# Completeness Masks and Galaxy Clustering in SAS2

Daniel Farrow

With Shaun Cole, Nigel Metcalfe, Peter Draper, Peder Norberg & the PS1 team

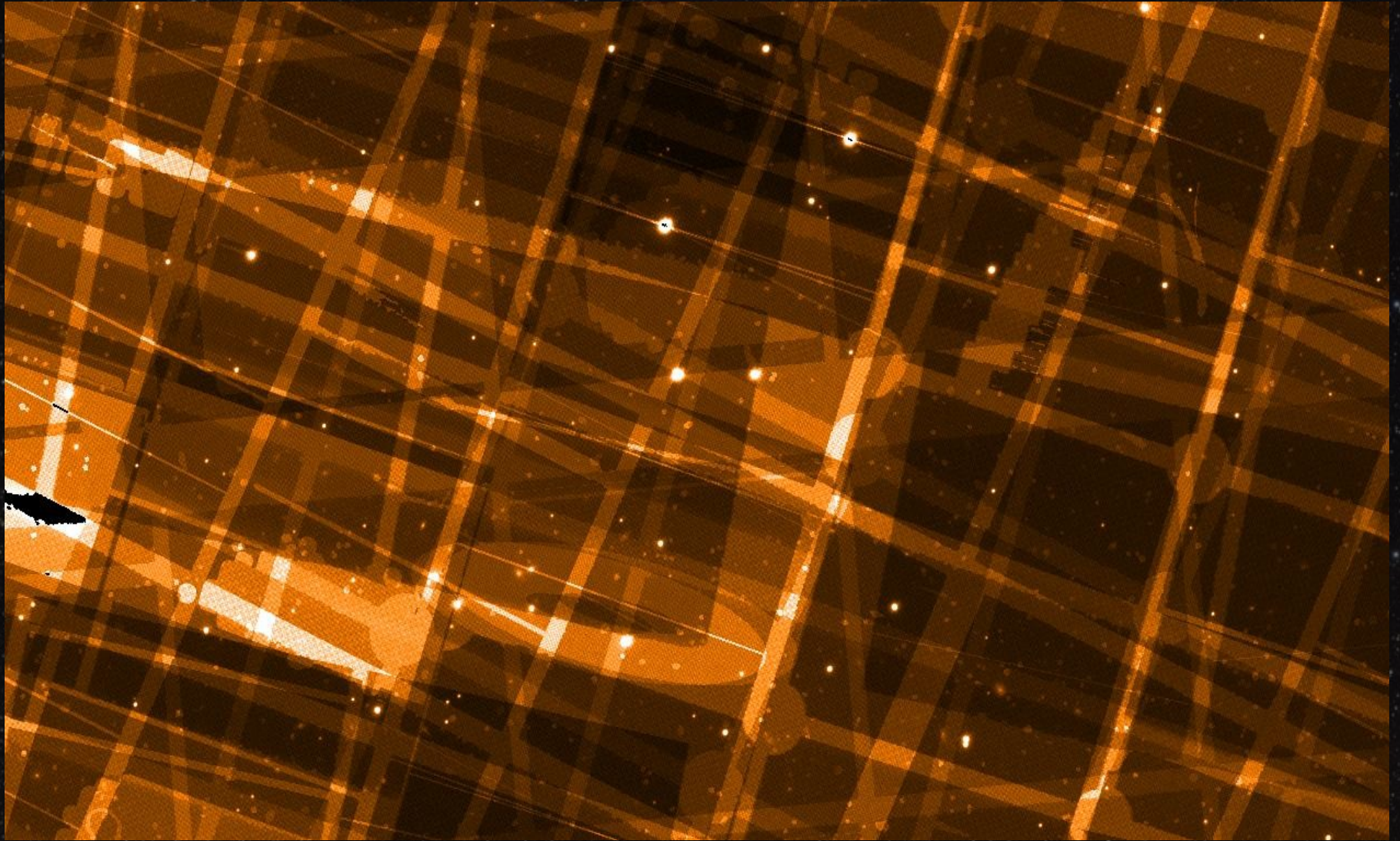Durham University

Pan-STARRS
PS1 Science Consortium

Outline

- Already seen technique we used to star/galaxy separate – now need angular masks

- Spatially varying depth and variance maps

- Producing masks & 'primary resolution' problem

- Bright star mask

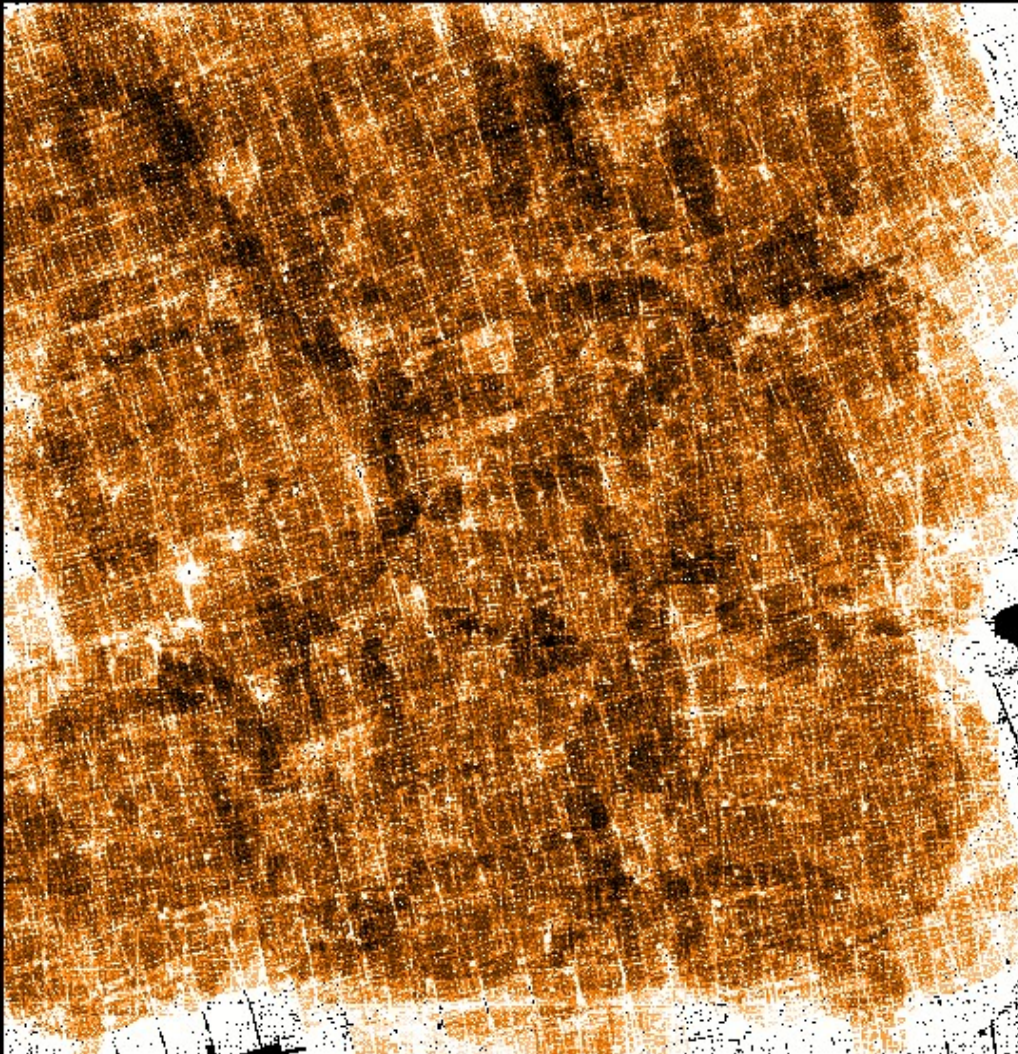- Correcting for spatially varying depth

- Results

Stacking

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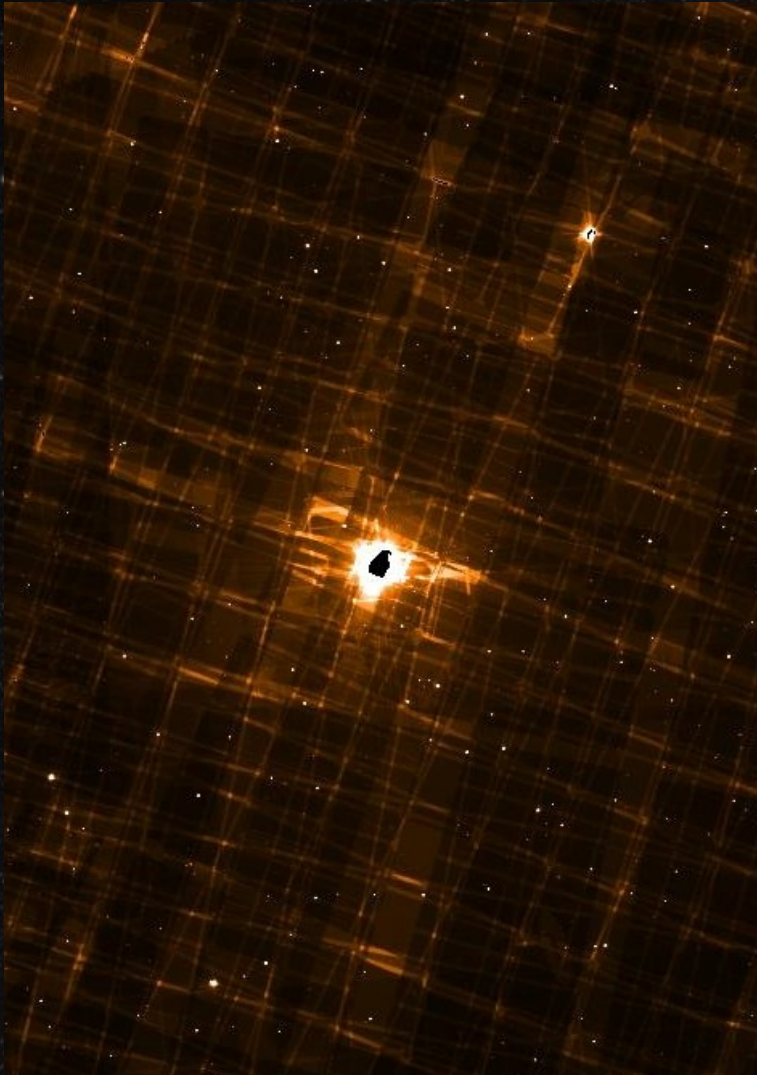
Variance Maps

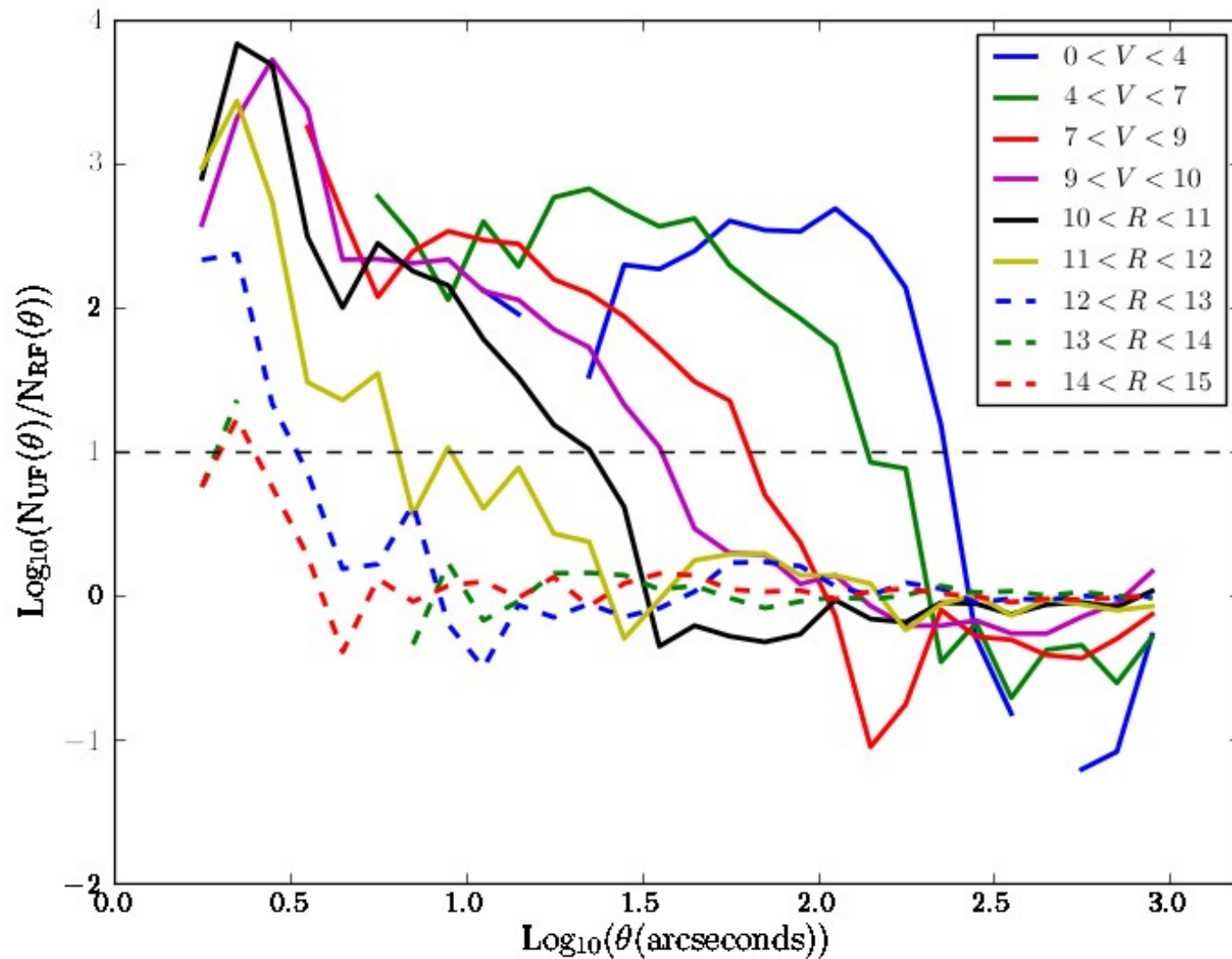Daniel Farrow
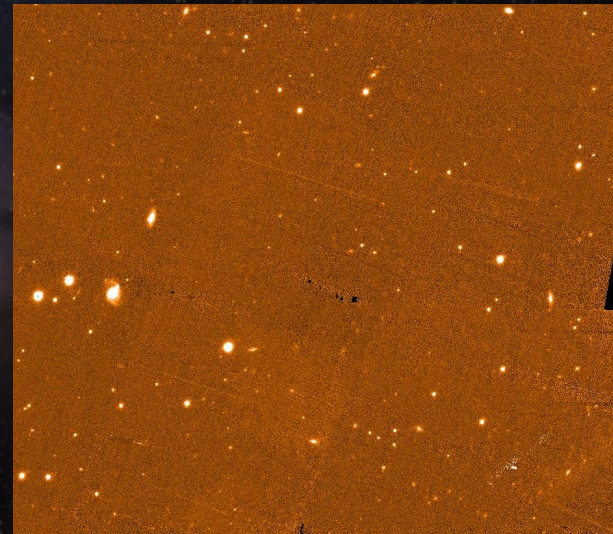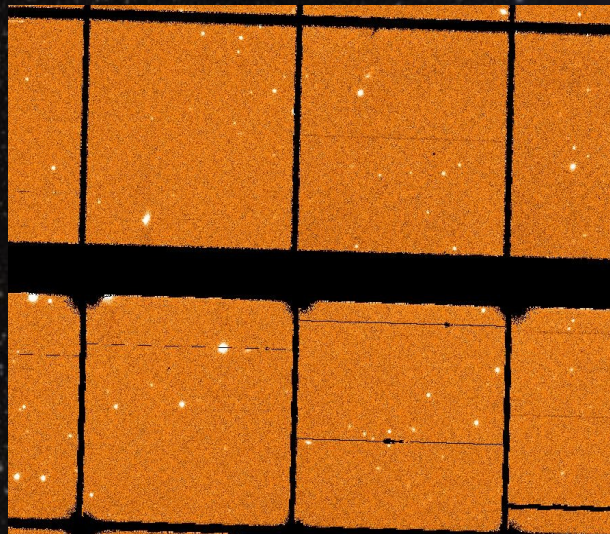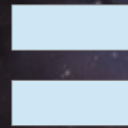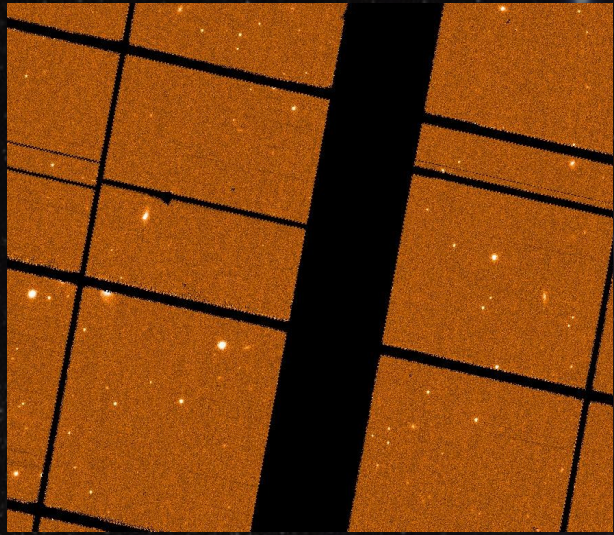
Binning and Primary Resolution

- Native pixel scale prohibitively large to work with across the full sky

- Skycells overlap, overlapping regions don't always contain the same pixels

- Need a lower resolution unique mask

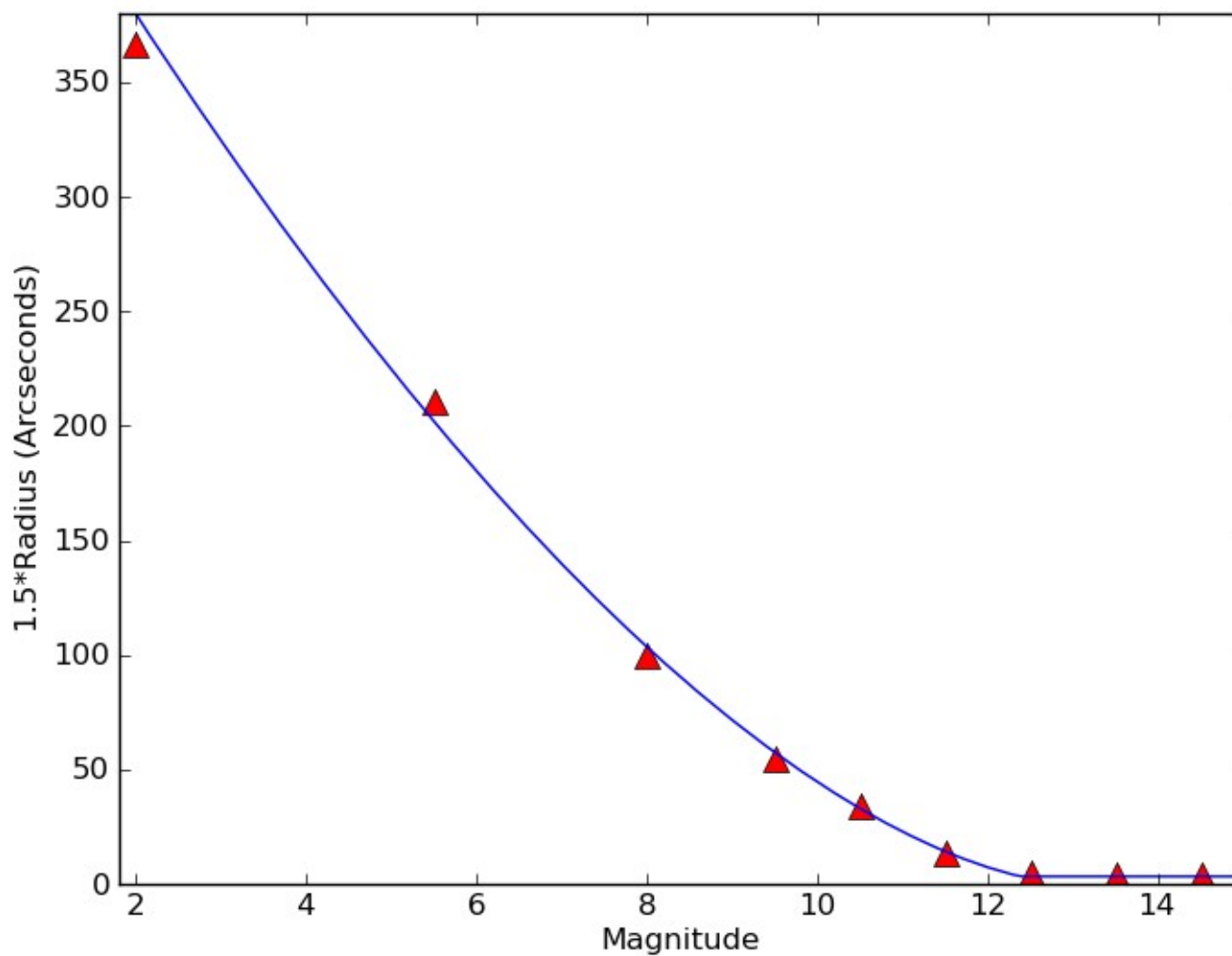Daniel Farrow

Bright Star Mask

- Bright stars cause false positives

- Need to mask them

- Statistical approach to deciding mask sizes

- UCAC4.0 photometry for bright stars
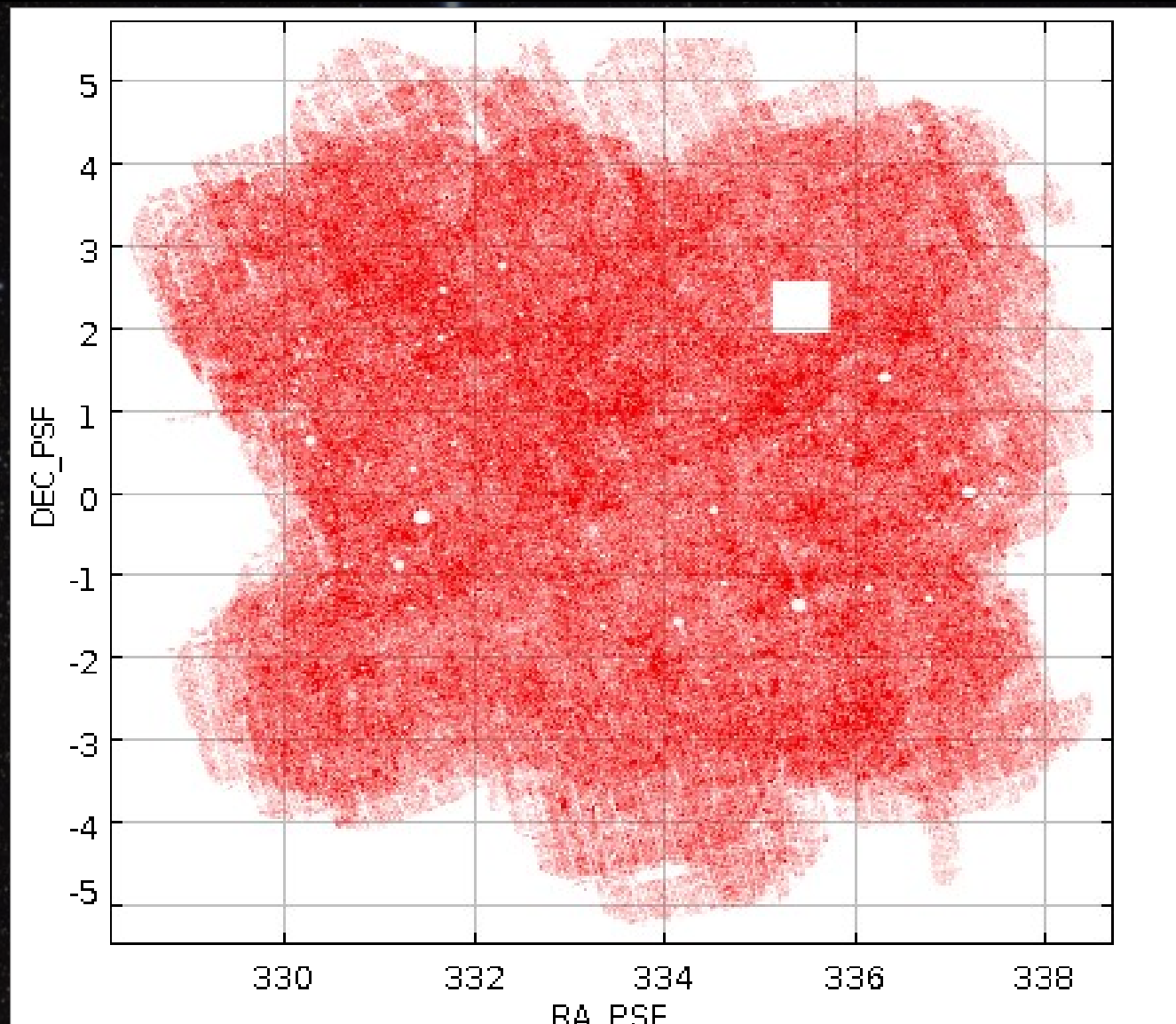
- Identify candidate false positives by g & r matching
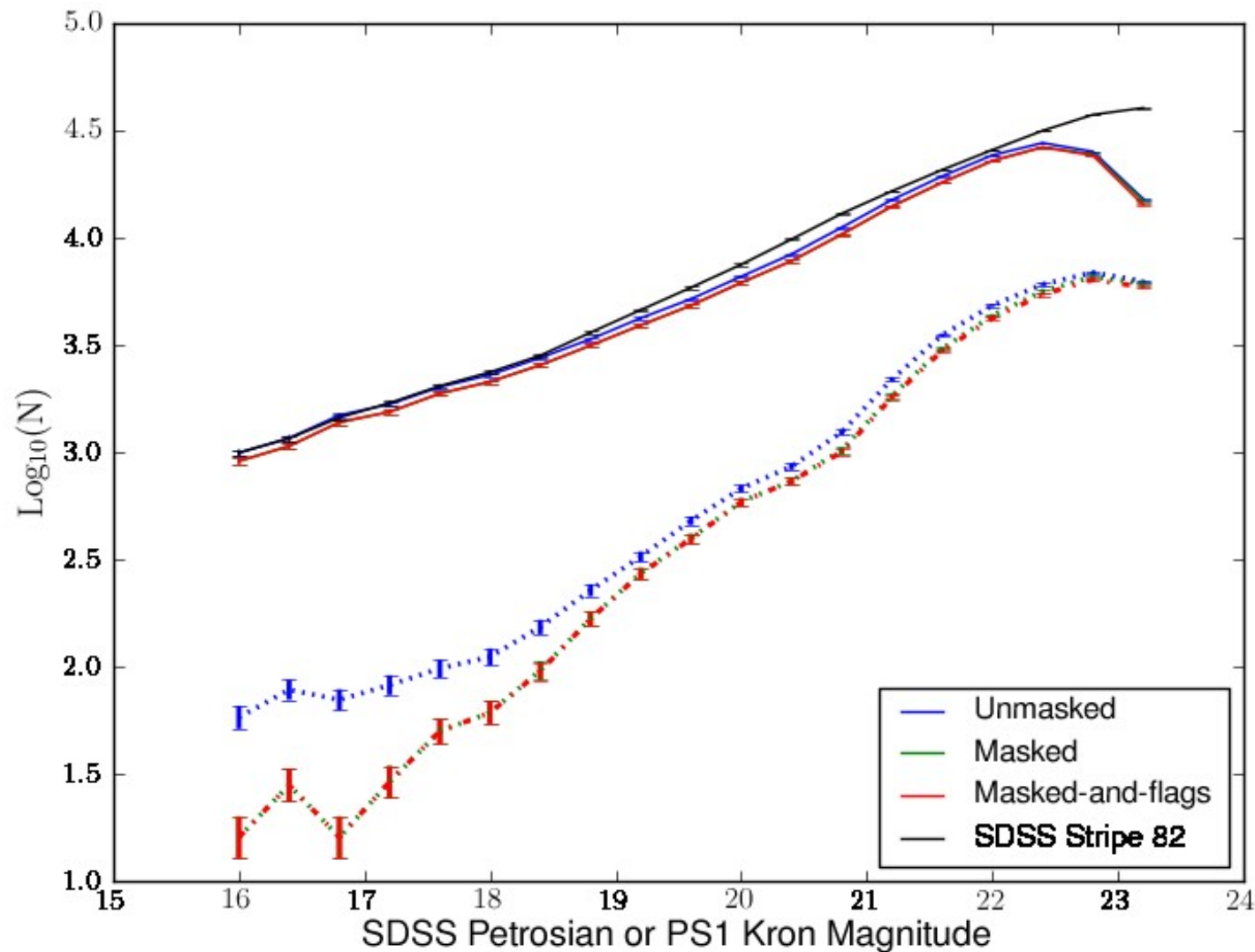
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Bright Star Mask

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Bright Star Mask

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The Mask
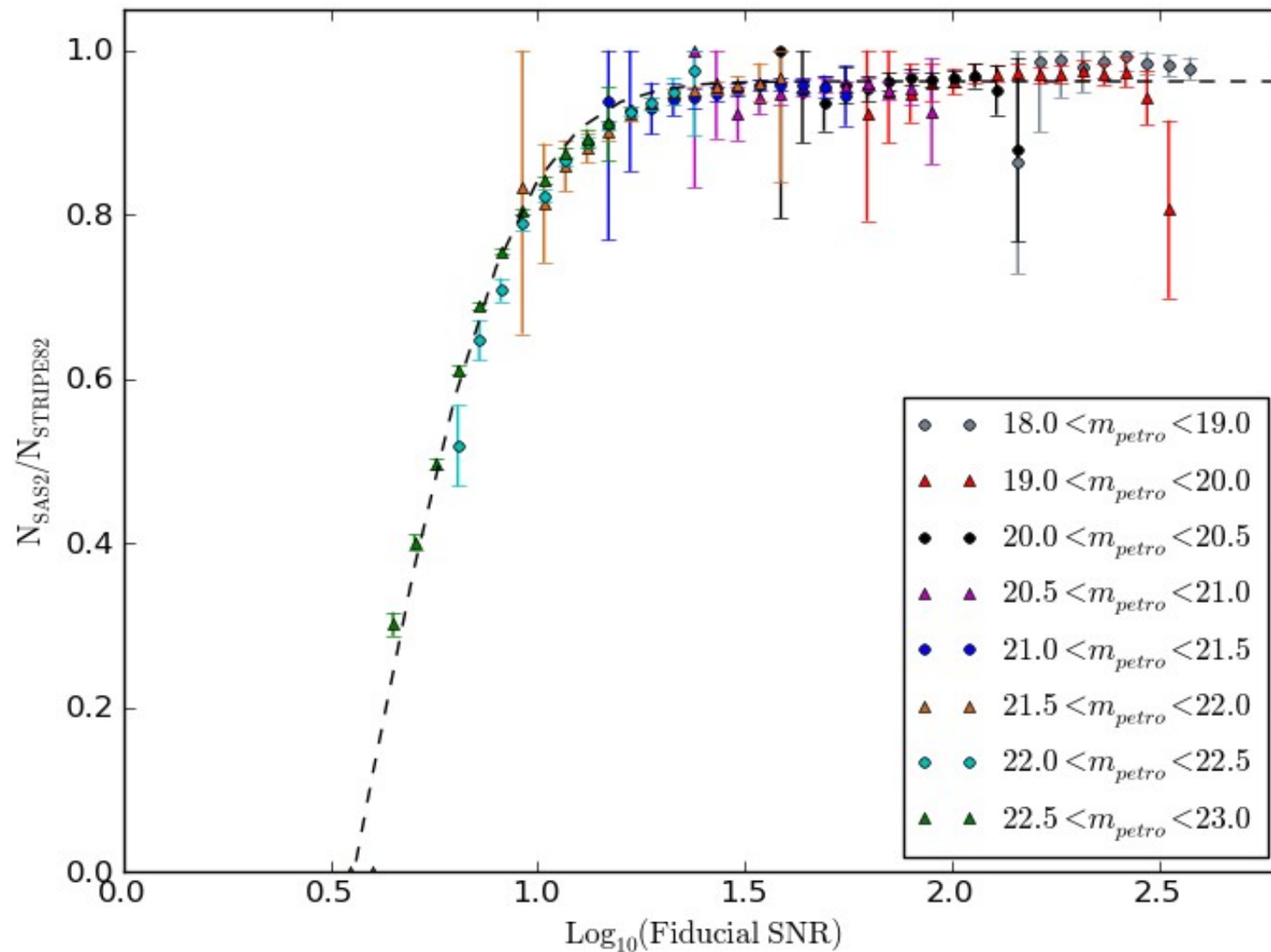

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Effect of Masking

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Spatially Varying Depth

- Can't use magnitude to asses detection probability as depth varies across the sky
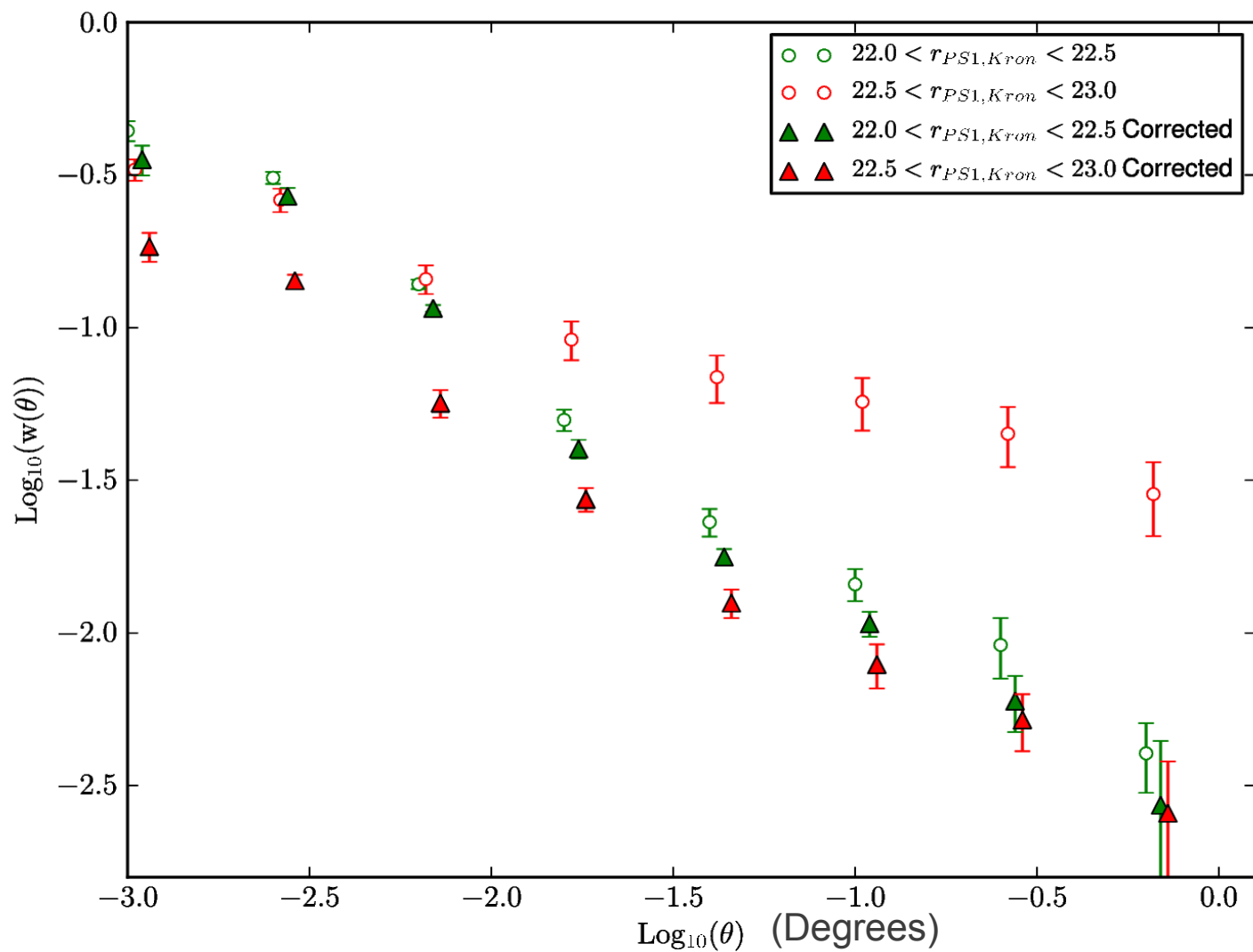
- Instead adopt a simplified measure of SNR

$$SNR = F / \sqrt{\pi * d^2 * variance}$$

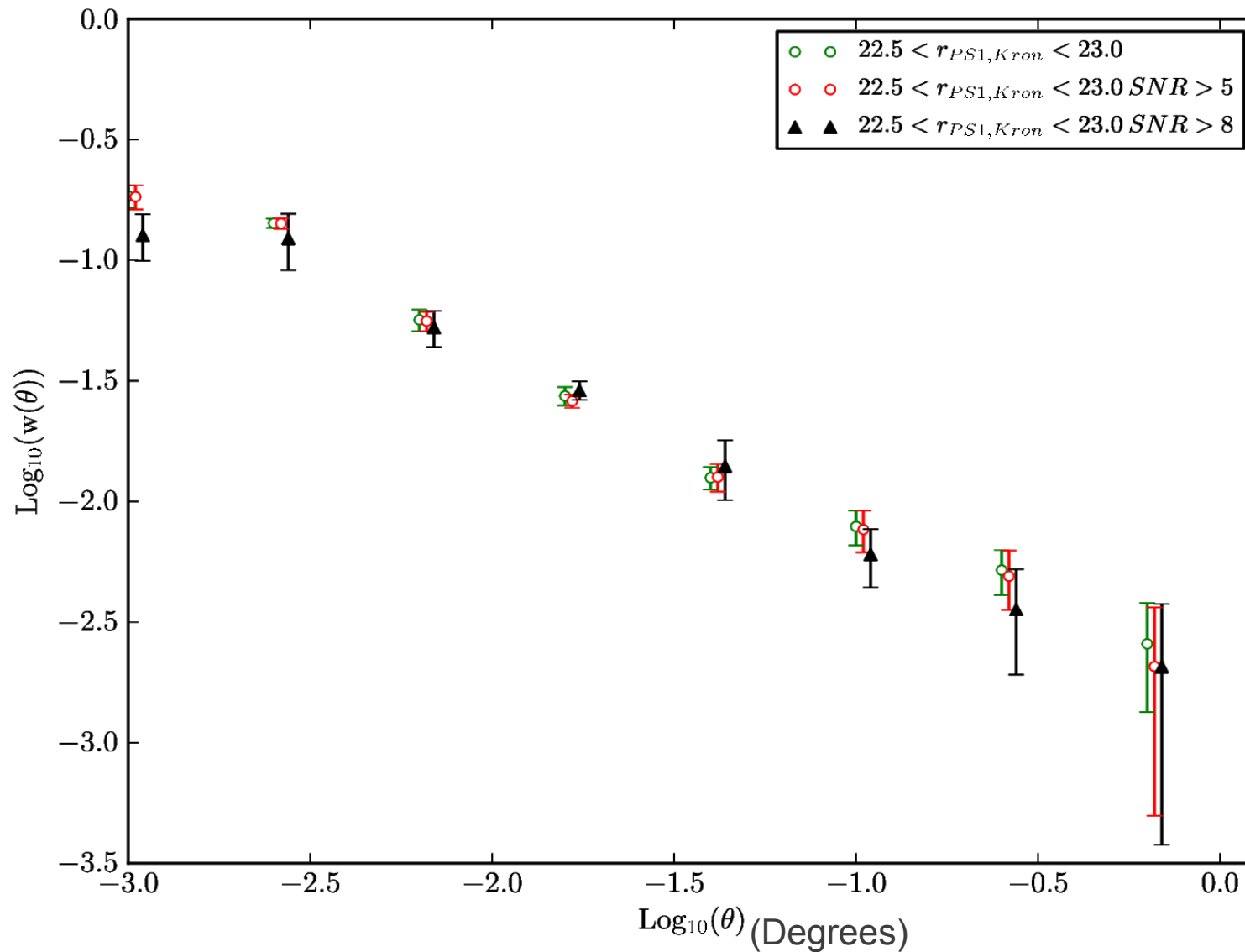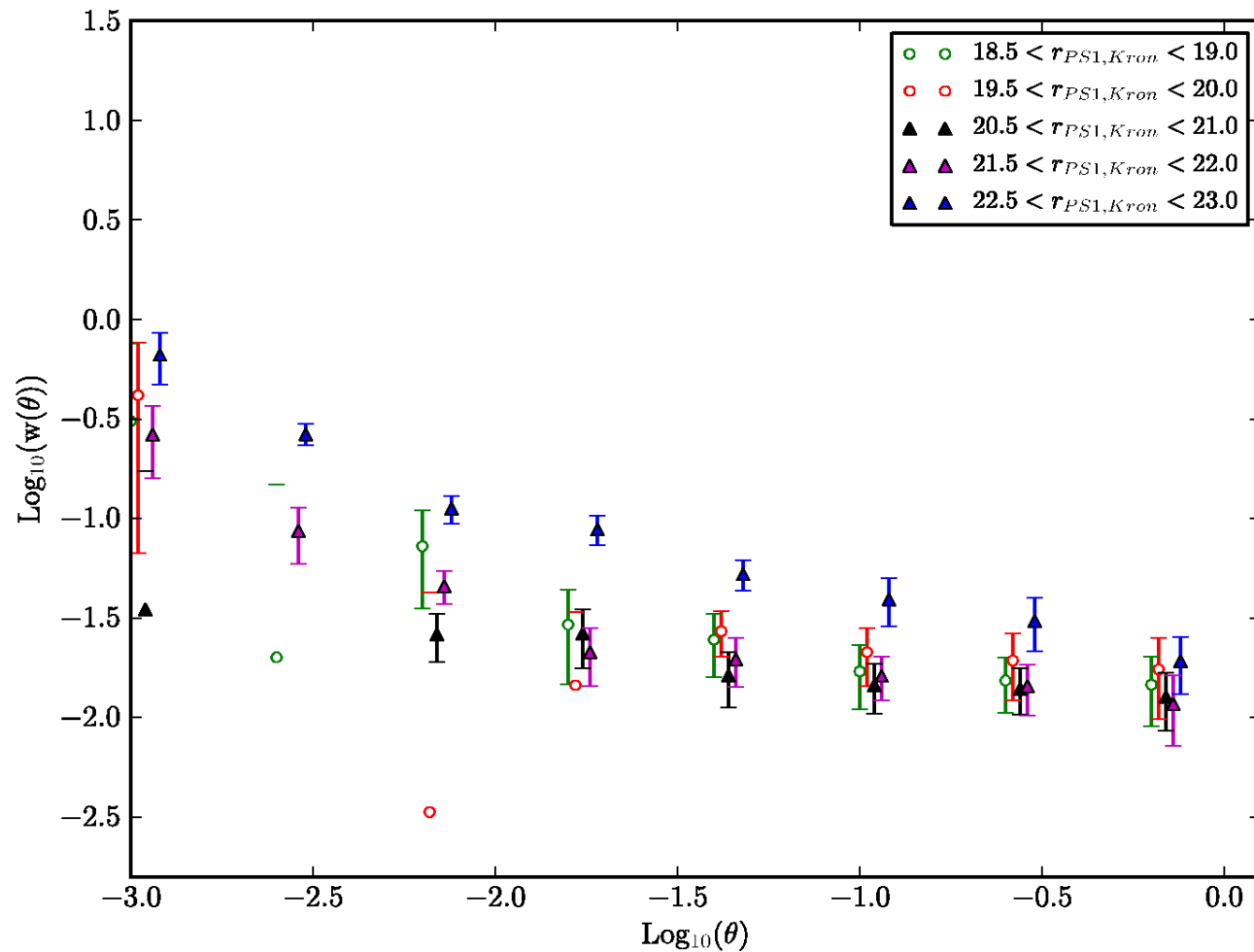- Match an overlap region to Stripe 82 to measure this

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Fiducial SNR

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Correction to clustering

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Tests of method

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Star Clustering

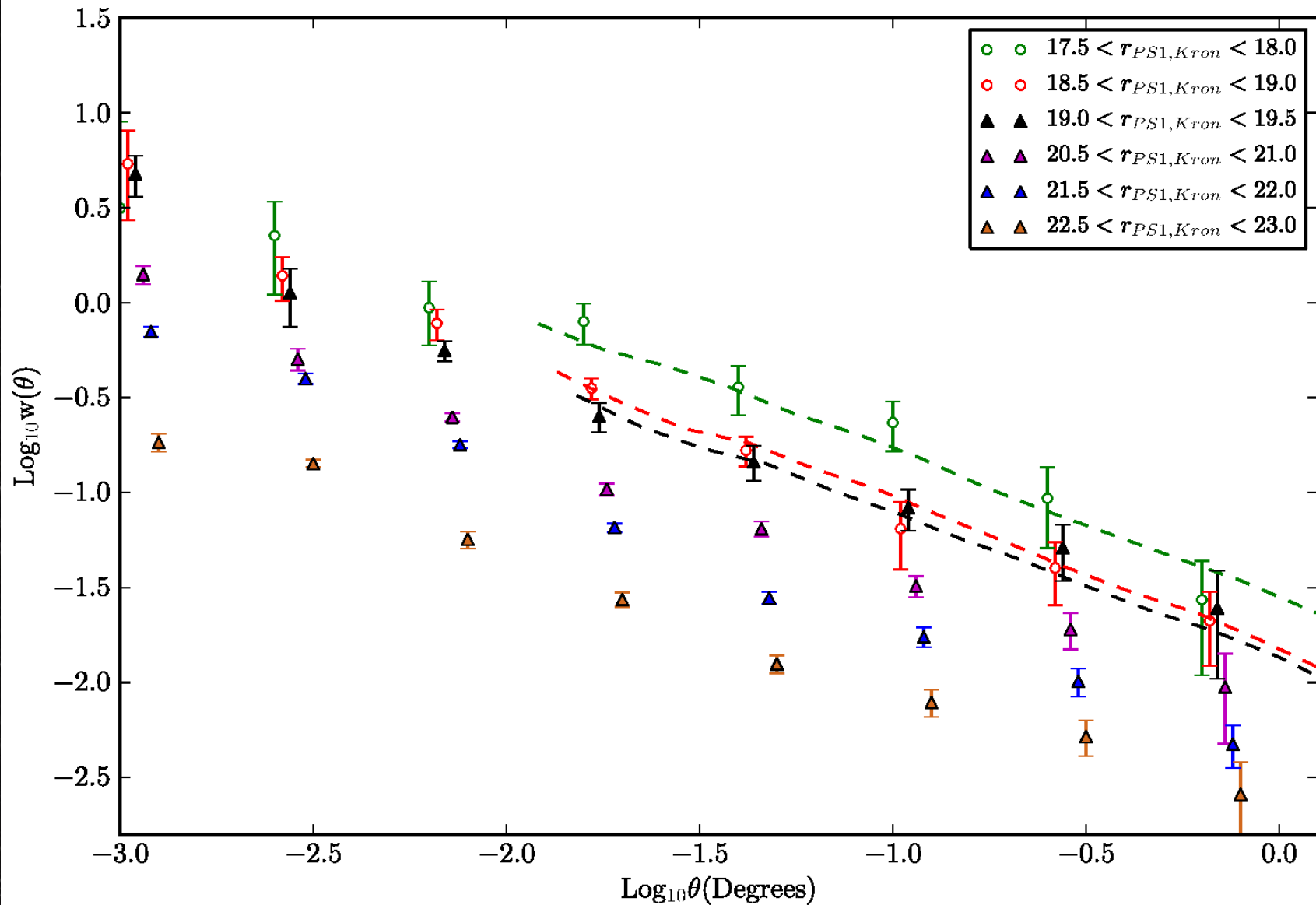Daniel Farrow

False Clustering

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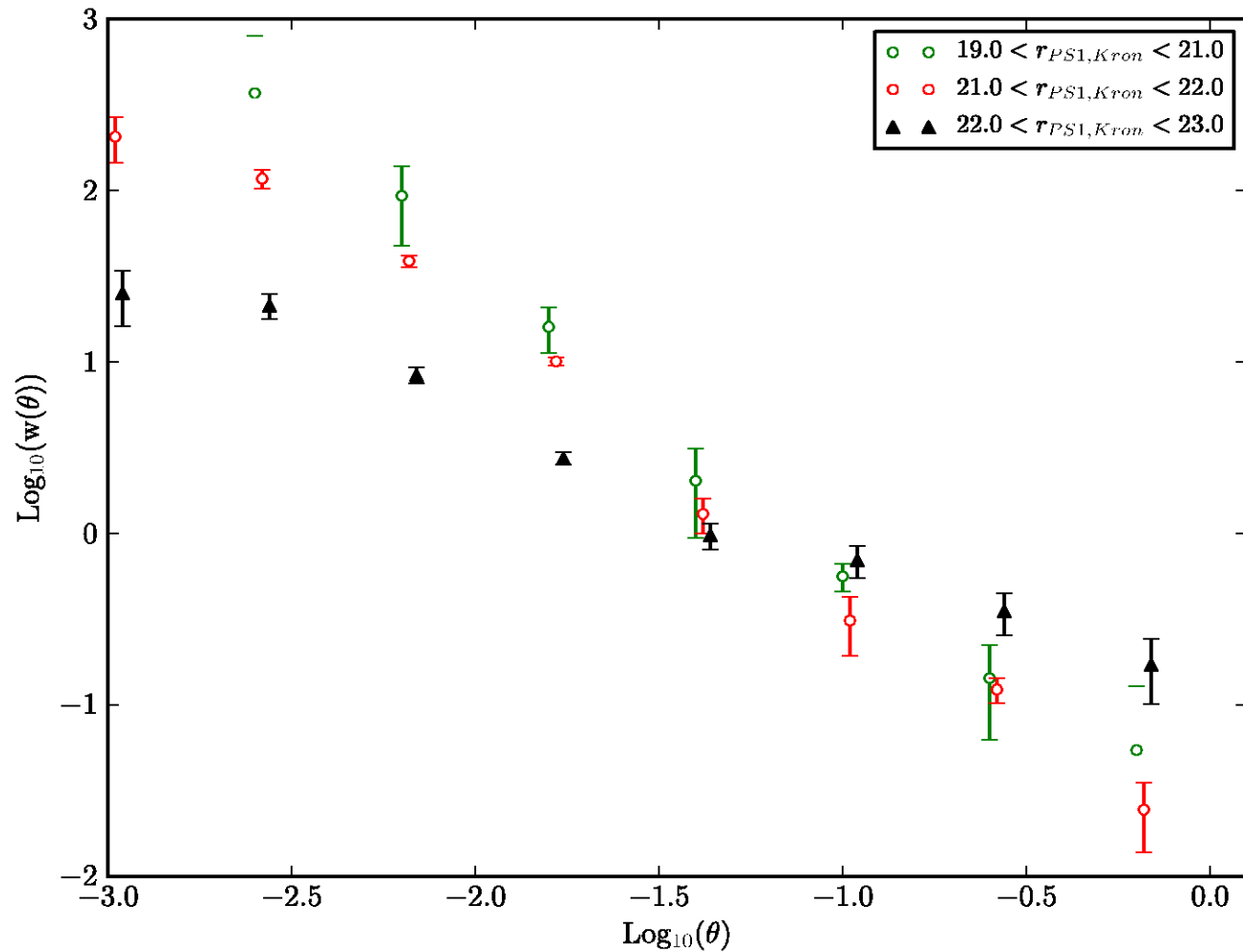
Galaxy Clustering

Conclusions & future

- Presented a method of producing masks and correcting galaxy clustering for variable depth

- Need to extend this to whole 3pi

- Need to decide mask pixel size

- Need to see how well method works with more widely varying PSF FWHM and background

- Can use fakes and comparisons with medium deeps to do this