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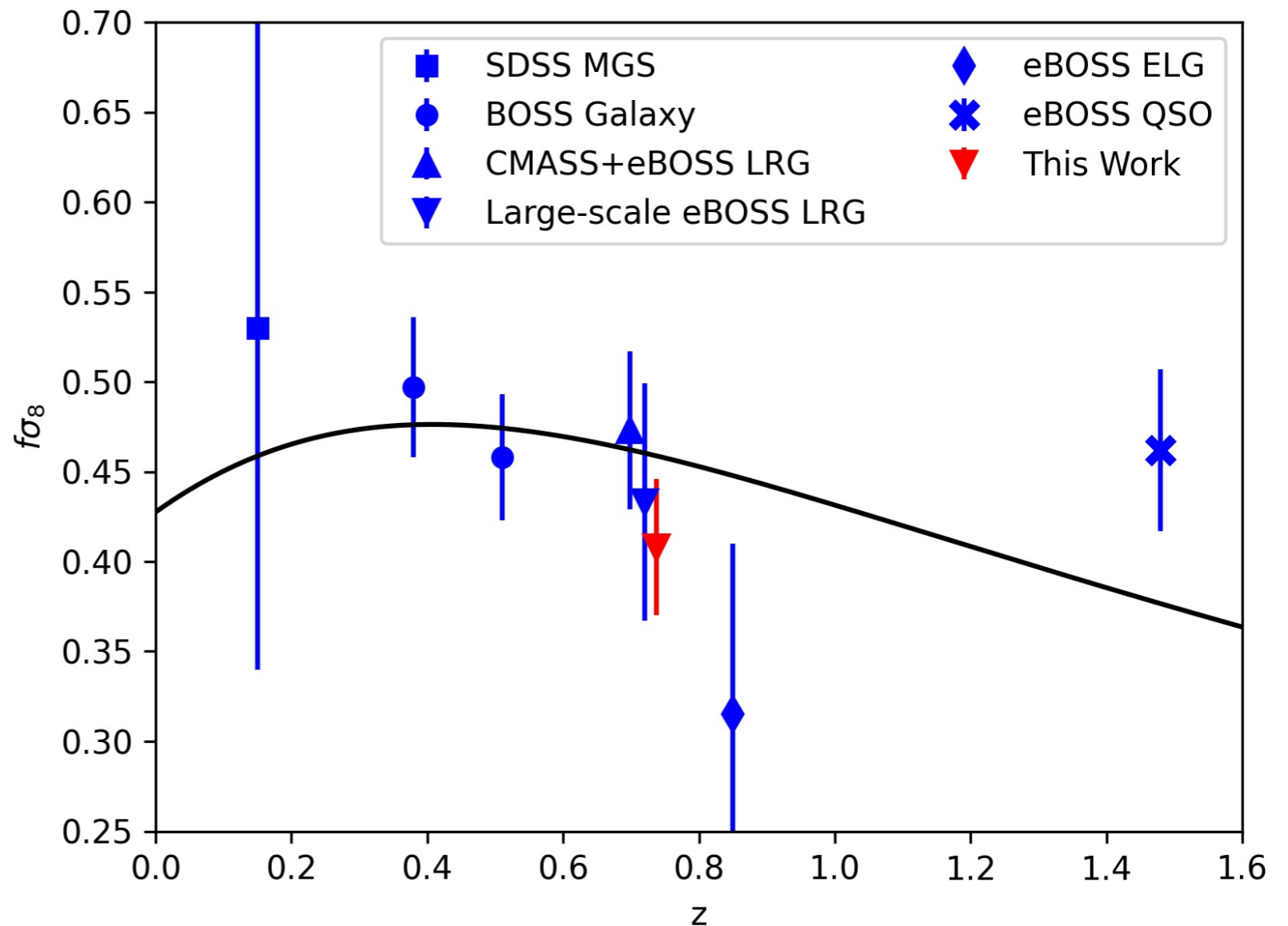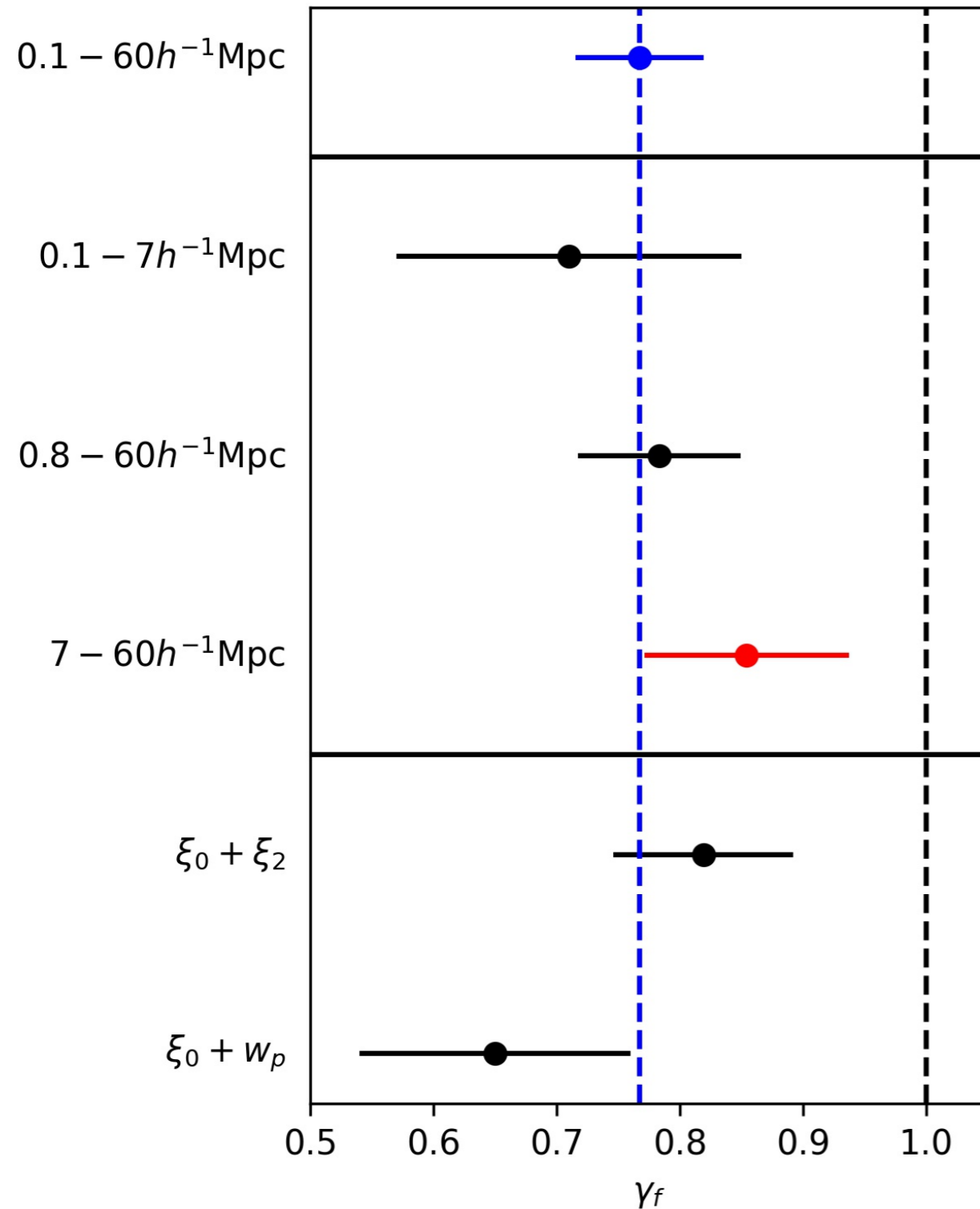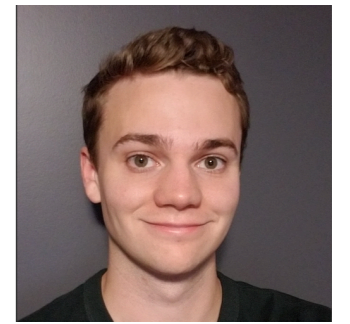**WATERLOO**

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# MEASURING THE GROWTH RATE FROM SMALL SCALES IN EBOSS

▸ Use Gaussian process emulator to access smaller scales

▸ Fit to quasi-linear scales $(7 - 60\,h^{-1}\mathrm{Mpc})$ gives $f\sigma_8 = 0.408 \pm 0.038$, $1.4\sigma$ below Planck2018 expectation

▸ Factor of 1.7 improvement over large scale analysis $(25 - 130\,h^{-1}\mathrm{Mpc})$ of the same sample



Legend:
- ■ SDSS MGS
- ● BOSS Galaxy
- ▲ CMASS+eBOSS LRG
- ▼ Large-scale eBOSS LRG
- ◆ eBOSS ELG
- ✖ eBOSS QSO
- ▼ This Work

Chapman et al. 2021 - arXiv 2106.14961

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▸ Fit to full emulator range $(0.1 - 60\,h^{-1}\,\text{Mpc})$ tests $\Lambda$CDM using the amplitude of the halo velocity field, $\gamma_f$

▸ Find low value, in $4.5\sigma$ tension with $\Lambda$CDM

▸ Tension could be due to deviation from $\Lambda$CDM or breakdown of HOD model used by emulator

▸ See paper on arXiv for more details, concerns for future surveys

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