PFS cosmology

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zSurvey meeting

CPPM – 07/12/2015

Objectives

1. Constrain the angular diameter distance and the Hubble expansion rate via the BAO experiment to improved precision and/or in a redshift range complementary to those probed by other surveys

2. Use the shape and amplitude of galaxy correlation function in order to constrain cosmological parameters as well as the growth rate of structure formation

3. Together with weak lensing measures of the growth of structure derived from HSC, improve the cosmological constraints by calibrating uncertainties that cannot be resolved by either of the PFS or HSC survey alone

PFS Cosmology survey

- Galaxy targets: OII galaxies at z>1 from HSC-Wide survey
- Color-preselection: g-r<0.3
- Area: 1400 deg^2
- Volume: 9.3 Gpc^3

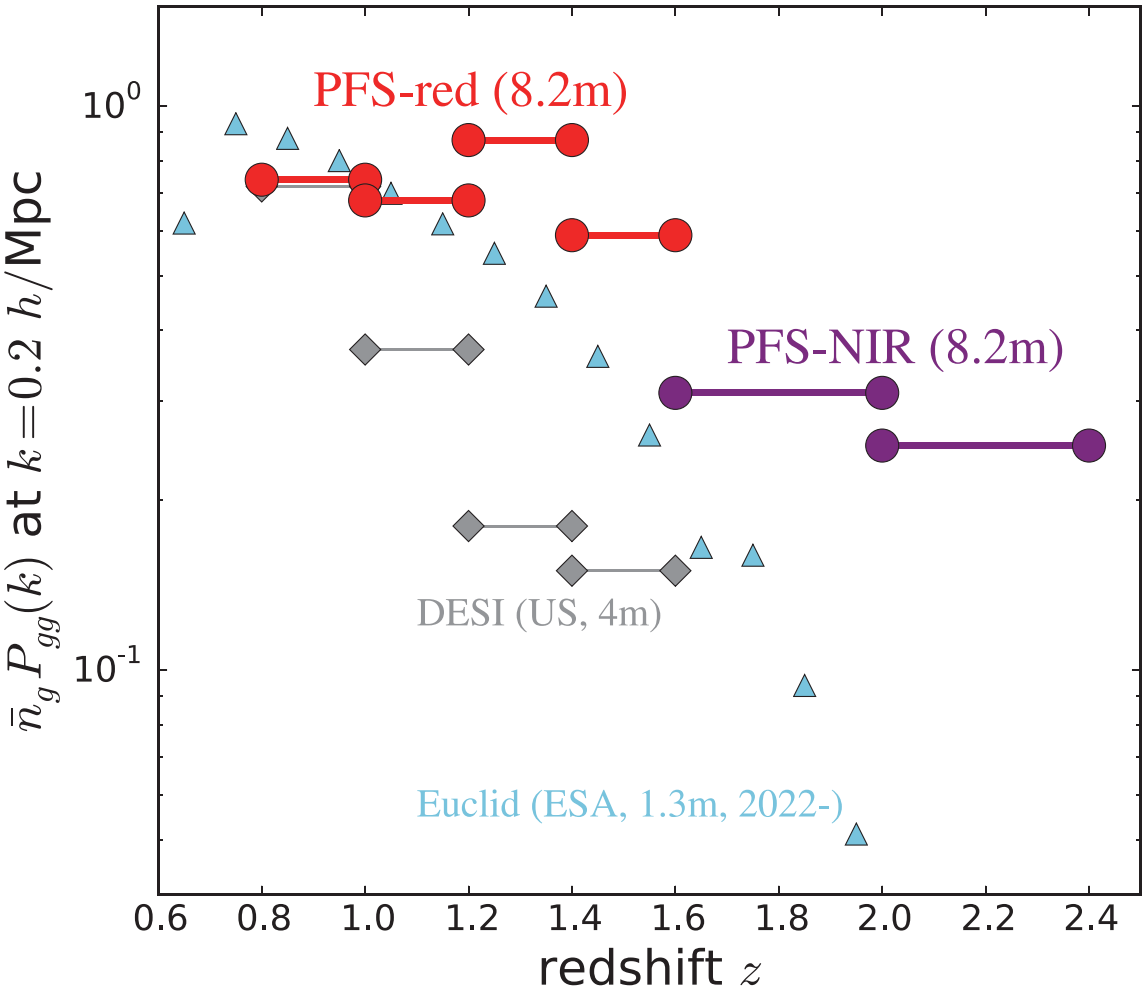
PFS Cosmology Survey Parameters

redshift	$V_{\rm survey}$ $[{\rm Gpc}/h]^3$	N_g per field	$\bar{n}_g$ $[10^{-4}(h/{\rm Mpc})^3]$	bias b_g	$\bar{n}_g P_g(k)$ $k = 0.1h/{\rm Mpc}$	$\bar{n}_g P_g(k)$ $k = 0.2h/{\rm Mpc}$
$0.6 < z < 0.8$	0.59	85	1.9	1.18	0.74	0.25
$0.8 < z < 1.0$	0.79	358	6.0	1.26	2.23	0.74
$1.0 < z < 1.2$	0.96	420	5.8	1.34	2.10	0.68
$1.2 < z < 1.4$	1.09	640	7.8	1.42	2.64	0.87
$1.4 < z < 1.6$	1.19	491	5.5	1.50	1.78	0.59
$1.6 < z < 2.0$	2.58	598	3.1	1.62	0.95	0.31
$2.0 < z < 2.4$	2.71	539	2.7	1.78	0.76	0.25

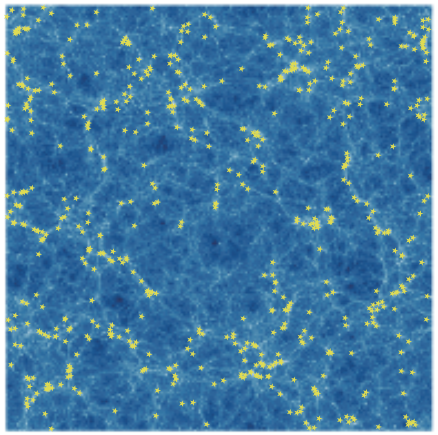
PFS collaboration

Forecast: power spectrum

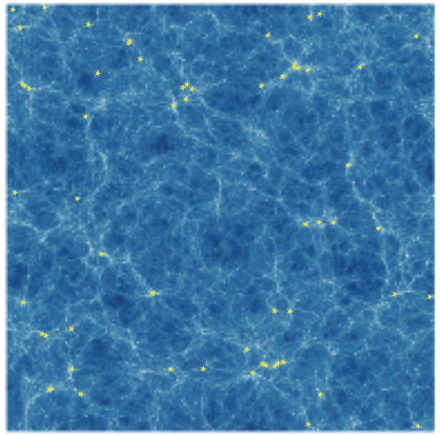
Best datasets at z>1… before WFIRST (NASA: 2025-)



PFS (8.2m) for z~1.5 slice

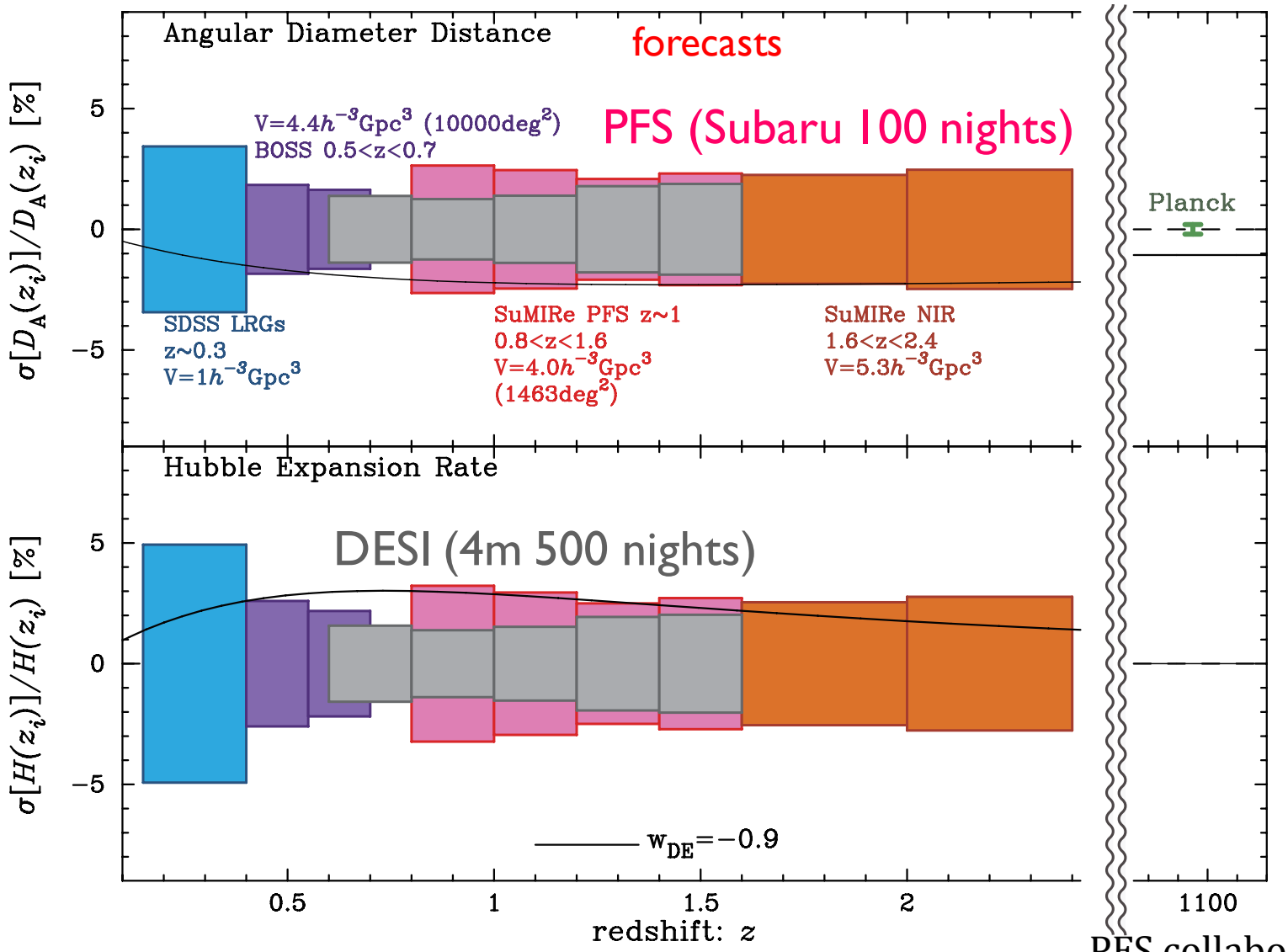


4m-class tel.



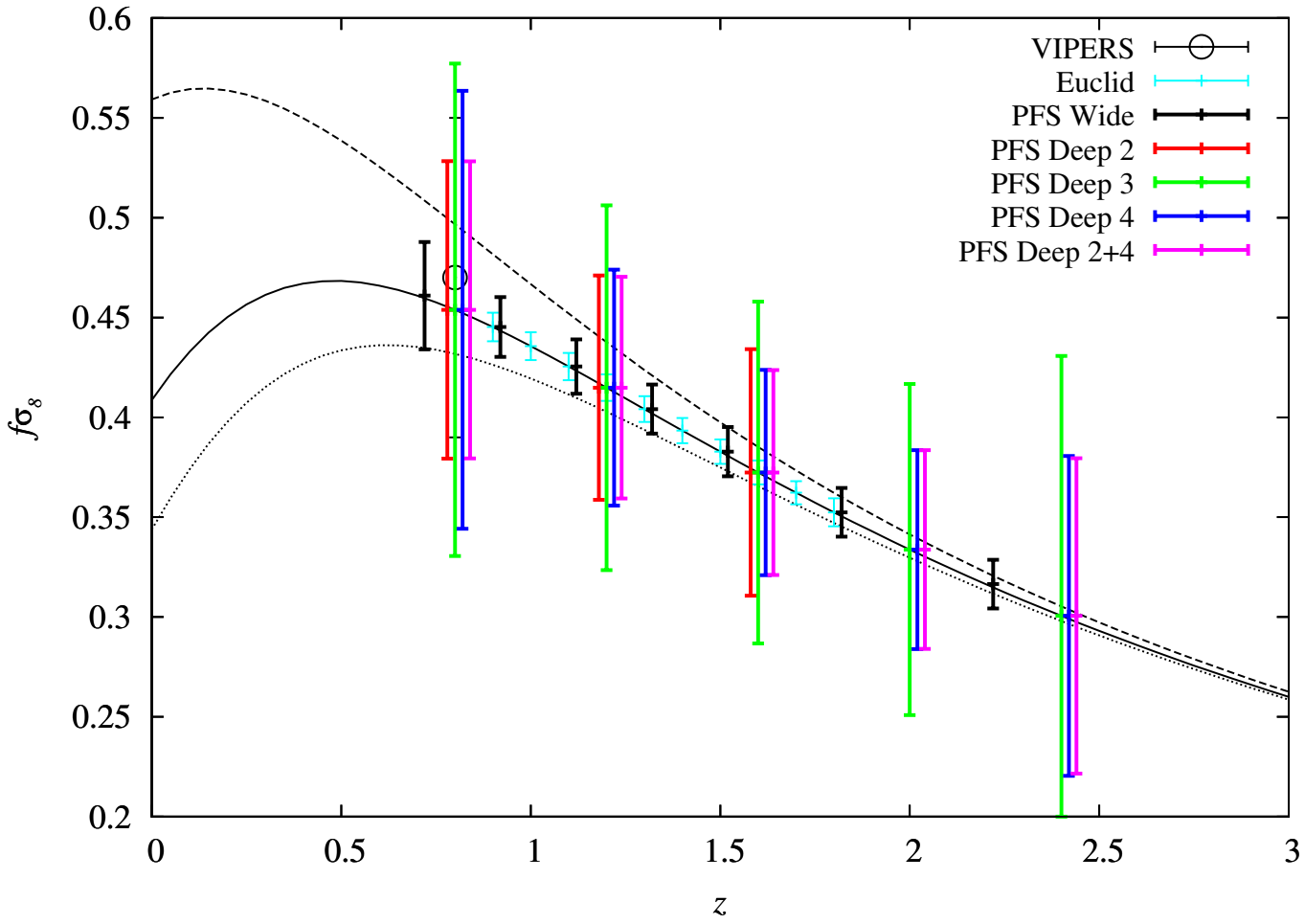
PFS collaboration

Forecast BAO: PFS vs DESI



PFS collaboration

Forecast RSD



PFS predictions of $f\sigma_8$: *Wide & Deep fields*

Roadmap

Subaru Strategic Program

- End of 2015: draft of PFS SSP proposal
- Oct 2017: PFS proposal submission (Japan)
- 2018: PFS engineering run
- Mid-2018: TAC/SAC approval of the PFS SSP survey
- Mid-2019: PFS SSP commences

OCEVU zSurvey (LAM)

Preparation:

- Spectrograph
- Spectroscopic pipeline
- Survey strategy

Exploitation: RSD, BAO, lensing/clustering