Testing Cosmology with 2-point correlation function

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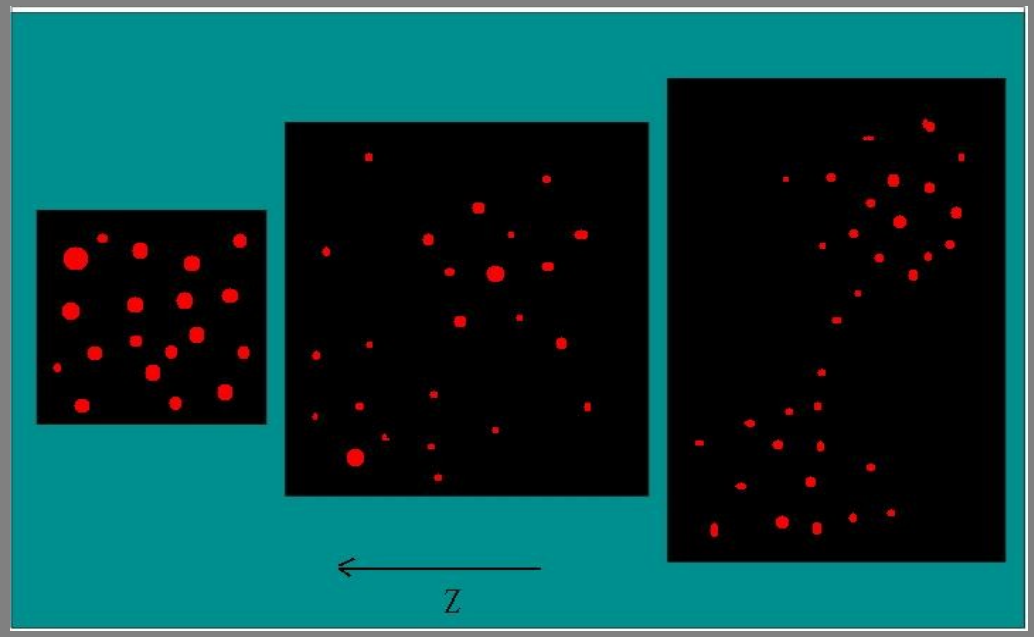
Testing Cosmology with 2-point correlation function:

what about clustering history?



Testing Cosmology with 2-point correlation function

- Peebles (1980) “Large Structures of the Universe”
- Perturbations on Cosmological equations
- Growth rate $f = d(\ln(D))/d(\ln(a))$
- Linder(2007) $f(z)=\Omega_m(z)^x$

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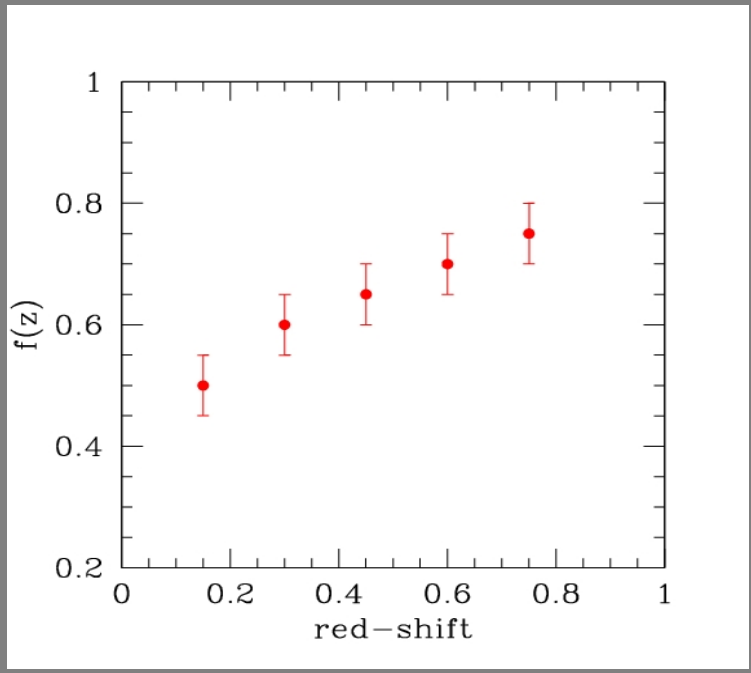
- Desirable:



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- Difficult to measure
- f = Beta * b
- Beta has been barely measured, need of big catalogs.

PREVIOUS RESULTS FOR β AND f

Survey	z	β	f	Reference
2dFGRS	0.15	0.49(09)	0.49(10)	Hawkins 2003
SDSS	0.34	0.34(03)	0.64(09)	Cabre & Gastañaga 2008
DEEP	0.77	0.70(26)	0.91(36)	Guzzo 2008

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- But now comes Wiggle-Z !!
- ~ 240,000 red-shifts
- $0.2 < z < 1.3$
- Big volume of space
- Data enough to do quality measurements of correlation function and Beta, in higher z.

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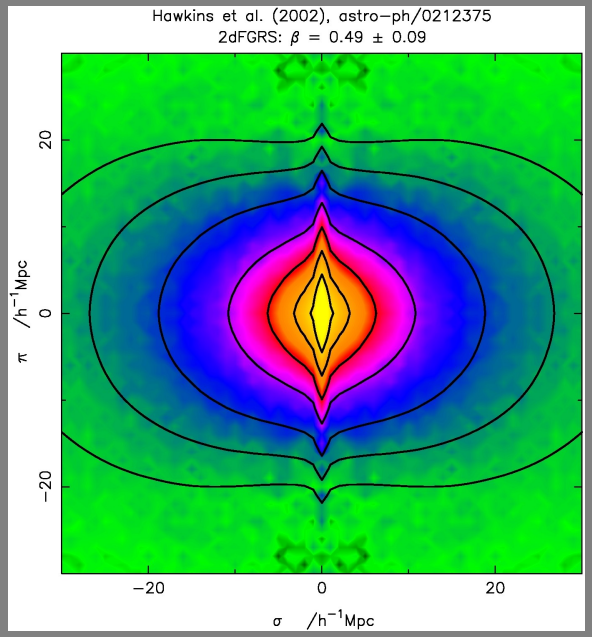
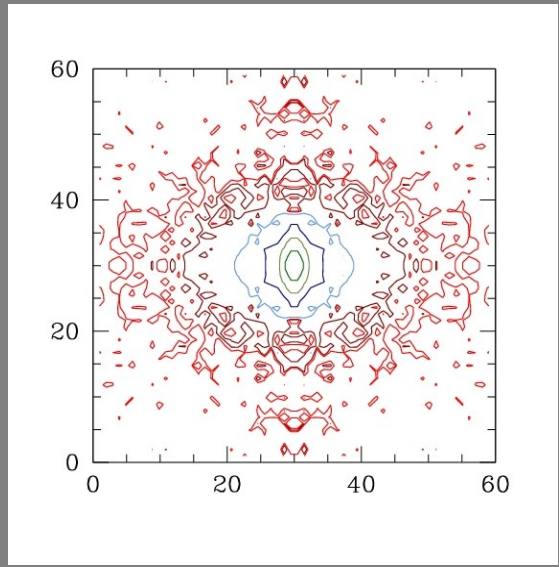
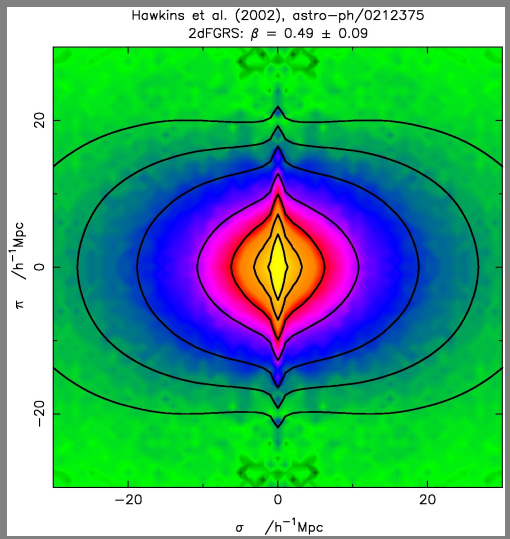
- But peculiar velocities distorts the correlation function.

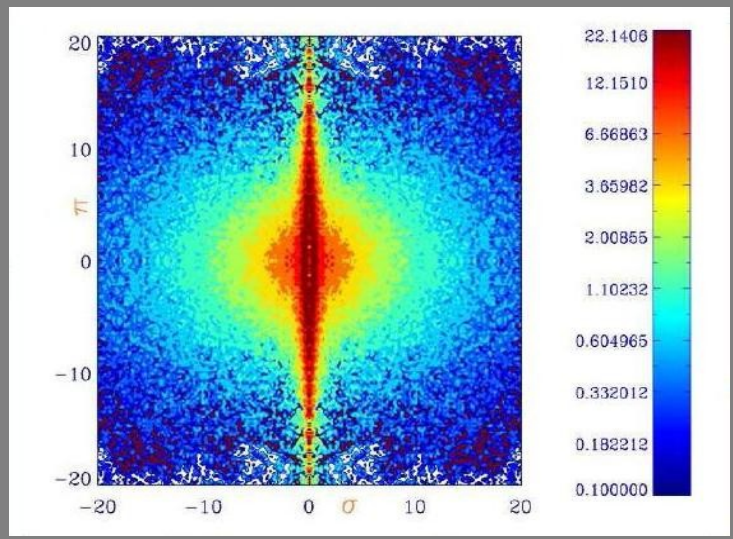


- The distortion can be modeled, and fitted to the data, to get Beta.

Correlation Function







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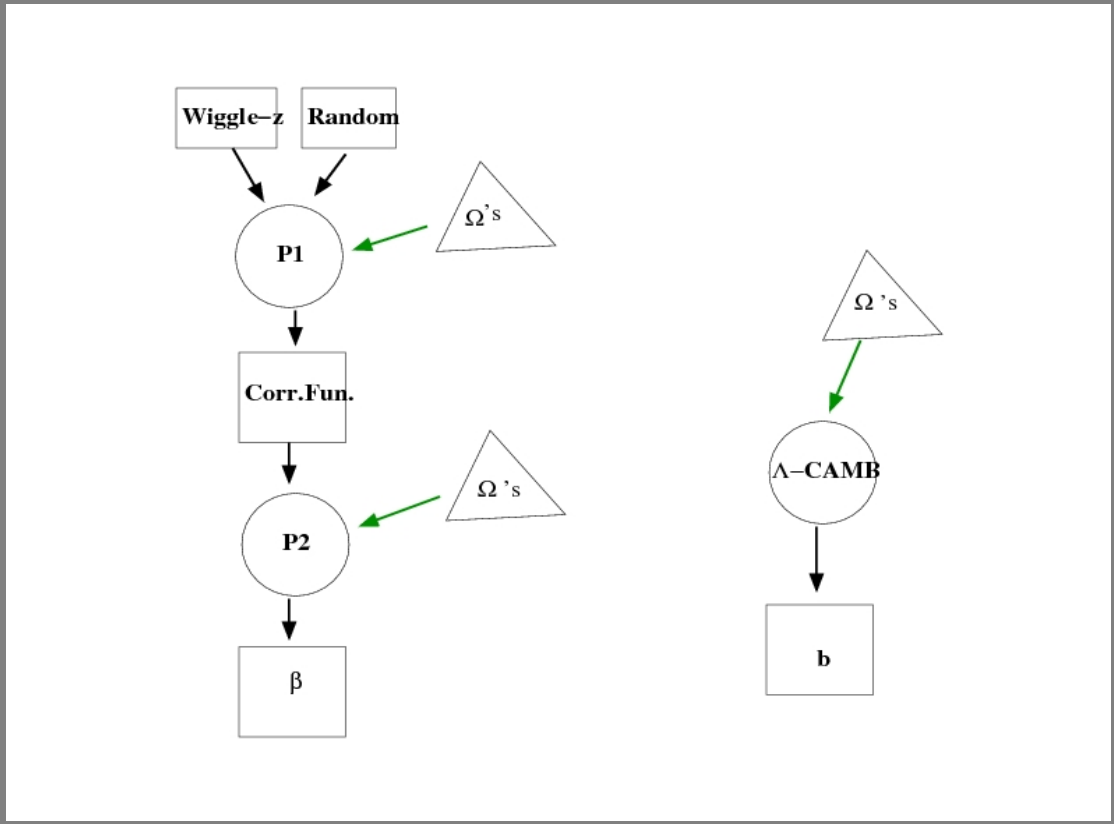

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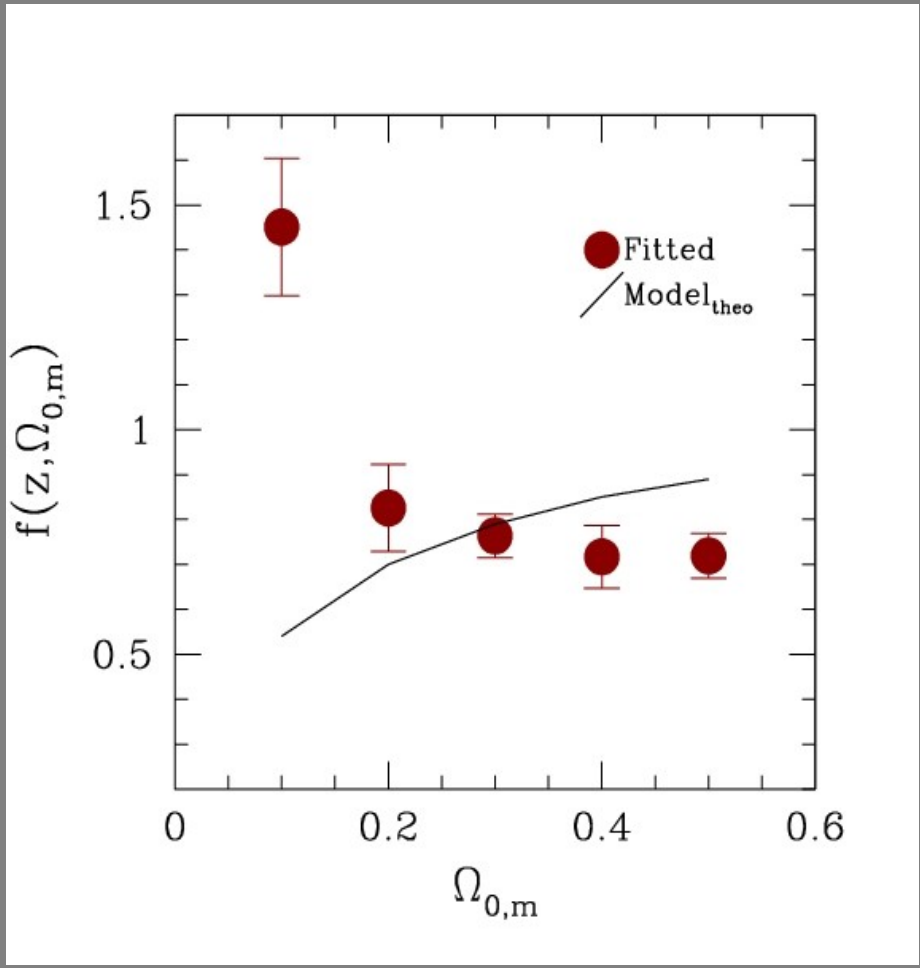

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- THE END

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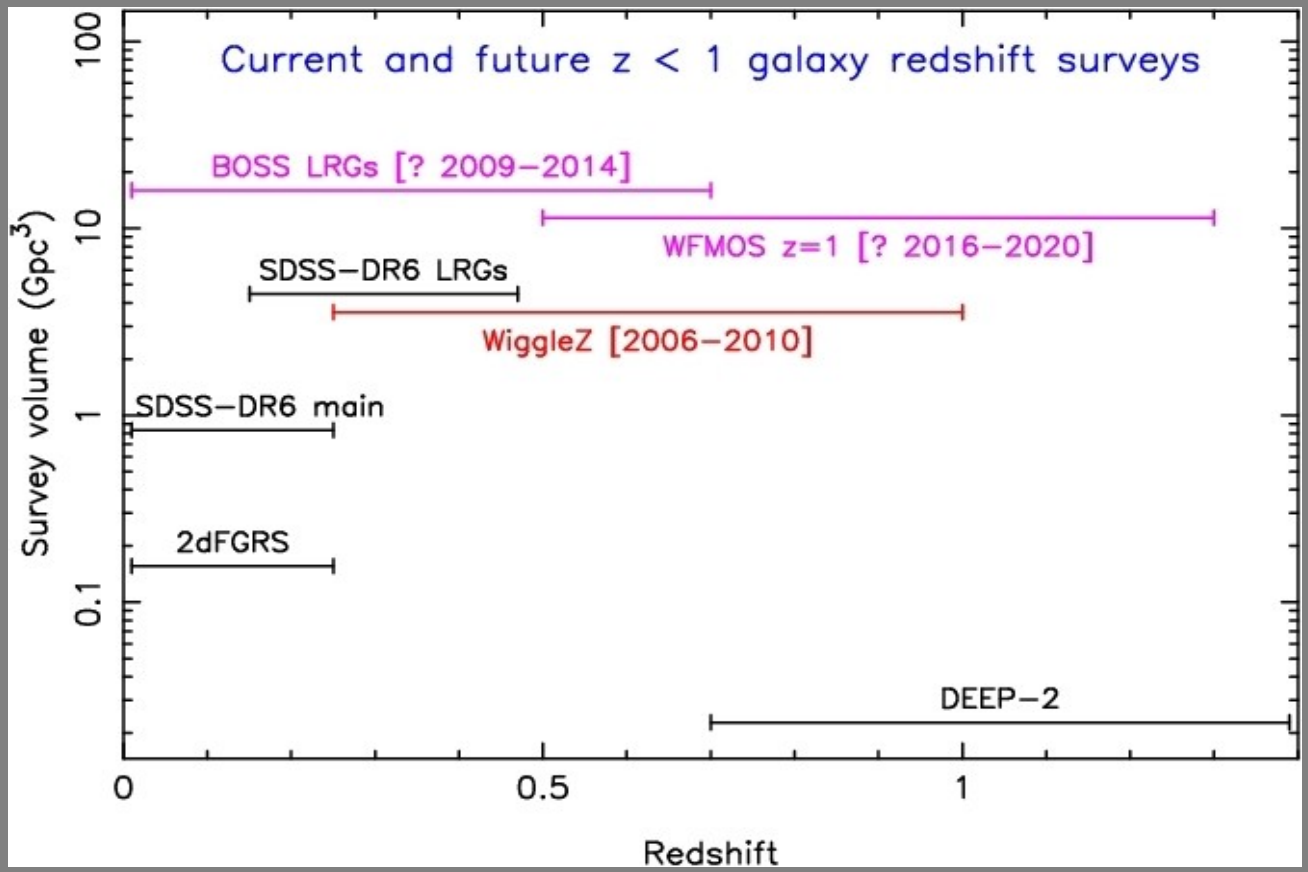
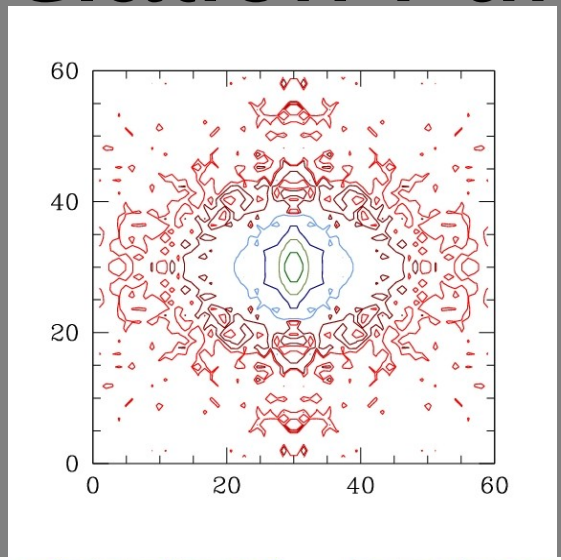
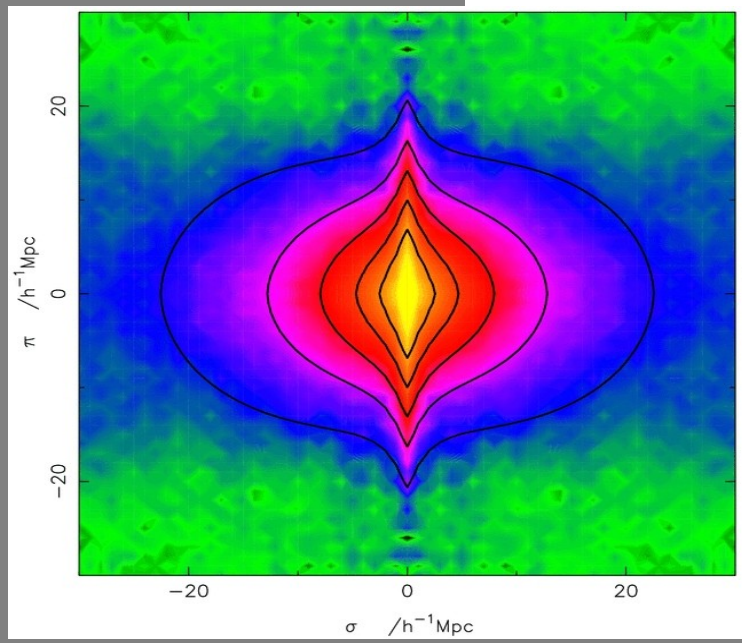
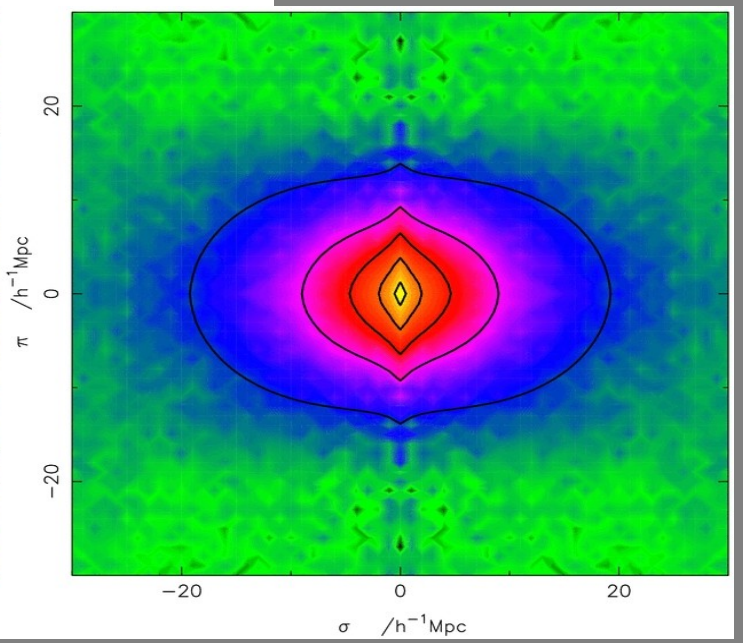


Correlation Function







Testing Cosmology with 2-point correlation function

- Fitting Model, with Simplex.
- Results:

Ω_m	γ	β	$r_0\ (Mpc\ h^{-1})$	$a\ (Km/sec)$
0.1	1.60(02)	0.57(06)	4.4(08)	238(13)
0.2	1.63(02)	0.68(08)	3.9(09)	263(11)
0.3	1.66(01)	0.79(05)	3.6(06)	280(08)
0.4	1.67(02)	0.82(08)	3.4(09)	280(11)
0.5	1.67(01)	0.87(06)	3.2(08)	280(05)

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- Correlation Function for Galaxies typically a power law:
- E(r) = (r/ro)^gamma
- usually ro ~ 4 Mpc/h gamma ~ -1.7

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- Model examples:
- 4 parameters: ro, gamma, Beta, a