

Weak Lensing for Precision Cosmology

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1 Notes

In this section I present some general notes on weak lensing.

1.1 Talk Structure:

1. Motivate The Problem Cosmo
2. Introduce The Theory Cosmo + Lensing
3. Explain How Theory Solves The Problem
4. Current Results/ Experiments
5. Explain Problems with WeakLensing
6. Summarise

1.1.1 Motivate The Problem

Discuss probing the large scale universe with CMB, supernvae, clustering and lensing. Note weak lensing makes no assumptions about the nature of dark matter and no assumptions about relationship between visible matter and mass therefore it provides a directly measured mass distribution in the universe as a function of redshift. Therefore we can get info on DE and DM directly. It is sensitive to intial conditions so it can even give info on inflation.

1.2 Lensing Basics

1.2.1 Lens Equations

$$\vec{\beta} = \vec{\theta} - \vec{\alpha}(\vec{\theta}) \tag{1}$$

$$\vec{\alpha}(\vec{\theta}) = \frac{1}{\pi} \int d^2\theta' \kappa(\vec{\theta}') \frac{\vec{\theta} - \vec{\theta}'}{|\vec{\theta} - \vec{\theta}'|^2} \tag{2}$$

1.2.2 Bending of Light

2 General Introduction

Layman friendly description of cosmology + weak lensing and its purpose.

3 Cosmological Observables

Discussion about cosmology in general and observable in the framework [4].

4 Gravitational Lensing

Discussion about lensing as a whole then specifics [2] [3] [1]

References

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