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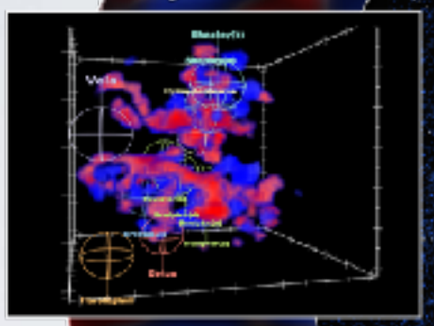

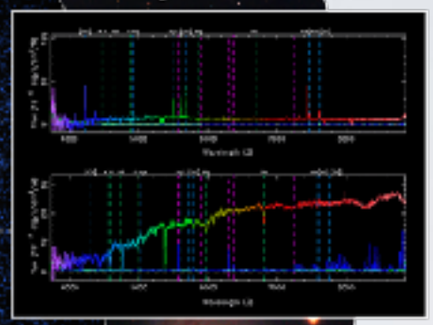

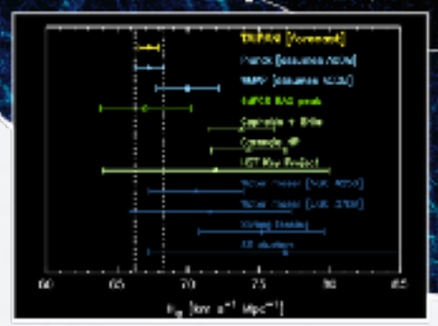

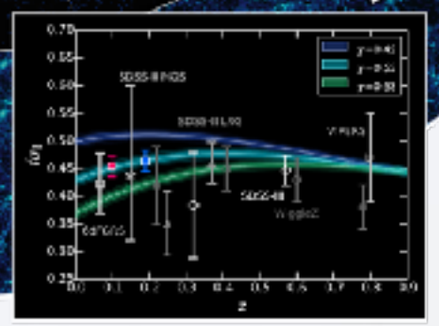

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OVERVIEW:

- Taipan is a multi-object spectroscopic survey starting in Feb, 2018.
- Will cover the whole southern sky (Dec < +15 deg, |b| > 10 deg).
- It is a 4-5 year survey, aiming to provide a complete sample (i <17) of about 1.2 million galaxy **plus** a sample of about 0.8 million LRG (i <18.1) out to z~0.4.
- Peculiar velocity of 100k of elliptical galaxies out to z ~ 0.1.
- It will be an order of magnitude larger than its ancestor the 6dF Galaxy Survey.

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INFRASTRUCTURE:

- The UK Schmidt telescope (UKST): 1.2m telescope at Siding Spring Observatory, completely refurbished so that it can operate in an automated mode, substantially increasing efficiency while reducing operating costs.
- A starbug fibre positioner: An innovative new optical-fibre positioner that collects light from 150 galaxies at the focus of the UKST (a proposal to upgrade this to 300 has been accepted last Friday). It is a prototype for the MANIFEST instrument on the GMT.
- The spectrograph: A purpose-built spectrograph designed to meet the scientific requirements of the Taipan survey.

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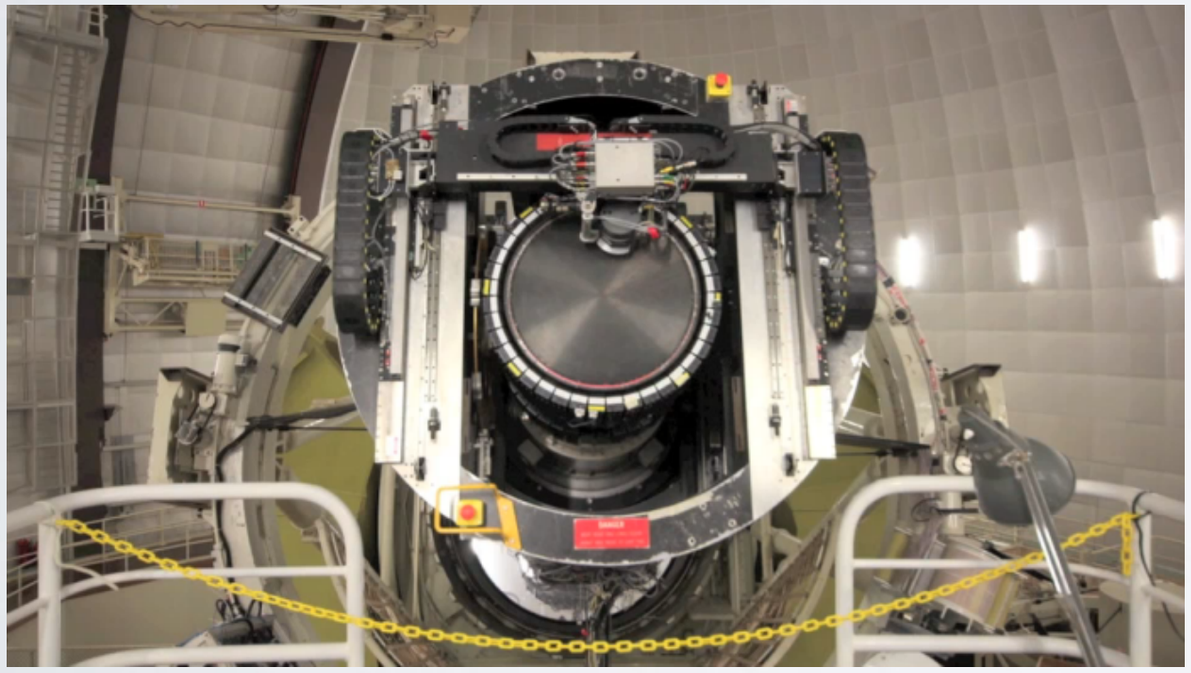
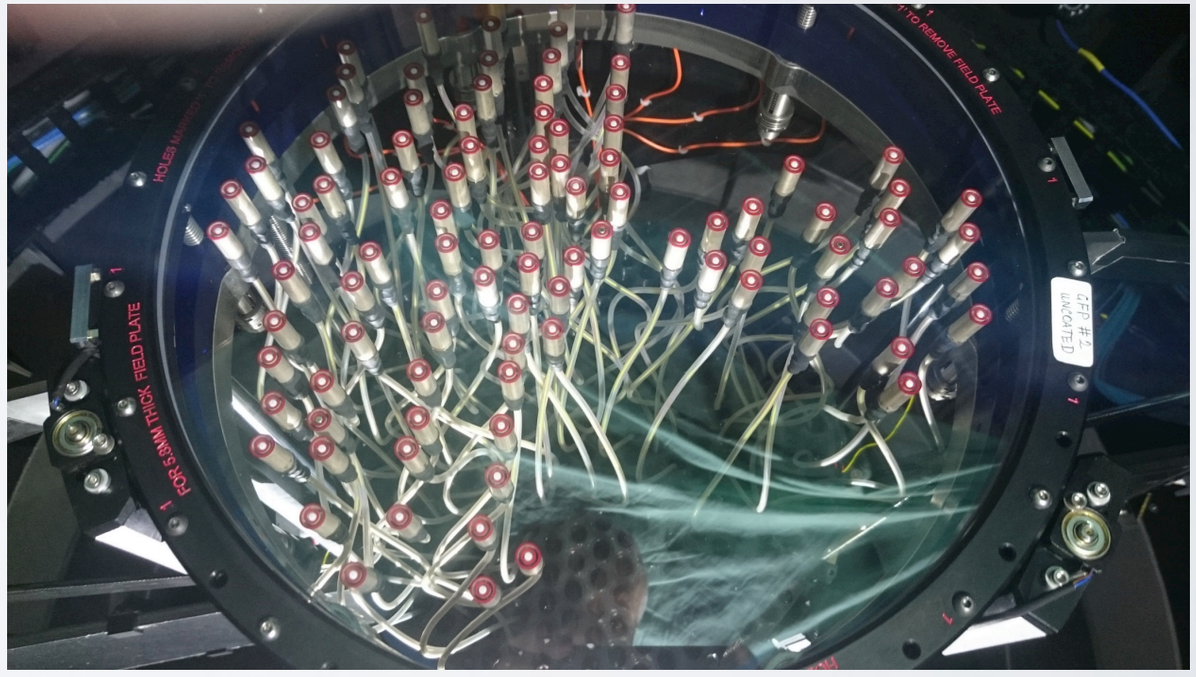
STARBUGS:

PAST

Future

2df sequential positioning robot vs. Starbugs parallel positioning robots





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COSMOLOGICAL GOALS:

- 1% measurement of the expansion parameter: using the baryon acoustic peak, which will be sharpen more by reconstructing the linear density field.
- Map both density and velocity fields to greater volume: using the fundamental plane relation for 100k elliptical galaxies.
- Preform tests of general relativity across a range of scales: By measuring the growth rate of cosmic structure through two complementary peculiar velocities and redshift space distortion.

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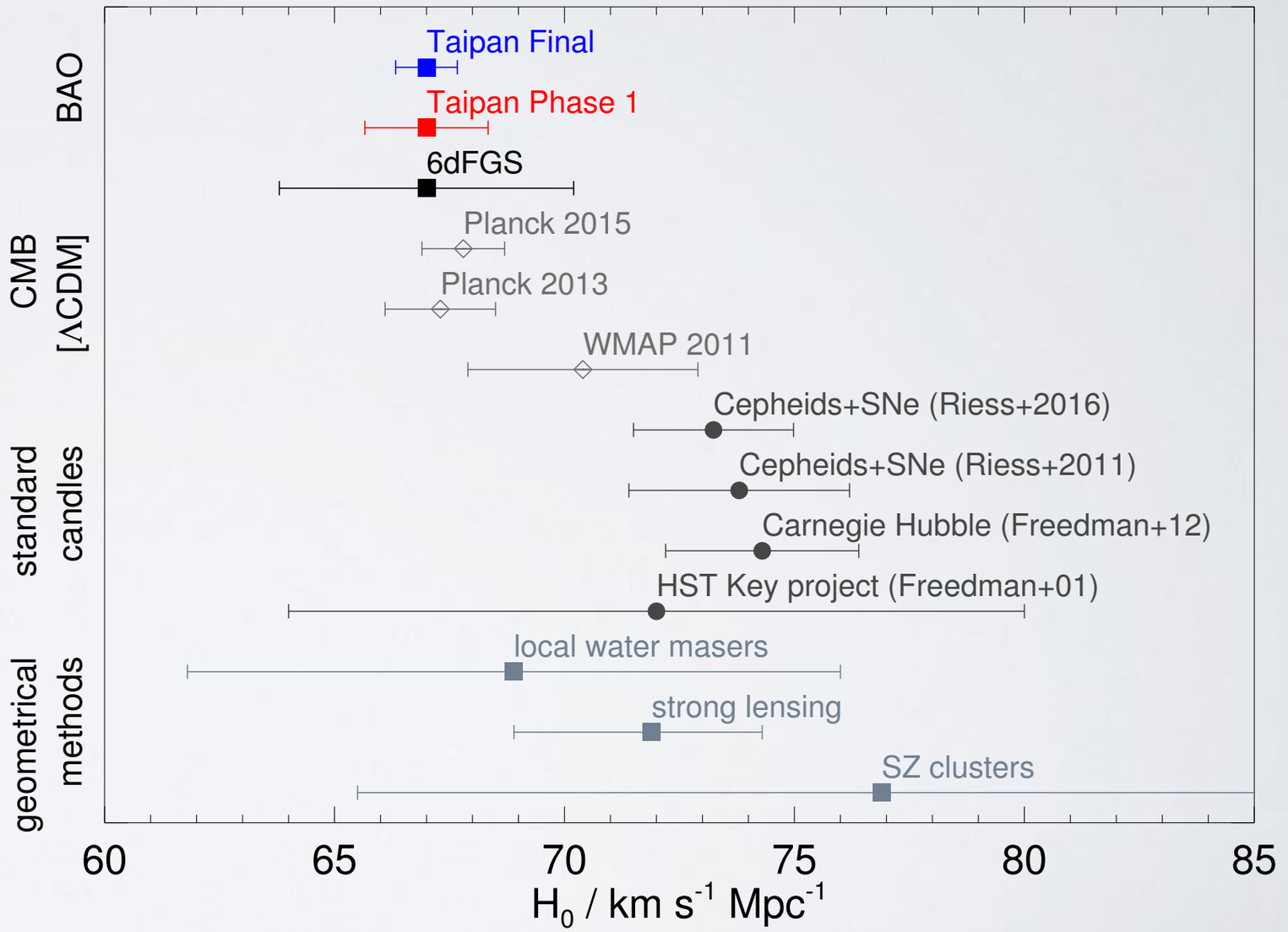
1% H_0 MEASUREMENT:

- Systematic discrepancies between H_0 determined from the CMB and the local measurement.



Da Cunha et al. (2017)

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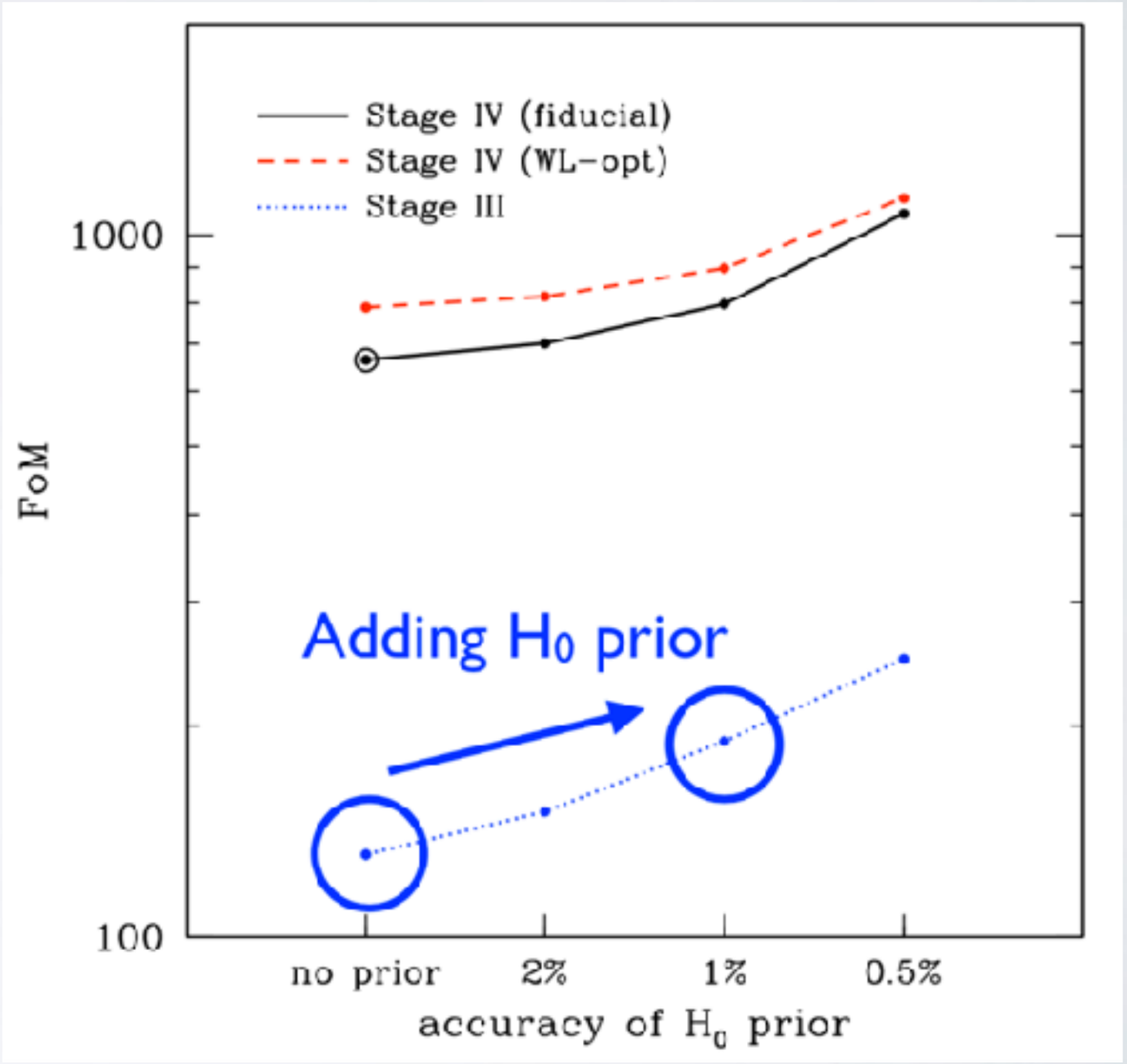
1% H_0 MEASUREMENT:

- H_0 prior raise the efficiency of dark energy experiments by 40% (Weinberg et al. 2013)



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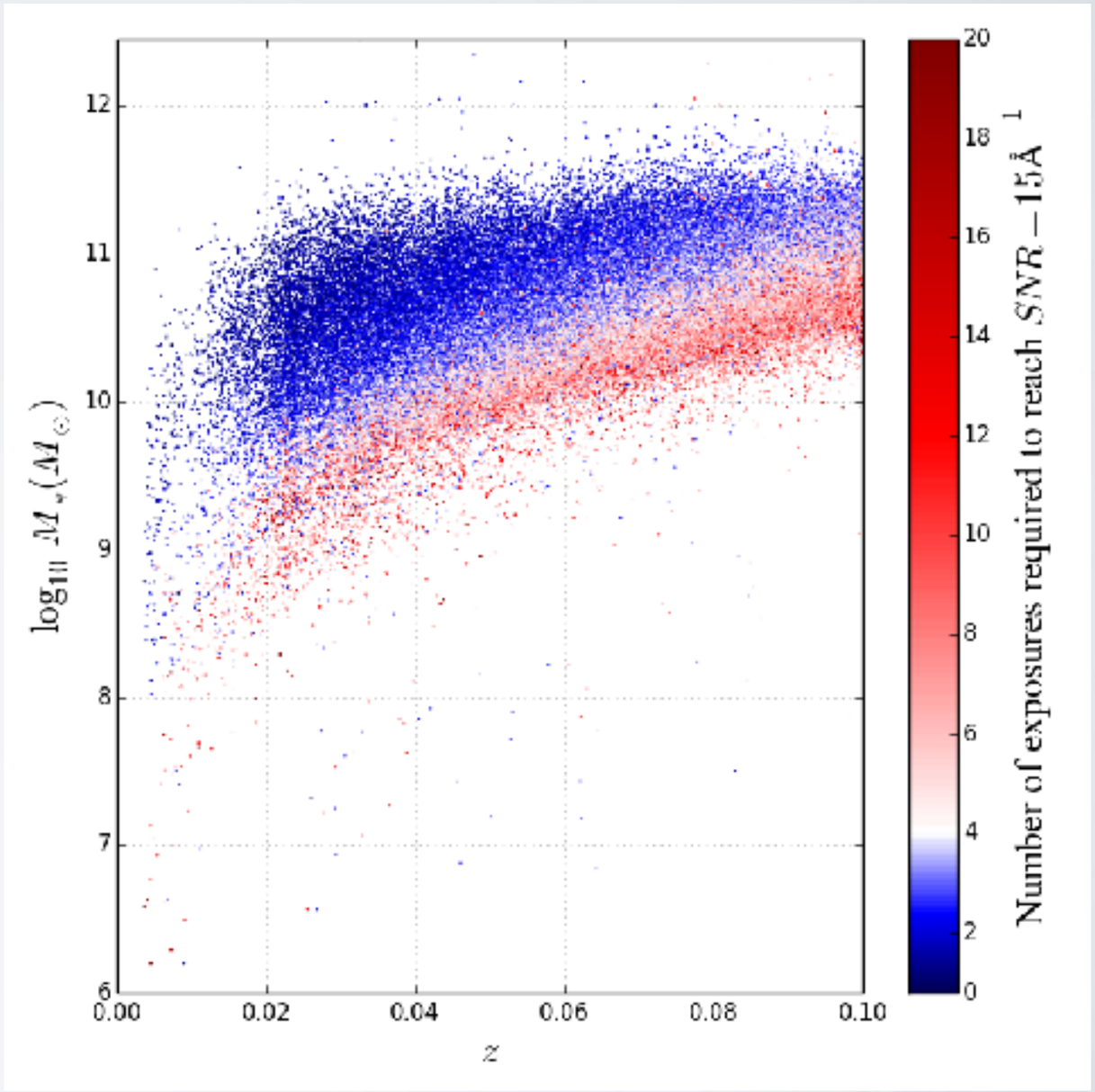
DENSITY AND VELOCITY MAPS:

- i-band magnitude < 17.0
- Redshift < 0.1
- Concentration index r_{90}/r_{50} > 2.5 in both r- and i-bands.
- The likelihood of a de Vaucouleurs fit > exponential fit in both r- and i-bands
- S/N > 15 A^{-1}

About 100k in 2pi



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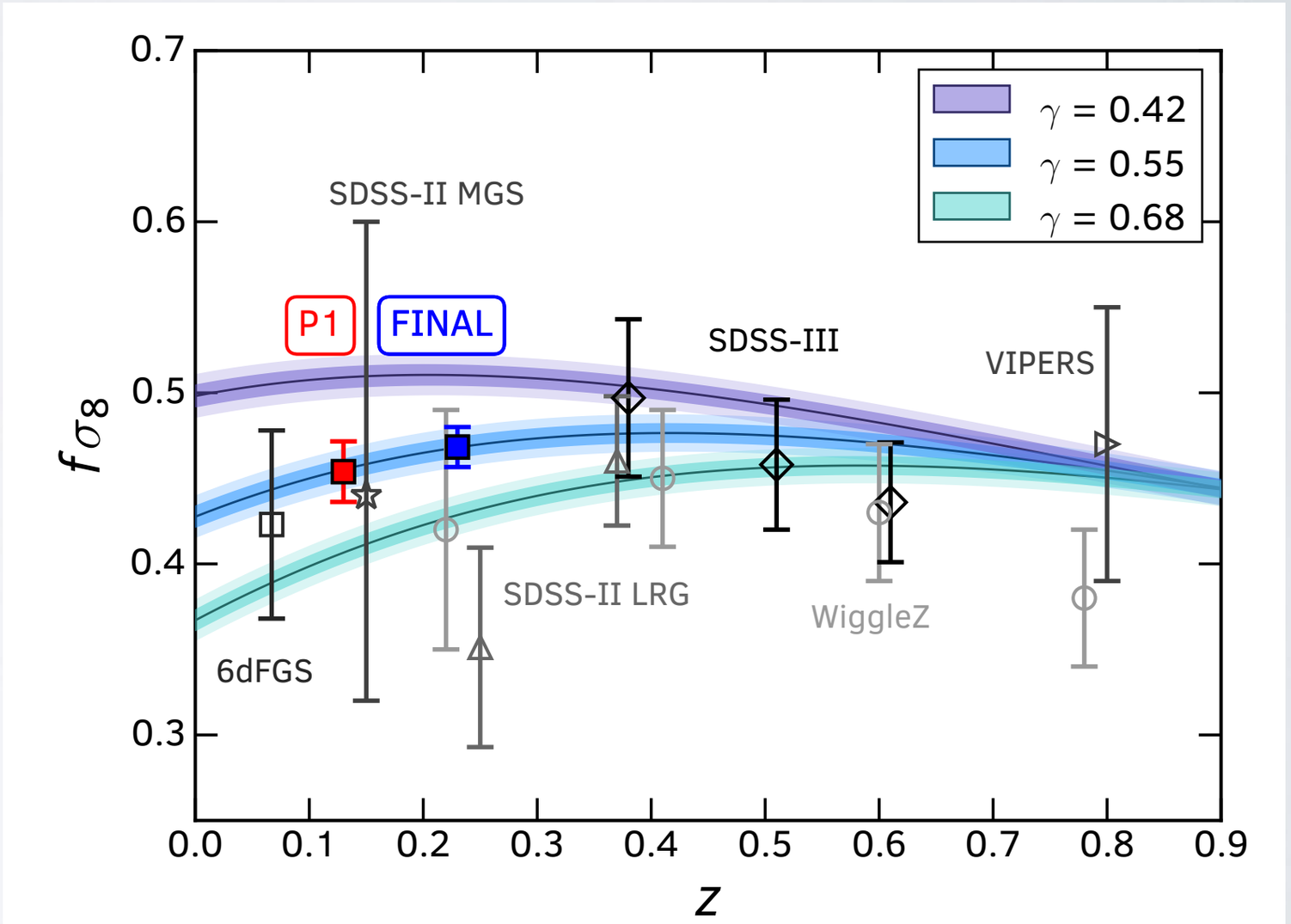
GROWTH RATE OF STRUCTURE:

- Measurement at low redshift will be able to distinguish between different models of gravity.



Da Cunha et al. (2017)

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WHITE PAPER PREPARATION:

- How will this effort enhance our current knowledge of dark energy?
- How does the idea complement other effort?
- Timeline?

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SUMMARY:

- The Taipan galaxy survey is a multi-object spectroscopic survey starting in 2017 that will cover 2π steradians over the southern sky and obtain optical spectra for about 2 million galaxies out to a redshift z=0.4
- Three working groups (Galaxy evolution, peculiar velocity, and LSS) ready to be on-sky early-2018.
- Interested to join the survey contact Matthew Colless matthew.colless@anu.edu.au or Andrew Hopkins andrew.hopkins@aao.gov.au
- To join the peculiar velocity working group contact Khaled Said khaled.said@anu.edu.au
- To join the LSS working group contact Chris Blake cblake@swin.edu.au
- **See Taipan white paper for a complete description: da Cunha et al (2017)**