

# Synergies of Large-Scale Structure and Cosmic Microwave Background Data in the 2020s

We<sup>1</sup>★

<sup>1</sup> Here

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## ABSTRACT

**Key words:** cosmological parameters – theory –large-scale structure of the Universe

**Table 1.** Fiducial parameters, flat priors (min, max) for cosmology and galaxy bias, and Gaussian priors ( $\mu$ ,  $\sigma$ ) for observational systematics. We consider optimistic and pessimistic scenarios in this paper, which is indicated in the corresponding sections of the table.

Parameter	Fiducial	Prior
<b>Survey</b>		
$\Omega_s$	18,000 deg <sup>2</sup>	fixed
$n_{\text{source}}$	51 gal/arcmin <sup>2</sup>	fixed
$n_{\text{lens}}$	66 gal/arcmin <sup>2</sup>	fixed
$\sigma_\epsilon$	0.26	fixed
<b>Cosmology</b>		
$\Omega_m$	0.3156	flat (0.1, 0.6)
$\sigma_8$	0.831	flat (0.6, 0.95)
$n_s$	0.9645	flat (0.85, 1.06)
$w_0$	-1.0	flat (-2.0, 0.0)
$w_a$	0.0	flat (-2.5, 2.5)
$\Omega_b$	0.0492	flat (0.04, 0.055)
$h_0$	0.6727	flat (0.6, 0.76)

**Table 3.** Fiducial parameters, flat priors (min, max) for cosmology and galaxy bias, and Gaussian priors ( $\mu$ ,  $\sigma$ ) for observational systematics. We consider optimistic and pessimistic scenarios in this paper, which is indicated in the corresponding sections of the table.

<b>Lens Sample = Redmagic</b>		
<b>Galaxy bias (tomographic bins)</b>		
$b_g^i$	1.3 + i × 0.1	flat (0.8, 3.0)
<b>Lens photo-z (optimistic)</b>		
$\Delta_{z,\text{lens}}^i$	0.0	Gauss (0.0, 0.002)
$\sigma_{z,\text{lens}}$	0.01	Gauss (0.01, 0.002)
<b>Source photo-z (optimistic)</b>		
$\Delta_{z,\text{source}}^i$	0.0	Gauss (0.0, 0.002)
$\sigma_{z,\text{source}}$	0.01	Gauss (0.01, 0.002)
<b>Shear calibration (optimistic)</b>		
$m_i$	0.0	Gauss (0.0, 0.002)

## 1 INTRODUCTION

## 2 MODELING AND ANALYSIS CHOICES

## 3 CONSTRAINING POWER AS A FUNCTION OF TIME

## 4 VARYING THE GALAXY SAMPLE

## 5 MODIFIED GRAVITY

## 6 PHOTO-Z OUTLIERS

## 7 CONCLUSIONS

★ E-mail:

**Table 2.** Fiducial parameters, flat priors (min, max) for cosmology and galaxy bias, and Gaussian priors ( $\mu$ ,  $\sigma$ ) for observational systematics. We consider optimistic and pessimistic scenarios in this paper, which is indicated in the corresponding sections of the table.

<b>Lens Sample = Source Sample</b>		
<b>Galaxy bias (tomographic bins)</b>		
$b_g^i$	1.3 + i × 0.1	flat (0.8, 3.0)
<b>Lens photo-z (optimistic)</b>		
$\Delta_{z,\text{lens}}^i$	0.0	Gauss (0.0, 0.002)
$\sigma_{z,\text{lens}}$	0.01	Gauss (0.01, 0.002)
<b>Source photo-z (optimistic)</b>		

**Table 4.** Fiducial parameters, flat priors (min, max) for cosmology and galaxy bias, and Gaussian priors ( $\mu$ ,  $\sigma$ ) for observational systematics. We consider optimistic and pessimistic scenarios in this paper, which is indicated in the corresponding sections of the table.

<b>Lens Sample = Gold Sample</b>		
<b>Galaxy bias (tomographic bins)</b>		
$b_g^i$	$1.3 + i \times 0.1$	flat (0.8, 3.0)
<b>Lens photo-z (optimistic)</b>		
$\Delta_{z,\text{lens}}^i$	0.0	Gauss (0.0, 0.002)
$\sigma_{z,\text{lens}}$	0.01	Gauss (0.01, 0.002)
<b>Source photo-z (optimistic)</b>		
$\Delta_{z,\text{source}}^i$	0.0	Gauss (0.0, 0.002)
$\sigma_{z,\text{source}}$	0.01	Gauss (0.01, 0.002)
<b>Shear calibration (optimistic)</b>		
$m_i$	0.0	Gauss (0.0, 0.002)