



# Preliminary results on CFIS

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**Guinot Axel**

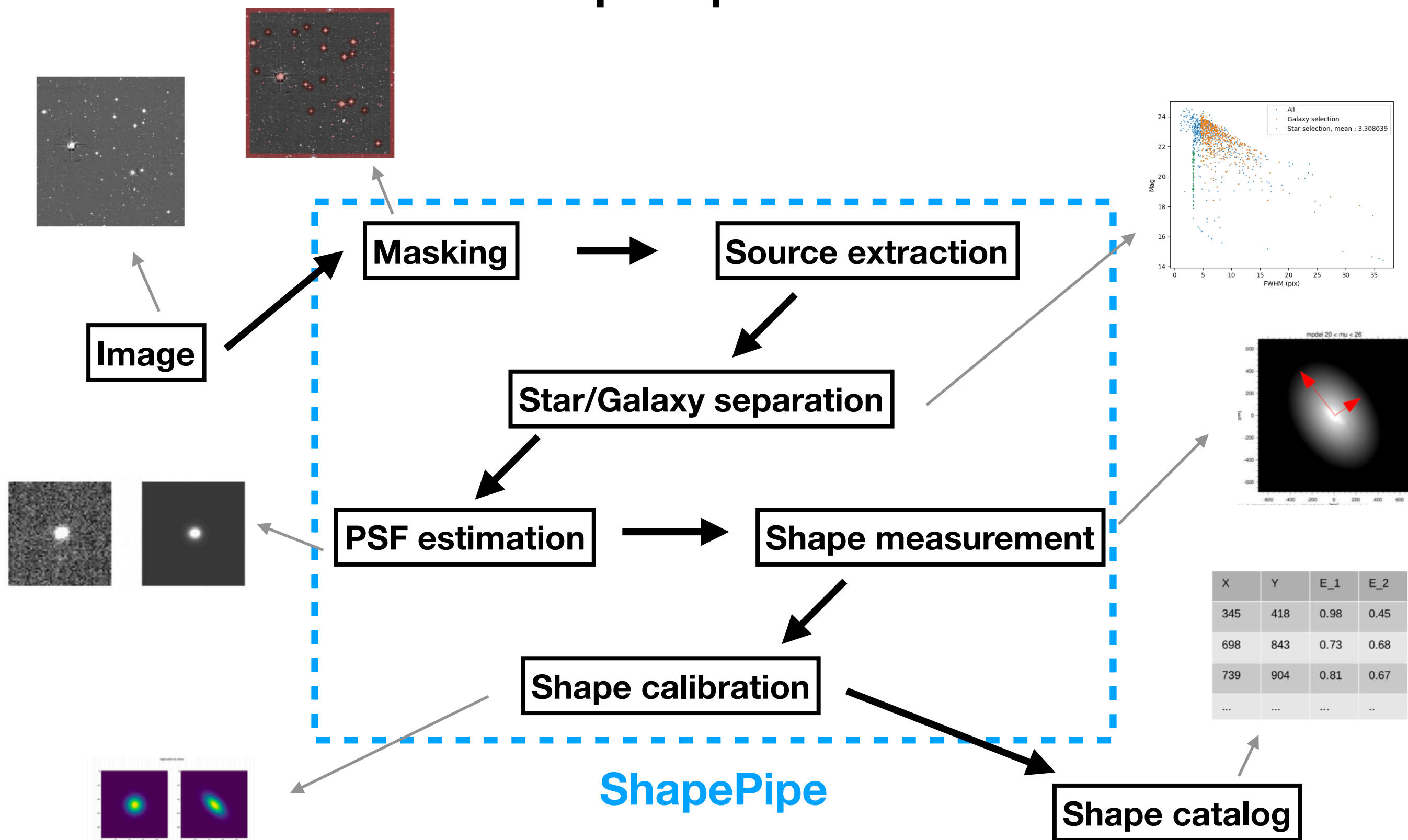
[axel.guinot@cea.fr](mailto:axel.guinot@cea.fr)

Supervised by Martin Kilbinger



# Presentation of ShapePipe

# ShapePipe overview

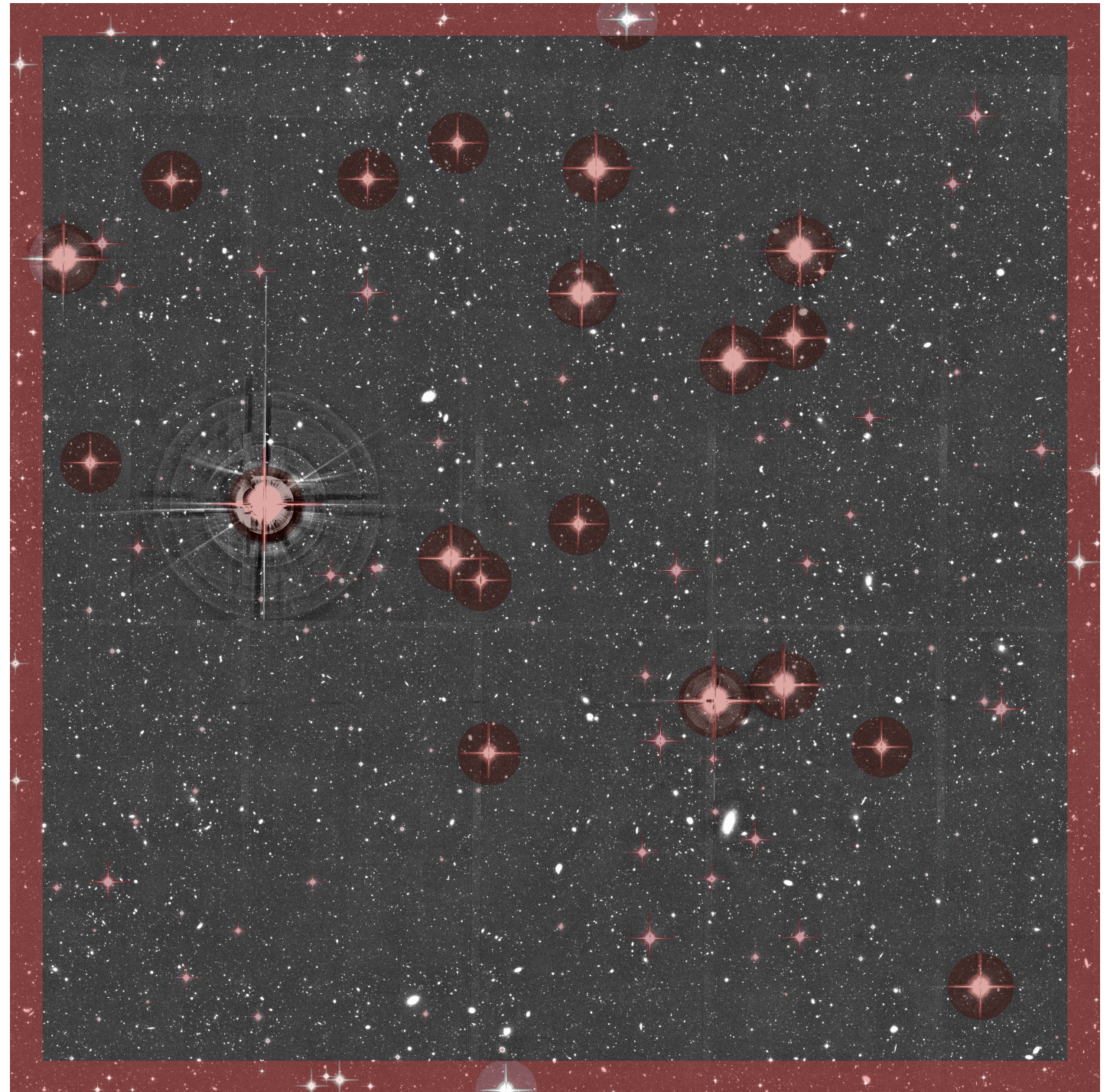




# Masking

## Mask :

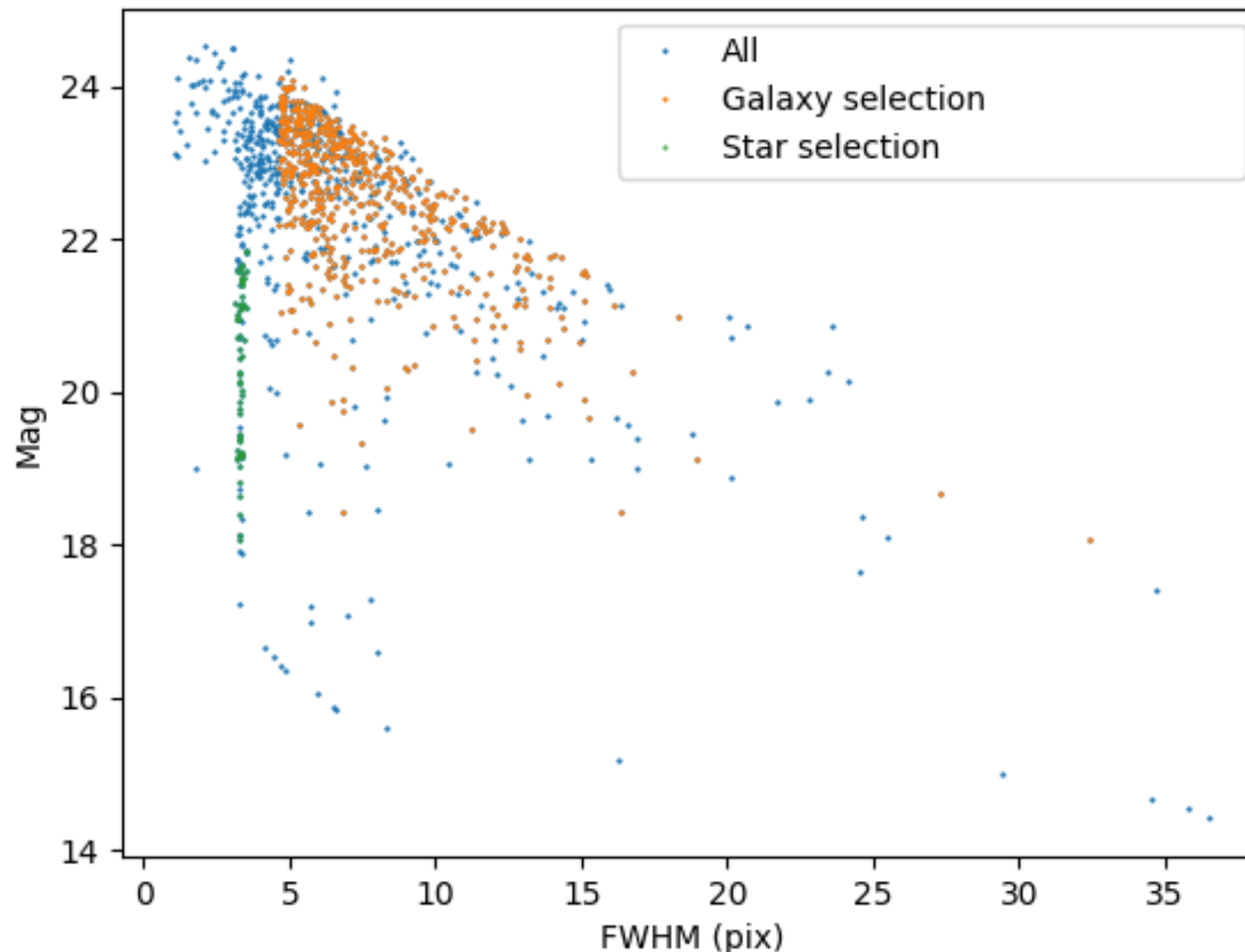
- Star spikes/halos
- Messier objects
- Cosmic ray





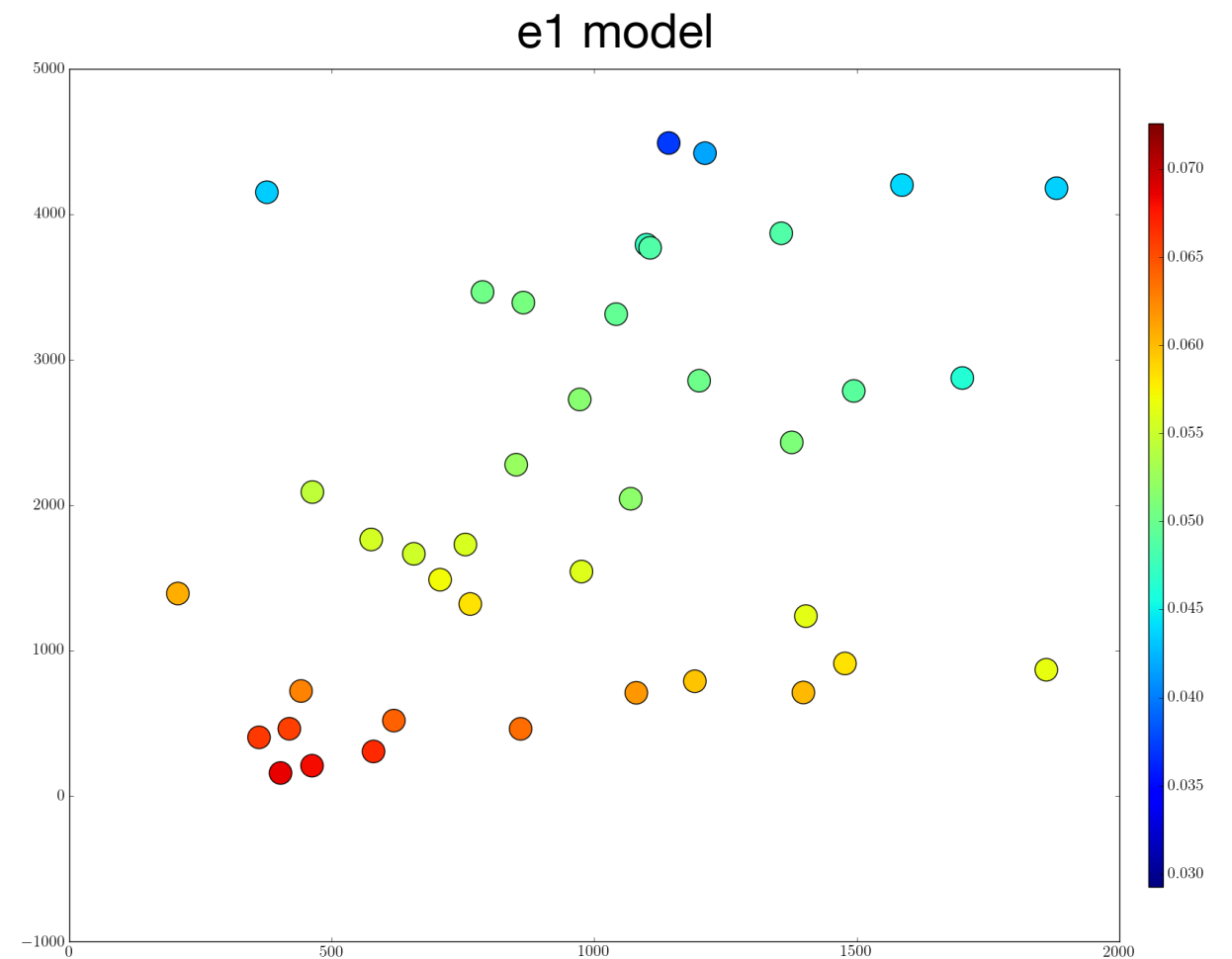
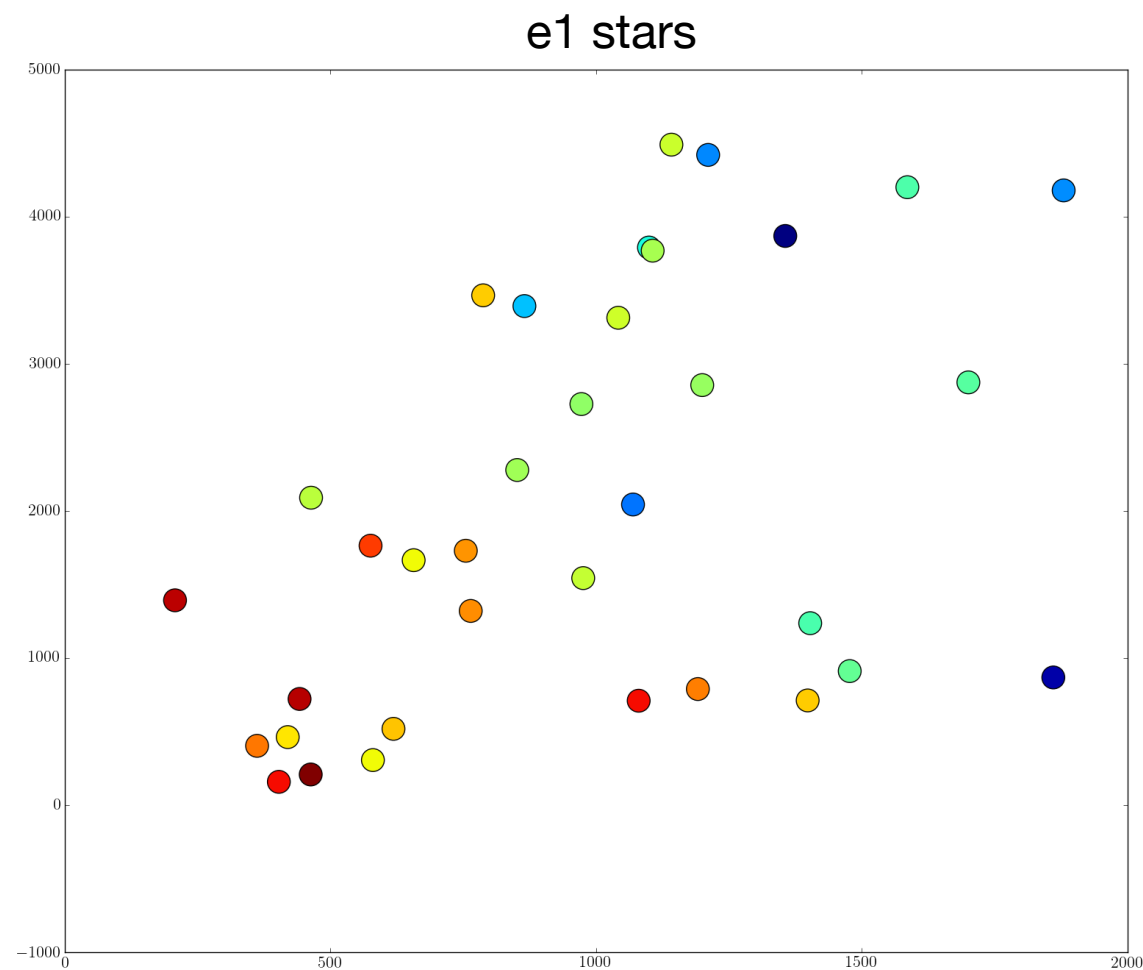
# Source extraction

- The source extraction is done with SExtractor (E. Bertin).
- Star-Galaxy separation is done in a size-mag plan.



# PSF estimation

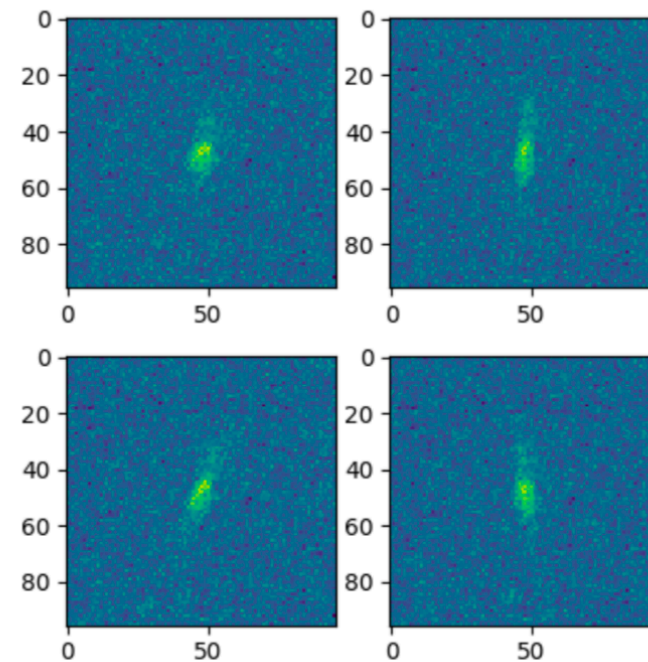
- The PSF is computed with PSFEx (E. Bertin). We then interpolate the model at the galaxy positions.



# Shape measurement and calibration

- The galaxy shapes are measured with the KSB method based on weighted moments. We use the shapelens code (P. Melchior).
- The bias calibration is computed using metacalibration through ngmix code (E. Sheldon).

$$e^{\text{obs}} = e^{\text{int}} + R\gamma$$



Images for  
the  
calibration

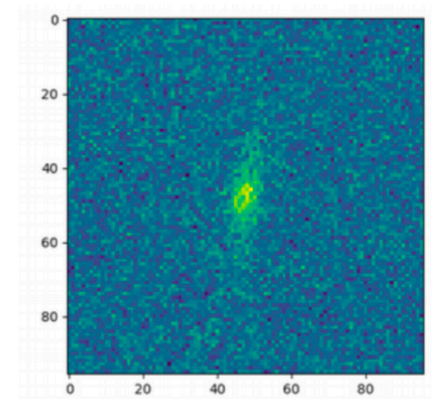
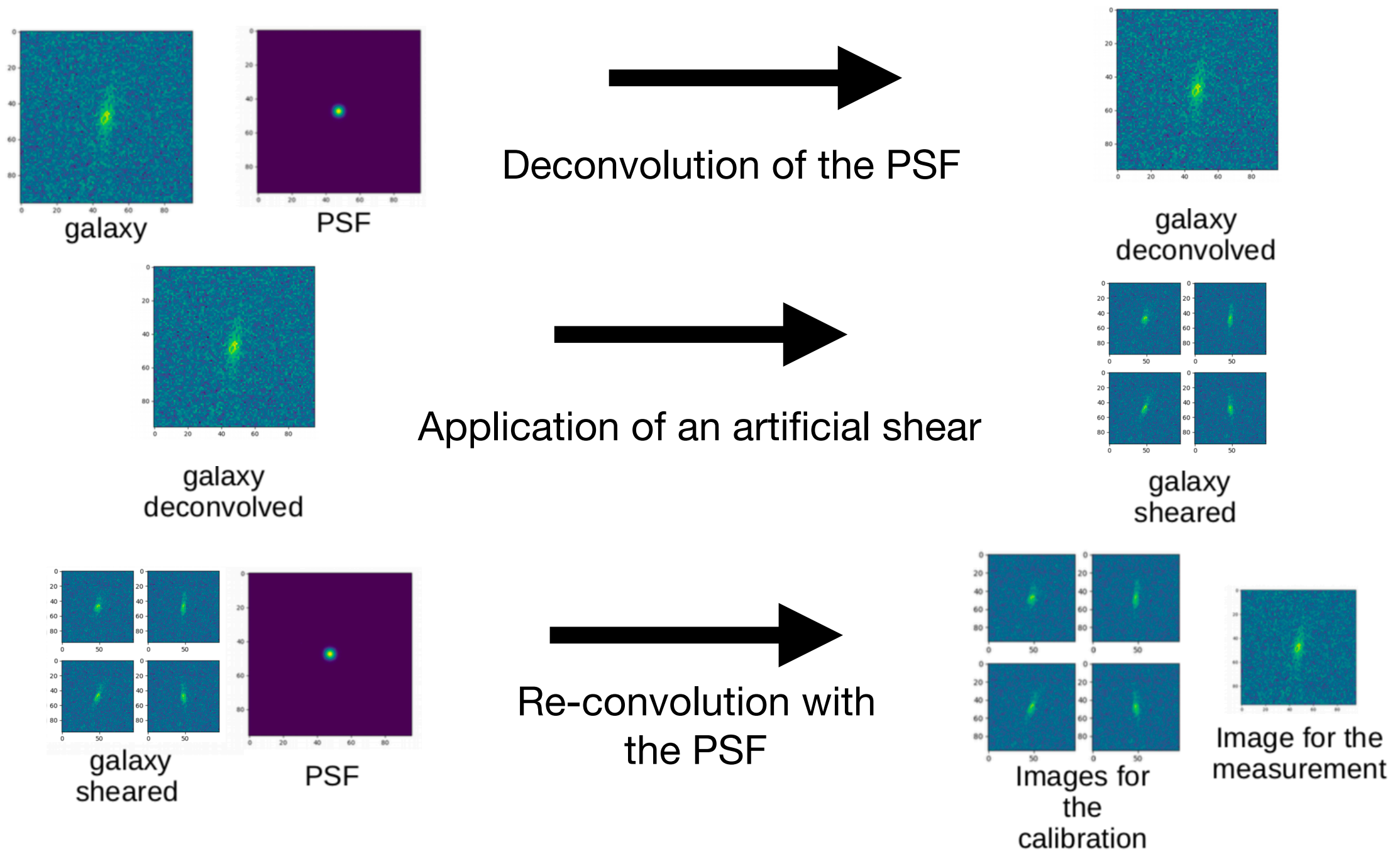


Image for the  
measurement



# Metacalibration

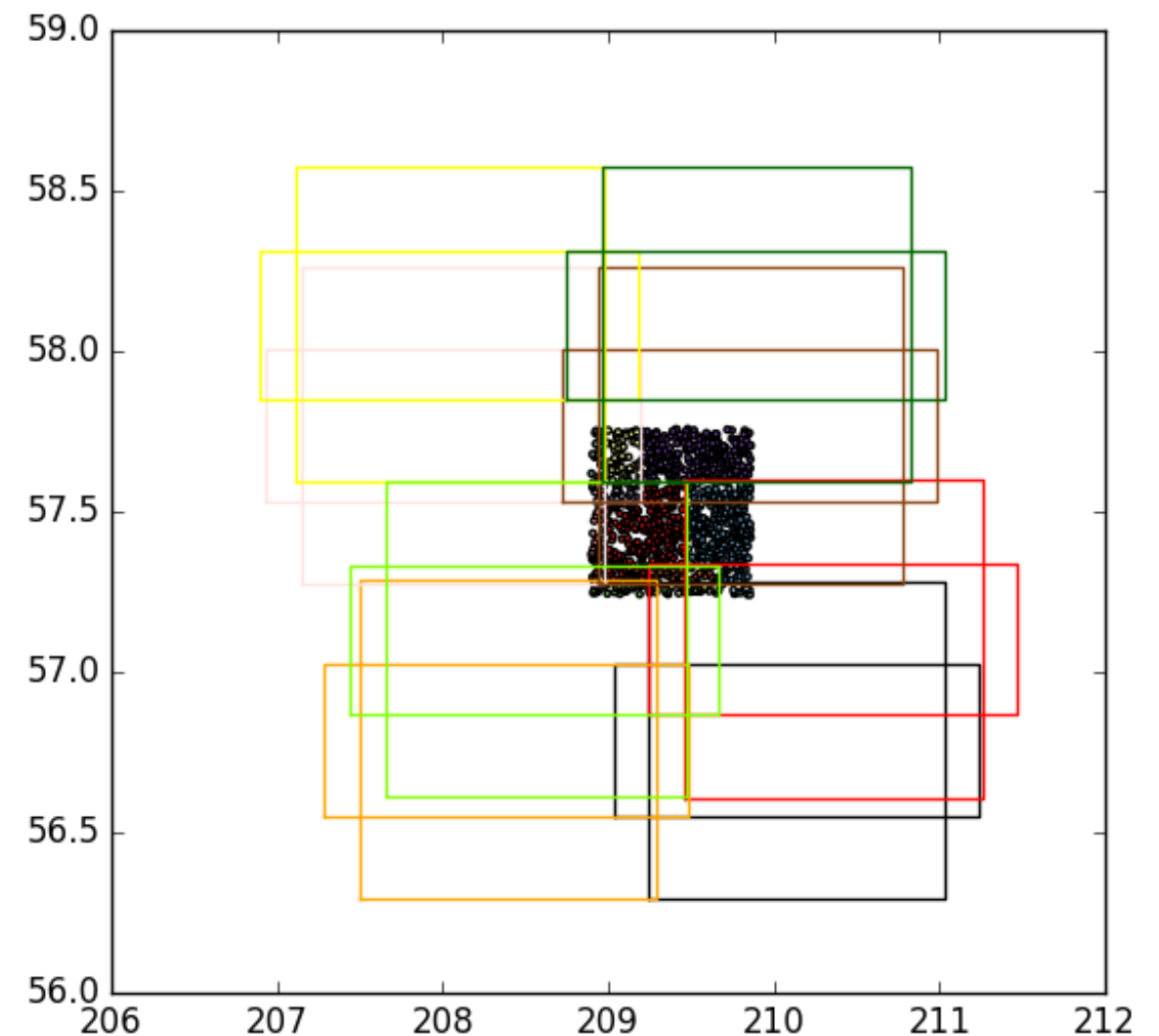
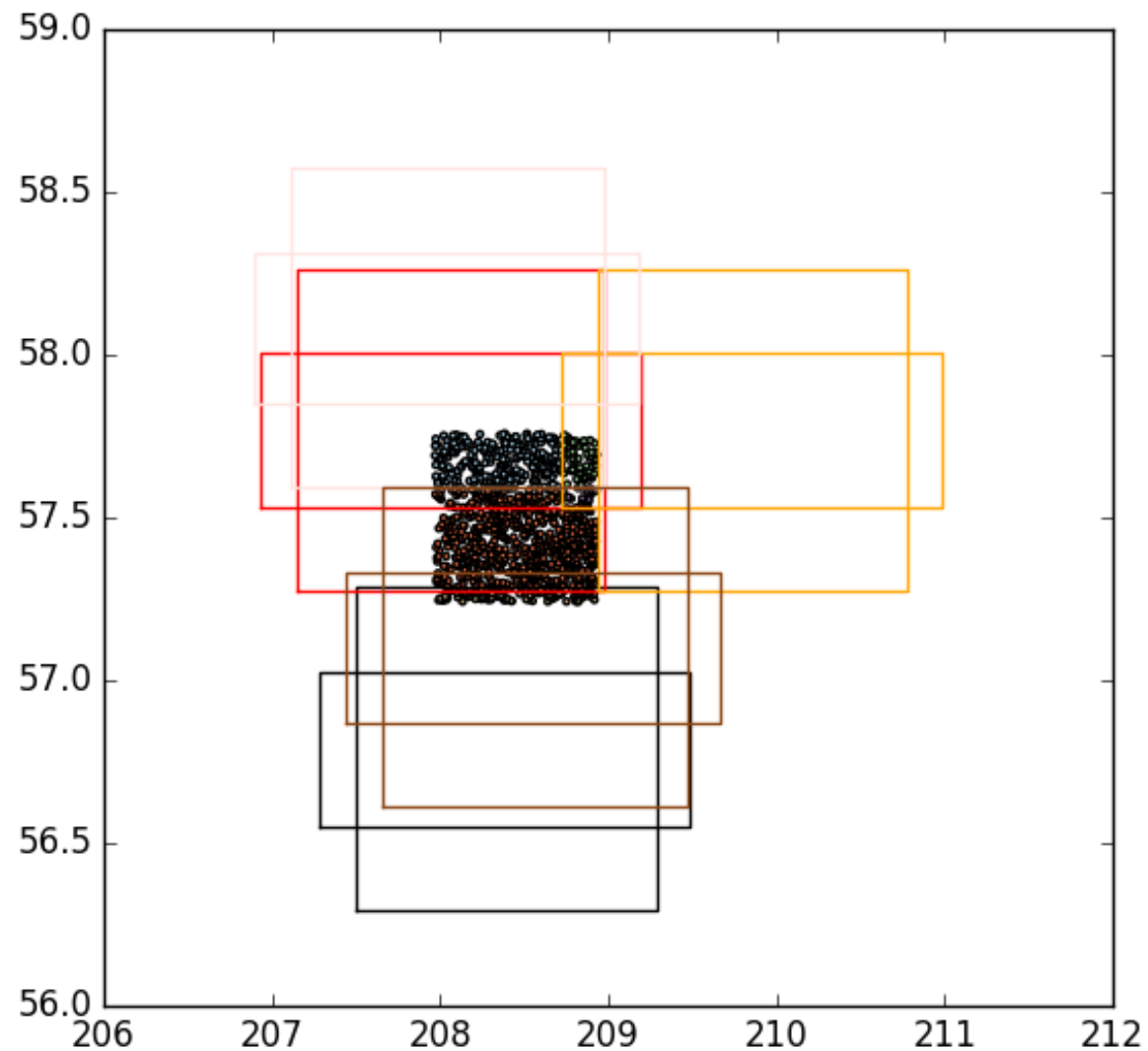


(Ref : Huff E., Mandelbaum R. 2017, arXiv:1702.02600)

# Work on stacked images

# Work on stacked images

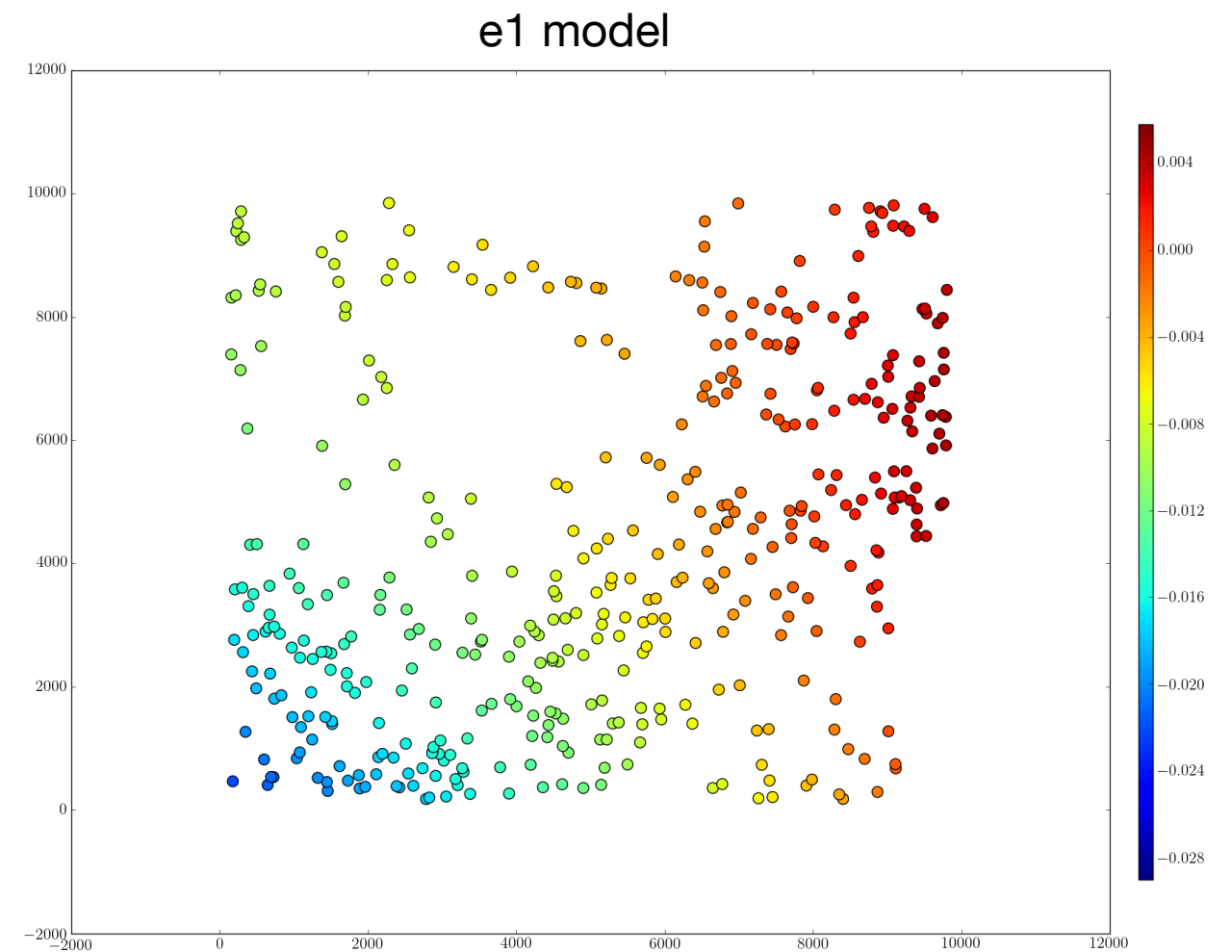
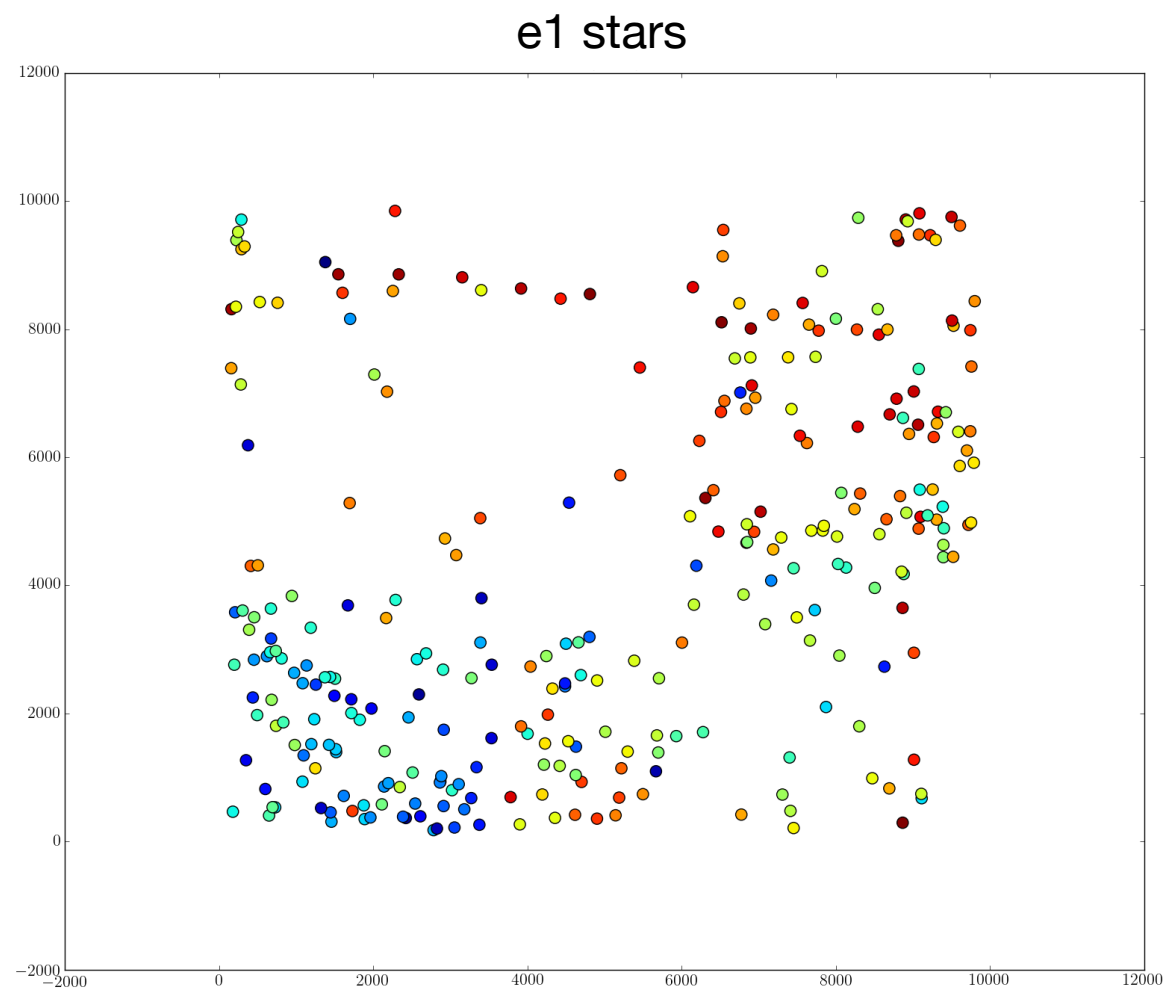
- Contributions of single exposures.





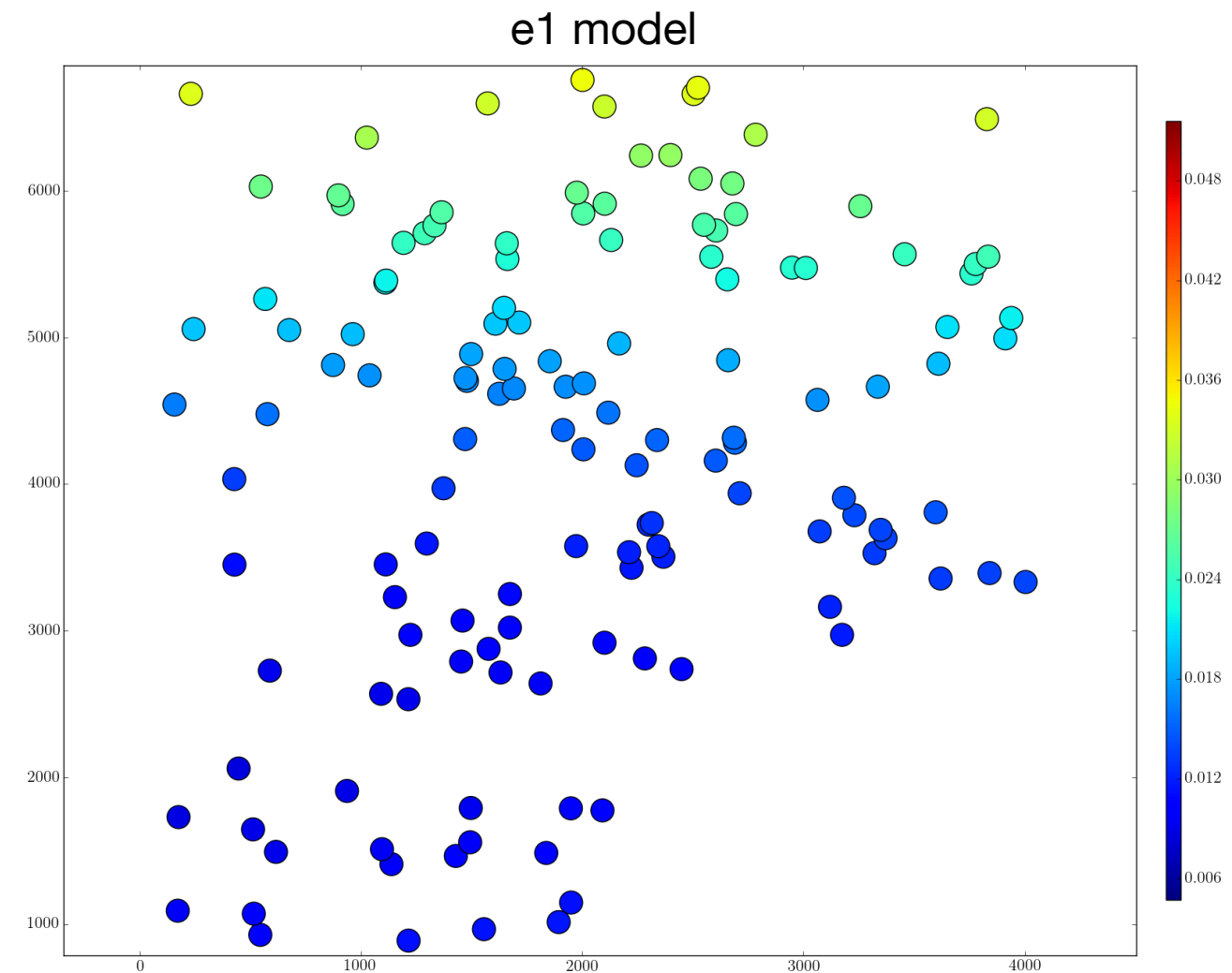
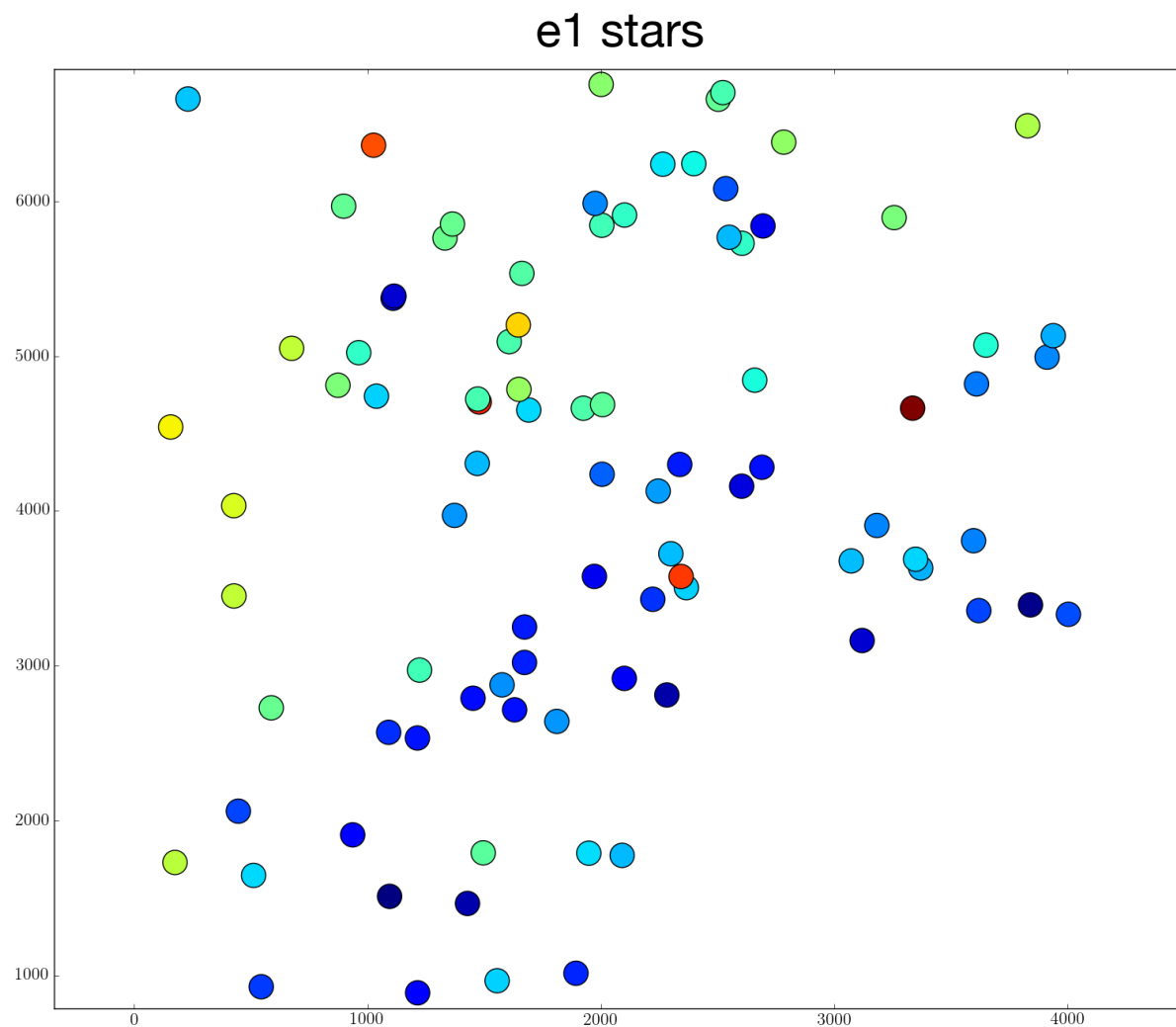
# Work on stacked images

- PSF modeling without the splitting.



# Work on stacked images

- PSF modeling after the splitting.



# Preliminary results



# Preliminary results

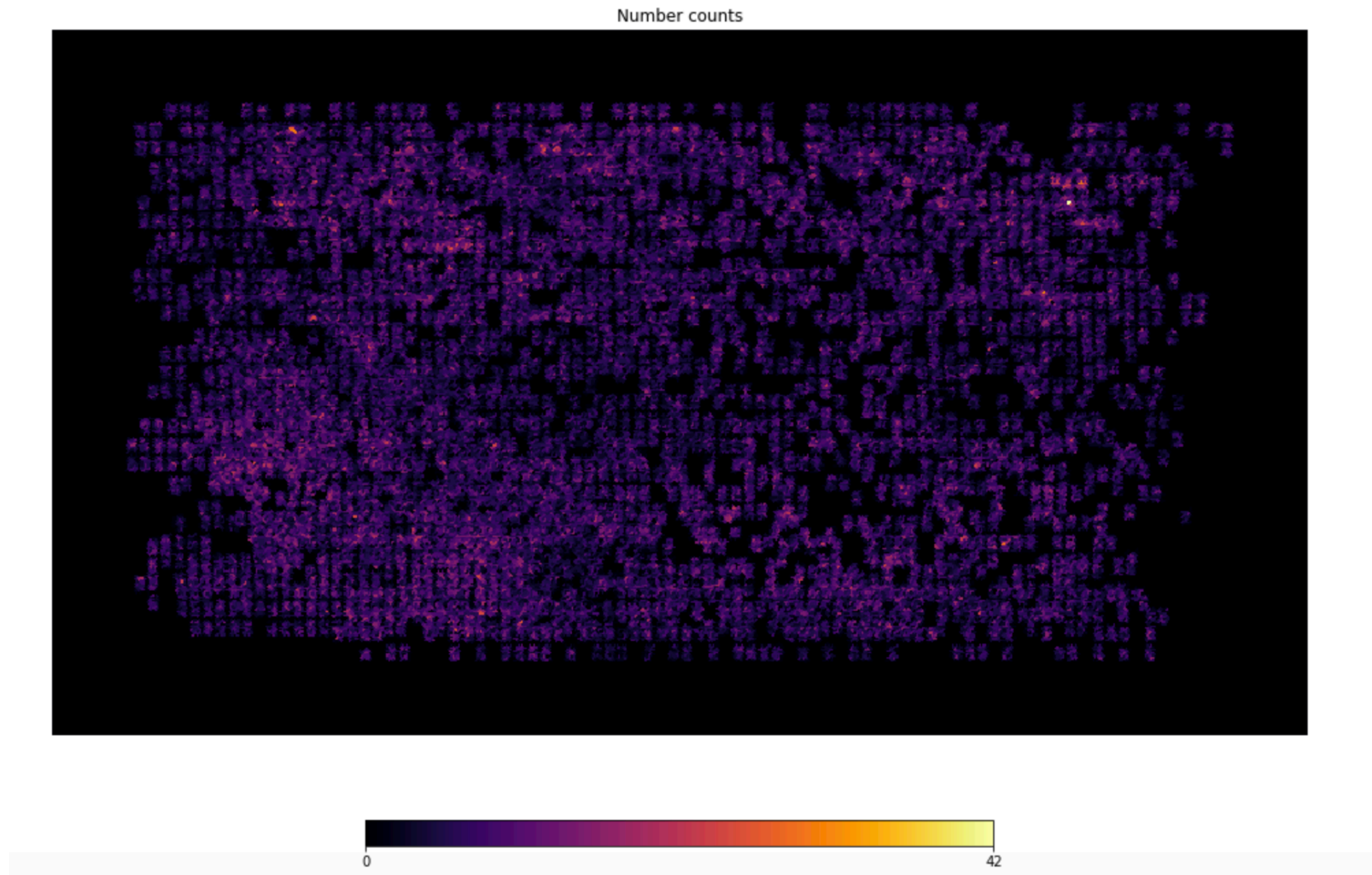
## Summary :

- Work on the CFHTLenS W3 field.
- 136 single exposures.
- 35 stars on average per CCD. (1500 stars/deg<sup>2</sup>)
- Around 500 000 “galaxies” in the W3 field.



# Preliminary results

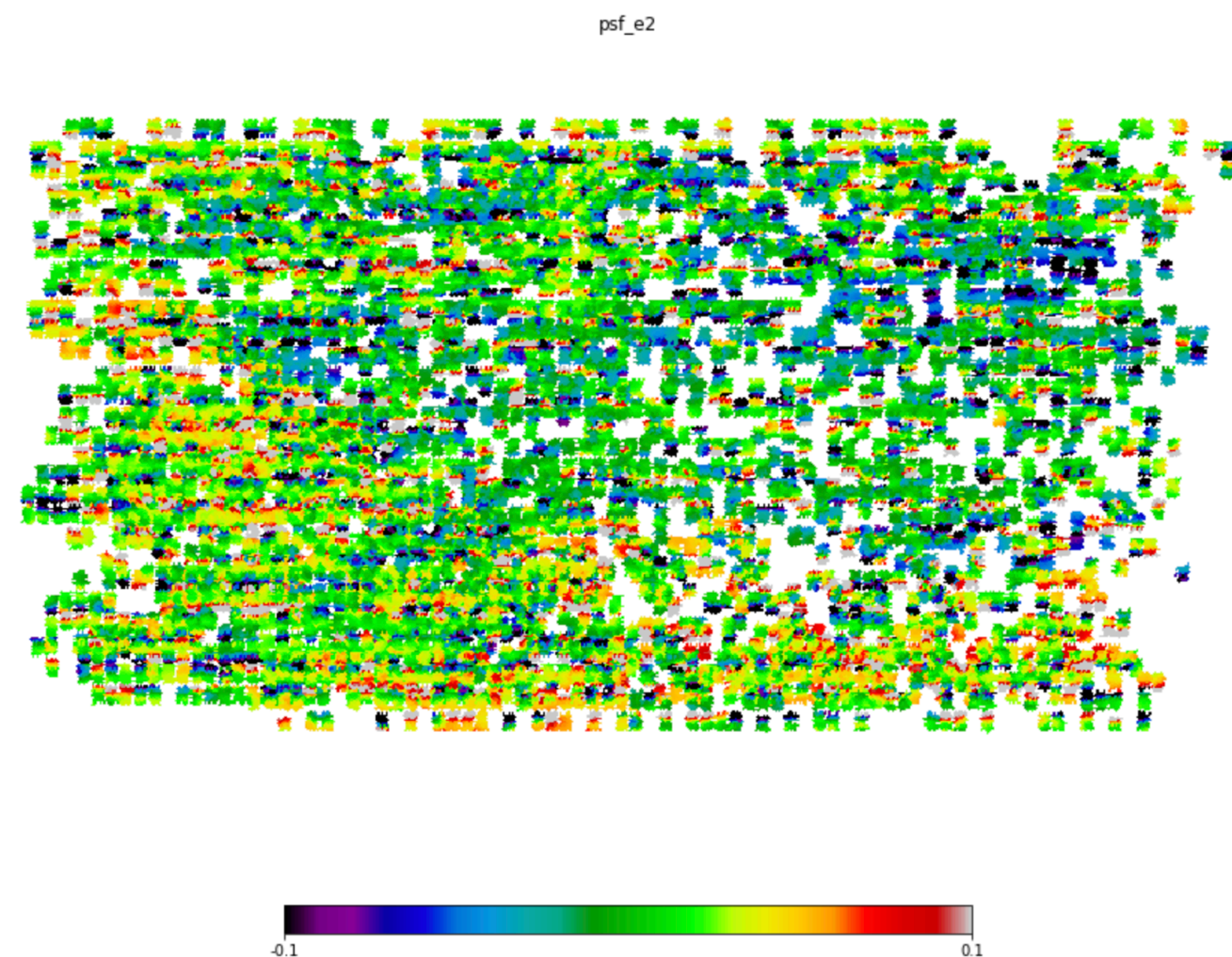
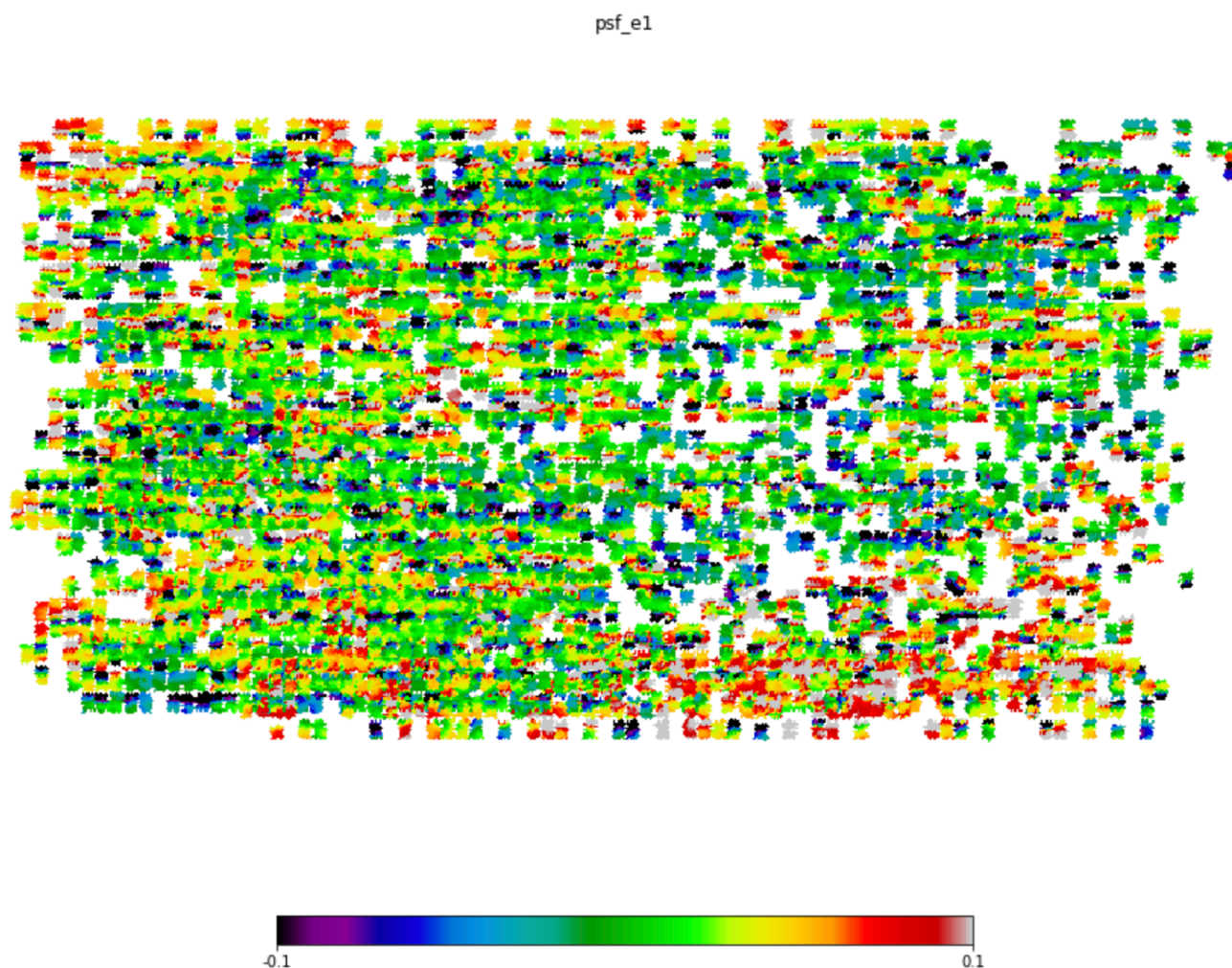
- W3 field.





# Preliminary results

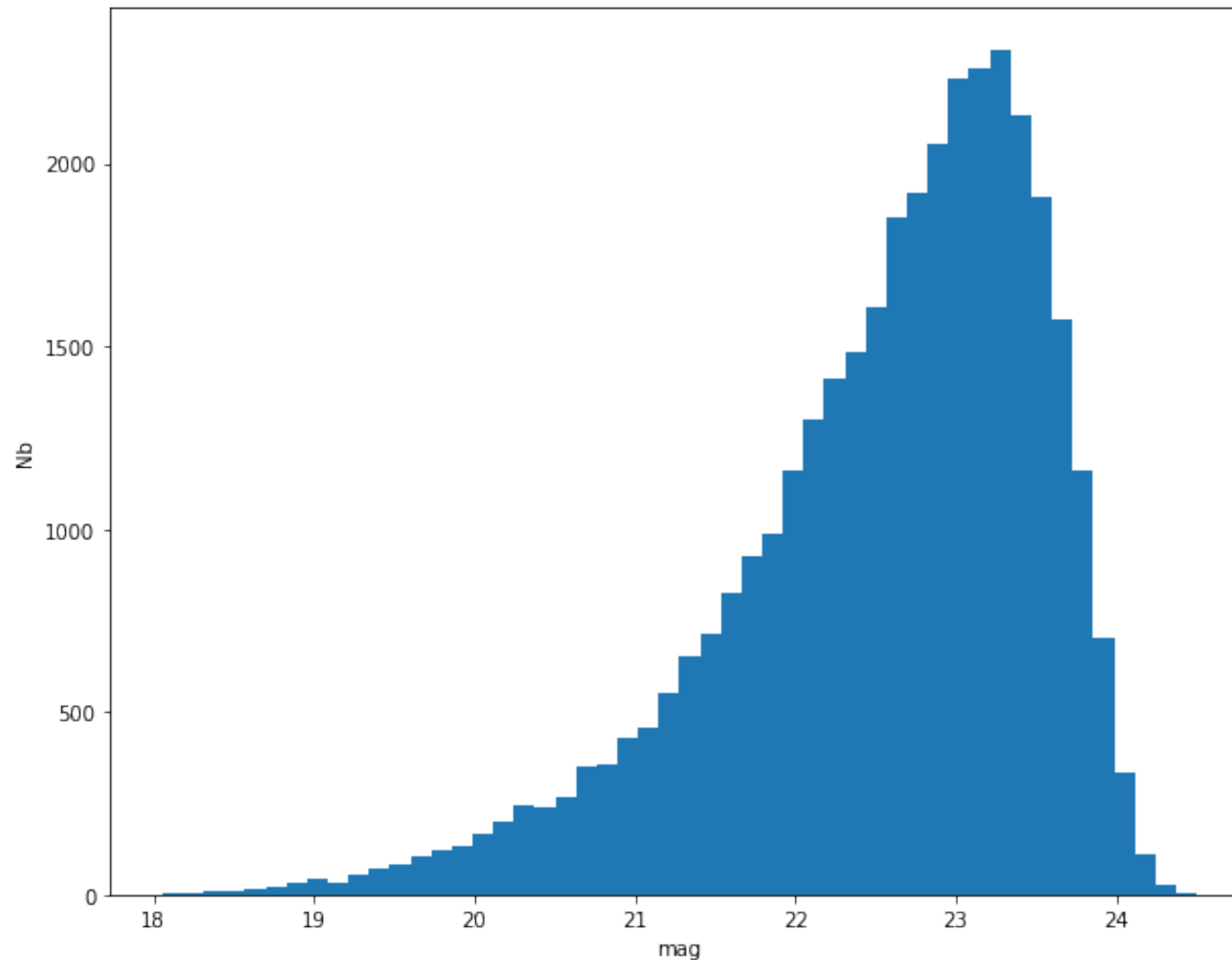
- PSF maps.





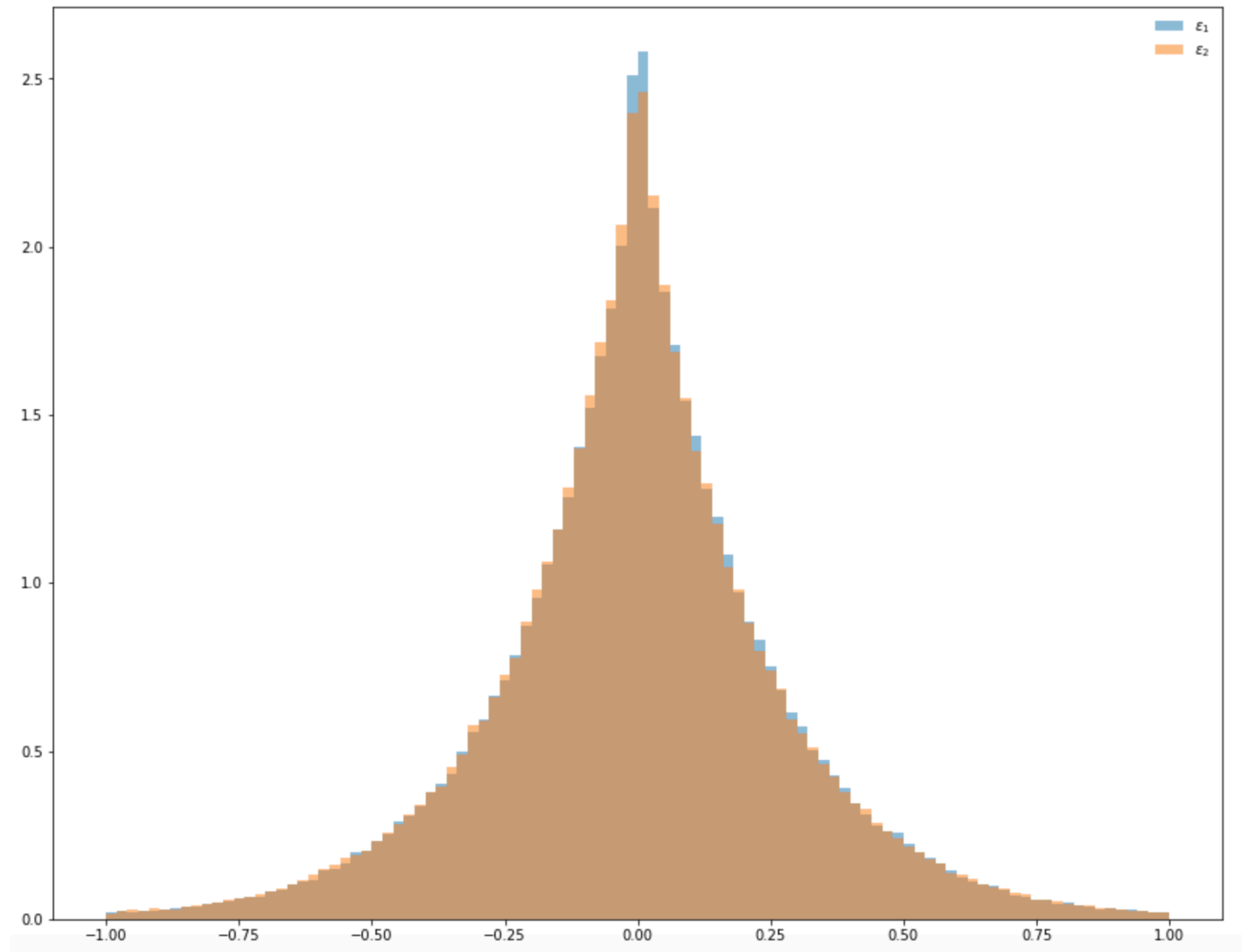
# Preliminary results

- Magnitudes distribution.



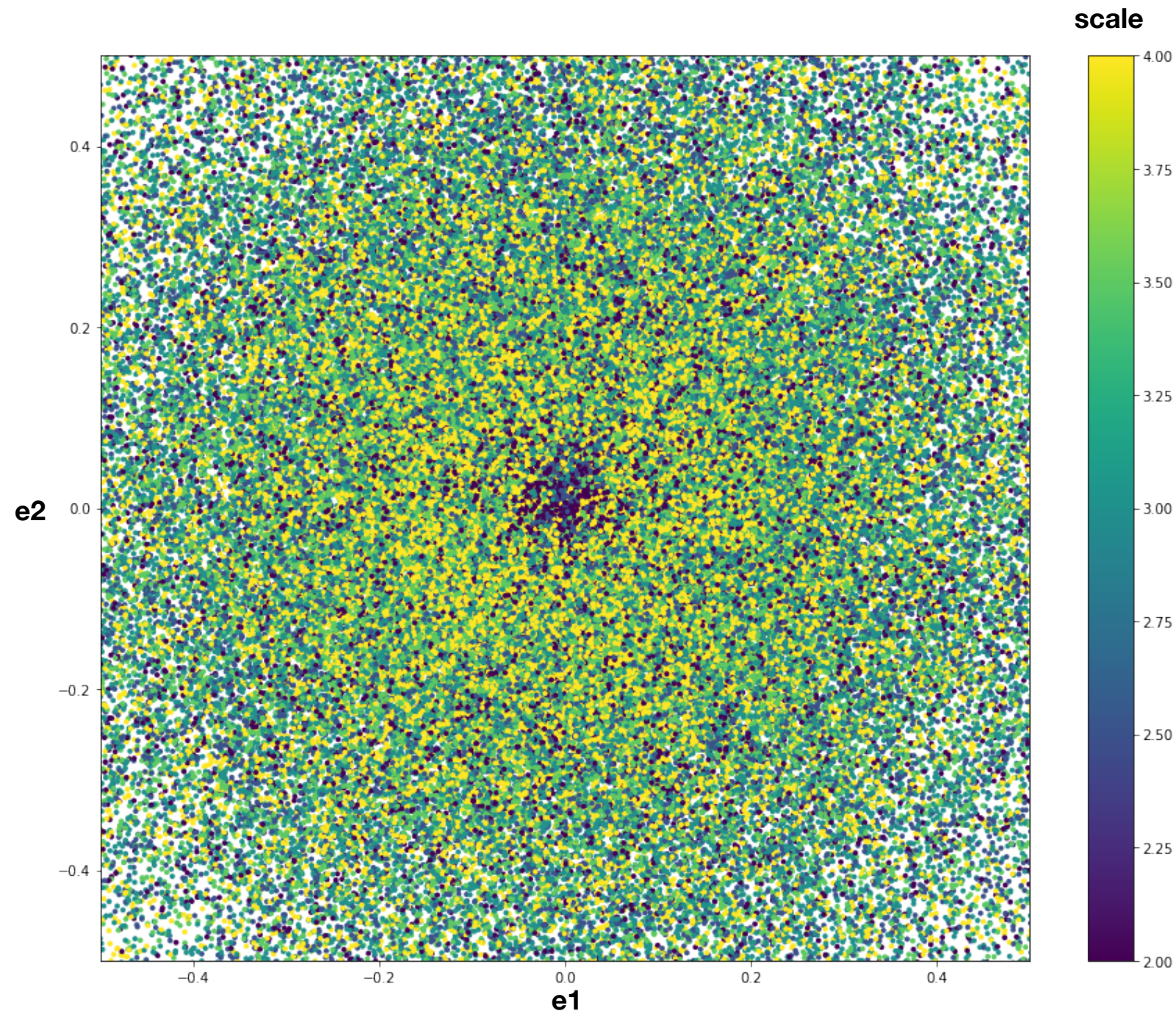
# Preliminary results

- Ellipticities distribution. (Computed with KSB)



# Preliminary results

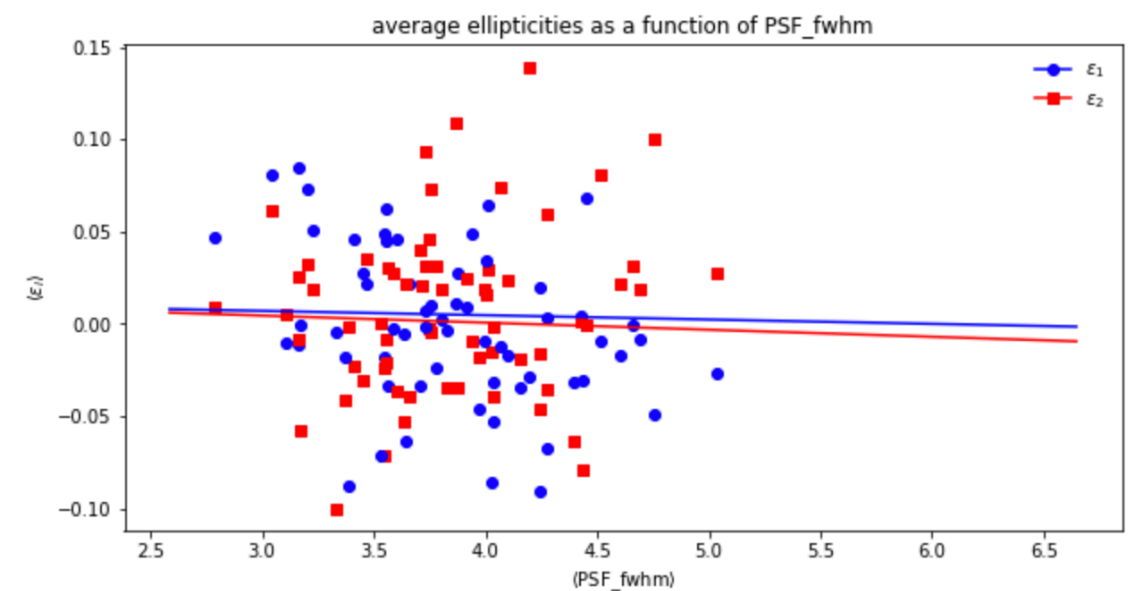
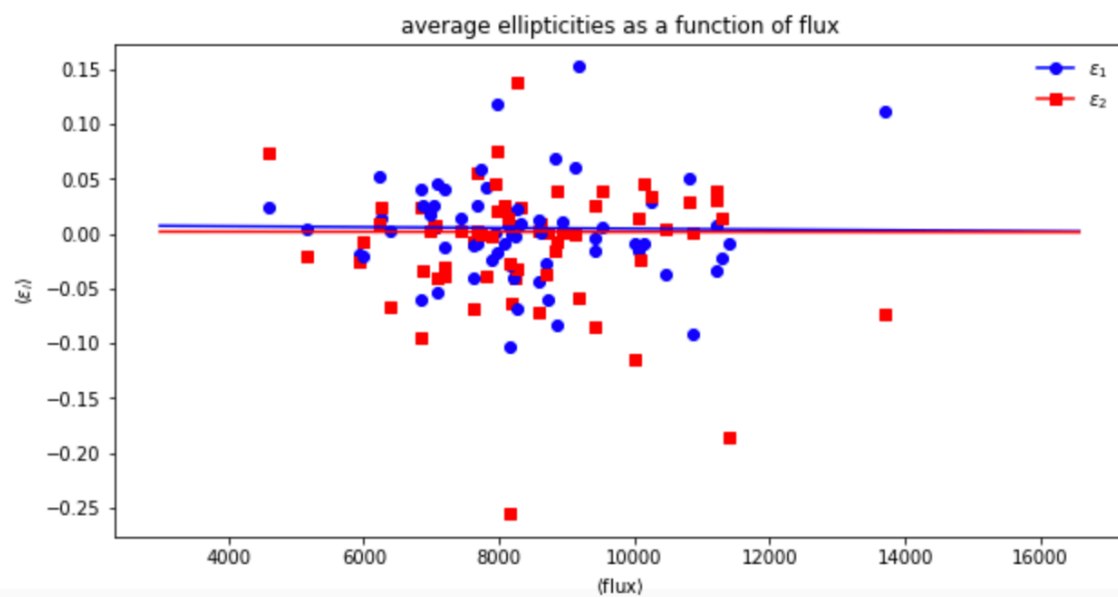
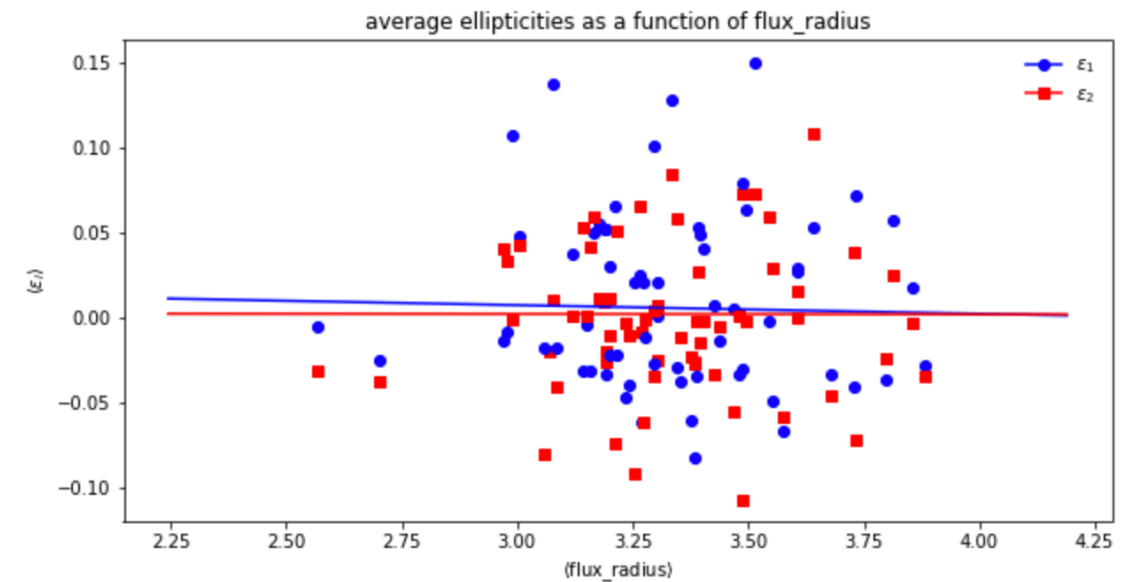
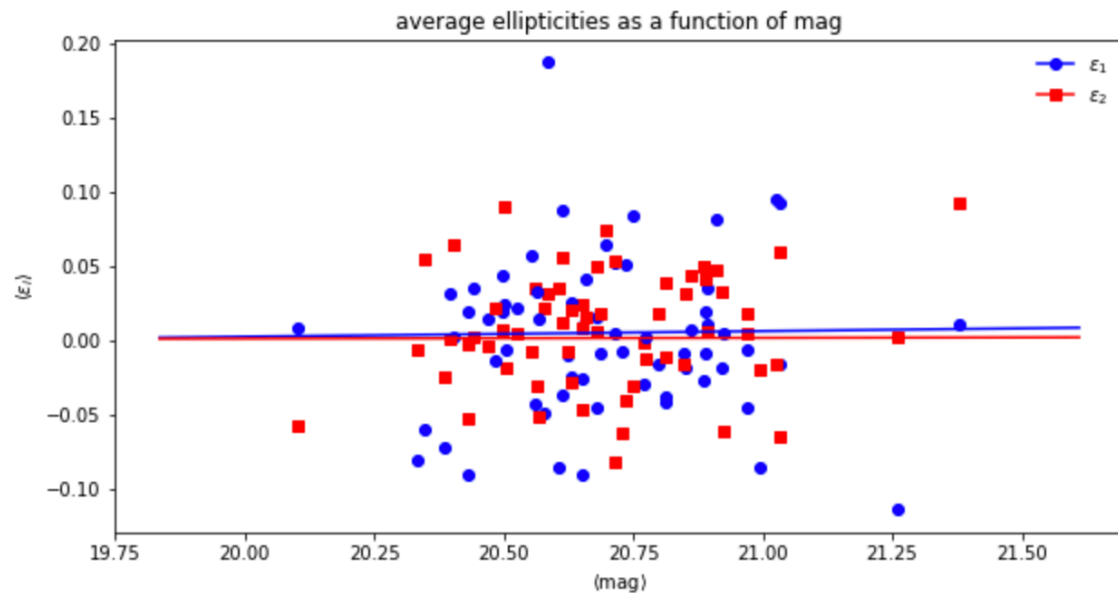
- Issue with shapelens window function.





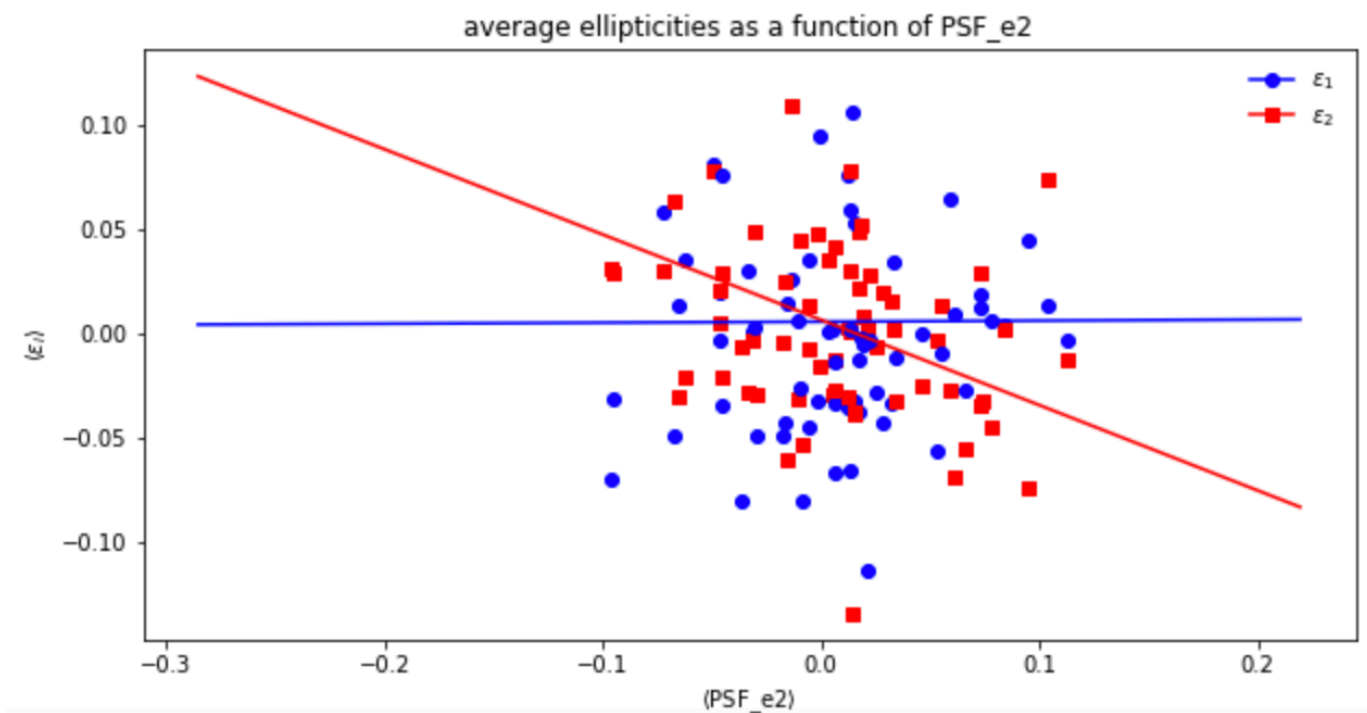
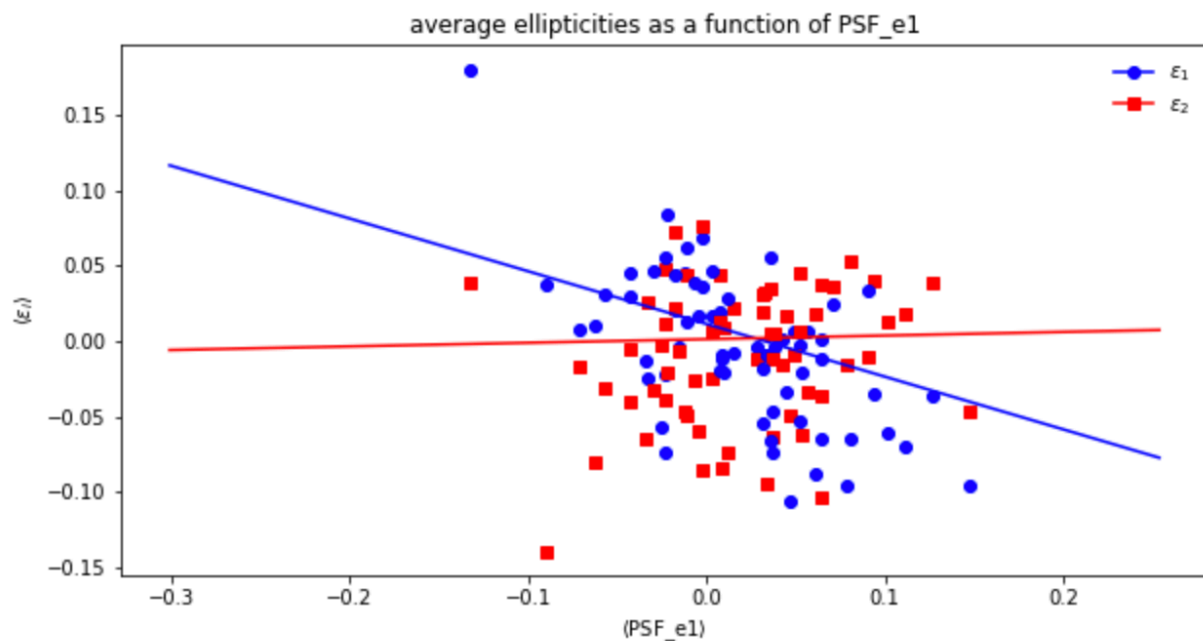
# Preliminary results

- Dependencies of the shape measurement against other parameters.



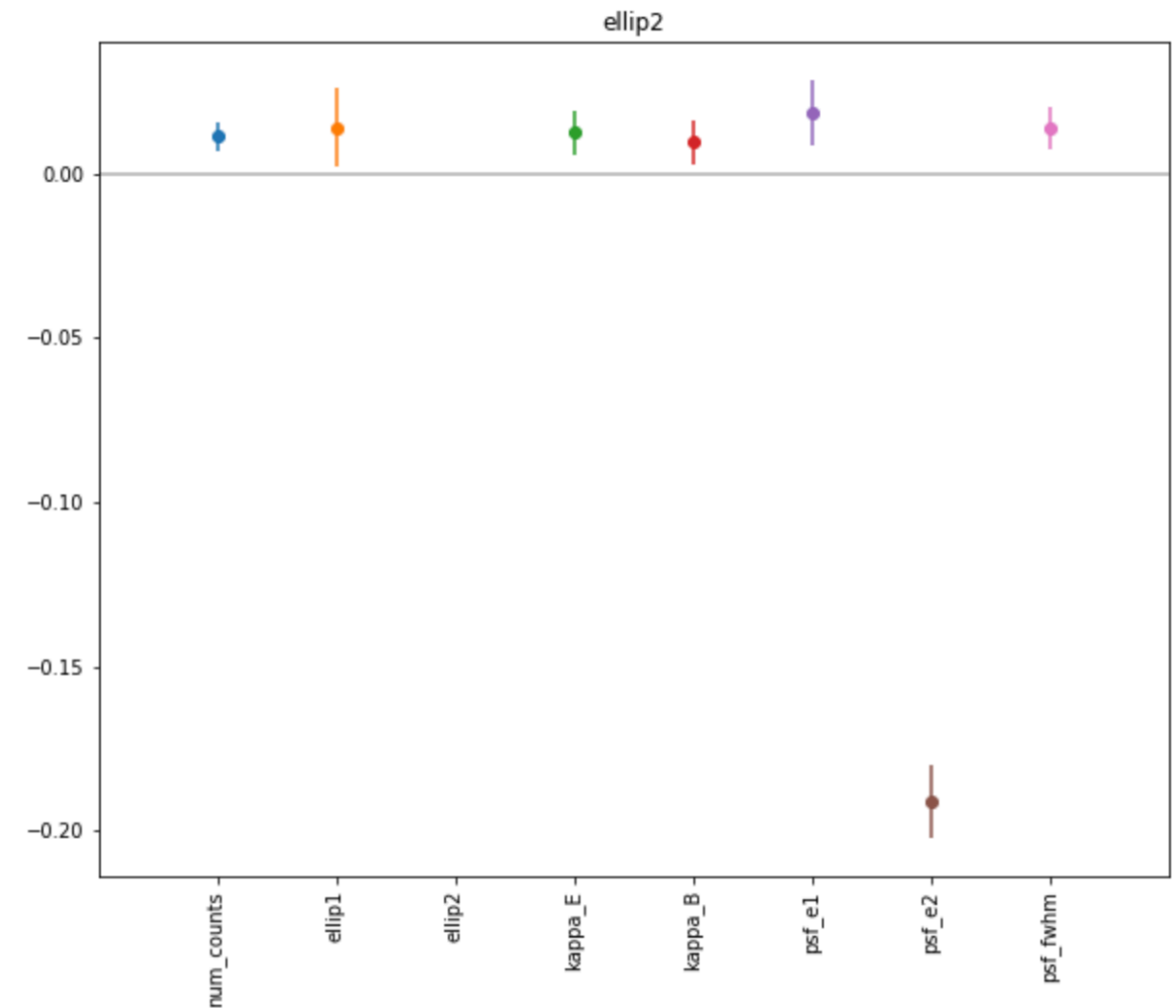
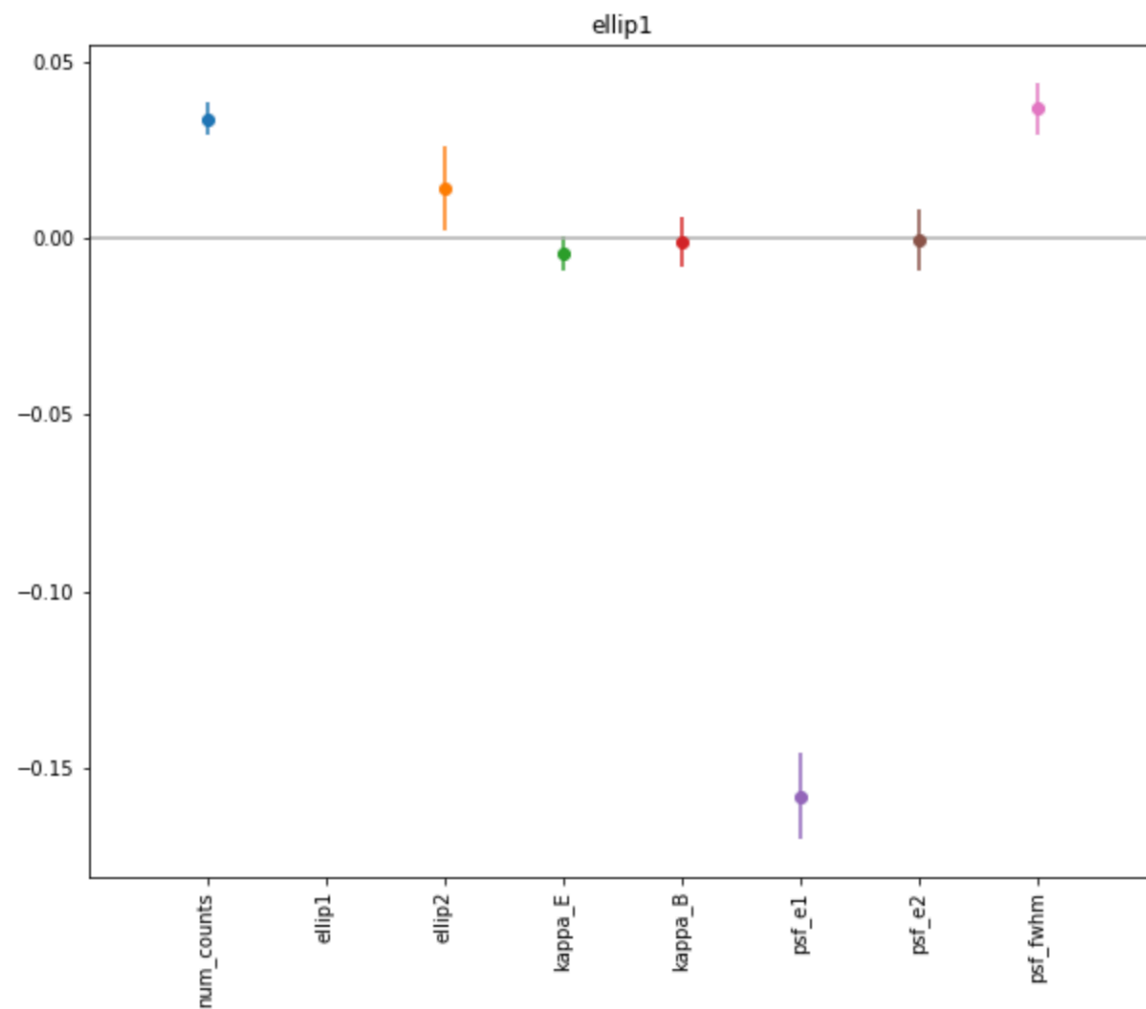
# Preliminary results

- Dependencies of the shape measurement against the PSF.



# Preliminary results

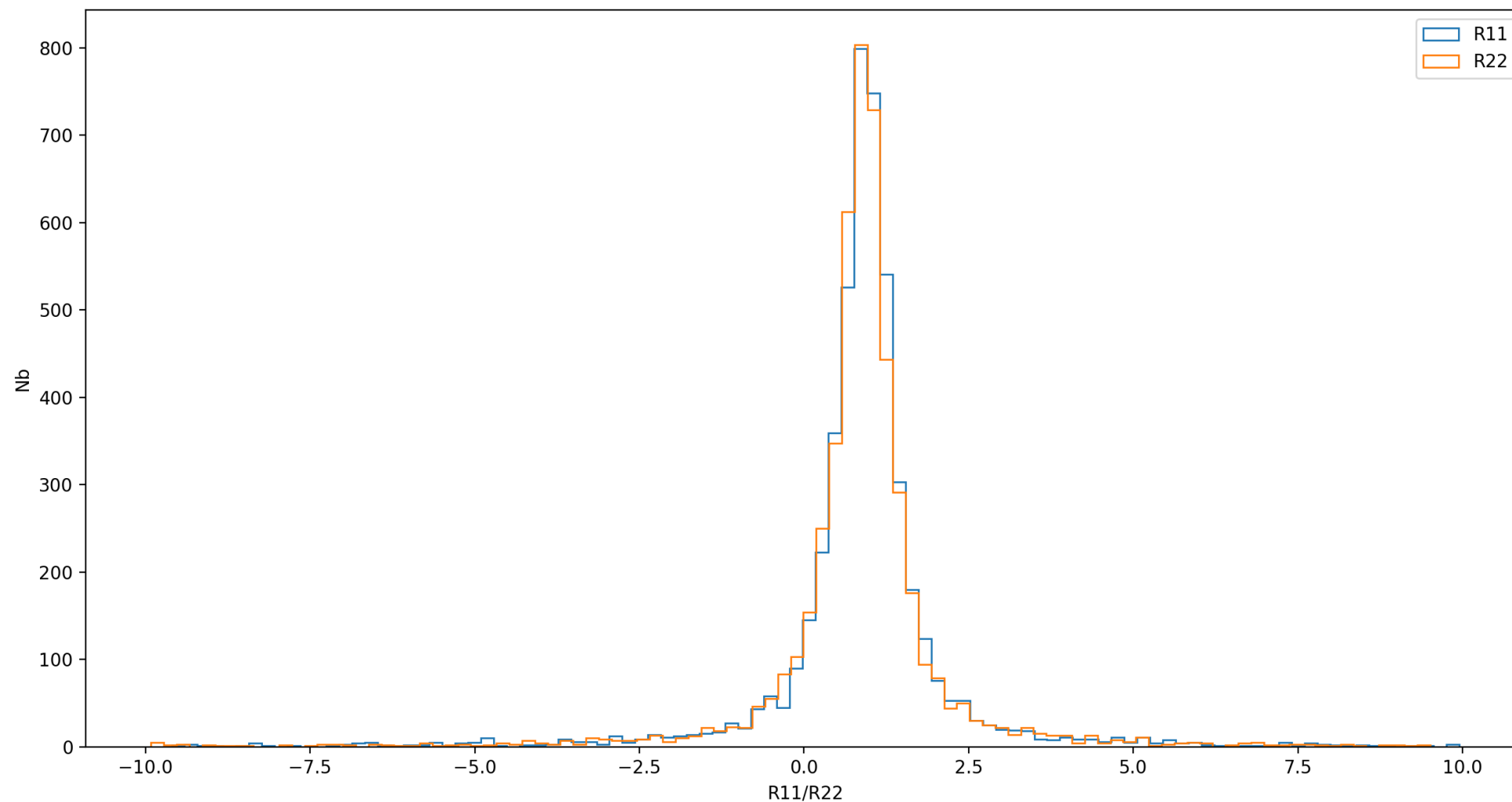
- Correlation observed between galaxies' shapes and the PSF.





# Preliminary results

- Metacalibration tested on one single exposure



Median values :  
 $R11 = 0.932$   
 $R22 = 0.896$

**Only 5000 objects**

# Preliminary results

- Gamma<sub>t</sub> and gamma<sub>x</sub> around a Planck cluster

