



Improving cosmological constraints from non-Gaussianity in Weak Lensing

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Weak gravitational lensing has become a common tool to constrain the cosmological model.

The majority of the methods to derive constraints on cosmological parameters use second-order statistics of the shear field.

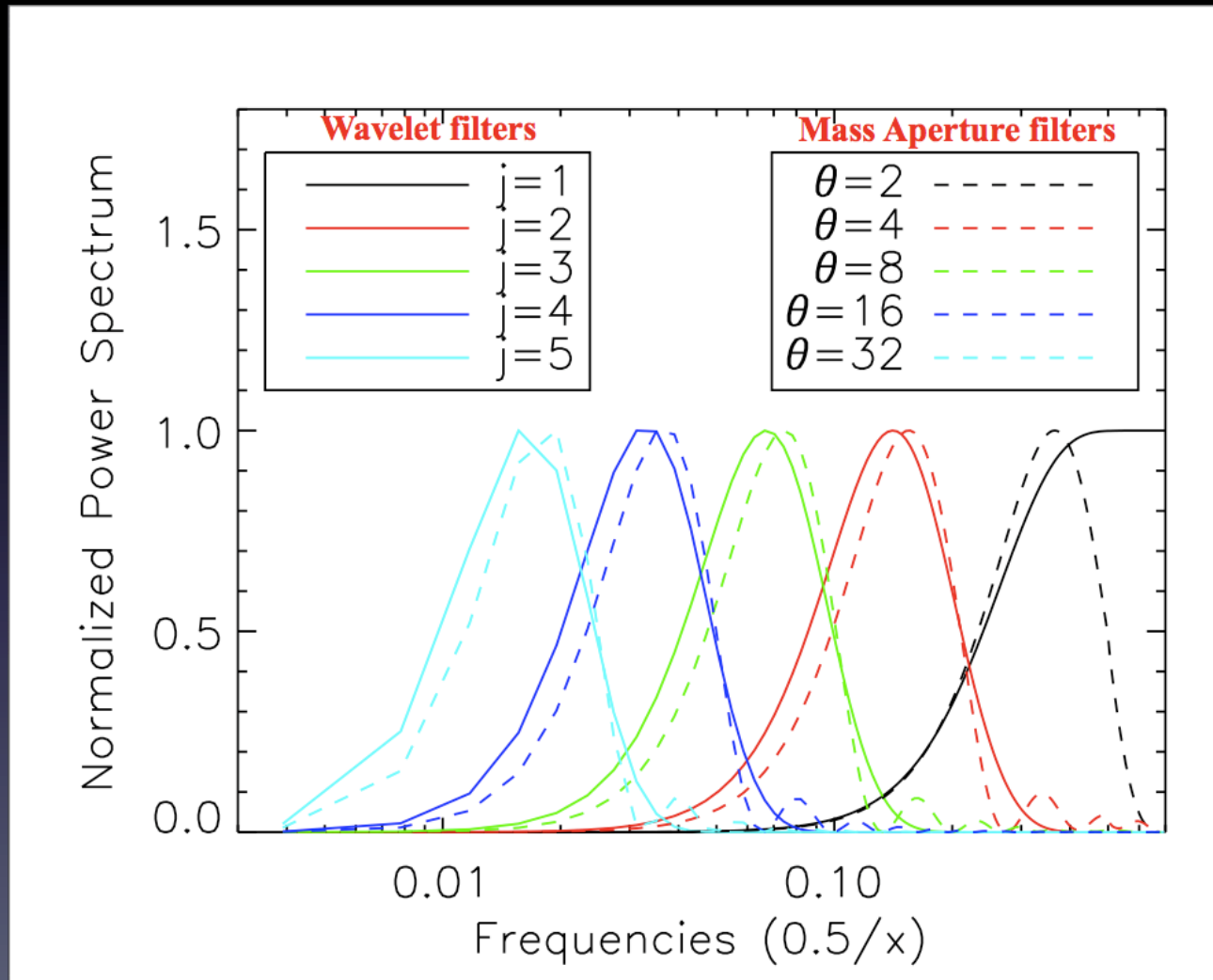
1- Second-order statistics are not optimal.

=> The weak lensing field is composed, at small scales, of non-Gaussian features such as clusters of galaxies.

2- The shear field is not optimal to extract non-Gaussianity.

=> Non-Gaussian features can be better extracted in the convergence map with denoising.

Mass Aperture = Wavelet Transform



Results of discrimination for an Euclid-like survey ($n_g = 30 \text{ gal/arcmin}^2$)

Max discrimination	WT (or <u>M</u> Ap) filter	WT filter + <u>denoising</u>
<u>Skewness</u> per scale	14.55%	44.75%
Kurtosis per scale	17.65%	32.25%
Peak Count per scale	62.75%	72.65%

	Purity		Completeness	
	<u>M</u> Ap	Wavelets	<u>M</u> Ap	Wavelets
PC (2sig)	10.77%	14.85%	35.60%	36.31%
PC (3sig)	33.15%	42.02%	11.56%	13.11%
PC (<u>M</u> RLens)	<u>x</u>	75.37%	<u>x</u>	25.92%