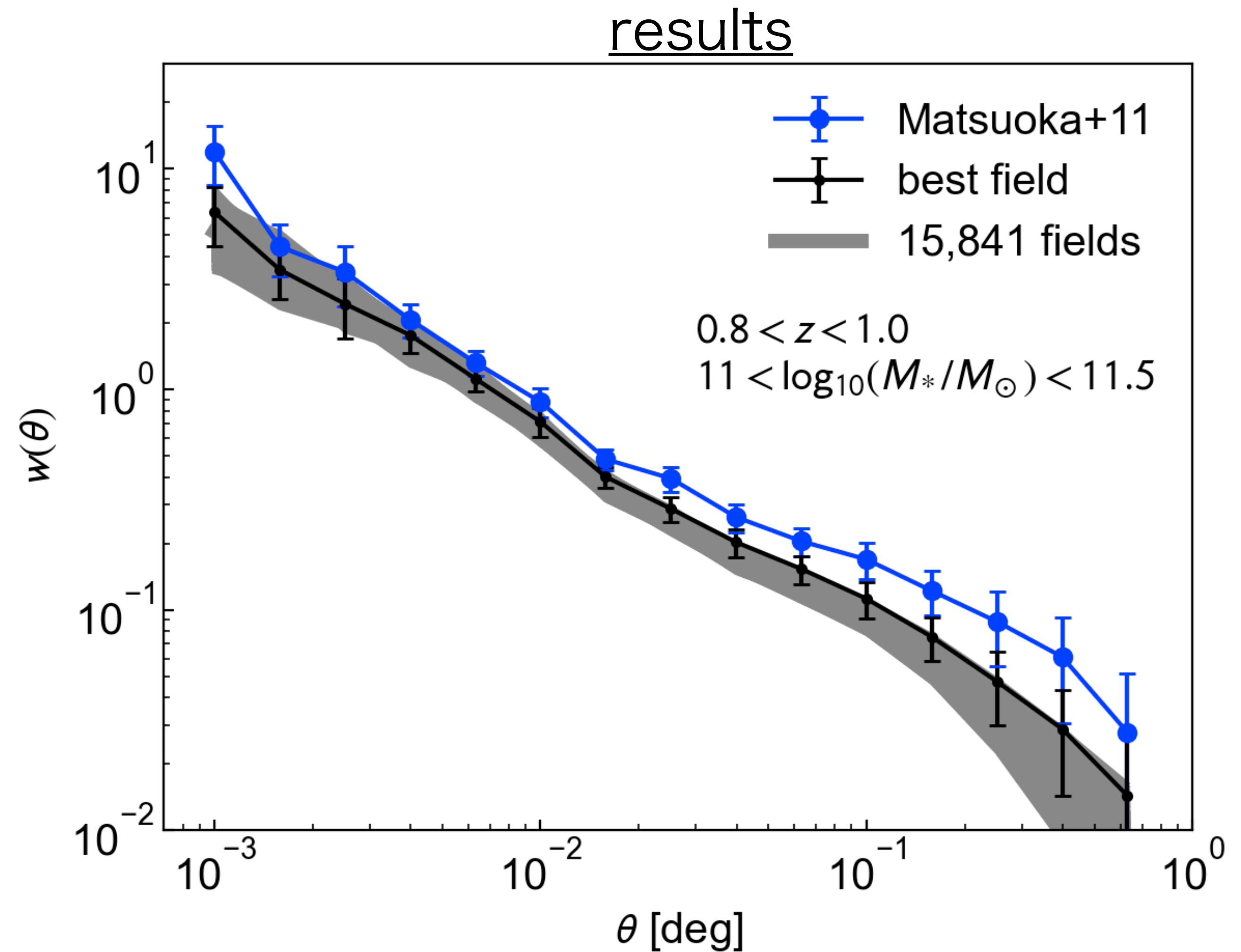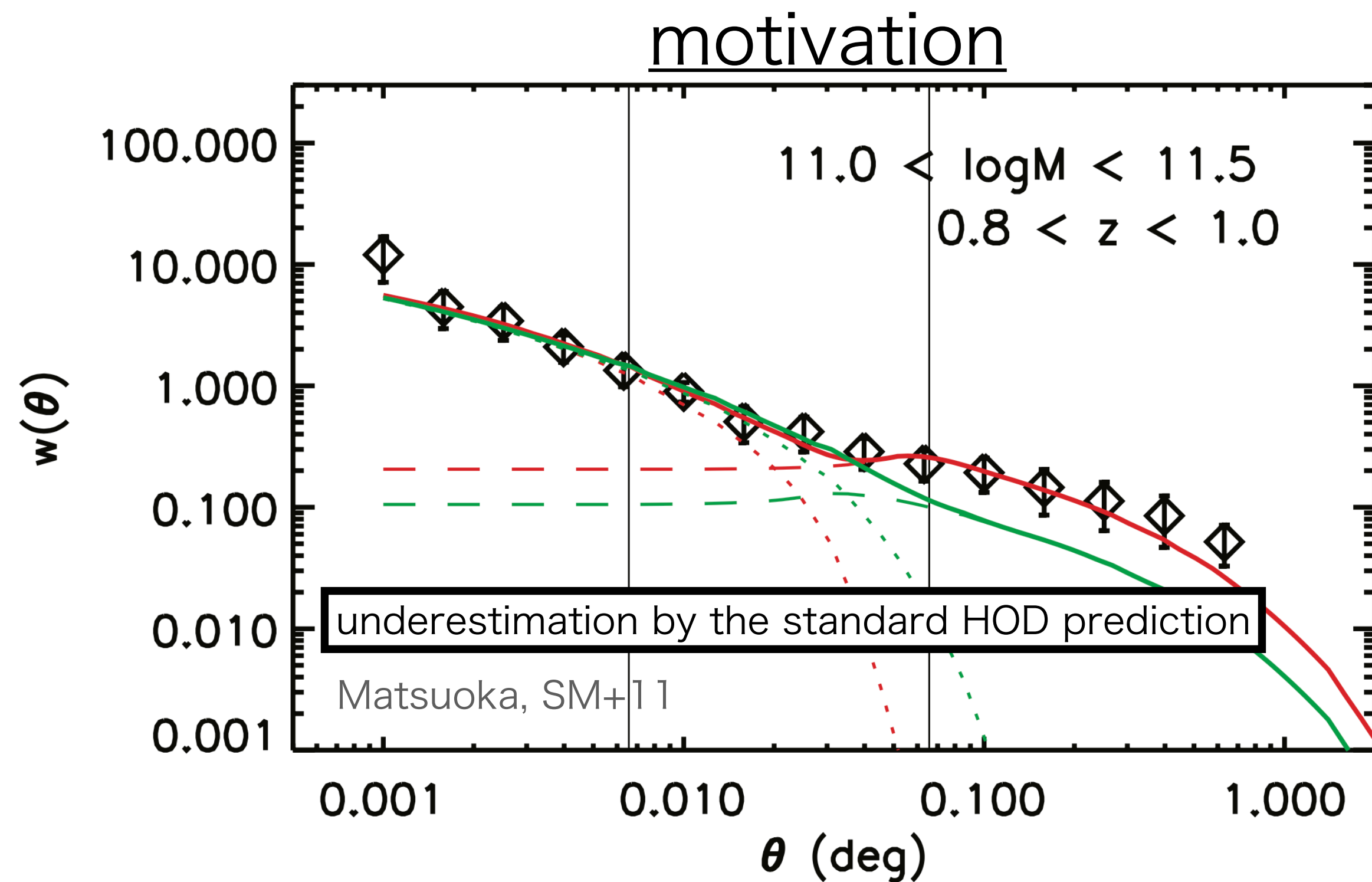# Validation of CDM cosmology for large-scale structure formation by considering cosmic variance

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Can cosmic variance account for anomalously strong galaxy clustering?

- The answer is "No"

- Much trial and error…

motivation

$11.0 < logM < 11.5$
$0.8 < z < 1.0$

underestimation by the standard HOD prediction

Matsuoka, SM+11

results

Matsuoka+11
best field
15,841 fields

$0.8 < z < 1.0$
$11 < \log_{10}(M_*/M_\odot) < 11.5$

A novel galaxy-subhalo connection model using progenitor mass at varying redshift as a proxy of stellar mass

Shogo Masaki (NIT, Suzuka College)

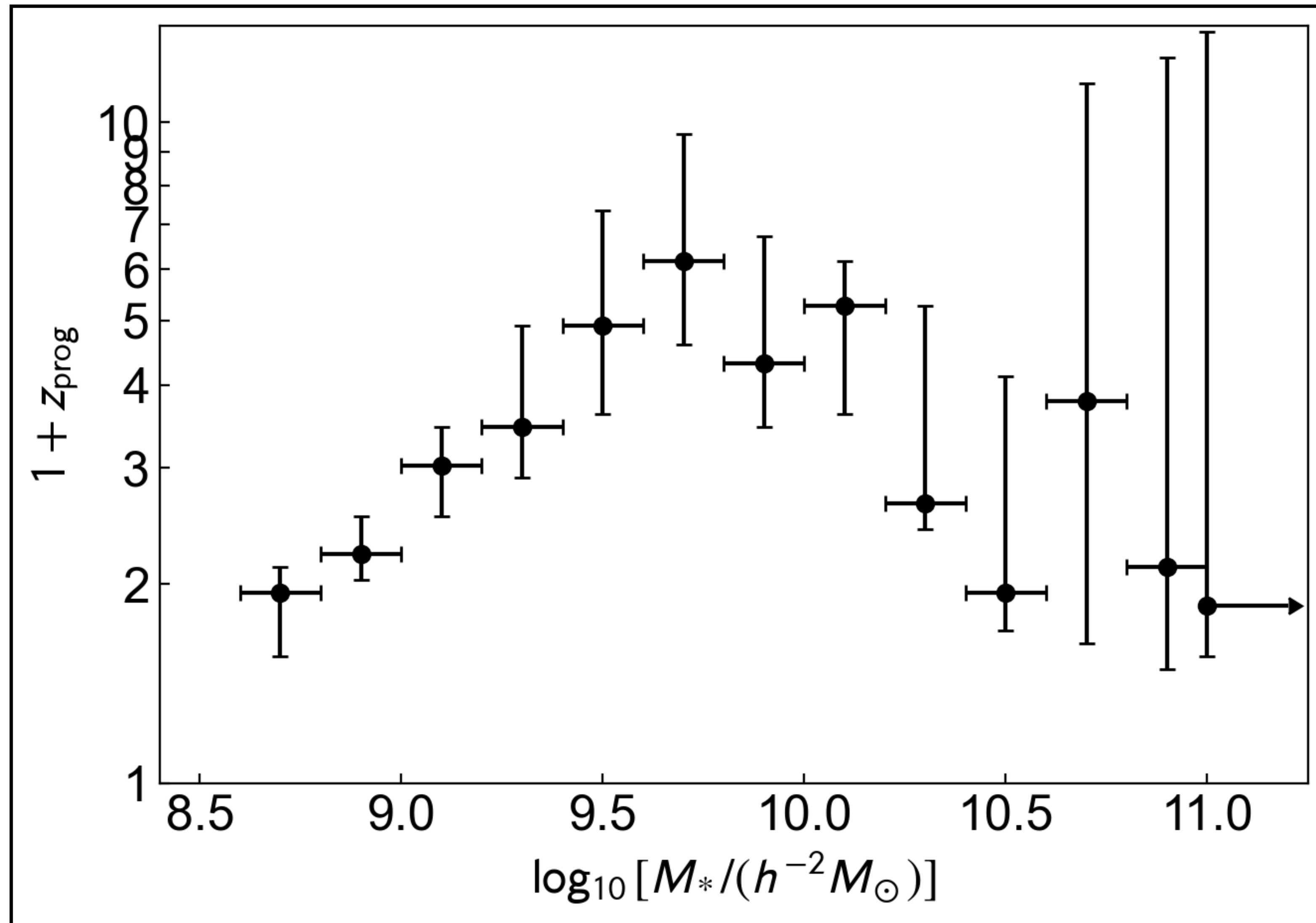working with Daichi Kashino (Nagoya U.), Yen-Ting Lin (ASIAA) / arXiv: 2210.11713

our M_{prog} model

- Assumption: a monotonic relation between progenitor mass of host subhalo M_{prog} at $z = z_{\mathrm{prog}}$ and M_* at the observed epoch

  - cf. V_{peak} (peak value of maximum circular velocity in its lifetime) is a popular model

- z_{prog} is …

  - a primary free fitting parameter (another one is for scatter)

  - dependent on M_*

  - an important epoch for stellar mass growth

results: clustering & mass profiles
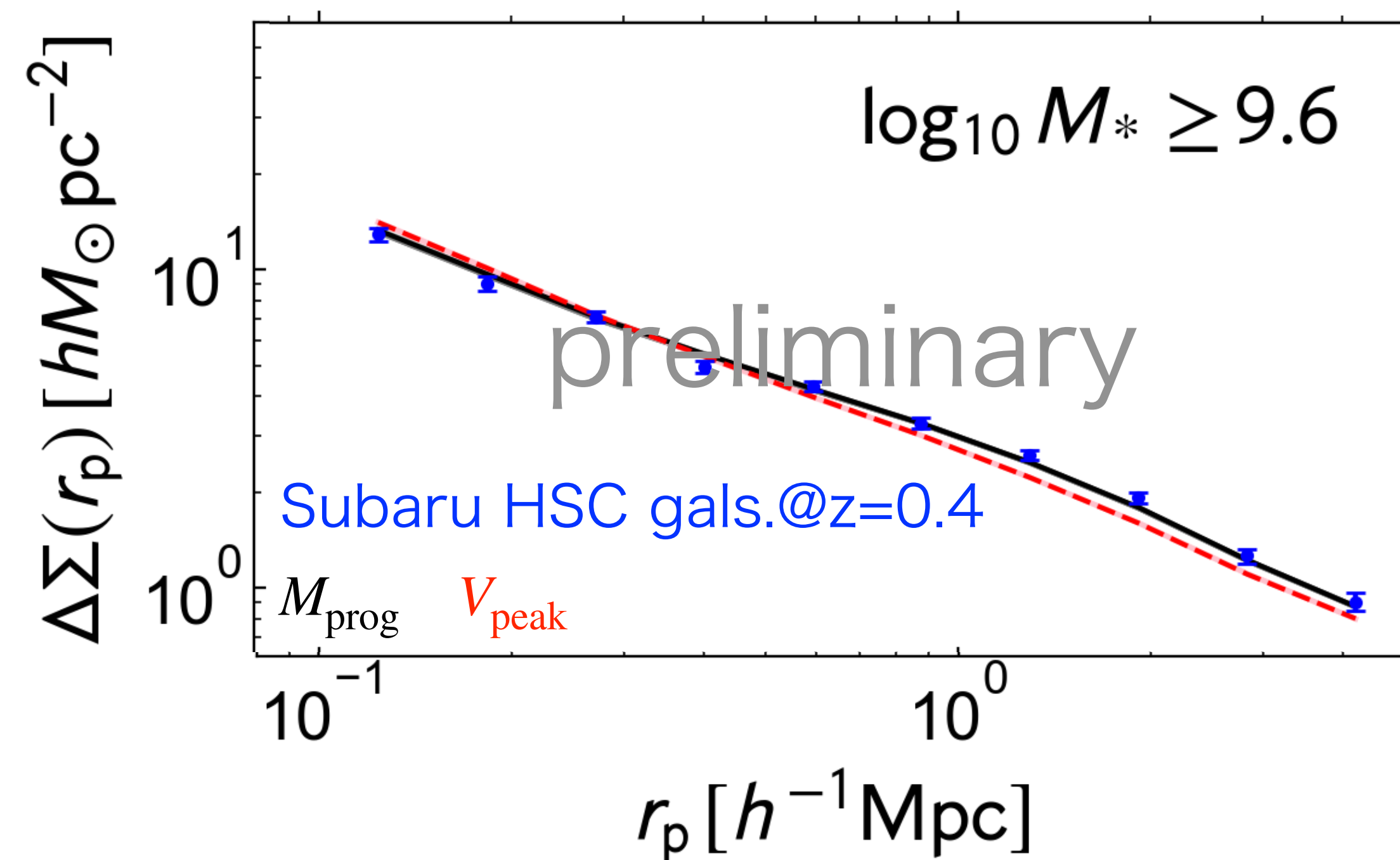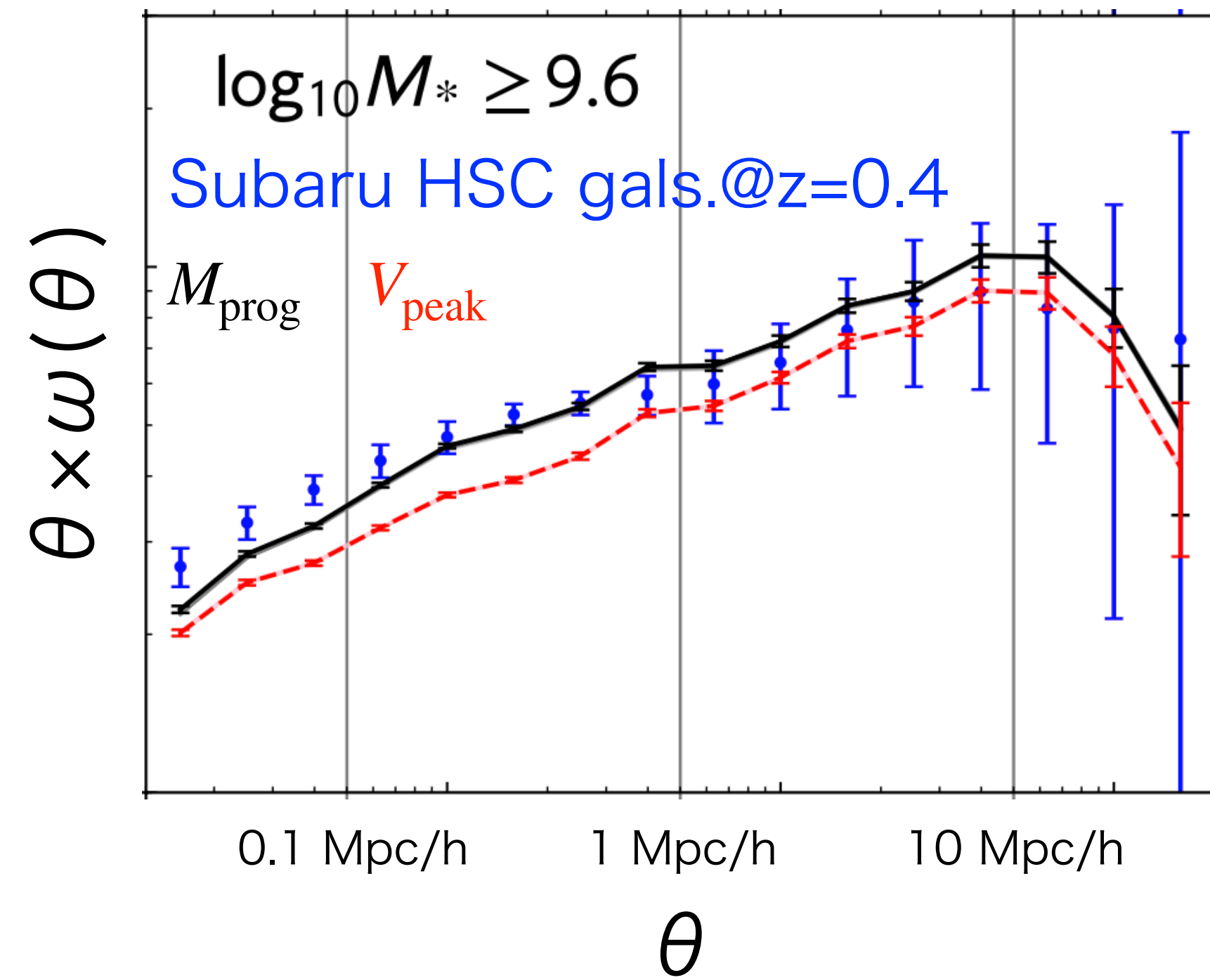
- The M_{prog} model reproduces observed clustering and mass profiles better than the widely-used V_{peak} model for the galaxies with $9 < \log_{10} M_* < 10$.

- **This simultaneous agreement is achieved with z_{prog} tuned only to fit clustering.**

results: best-fit z_{prog} (important epoch for stellar mass growth)

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