Enhancing cosmic shear with clipping: a KiDS-450 analysis

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Statistical Challenges in the Era of LSS, Oxford, April 2018

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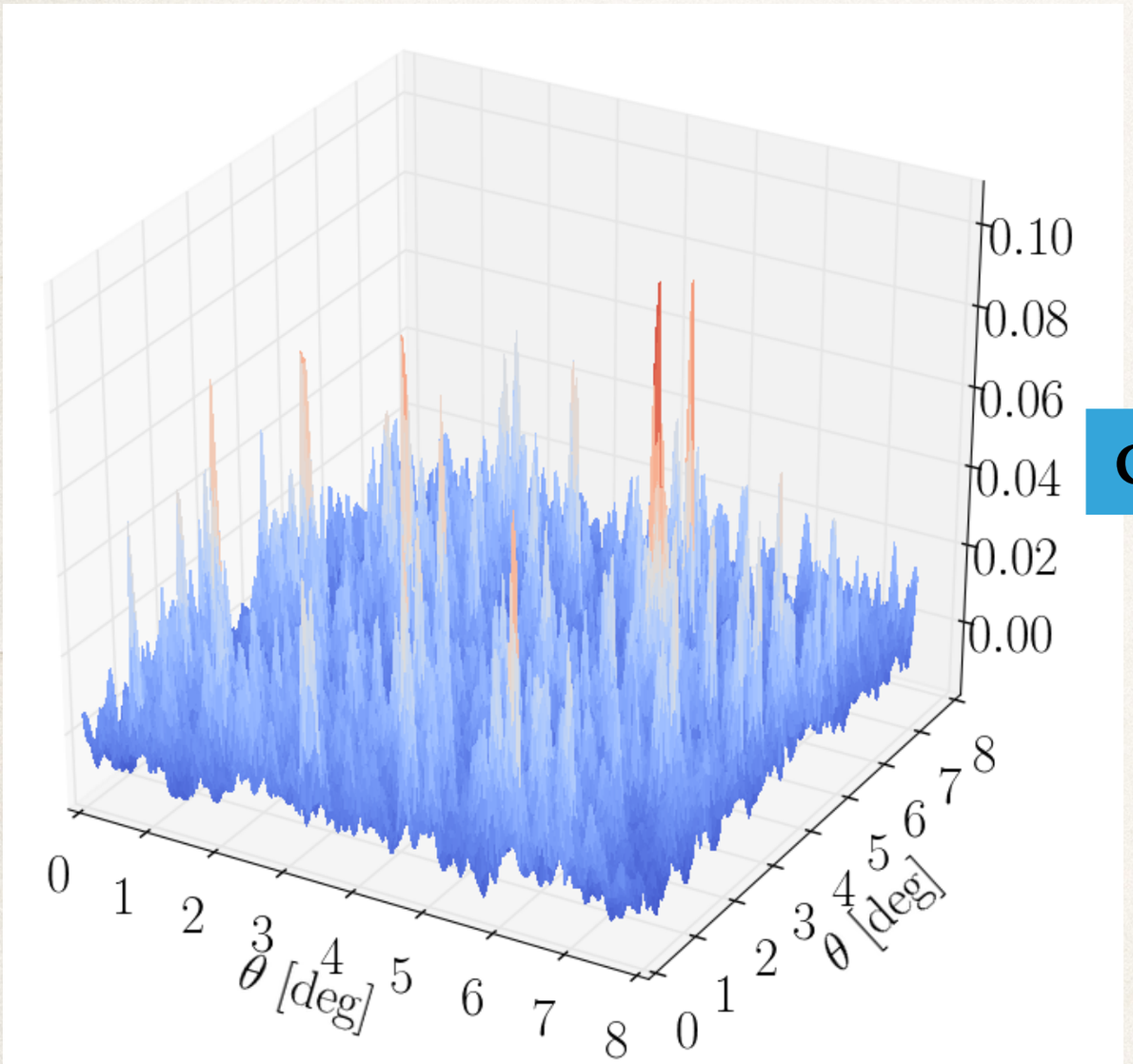
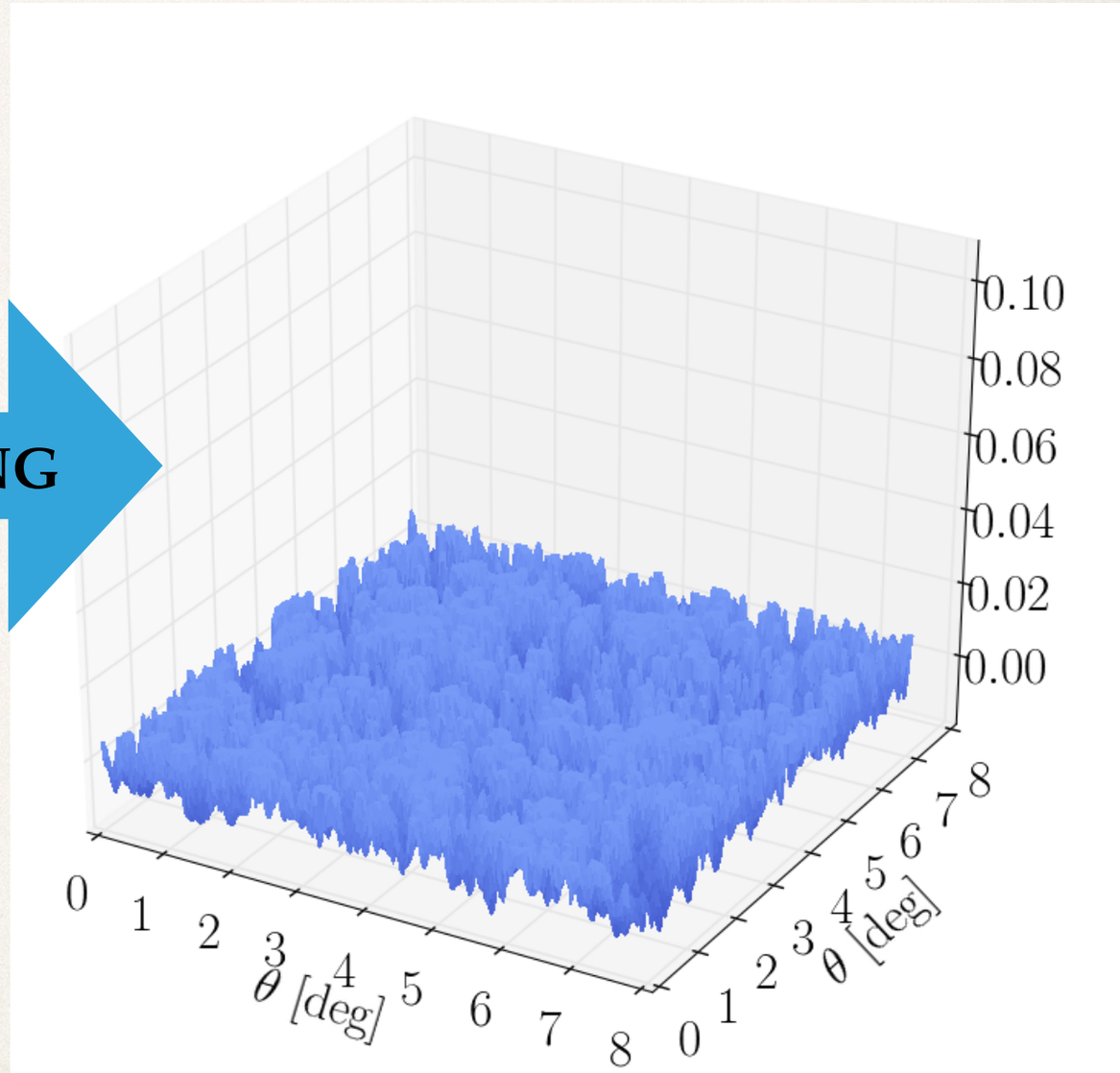
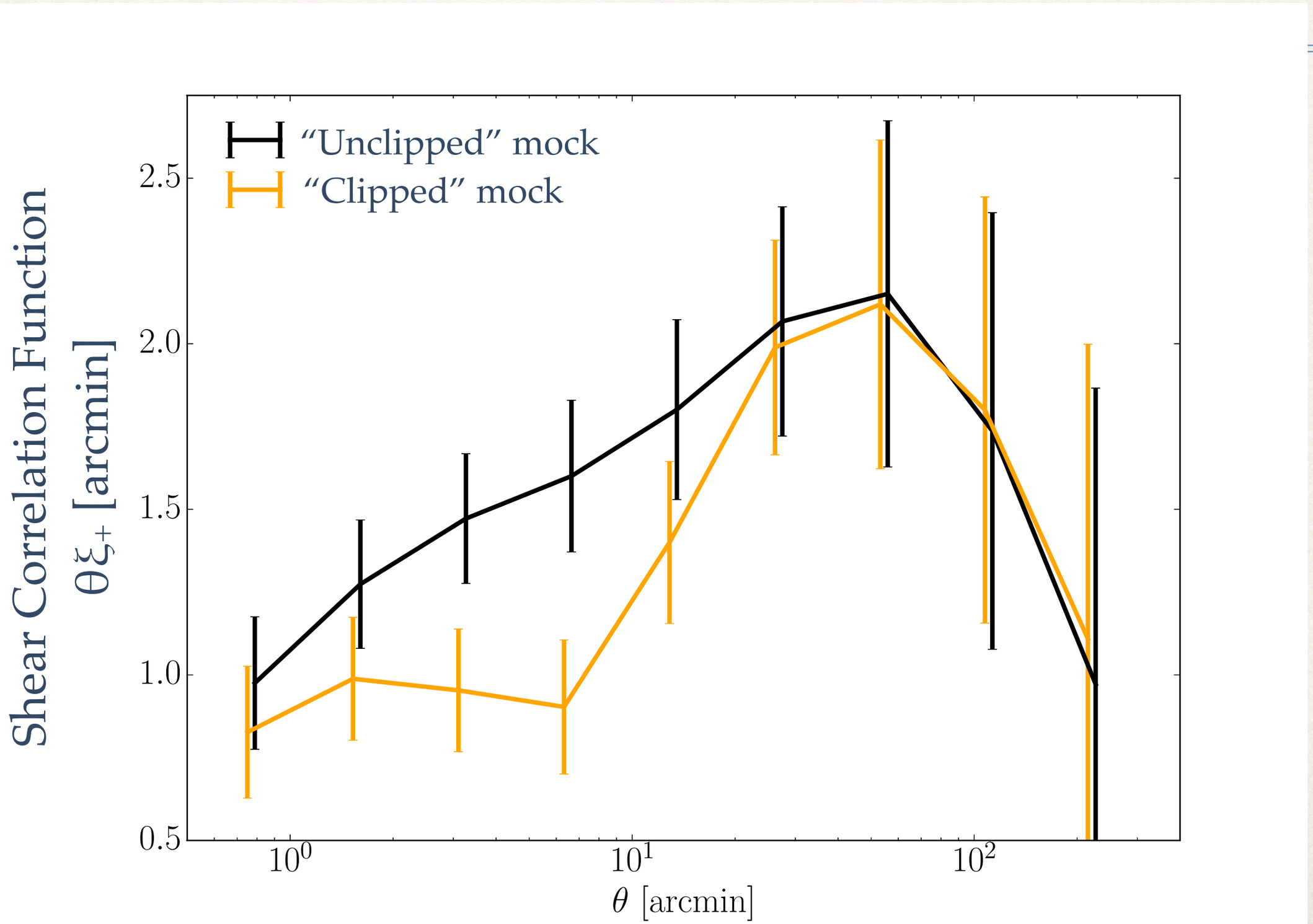
Clipping the non-linearities…



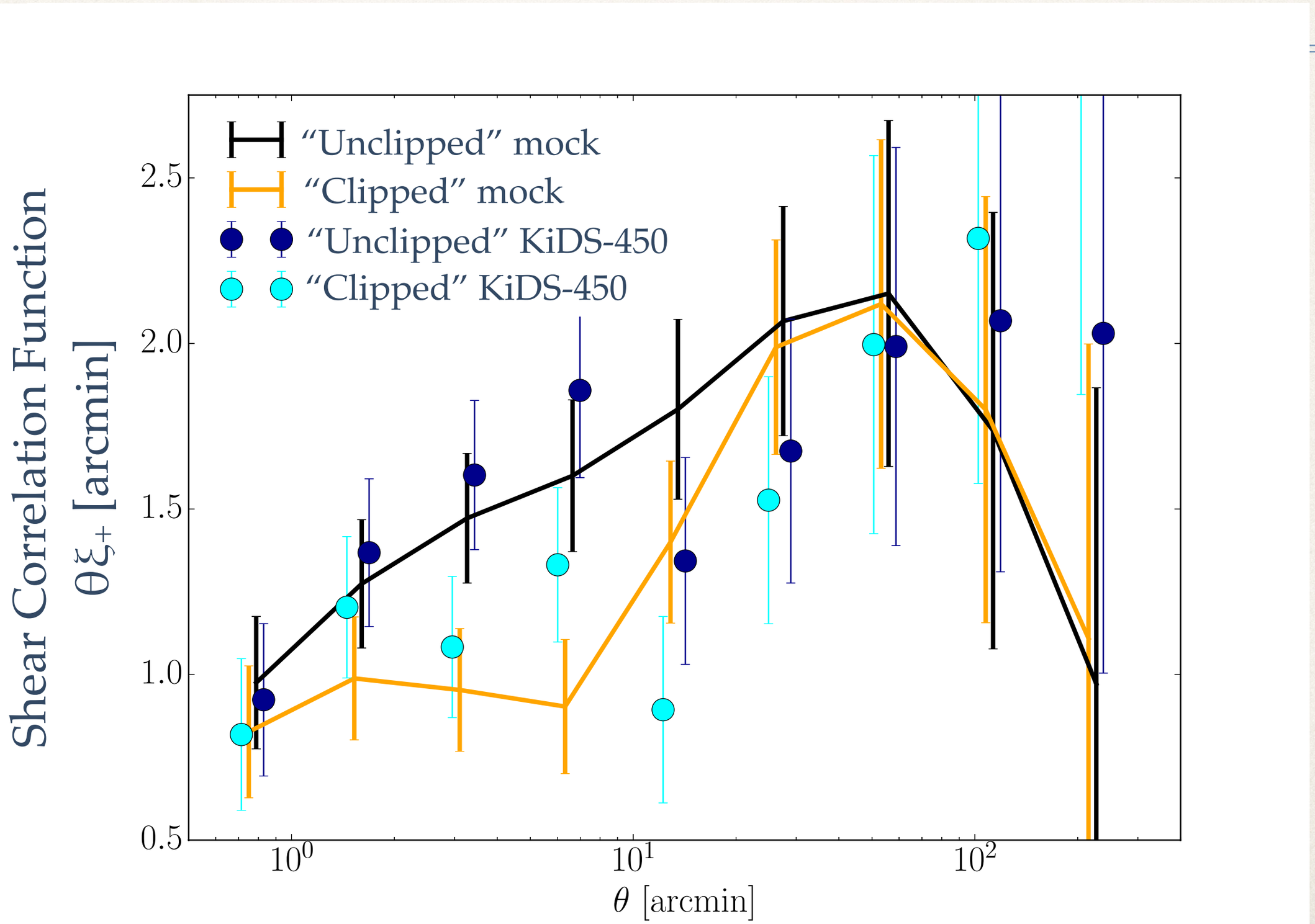
CLIPPING



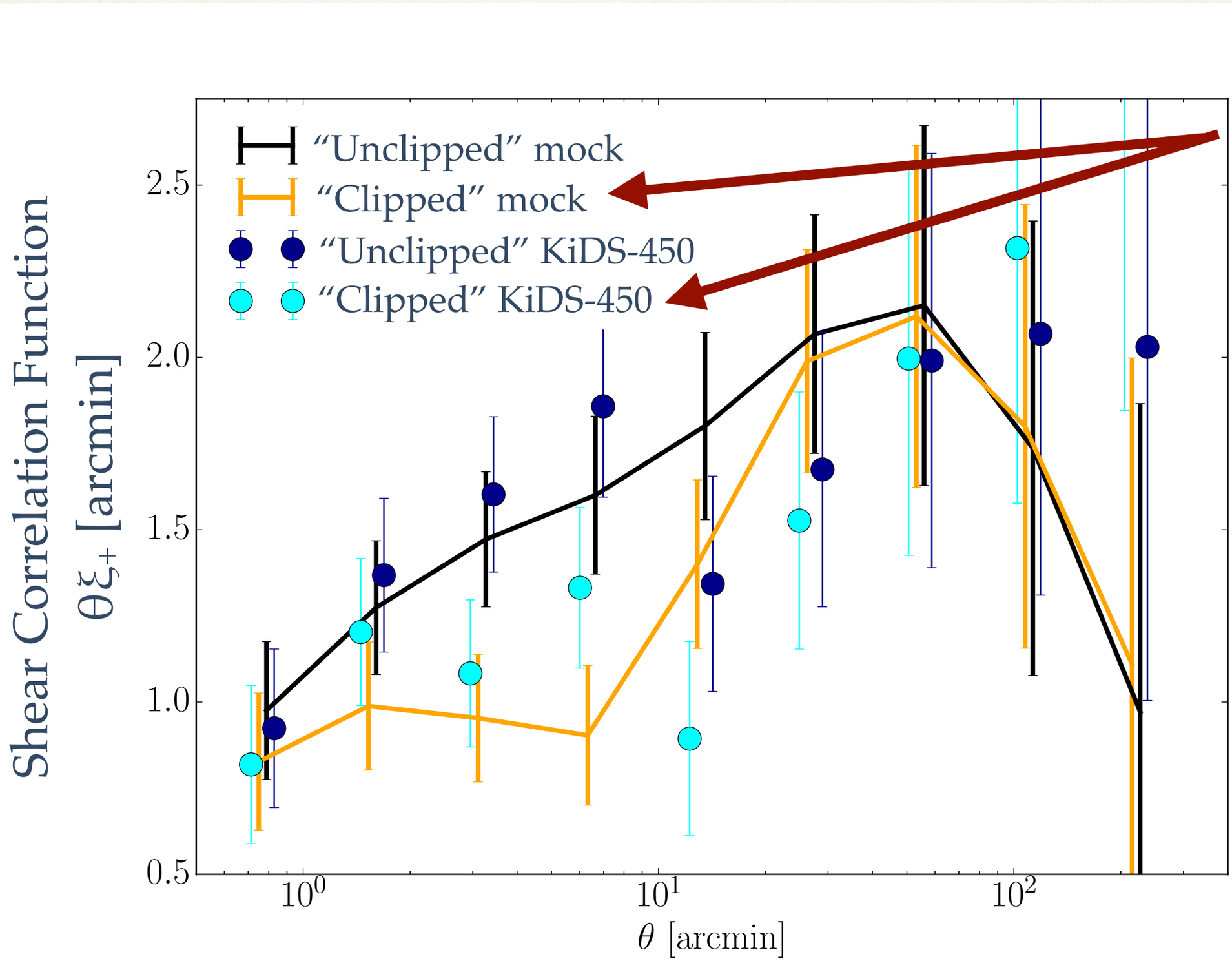
Clipping cosmic shear



Clipping cosmic shear

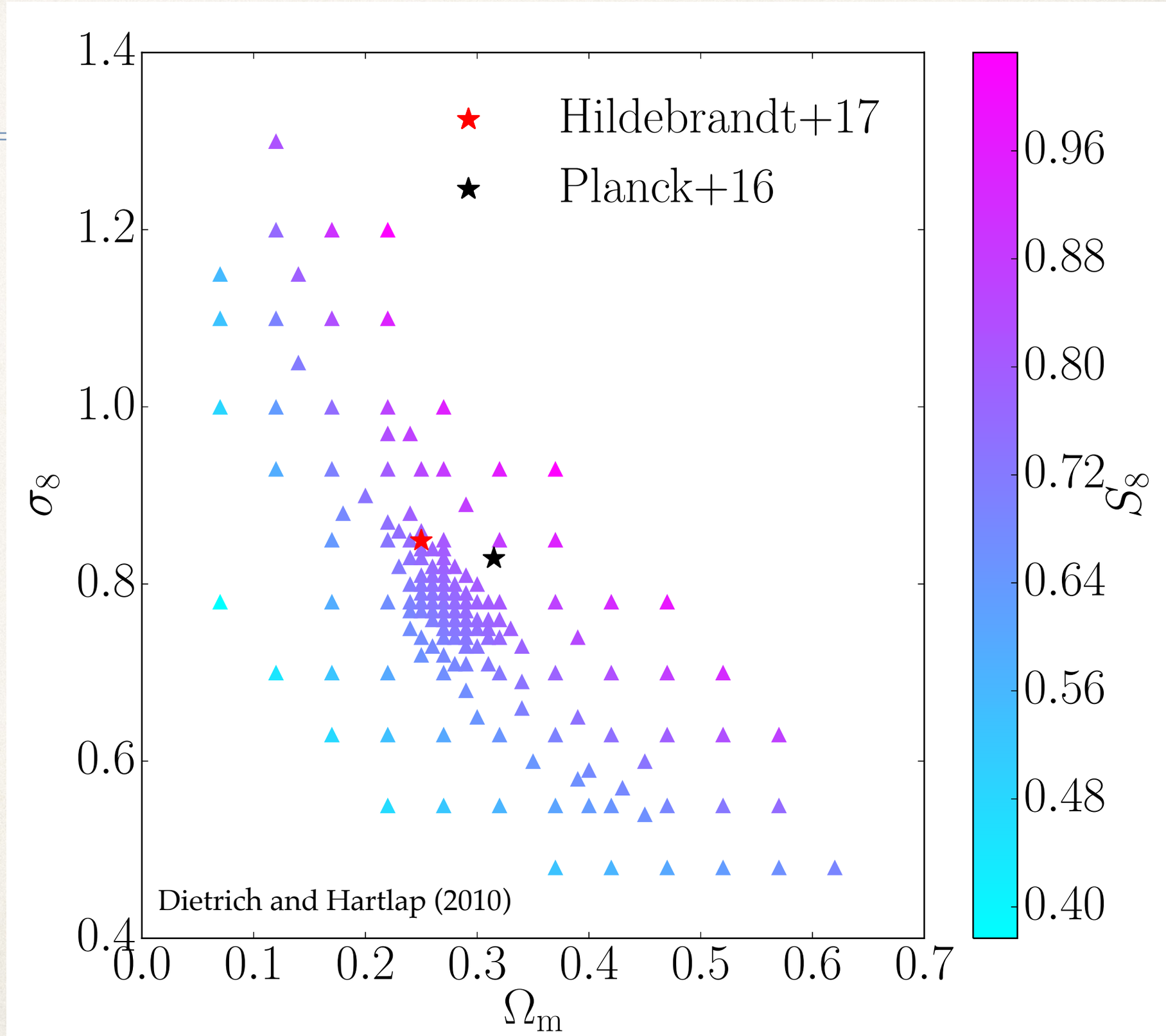


Clipping cosmic shear

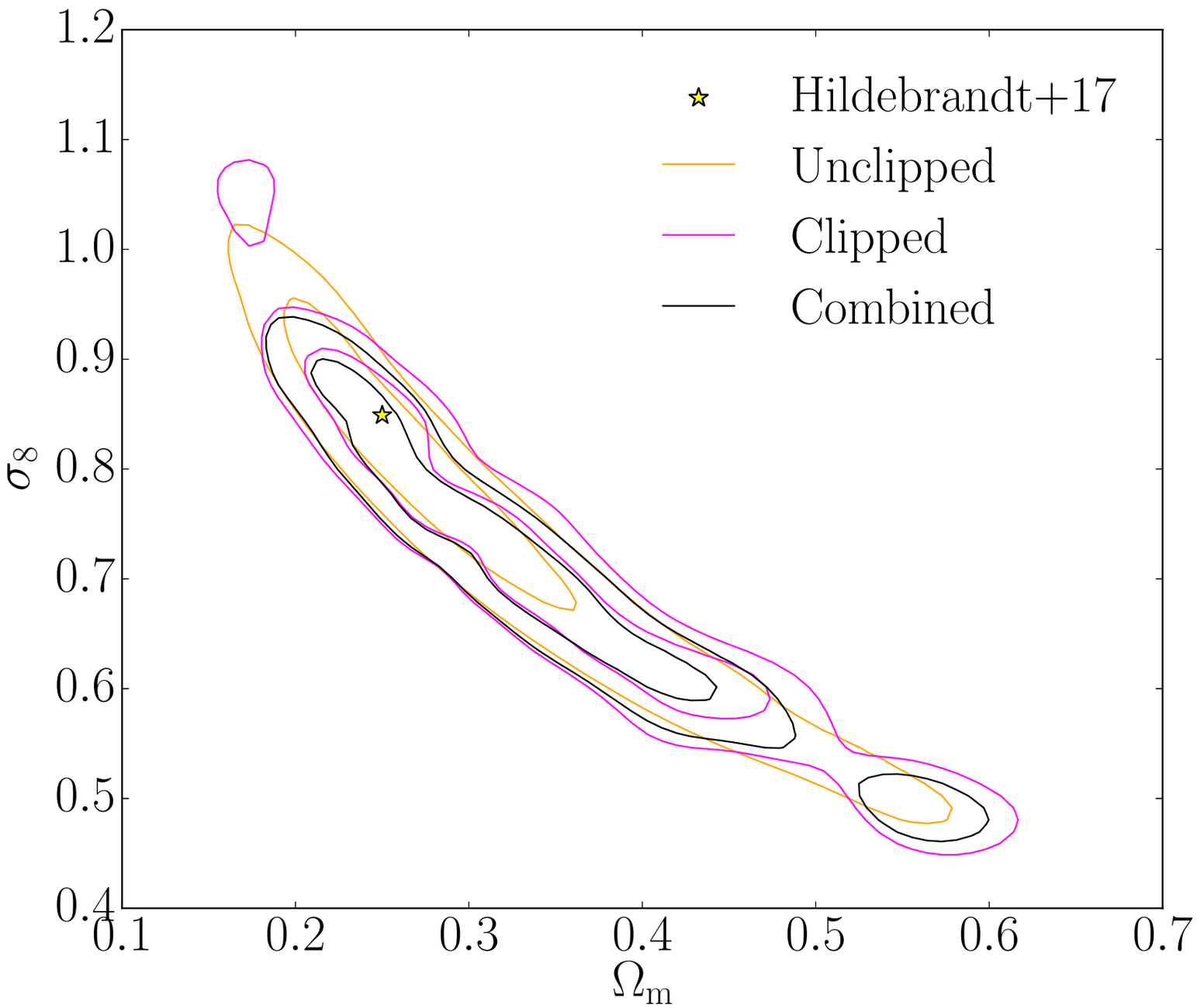


But how do these clipped statistics vary with cosmological parameters?

Calibrating clipping with mocks



The results for KiDS-450



- Combined clipped and unclipped analyses improve constraints on:
  - Ω_m by 16%
  - σ_8 by 9%
  - S_8 by 22%

Conclusions

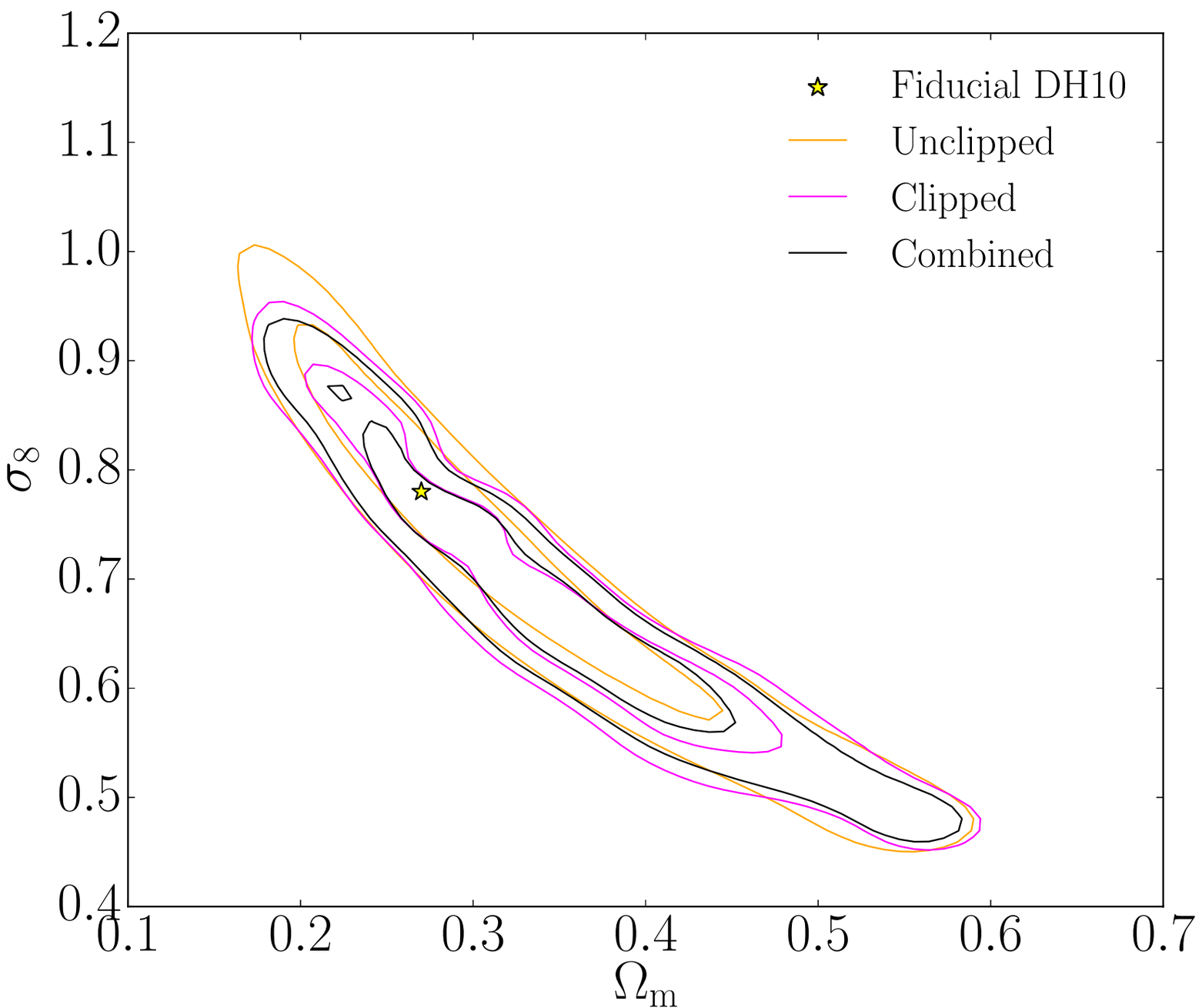
- Clipping suppresses the signal from high-density, non-linear regions of analysis.

- We have found clipping to be effective at improving cosmological parameter constraints.

- Work to be done on folding in systematics, e.g. baryons and intrinsic alignments.

- Paper coming very soon - Giblin et al. (May 2018)

The results for a mock dataset



- Combined clipped and unclipped analyses improve constraints on:
  - Ω_m by 27%
  - σ_8 by 24%
  - S_8 by 25%

Choosing the clipping threshold & smoothing scale