

# SDSS-IV/eBOSS LRGs Clustering Using Photo-z

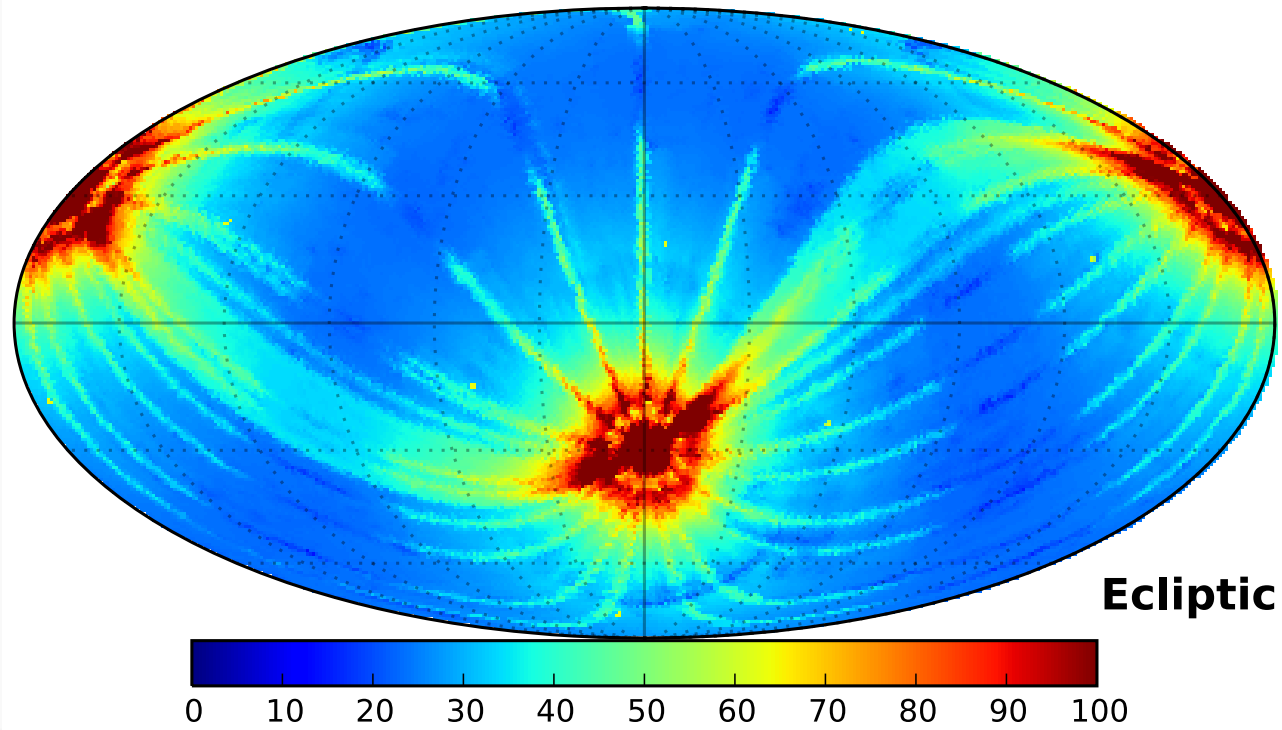
Abhishek Prakash,  
SDSS-IV/eBOSS Collaboration  
University of Pittsburgh, PITT PACCC

# SDSS-IV/eBOSS LRG sample

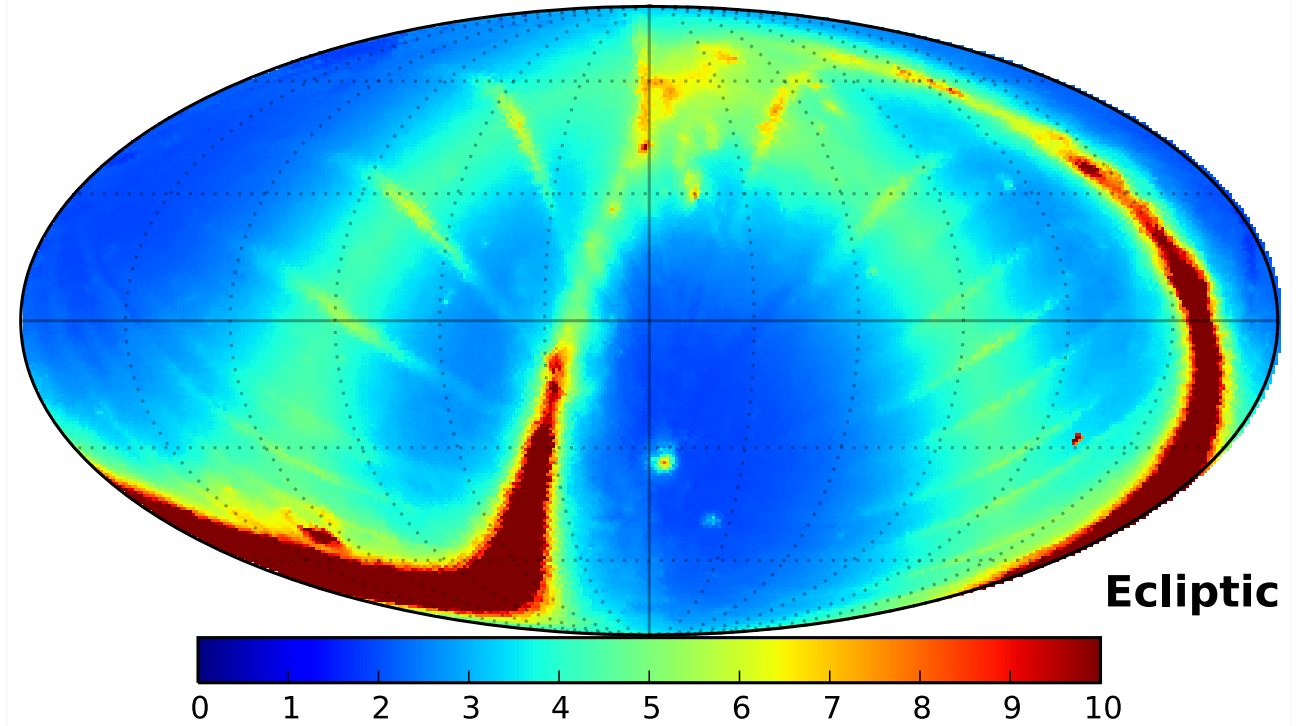
- Probing the redshift range  $0.6 < z < 1.0$
- 60 targets  $\text{deg}^{-2}$ , aiming for  $\sim 1\%$  BAO measurement.
- Color selected combining SDSS and WISE (Infrared) photometry
- Flux limited in  $z$ -band and  $i$ -band
- 600,000 LRGs over  $10,000 \text{ deg}^2$  of SDSS-III/BOSS footprint.
- Targets over  $7,500 \text{ deg}^2$  to be observed in SDSS-IV.

# Wise Systematics maps

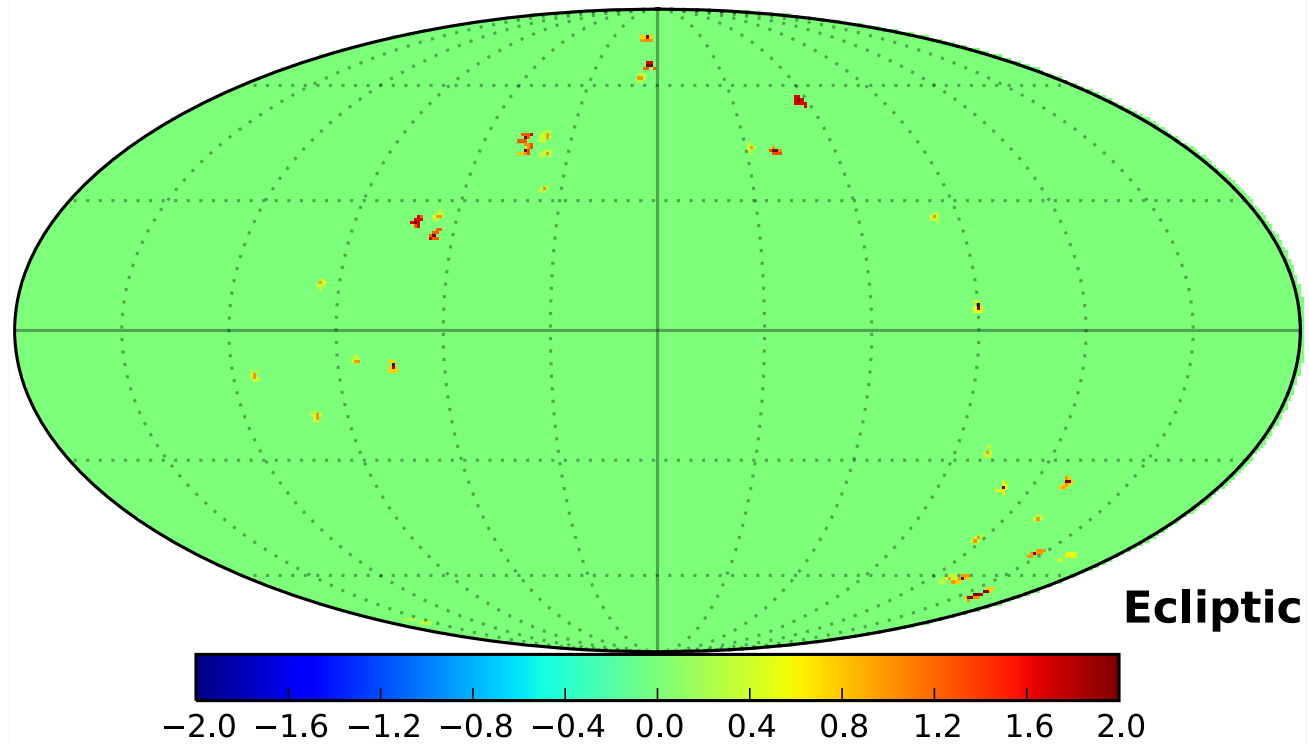
WISE W1 CovMedian map



WISE W1 Median map

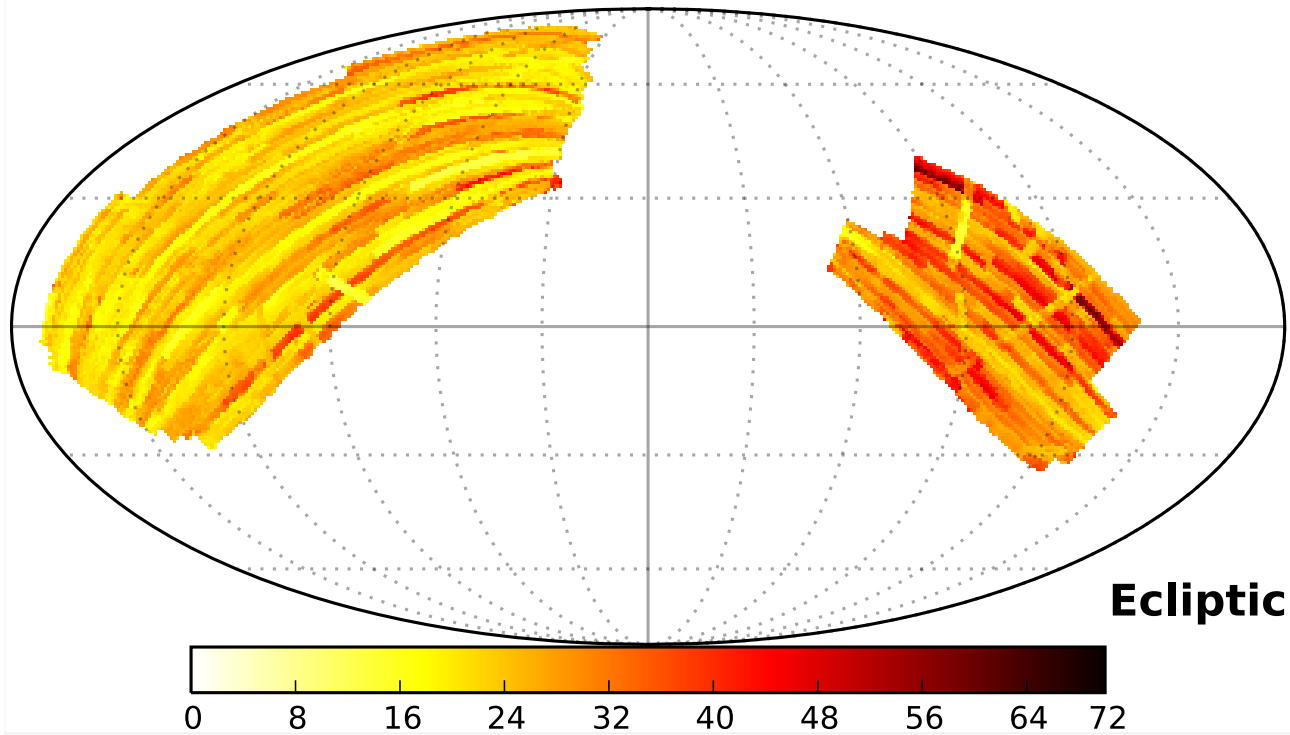


WISE W1 Moonlev map

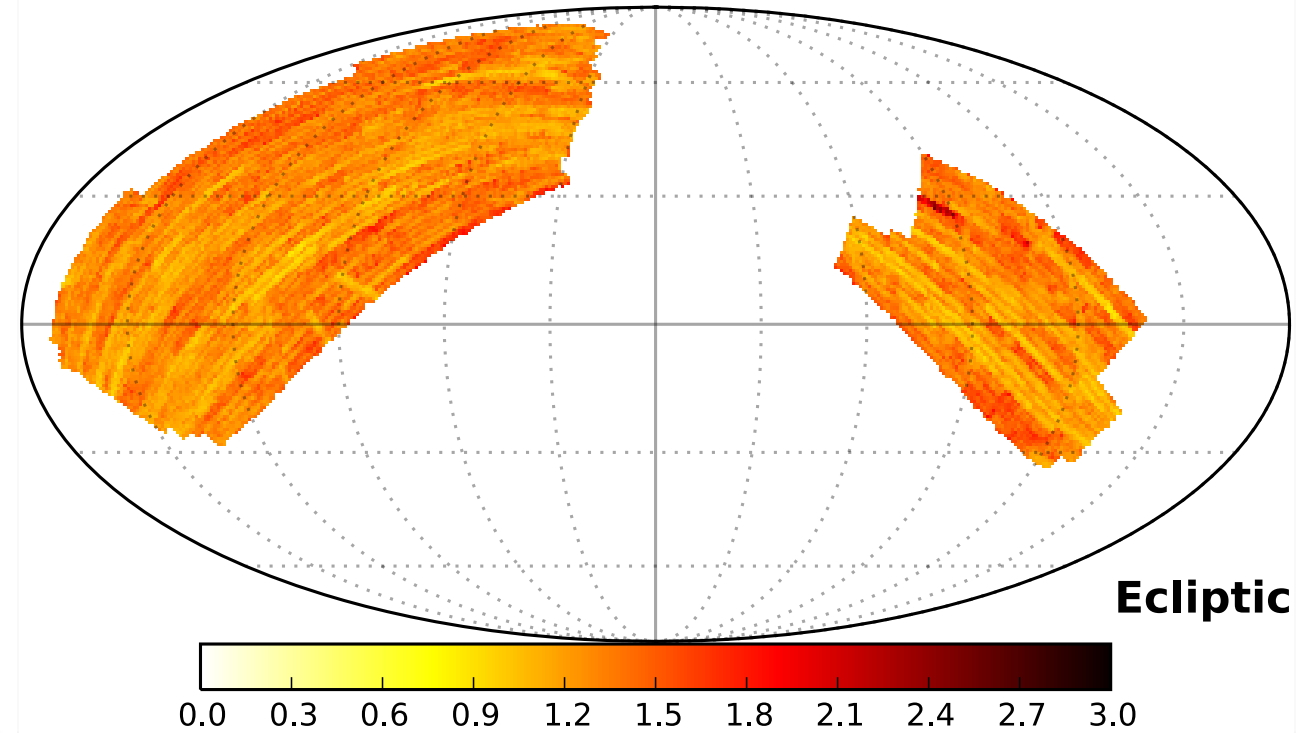


# SDSS Systematics maps

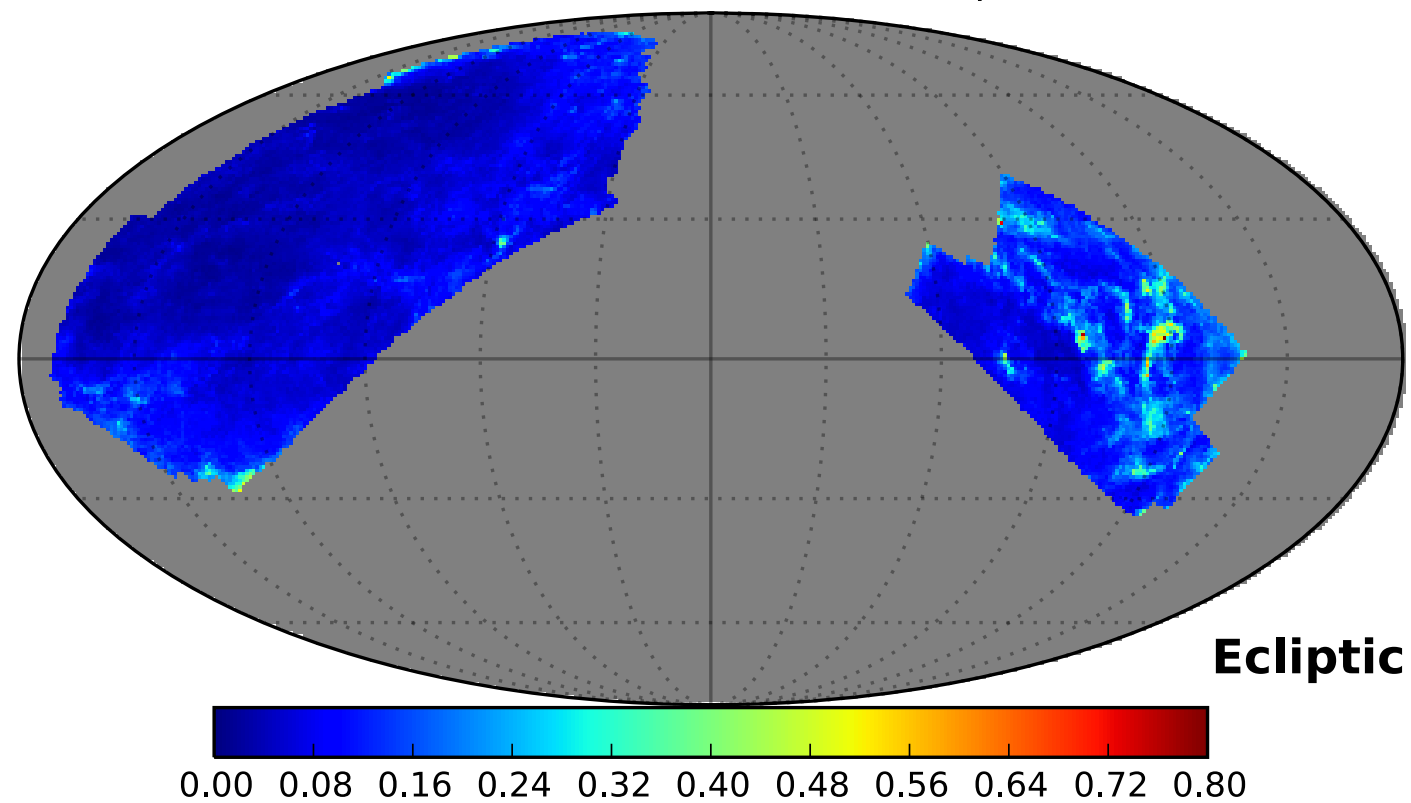
SDSS z-band SKYFLUX map



SDSS z-band SEEING map

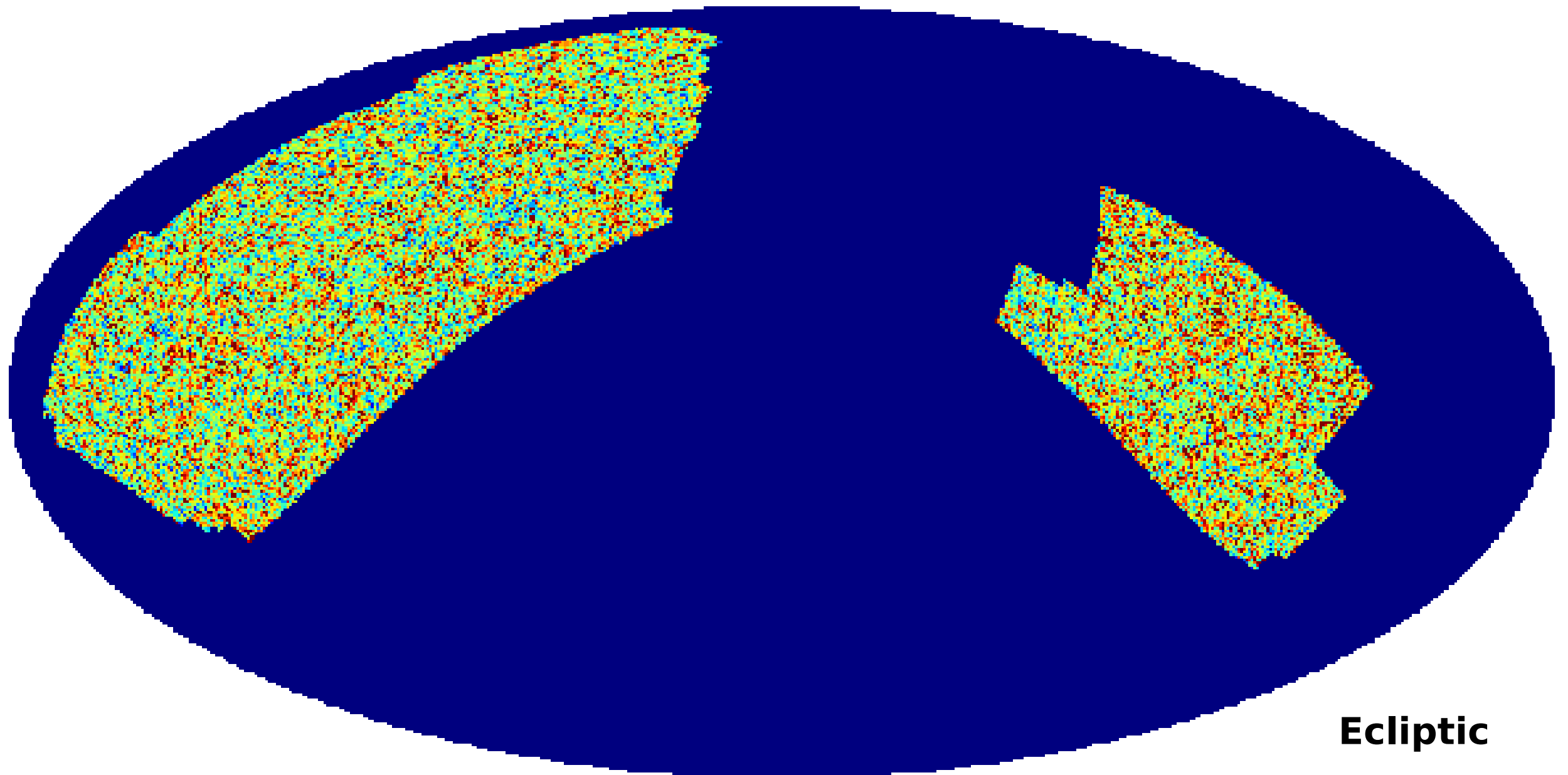


SDSS r-band extinction map

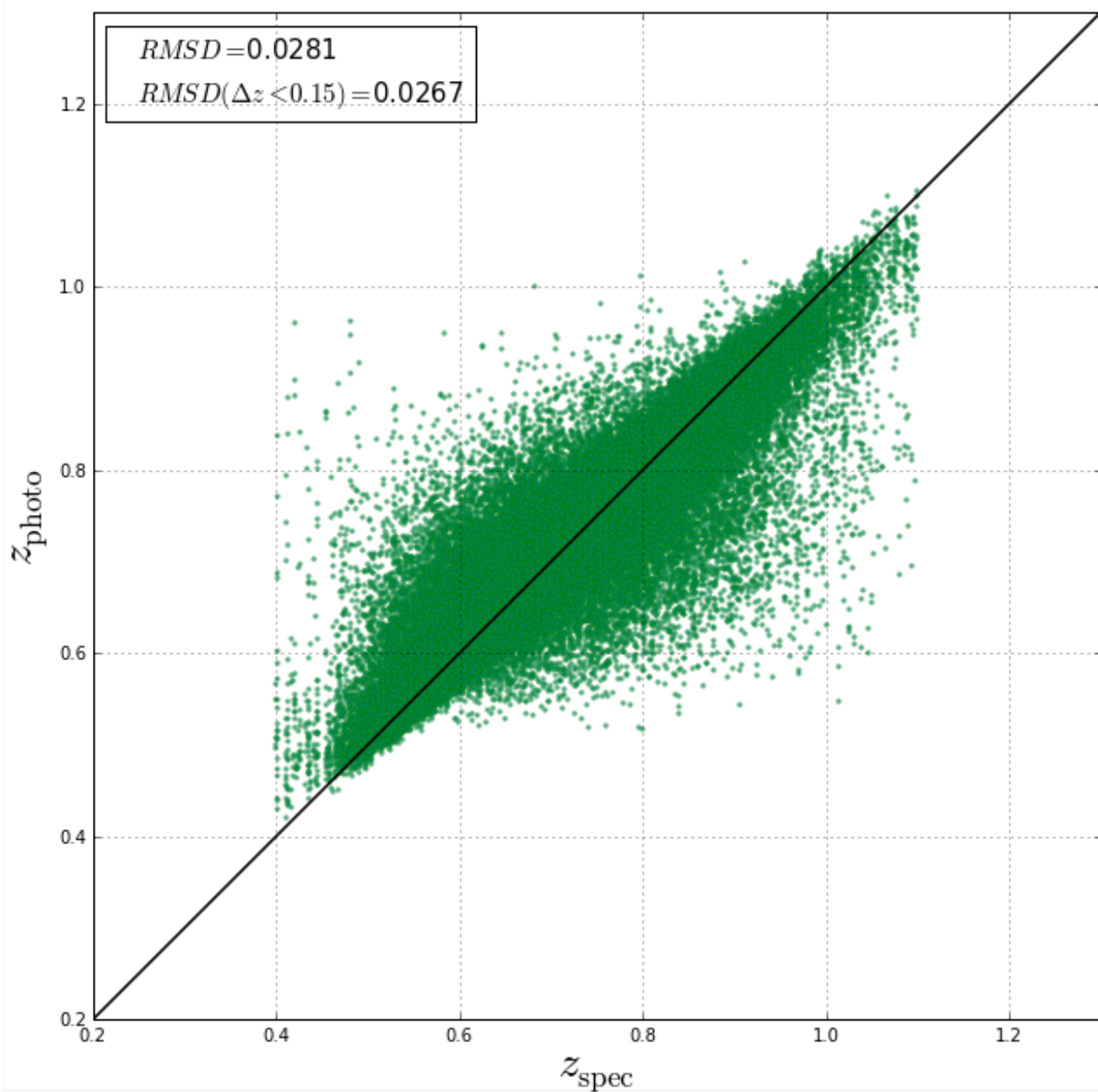


# Density of LRG targets

LRG density per square deg

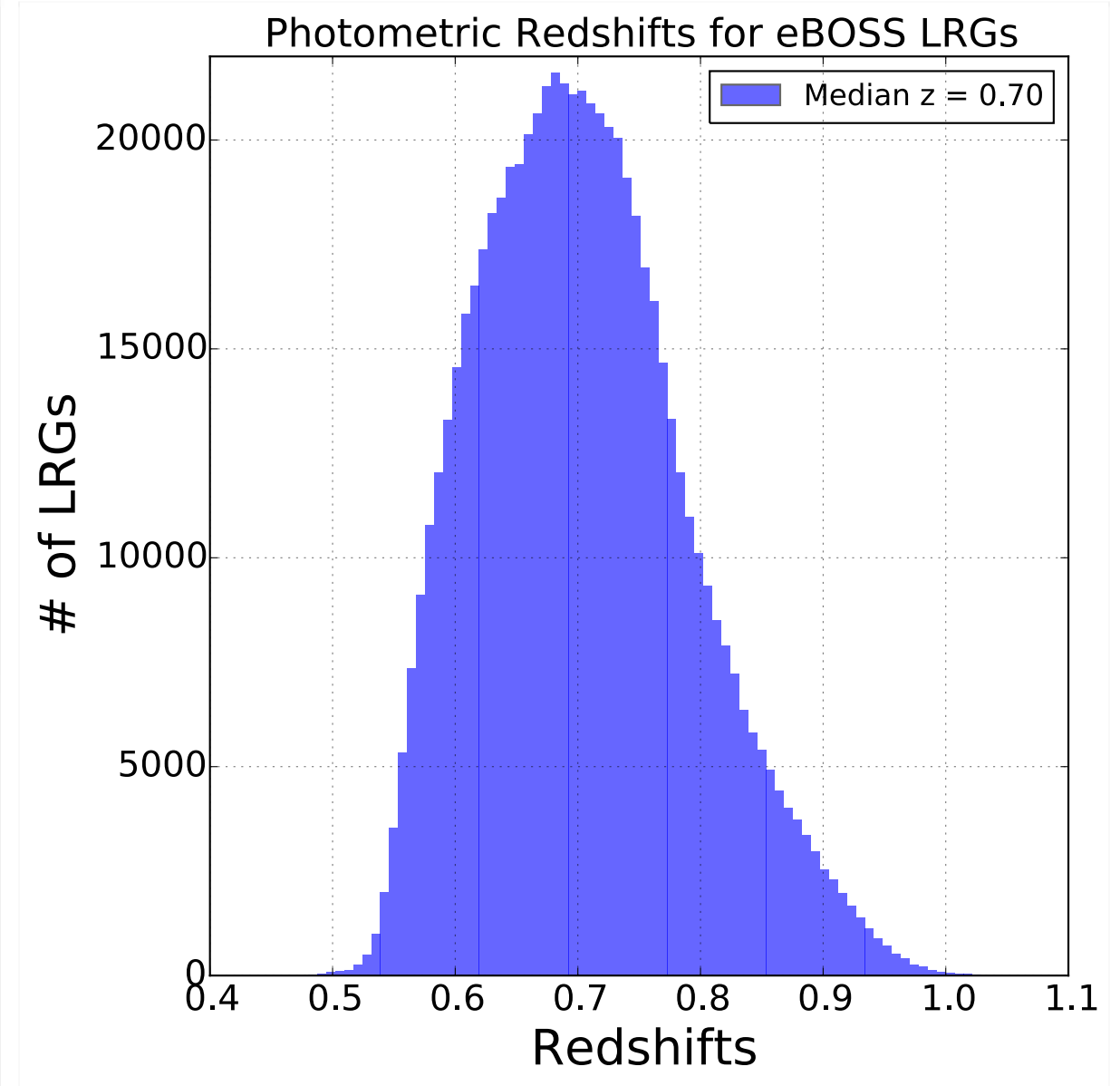


# Photo-z estimations

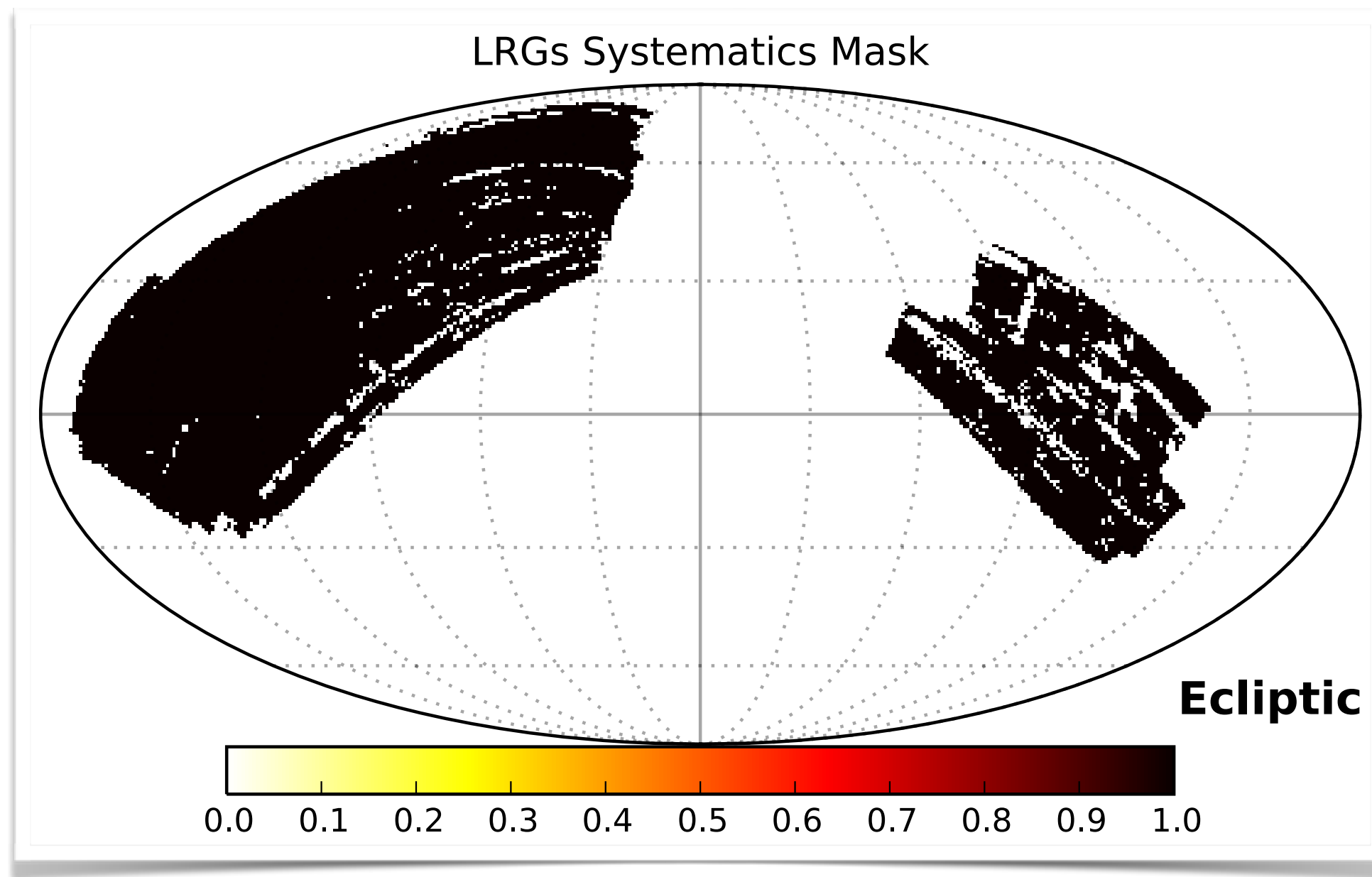


Further improvements possible!

Current eBOSS spectroscopic data used for training(80%) and validation(20%).

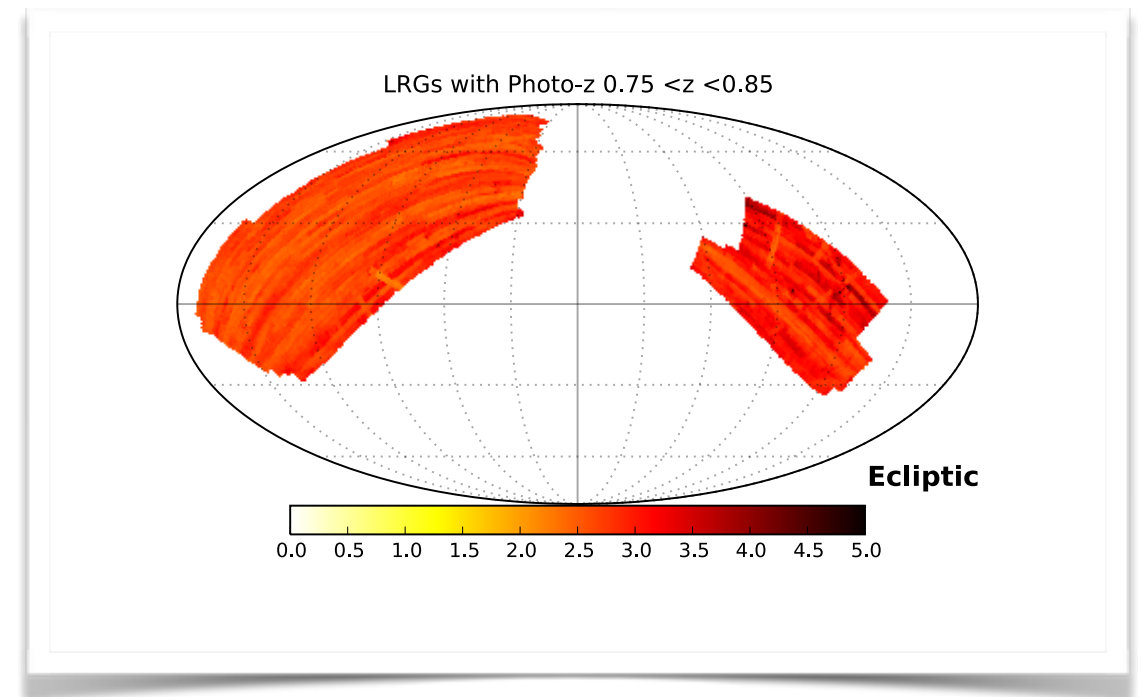
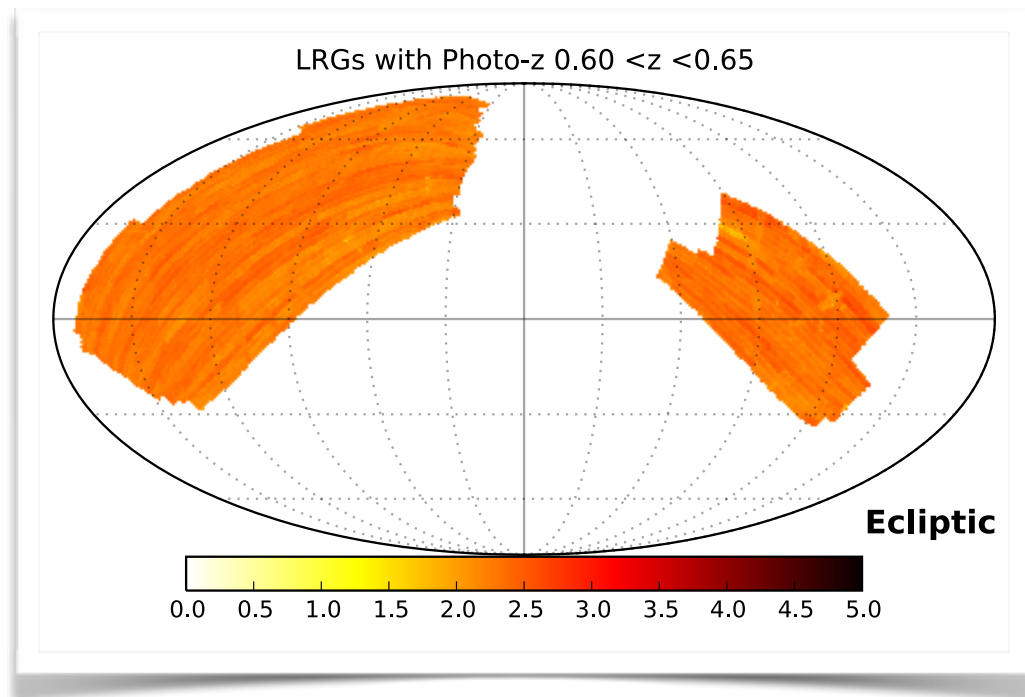


# LRGs survey binary mask

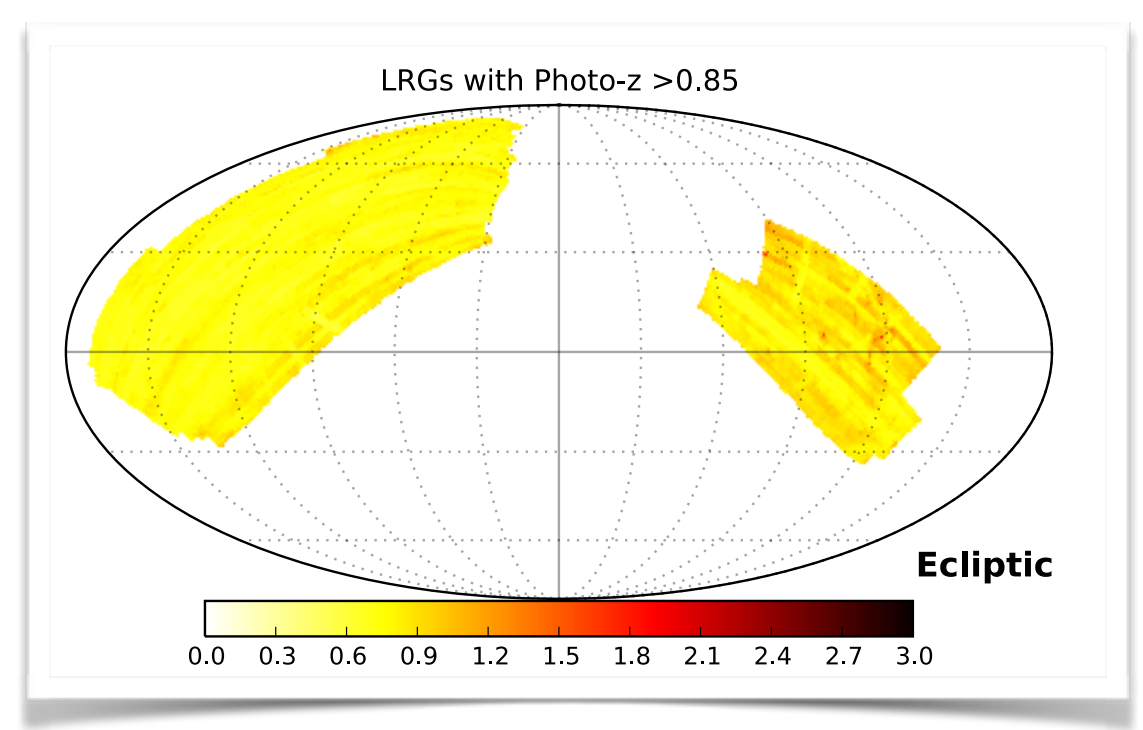
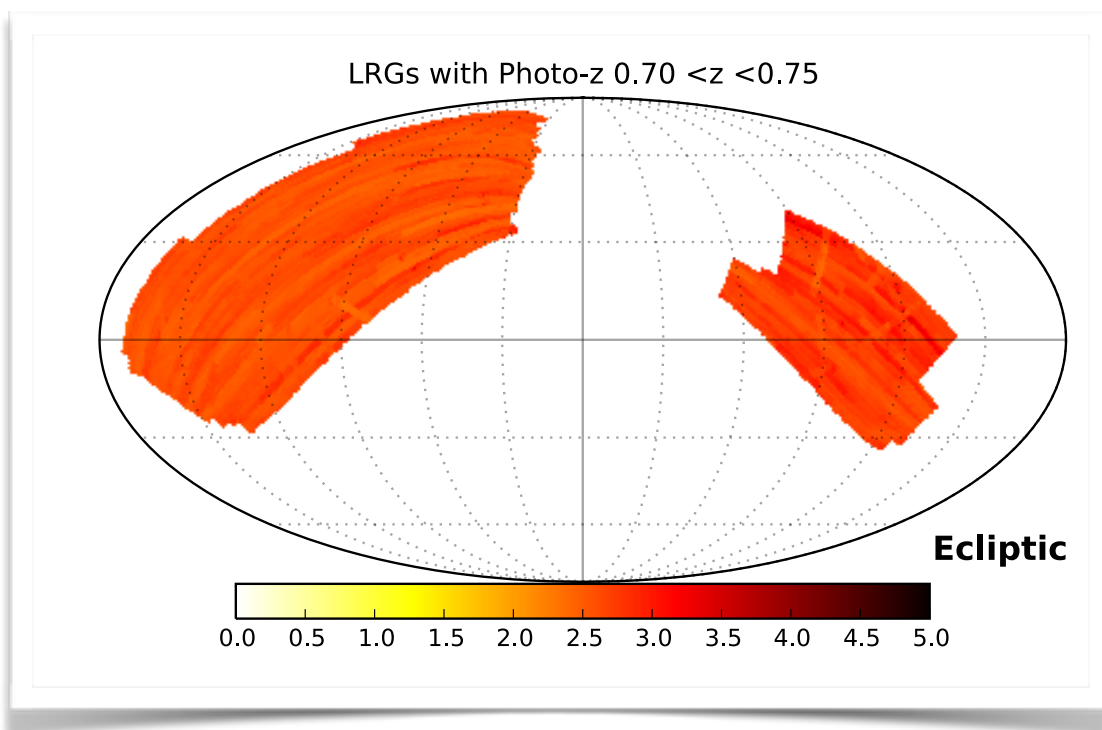


Areas showing  $>15\%$  variation in target density are rejected.

# Predicted density maps at different redshifts

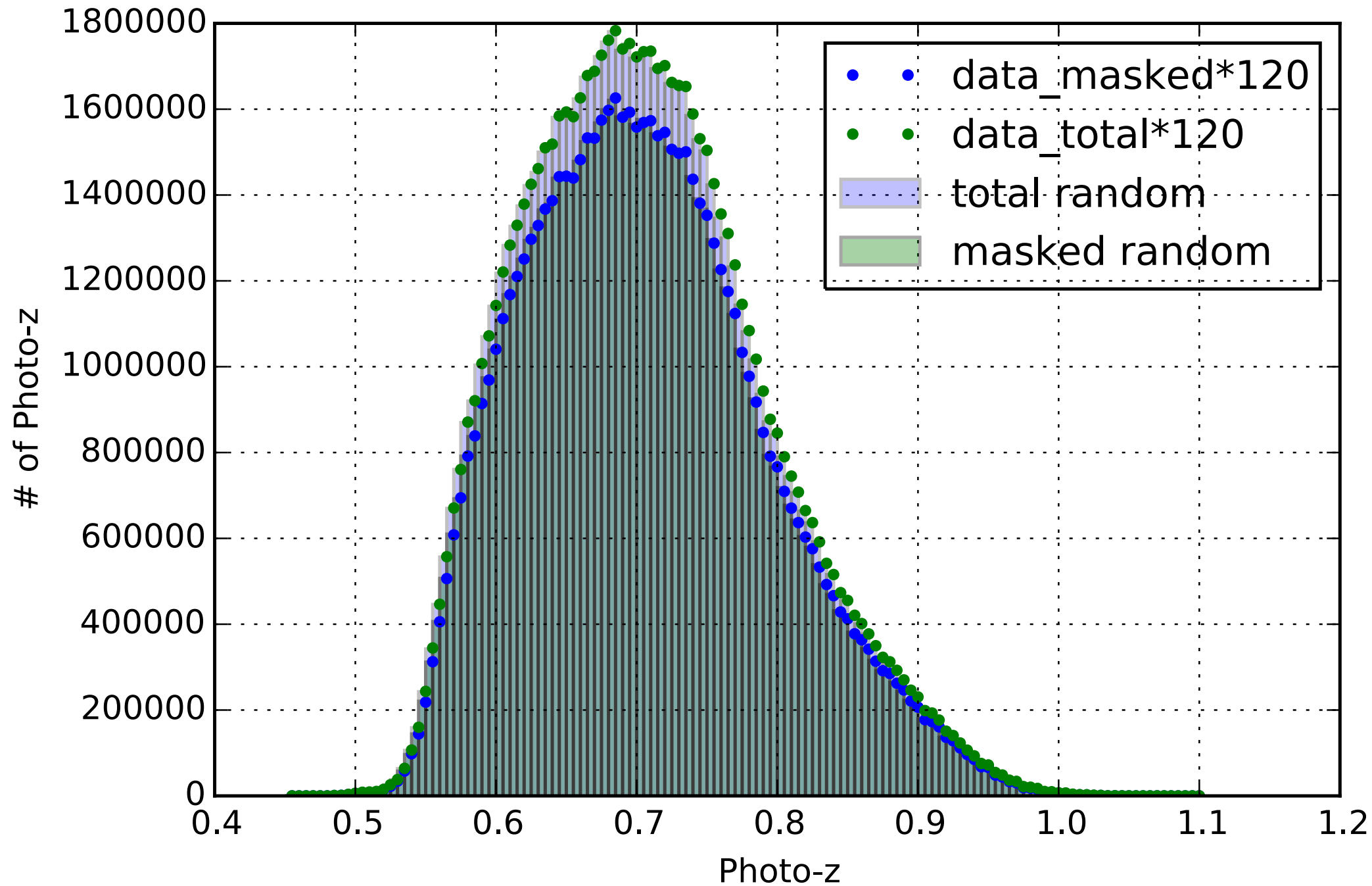


Linear multivariate regression predicts density using SDSS/WISE systematics maps



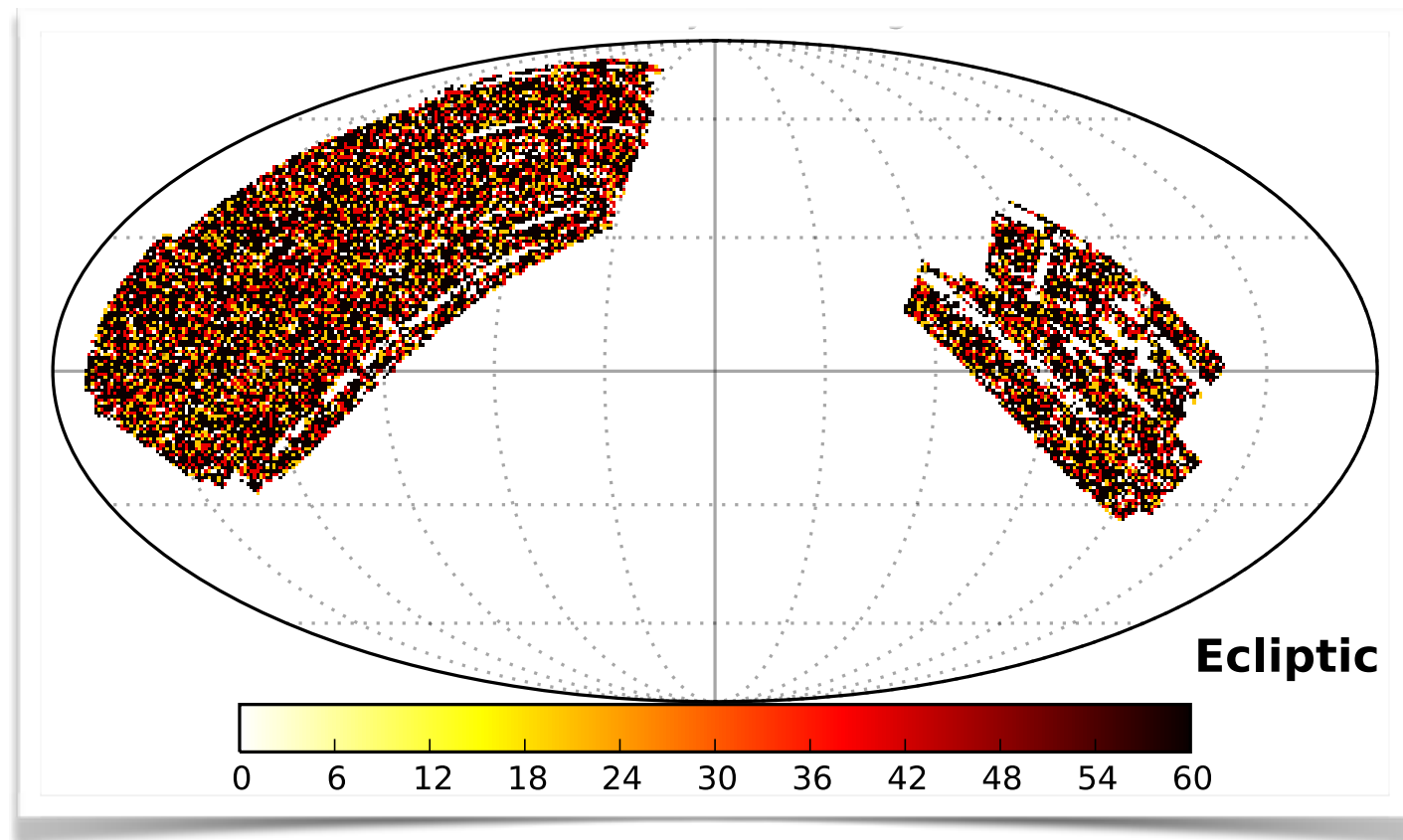


# Randoms Reflect Systematics Variation

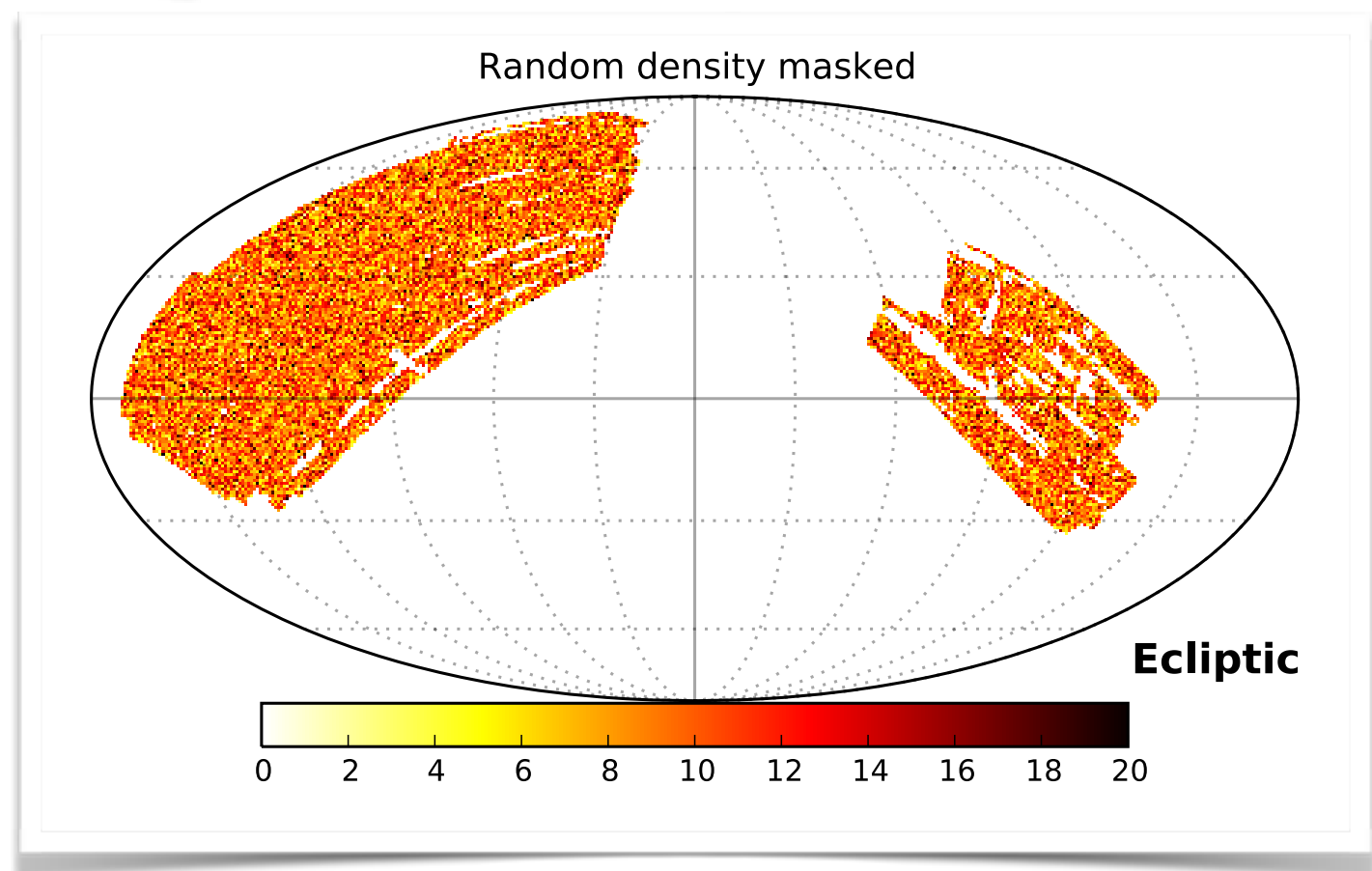


Predicted density maps are normalized on the same scale to sample randoms

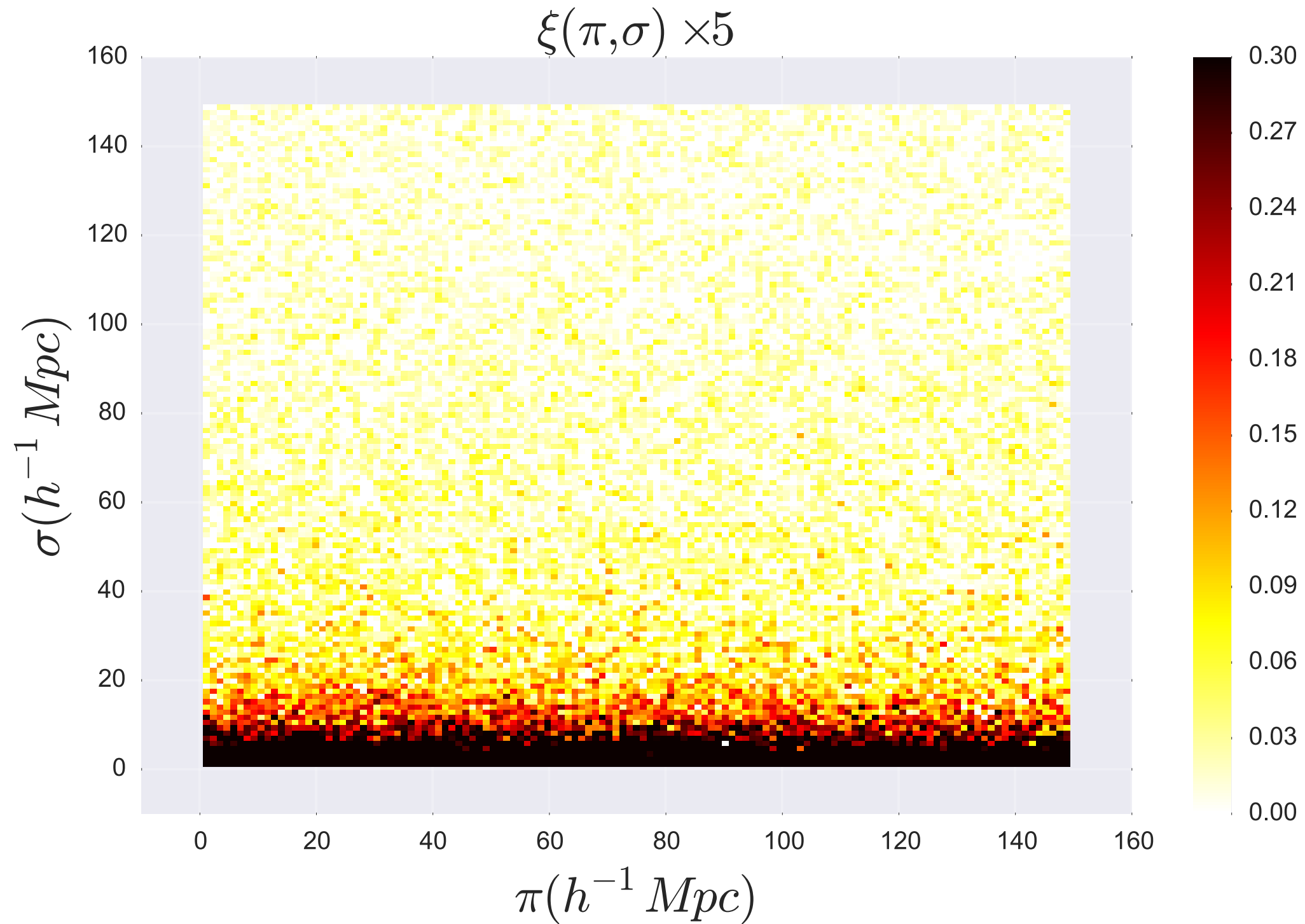
# LRGs post-masking



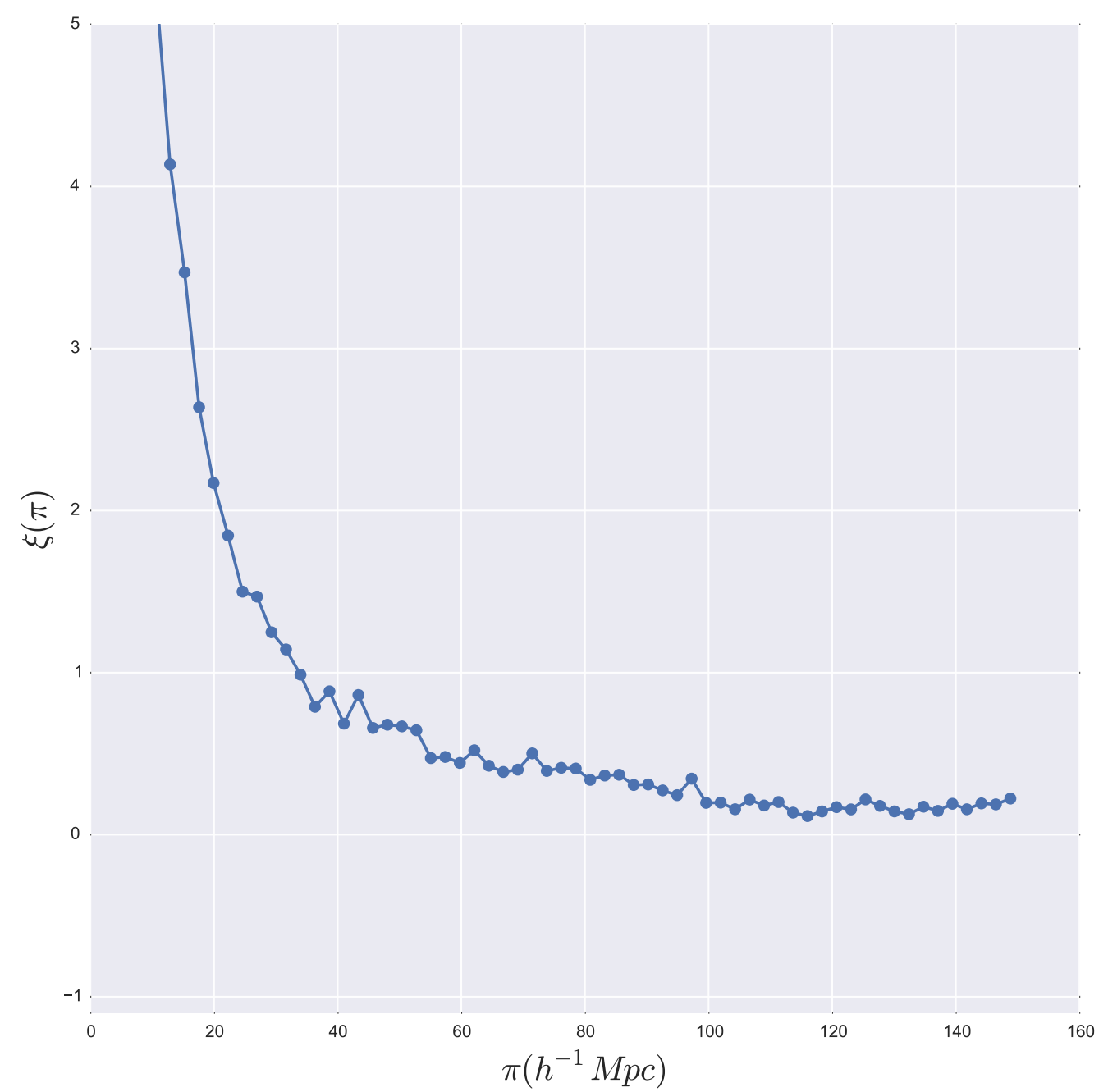
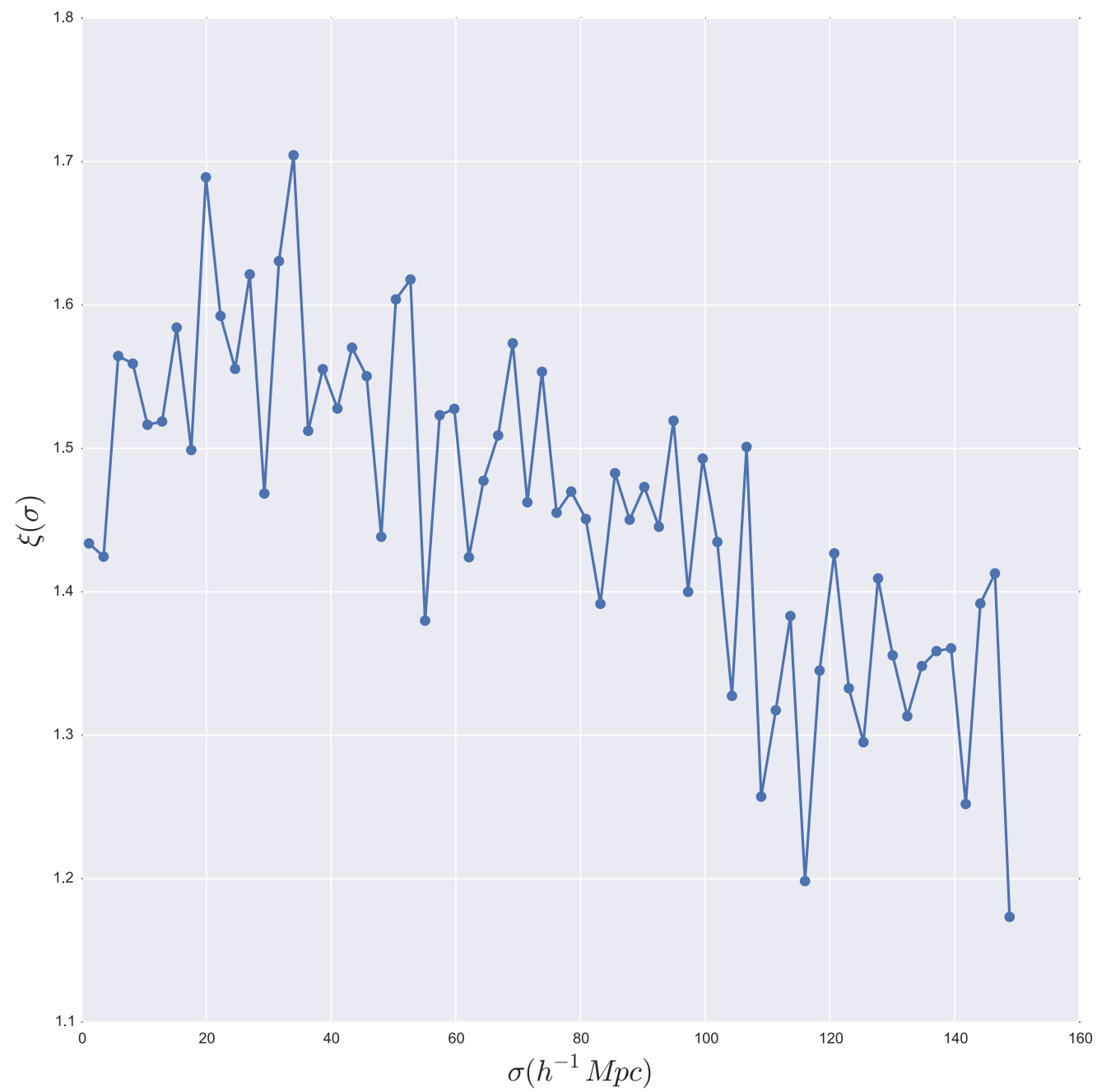
LRG sample and  
randoms masked  
same way.



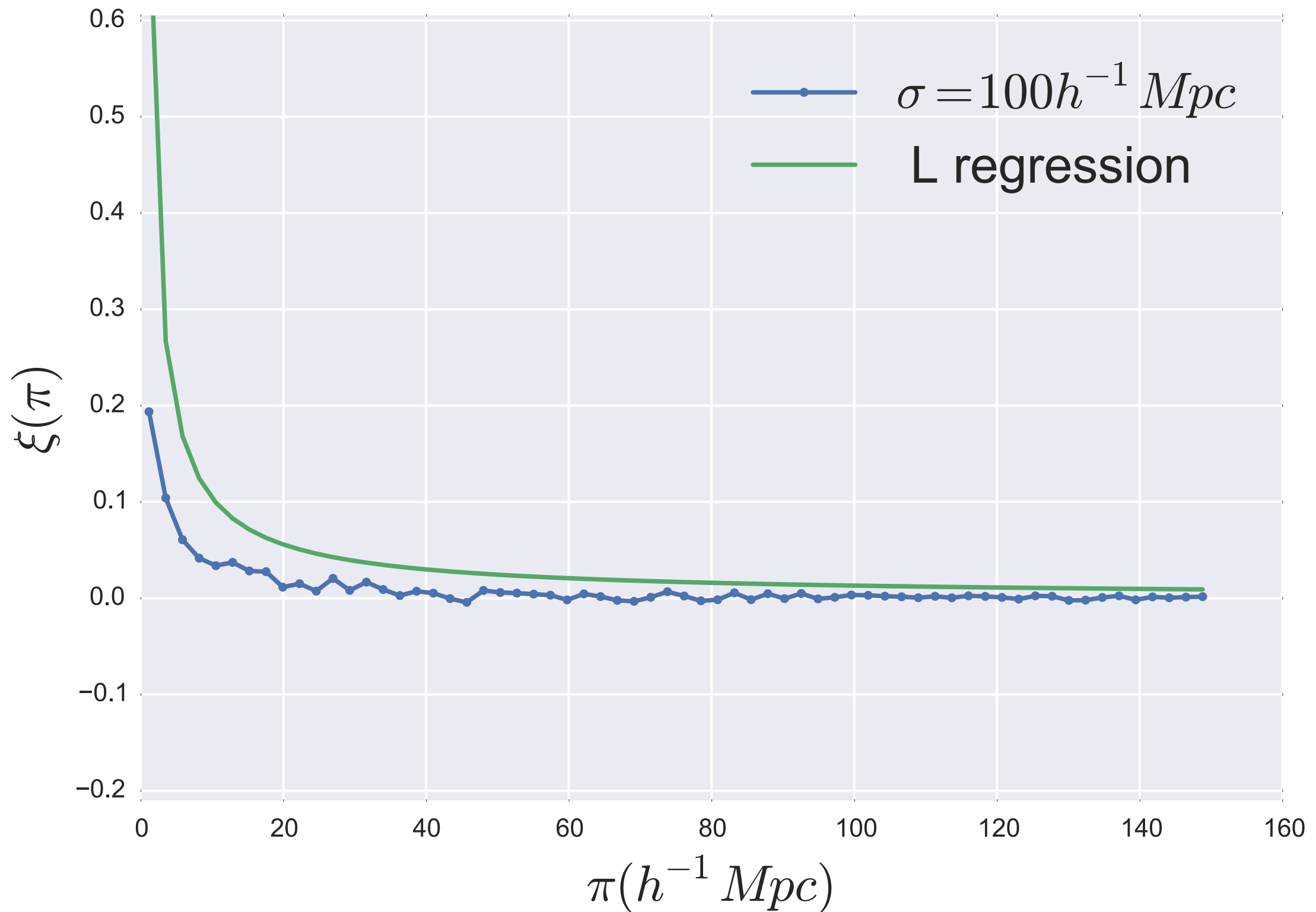
# 3D correlation (CUTE)



# 3D correlation



# 3D correlation



Next, modeling as power-law in bins of sigma