

Weak Lensing Mass Maps in Euclid

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COSMOS Survey (HST)



FoV = 1.64 deg^{2} , ng = 67 gal/arcmin^2

Massey et al., Nature, 2007



CFHTLens Survey (CFHT)



ng ≈12 gal/arcmin²



DES Survey



FoV = 139 deg² of 5000 deg² ng \approx 5 gal/arcmin²

4

Weak Lensing Survey



The Euclid mission





Euclid Mission

- 6-year mission, to be lauched in
 2020
- 1.2m diameter miror, field of view : 0.5 deg²
- Wide Survey : 15000 deg² (1/3 of the full sky)
- Deep survey : 2 x 20 deg²
- Euclid Consortium
- 1200 members
- 130 laboratories from 14
 European countries + NASA/US



Euclid Reference Survey



I. Tereno et al., IAU, 2014

FoV = 15.000 deg^{2} , ng = 30 gal/arcmin^2



Why produce Weak Lensing Mass Maps for Euclid ?

Small field Weak Lensing Mass Maps

Clusters Characterization



Umetsu et al, ApJ, 2014

Other objects characterisation



Bullet Cluster, Clowe et al., ApJ, 2006



Why produce Weak Lensing Mass Maps for Euclid ?

Wide field Weak Lensing Mass Maps

Weak Lensing data analysis



Kilbinger et al., MNRAS, 2013



Weak Lensing field



Full-sky convergence map derived from the Horizon simulation

Weak Lensing Current state-of-the-art



Kilbinger et al., MNRAS, 2013

Peak Count



Euclid Weak Lensing Autumn, London, November 6th, 2015



 $n_g = 30 \text{ gal}/ \text{ arcmin}^2$, on a scale corresponding to $\theta = 1.85'$

Aperture Mass on shear catalogue	Purity	Completeness
2σ-threshold	10.77%	35.60%
3σ-threshold	33.15%	11.56%
Wavelet Transform on convergence map	Purity	Completeness
2σ-threshold	14.85%	36.31%
3σ-threshold	42.02%	13.11%
Wavelet Transform on convergence map	Purity	Completeness
MRLens Filter	75.37%	25.92%

Constraints on cosmological parameters



Pires, Leonard & Starck, 2012



Constraints on cosmological parameters



Pires, Leonard & Starck, 2009

Weak Lensing Survey Characteristics



Weak Lensing Maps Resolution

COSMOS



Euclid



CFHTLens







Noiseless simulation



2°

