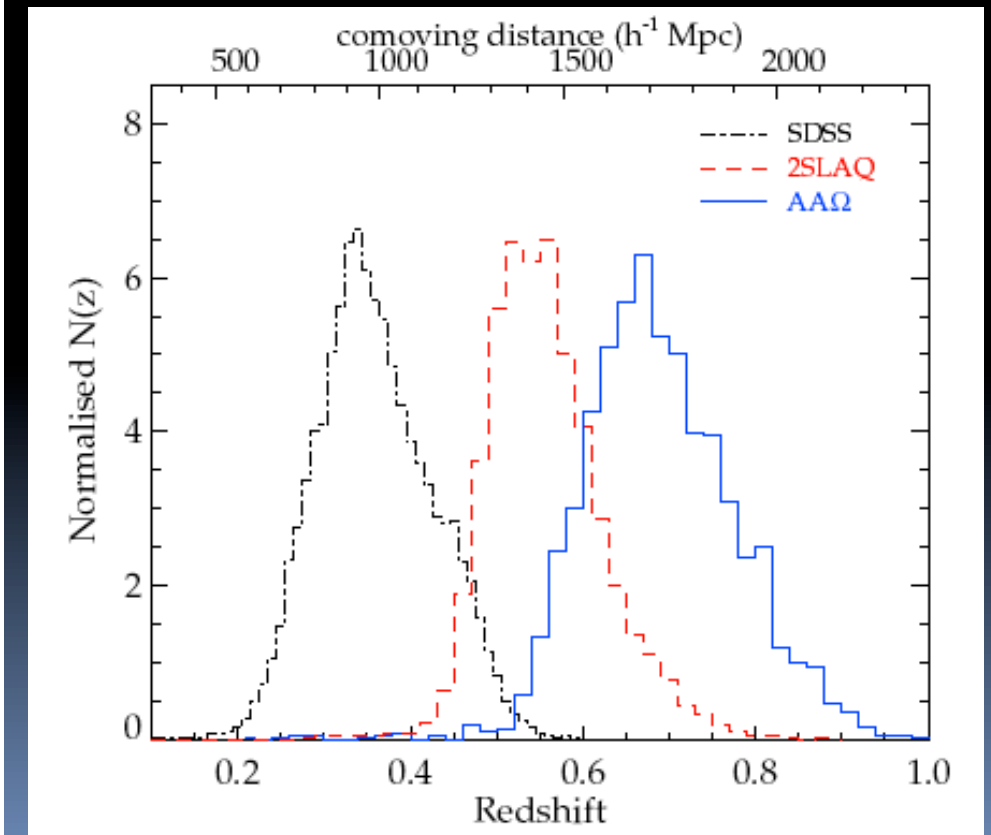
LRG COSMOLOGY

With U. Sawangwit, N. Nikoloudakis et al

Integrated Sachs Wolfe Effect

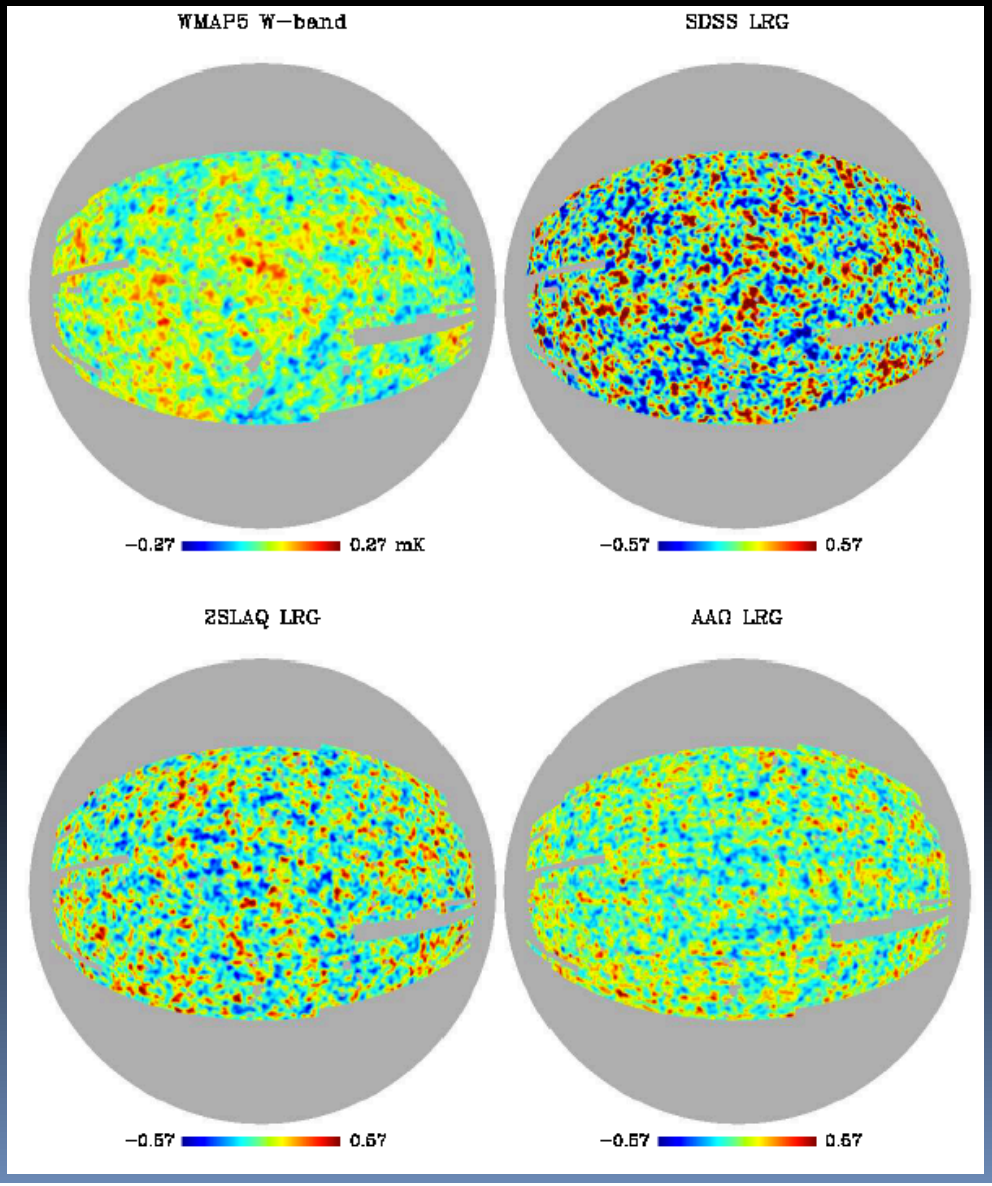
Table 1. Summary of the LRG samples used in the cross-correlation analyses.

Sample	$\bar{z}$	Number	Sky density (deg^{-2})	Magnitude (AB)
SDSS	0.35	106,699	≈13	$17.5 \leqslant r < 19.5$
2SLAQ	0.55	655,775	≈85	$17.5 < i < 19.8$
AAΩ	0.68	800,346	≈105	$19.8 < i \leqslant 20.5$



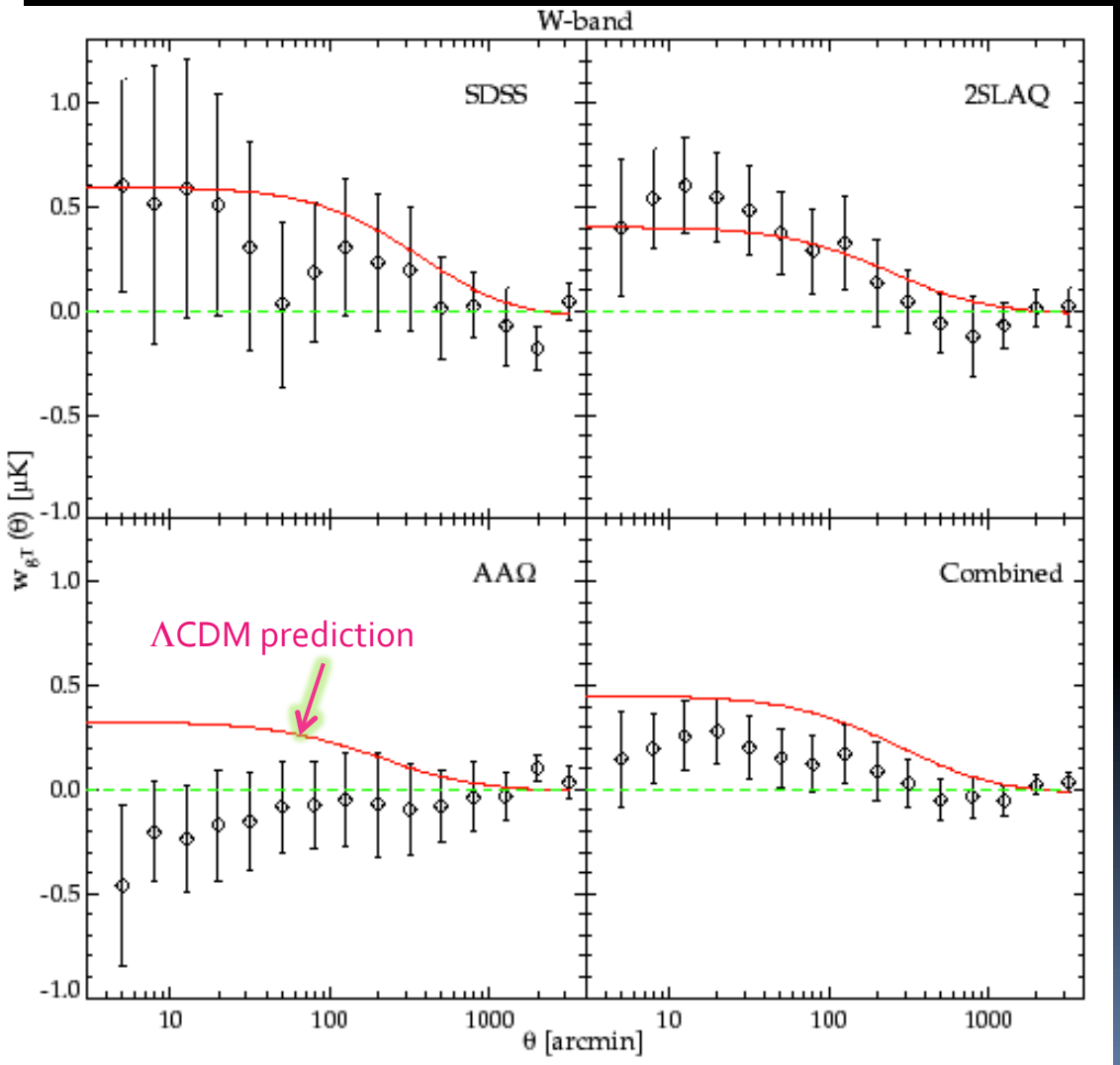
- Sawangwit et al (2010)
- 3 LRG samples at z~0.35, z~0.55 and z~0.68

Integrated Sachs Wolfe Effect



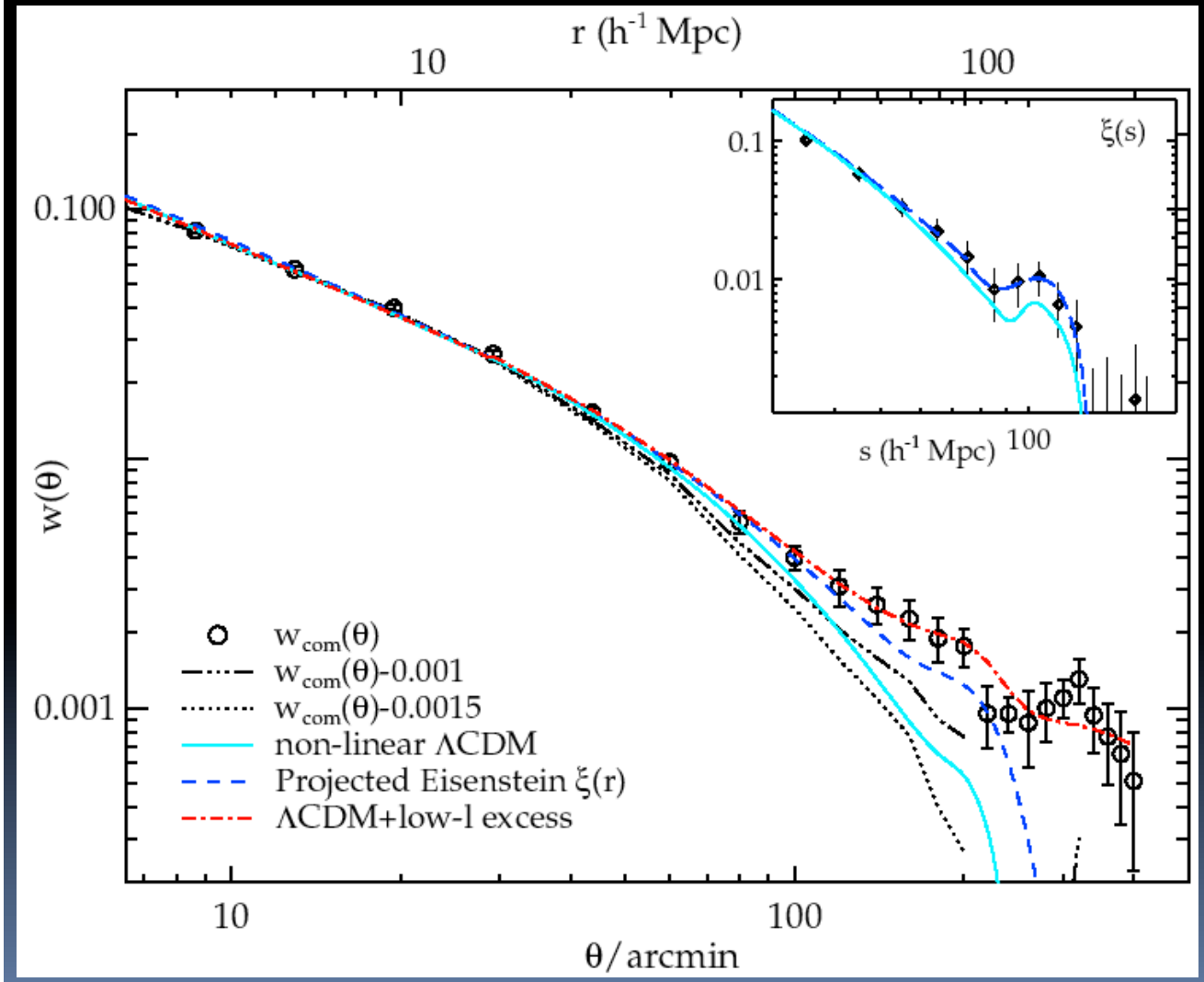
- ISW for 3 samples
- SDSS at z=0.35
- 2SLAQ at z=0.55
- AAOmega at z=0.68
- Cross-correlate with WMAP CMB map

ISW test of 2011 Nobel Prize!



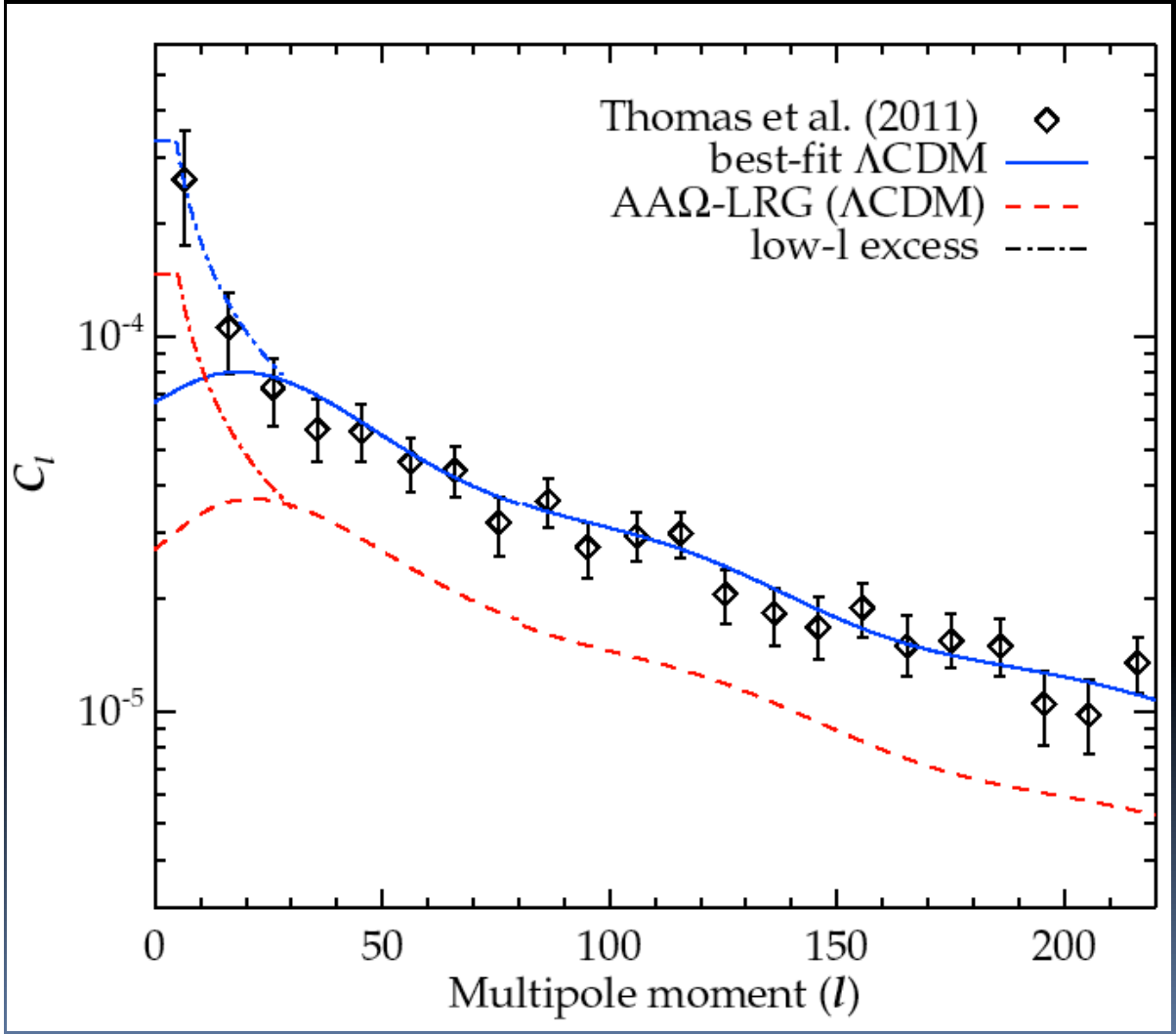
- Cross-correlated 3 LRG samples with CMB
- 2 showed ISW
- 1 didn't
- Combined sample as consistent with no ISW as ΛCDM prediction

LSS/Non-Gaussianity – z~0.68 LRGs



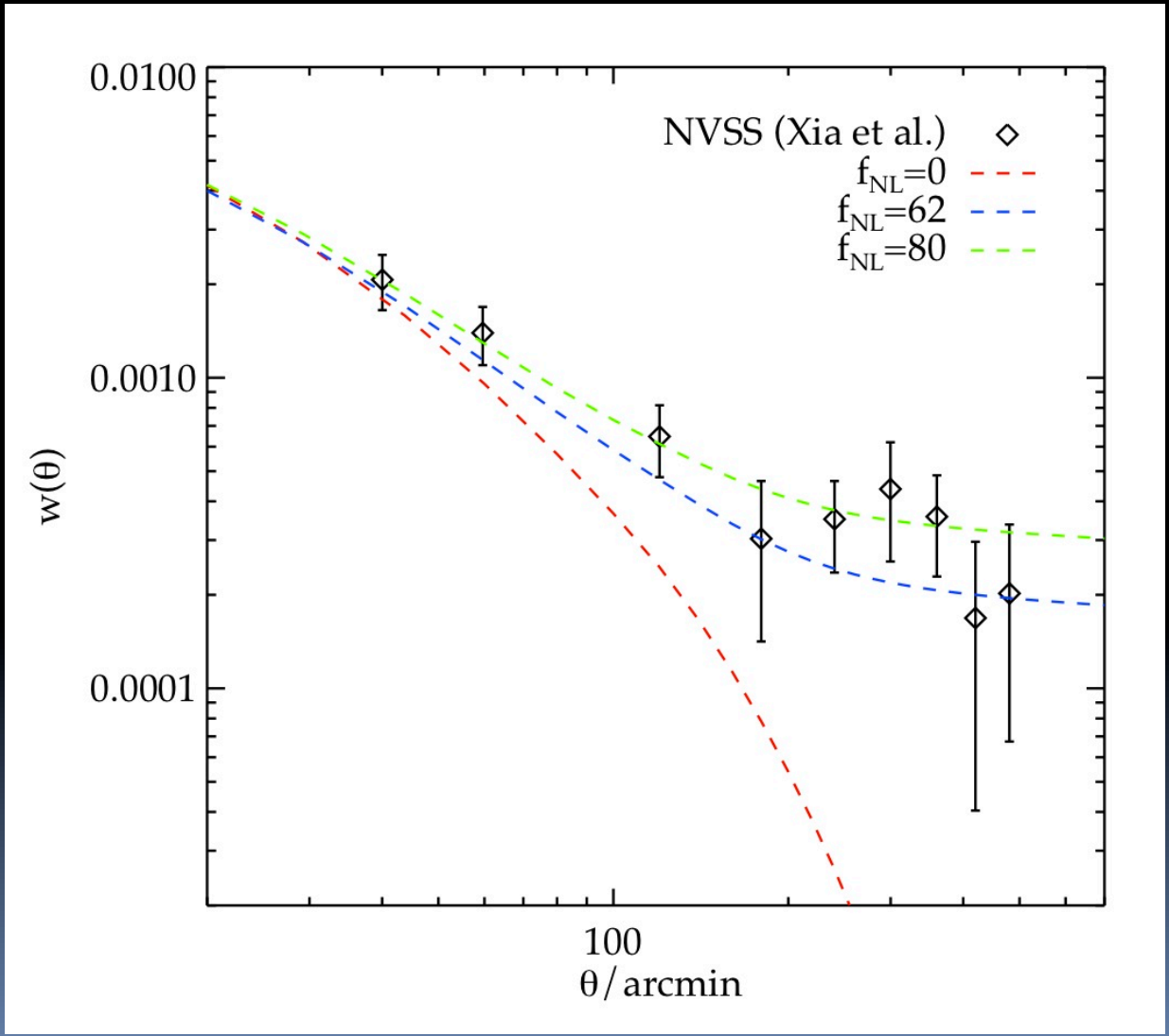
- AAOmega LRGs at z~0.68
- Large – scale clustering shows excess power
- Unclear if real or caused by artefacts

LSS/Non-Gaussianity –LRG C_l



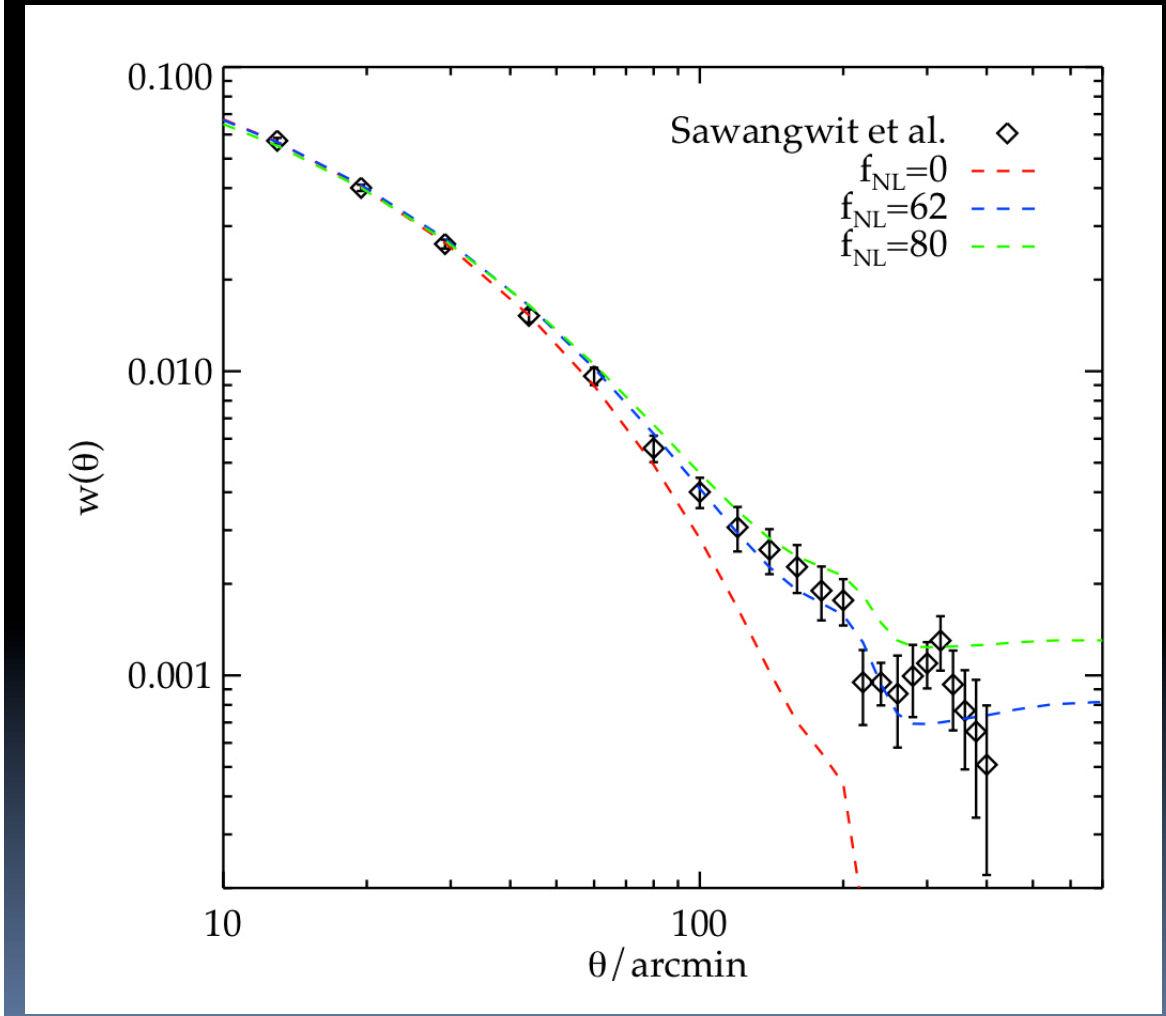
- Angular power spectrum from Mega-Z LRG survey
- Agrees with AAOmega LRG $w(\theta)$

Non-Gaussianity – NVSS radio sources



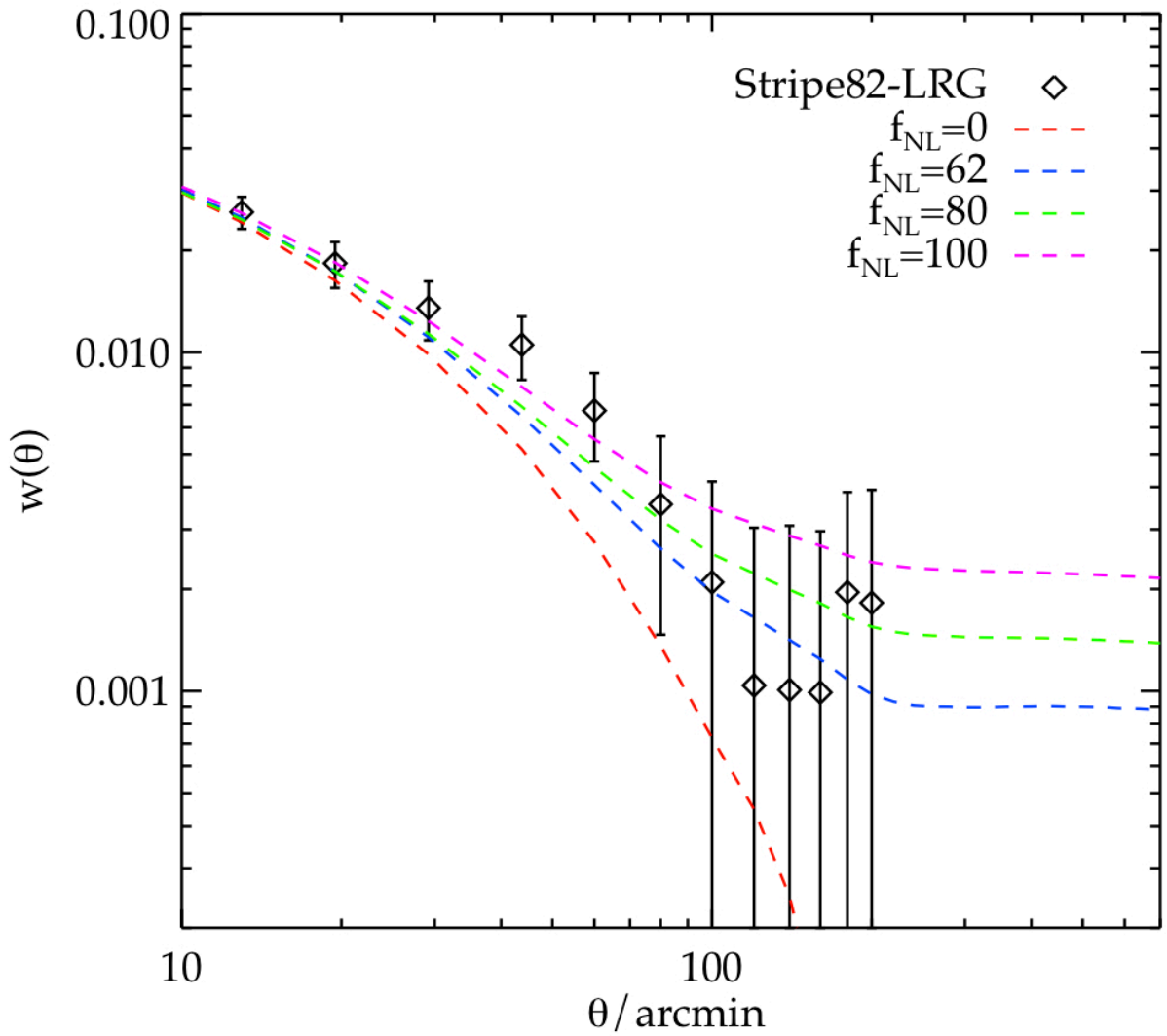
- Xia et a l (2010,2011) find w(θ) excess
- Radio source n(z) peaks at z~0.7 with range 0.4<z<2
- f_{NL}=58±28

Non-Gaussianity – AAOmega LRGs



- Large – scale clustering excess in z~0.68 LRGs
- May indicate non-Gaussianity at similar level to NVSS
- f_{NL} ~ 60±15

Non-Gaussianity– Stripe 82 z~1 LRGs



- Nikoloudakis et al also find w(θ) excess
- NG effect predicted to increase as (1+z)
- f_{NL}~80±20

Summary

- VST ATLAS → new Southern LRG surveys
- New ISW test of accelerating expansion
- Only route to ultimate ISW test of accelerating expansion
- LRG surveys to determine large-scale correlation functions
- Test reliability of possible detections of non-Gaussianity
- Non-Gaussianity also target of 2dF QSO DE Survey