Galaxy Cluster SWG

J.G Bartlett
APC – Université Paris Diderot

Euclid France 2015

The Science Working Group

- Leads: L. Moscardini (IT), J. Weller (G), J.G. Bartlett (deputy, F)
- Cosmology and Legacy science with clusters
- Eight internal and one external work packages established in 2015
  - http://euclid.roe.ac.uk/projects/cgswg/wiki/
- Cosmology forecast paper submitted to A&A as an official *Euclid* paper
  - Sartoris et al., arXiv:1505.02165

SWG Work Packages

- Sample Selection
  - Gonzalez, Iovino, Moscardini
- Mass Modeling
  - Von der Linden, Meneghetti, Hoekstra
- Likelihood
  - Borgani, Weller
- Statistics on Cluster Samples
  - Weller, Bartlett, Moscardini

SWG Work Packages

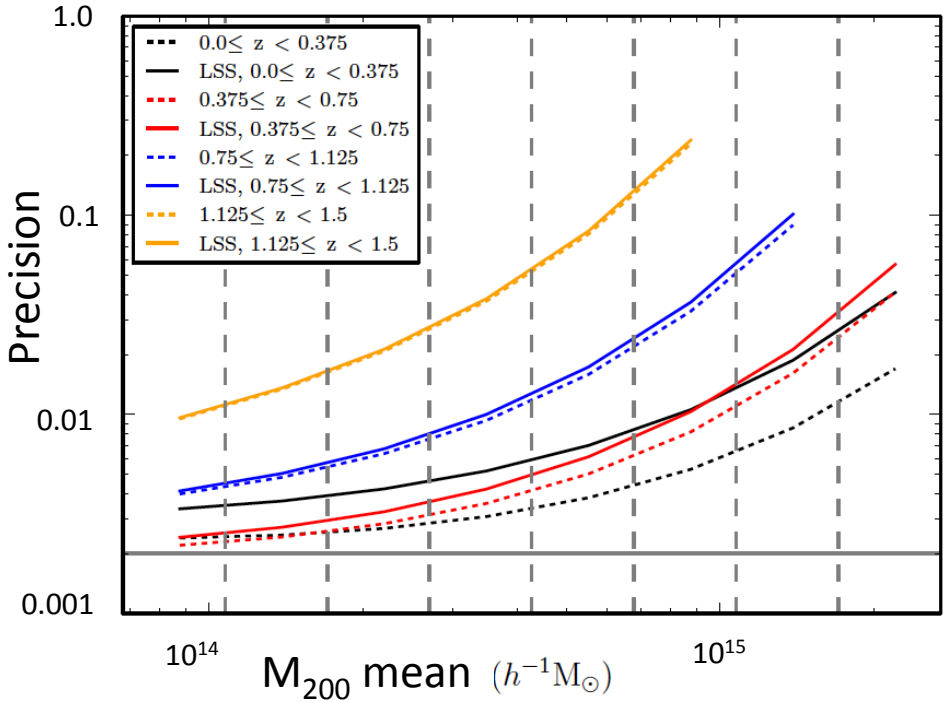
- Mass-Observable Relation
  - Bartlett, Biviano, Maurogordato
- Validation
  - Bardelli, Stanford
- Astrophysics of Galaxy Clusters
  - Mei, De Lucia
- External Data
  - Reiprich, Rosati, Melin

Galaxy Cluster Cosmology

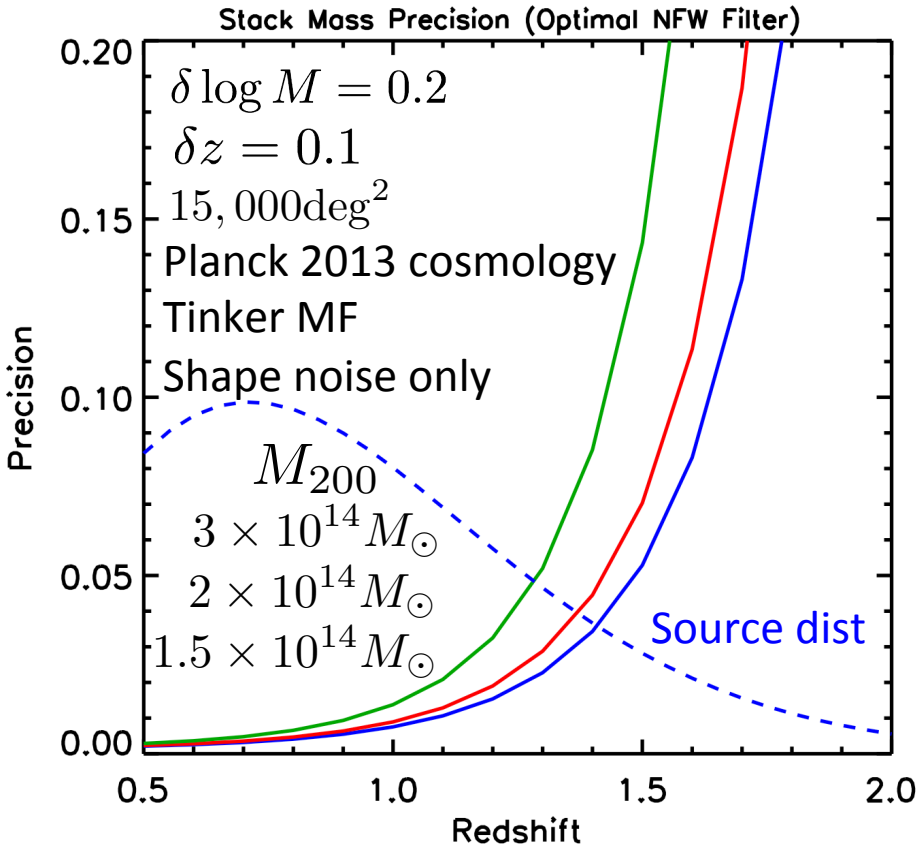
- Catalog construction and characterization
  - Baseline – photometric survey: ~60,000 clusters
    $M \sim (1-2) \times 10^{14} \mathrm{M}_{\odot}$ out to $z > 1$
  - Catalog construction challenges on mocks
  - Studies using grism
- Cluster observable-mass distribution
  - Lensing masses – *Euclid* strength
- Cosmology forecast paper submitted to A&A
  - Processed through *Euclid* Editorial Board
  - Received comments from A&A referee; response in preparation.

Mass Calibration from Shear

Mean Mass of Cluster Stack



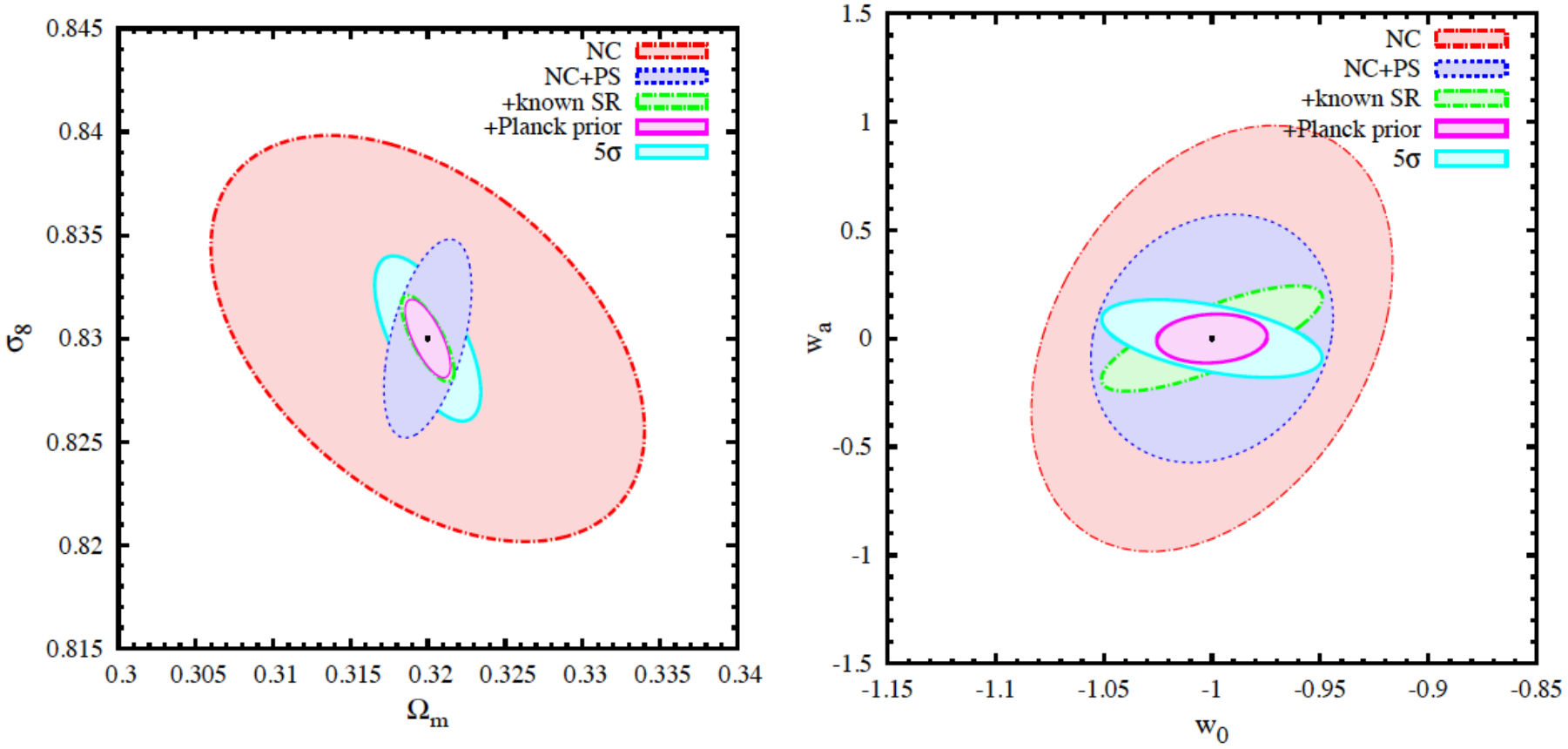
Köhlinger, Hoekstra, Eriksen (2015)



Bartlett (2014), internal note

Forecast Results

Sartoris et al. (2015)



68% confidence regions

Forecast Results

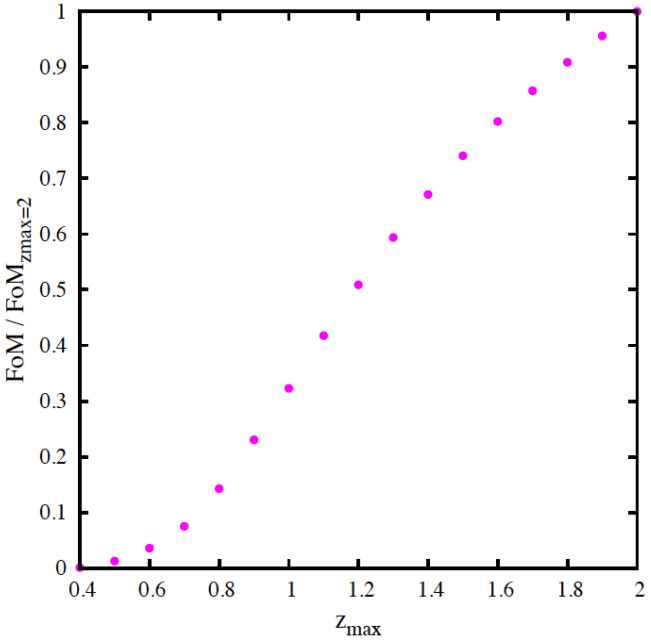
Sartoris et al. (2015)

$N_{500,c}/\sigma_{field} \geqslant 3$ *Euclid* photometric cluster selection		Eqs. 16 & 28				Eqs. 22 & 28	Eqs. 20 & 28	Eqs. 26 & 28
Parameter arrays:								
Constraints:	FoM	Δw_0	Δw_a	$\Delta\Omega_m$	$\Delta\sigma_8$	$\Delta\gamma$	Δf_{NL}	$\Delta\Omega_\nu$
NC+PS	73	0.037	0.38	0.0019	0.0032	0.023	6.67	0.0015
NC+PS+known SR	291	0.034	0.16	0.0011	0.0014	0.020	6.58	0.0013
NC+PS+known SR+Planck	802	0.017	0.074	0.0010	0.0012	0.015	4.93	0.0012
$N_{500,c}/\sigma_{field} \geqslant 5$ *Euclid* photometric cluster selection								
NC+PS+known SR+Planck	209	0.034	0.12	0.0022	0.0026			

Gravity | Non-Gauss | Neutrinos

Importance of reaching higher redshifts

A specific Euclid strength



SWG Meeting

- 1 – 3 February 2016, APC Paris
- Tentative program
  - Update on *Euclid* mission (EC Lead)
  - Update on OU-LE3
  - SWG WP structure, workflow and interface with LE3
  - New mechanism for updating requirements
  - IST combining cosmology probes
  - Work package reports
  - Status of simulations
  - Euclid publication policy
  - Pertinent topics in cluster science