

Stellar-Halo Mass ratio until $z \sim 5$

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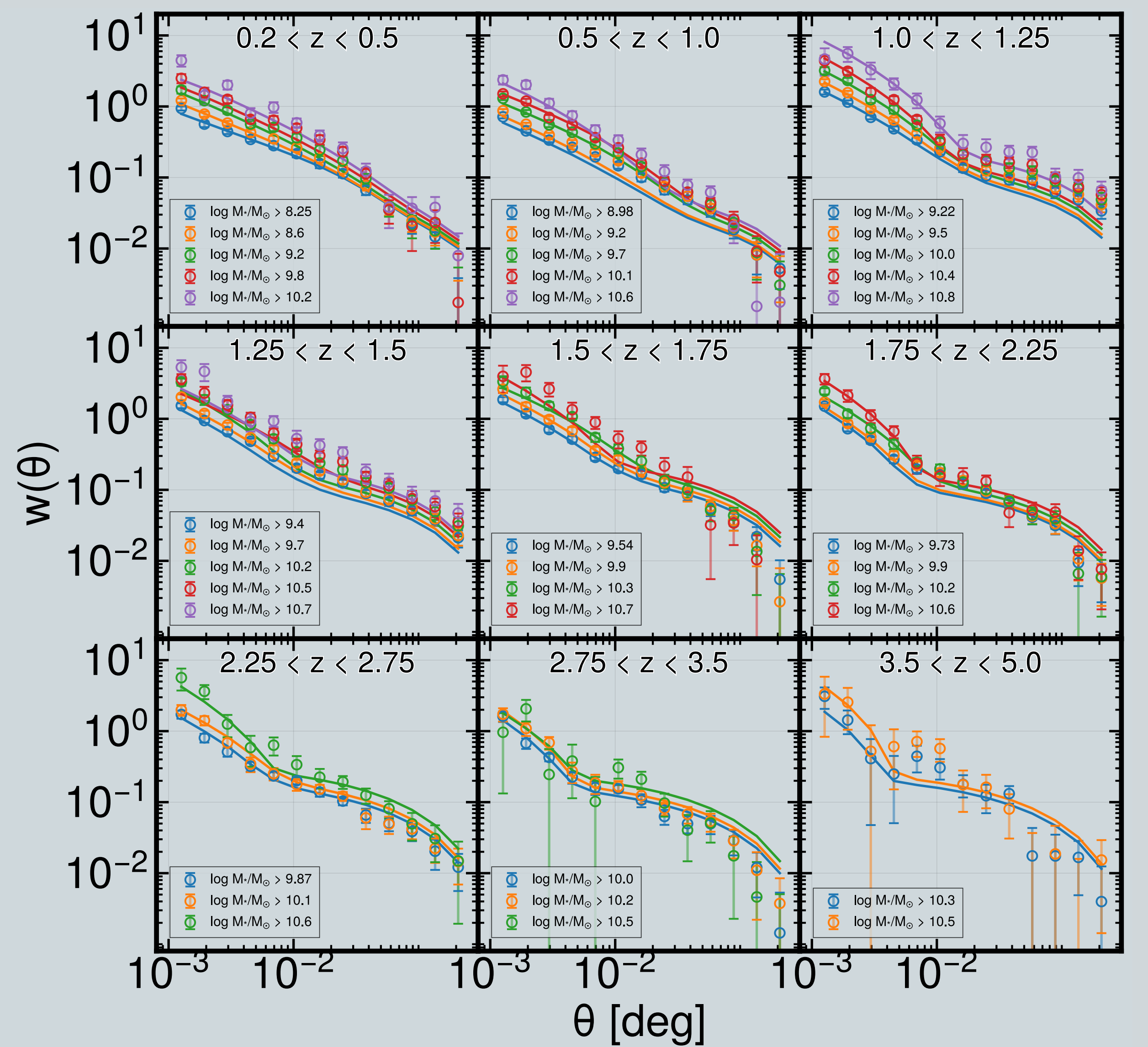
Measurement of Galaxy Clustering

- **Galaxy Clustering** is a strong tracer of the distribution of **Dark Matter** in the universe.
- Here, we measure the **Galaxy clustering** (two-point correlation) in **two large widely separated fields**:
 - **UDS** (FENIKS survey, Zaidi+ 23, in-prep)
 - **COSMOS** (u-deep stripes from the UVISTA DR3 survey)

Total effective area of 1.68 deg².
- **Galaxy Clustering** \propto **Stellar Mass**: Massive Galaxies live in denser environments.

5 parameter Zheng+ 05 Halo Occupation Distribution (HOD) model used to fit the measured Galaxy Clustering

Galaxy Clustering ↑

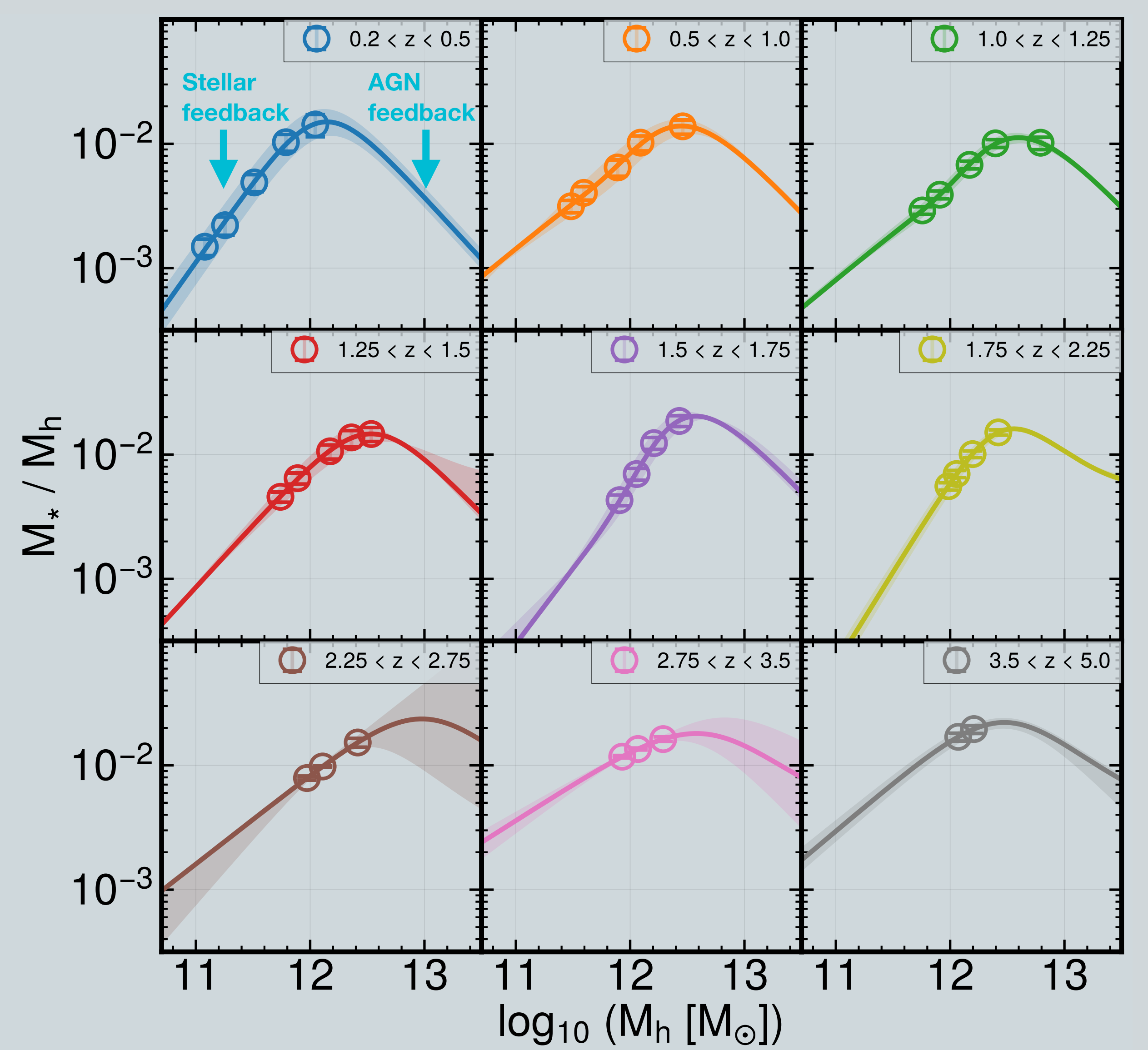


Stellar-to-Halo Mass ratio (SHMR)

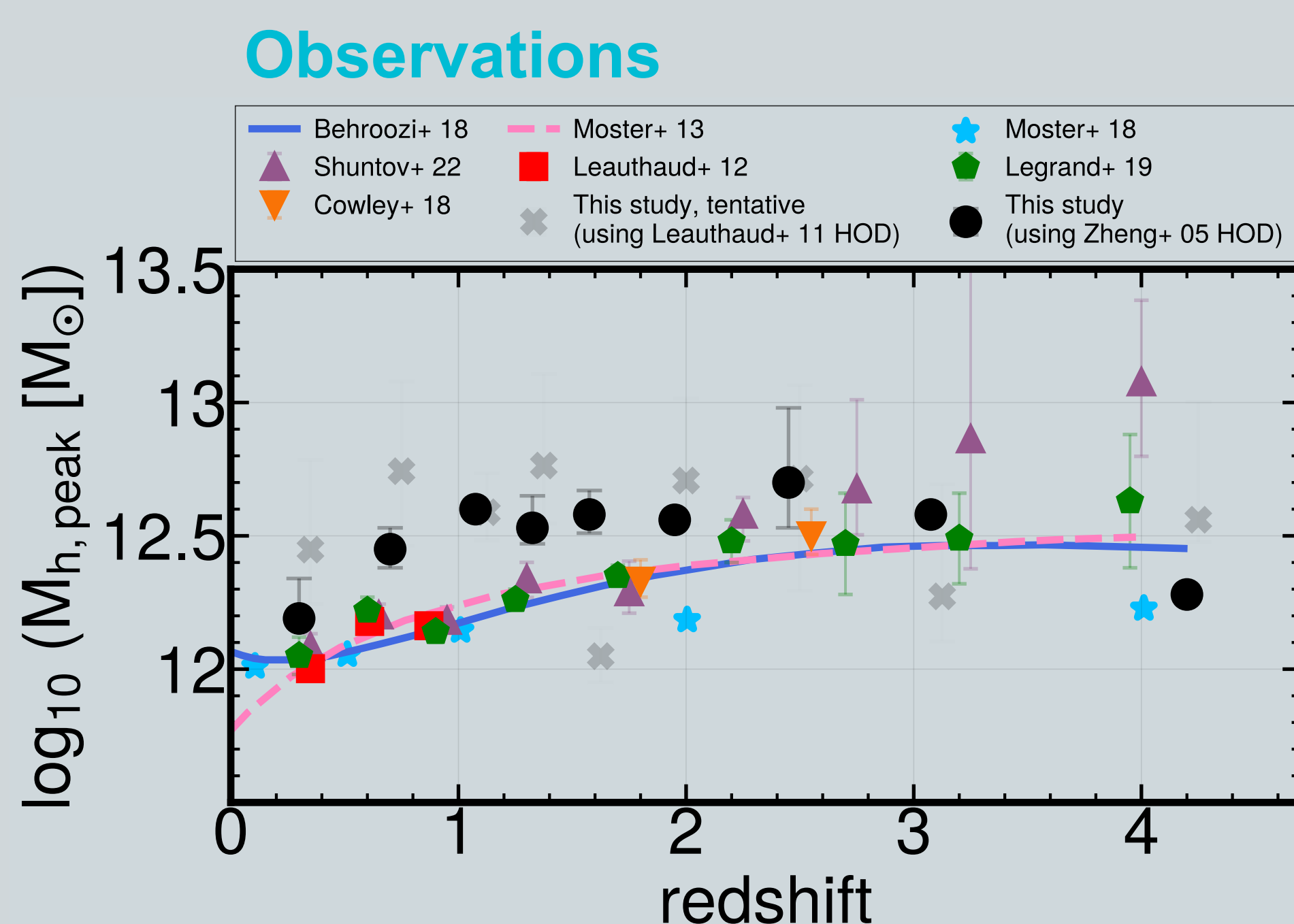
- Using the fitted correlation functions, we derived the **SHMR** which is a proxy for the **star formation efficiency (SFE)**.
- In all redshifts, the SHMR corresponds to SFE lower than a meager **~20%** at all halo masses - a usual finding in the literature.
- At **lower masses**, **stellar feedback** is important for curbing the star formation, whereas at **higher mass Active Galactic Nuclei (AGN) feedback** becomes important to **quench** the star formation.

$$\text{SFE} = \text{SFR} / \text{gas mass} / \text{dynamical time}$$

SHMR fitted by the 5 parameter model proposed in Behroozi+ 2013b



Redshift Evolution of the Peak Halo Mass



- The **peak Halo Mass** increases with redshift, at least until $z \sim 2.5$, indicating that the **AGN feedback** becomes less important in the past.
- At $z > 3$ or so, our study indicates a **downturn** in the peak Halo mass, in contrast to **flattening** or an **upturn** as seen in Shuntov+ 22, for instance.

