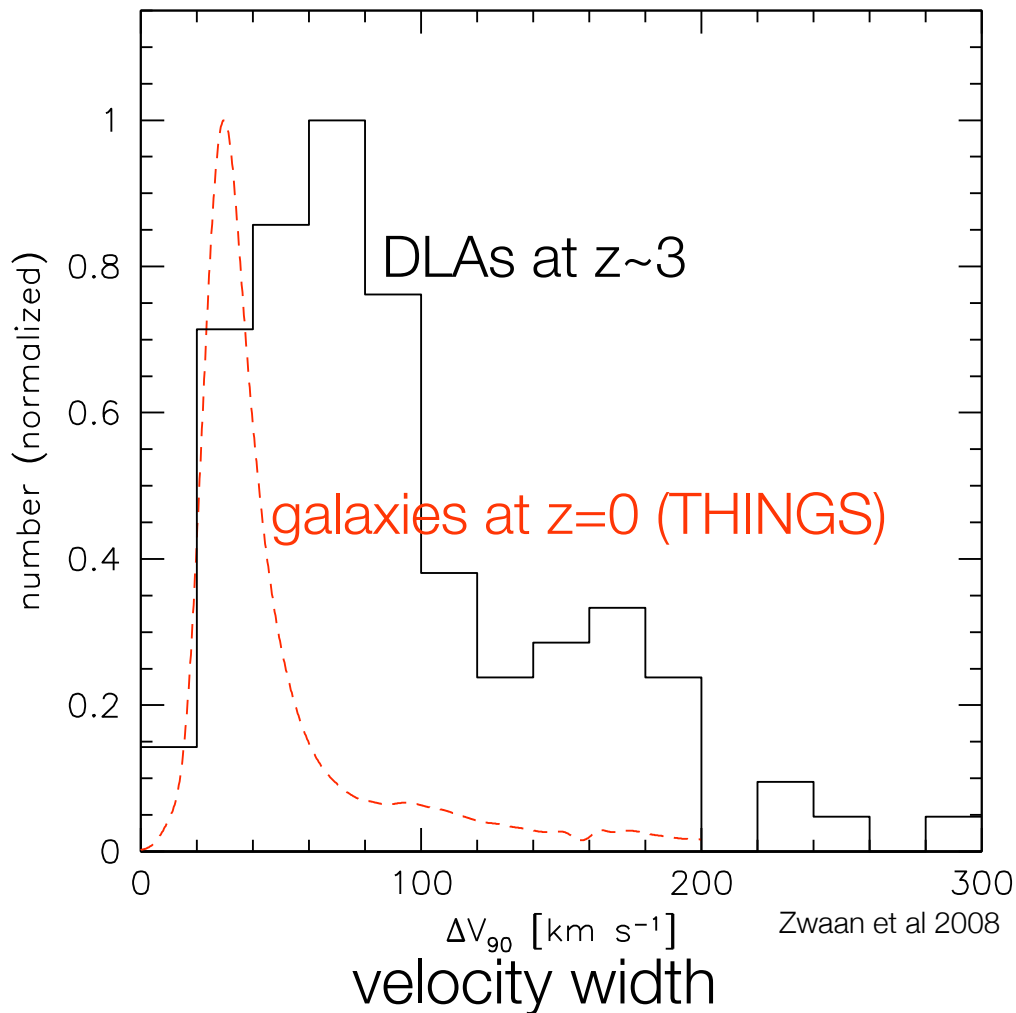
- What is this telling us?
- Laws of star formation similar at all redshifts?

Number of **HI atoms** does **not evolve** much



- DLAs are a “phase” not a “reservoir”
- Where is the missing gas?

Kinematics of DLAs different from local galaxies



- Interactions, winds and outflows increasingly important at higher z

The future...

★ Measure Ω_{HI} in emission at $z > 0$

- HIPASS/ALFALFA at $z=0.2-0.5$ → AUDES, and... SKA pathfinders
- Why do we still want to know Ω_{HI} ?

★ Find the 'missing gas'

- ALMA surveys → molecules

★ Understand DLAs

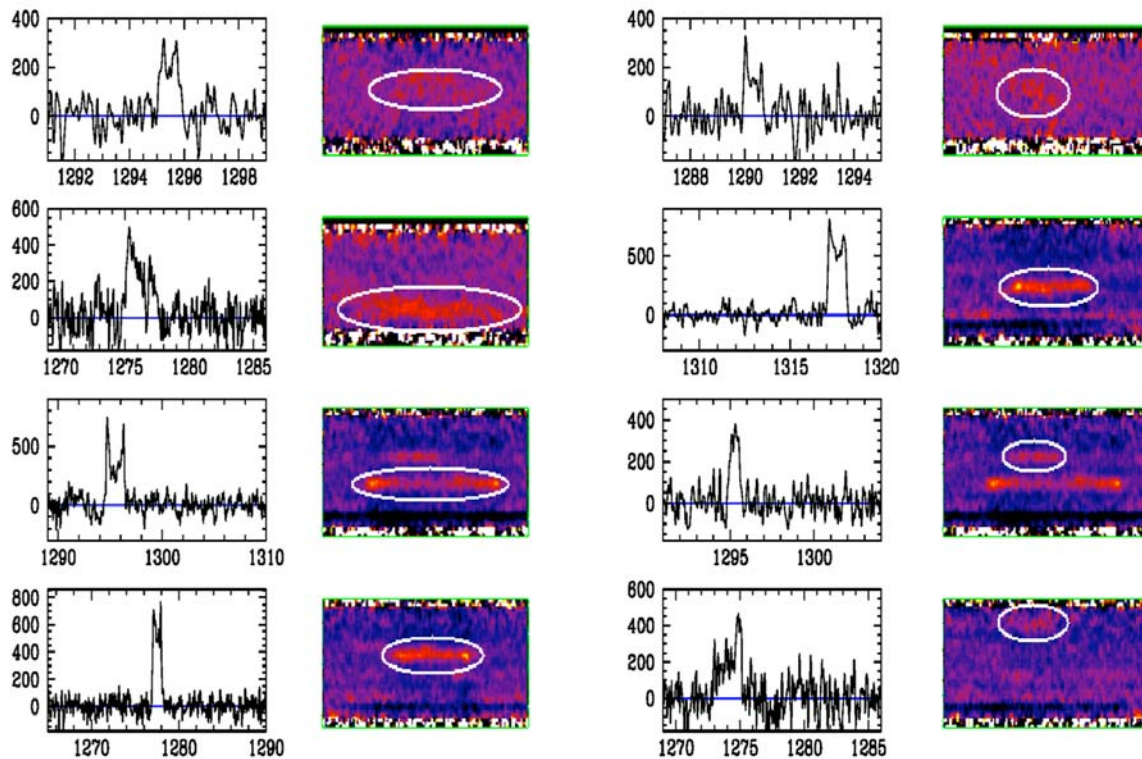
- Map individual DLAs → need SKA
- SF in DLAs → CII emission with ALMA

★ Map sub-DLAs/Lyman Limit Systems in 21-cm emission

- Deep surveys → AUDES, SKA...

Arecibo **U**ltra-**D**eep **S**urvey (AUDS) (Freudling et al)

- Deepest blind HI survey: 50 μJy rms, 1000 hours are allocated
- 0.36 degree² out to $z=0.16$
- Two fields in SDSS regions, no bright 20-cm sources



α_{2000}

- Precursor observations:
- 53 hours of ‘drift-and chase’ resulted in 14 detections between $z=0.07$ and $z=0.15$
- Detections confirmed with WSRT