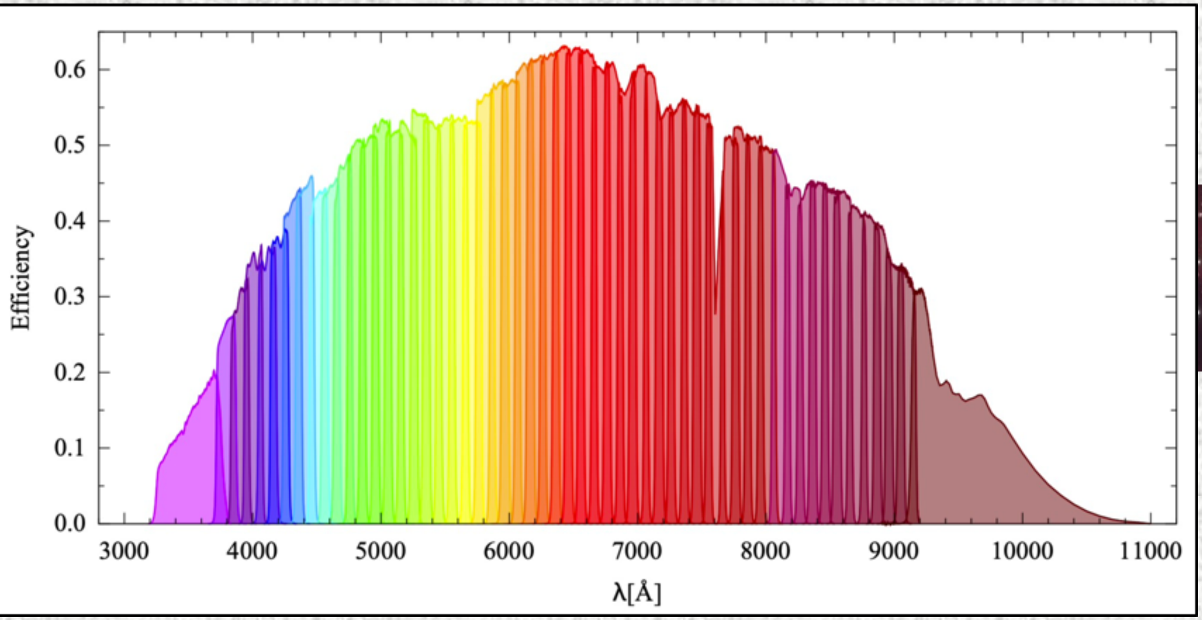
PID2021-126616NB-I00

Indiscriminate $R \sim 50$ spectroscopy in the entire footprint: the spectro-photometric approach of J-PAS



J-PAS
Javalambre Physics of the Accelerating Universe Astrophysical Survey

Carlos Hernández-Monteagudo (IAC/ULL)

On behalf of the J-PAS collaboration

Colloque national *Action Dark Energy*, IAP, October 28-30 2024

Outline

- Spectro-photometry as midway approach to full spectroscopic and photometric surveys
- The Javalambre PAU Astrophysical Survey (J-PAS)
- Predictions versus first observations in miniJPAS and J-NEP: depth, photo-*z* precision and accuracy, and galaxy cluster and group abundances
- Prospects for Dark Energy Probes: Multi-probe clustering, galaxy clusters, and QSOs
- Current status and forecasts for the future

Photometry vs. Spectroscopy

Photometry

- Unbiased samples
- Faster & cheaper
- Large Volumes
- High number density

Spectroscopy

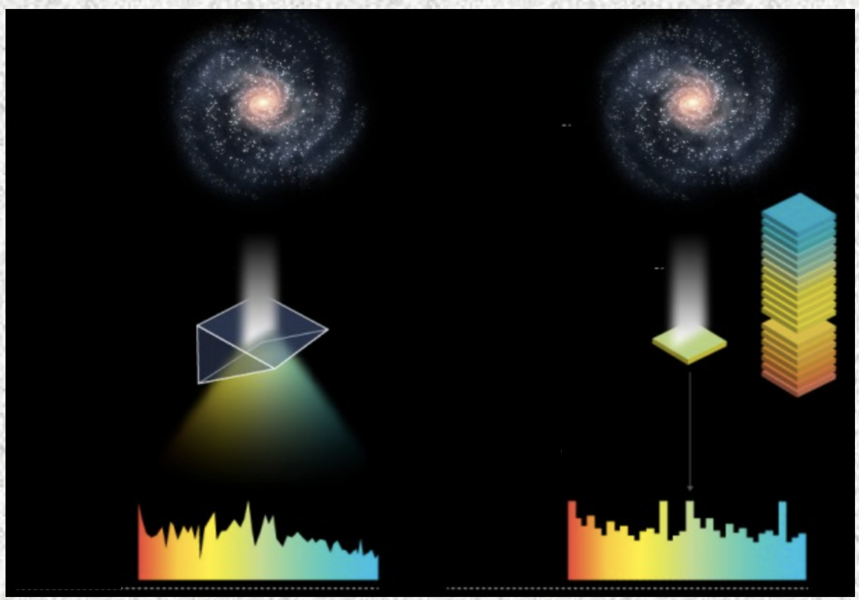
- SED of targets
- Precise redshifts

Photometry vs. Spectroscopy

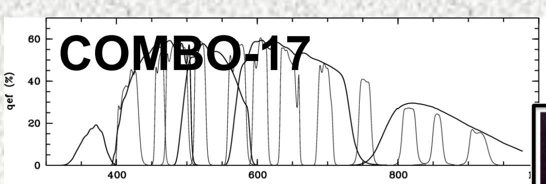
- Unbiased samples
- Faster & cheaper
- Large Volumes
- High number density

- SED of targets
- Precise redshifts

Spectro-Photometry



This provides a ***low resolution (R~50)*** **pseudo-spectrum** in ***every pixel*** of the footprint



SHARDS

CONSOLIDER - INGENIO

GTC

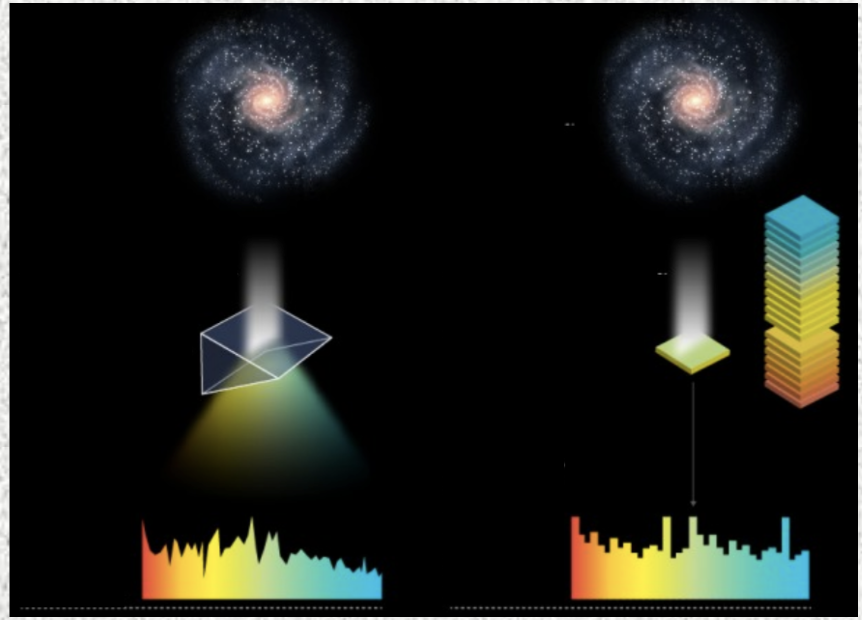
Cosmic Evolution Survey

COSMOS

PAU

ALHAMBRA SURVEY

Spectro-Photometry



Javalambre **P**hotometric **L**ocal **U**niverse **S**urvey

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J-PLUS

The *Observatorio Astrofísico de Javalambre* (OAJ)

Pico del Buitre (Vulture's Peak), By *Arcos de las Salinas*, about 60' from Teruel and 80' from Valencia

The *Observatorio Astrofísico de Javalambre* (OAJ)

Pico del Buitre (Vulture's Peak), By *Arcos de las Salinas*, about 60' from Teruel and 80' from Valencia

EL PAÍS · ESPAÑA

ANDALUCÍA · CATALUÑA · C. VALENCIANA · GALICIA · MADRID · PAÍS VASCO · MÁS COMUNID

La Laponia española

The “Spanish Lapland”

La región de los Montes Universales, entre Teruel y Cuenca, tiene una densi
Laponia. Un recorrido por esta zona permite ver cómo es la aislada vida de s

120

NACHO CARRETERO

El País, 11/03/17

En los Montes Universales, un territorio del tamaño de Guipúzcoa, la densidad de población es de 1,63 habitantes por km^2. En Laponia, la región más septentrional de Escandinavia, hay 1,87.

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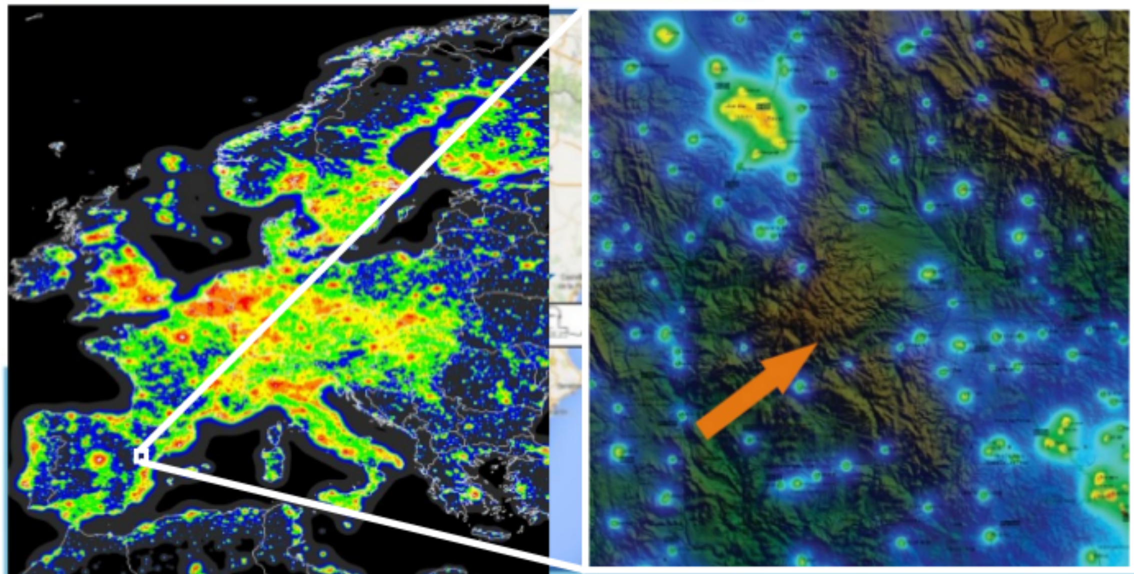
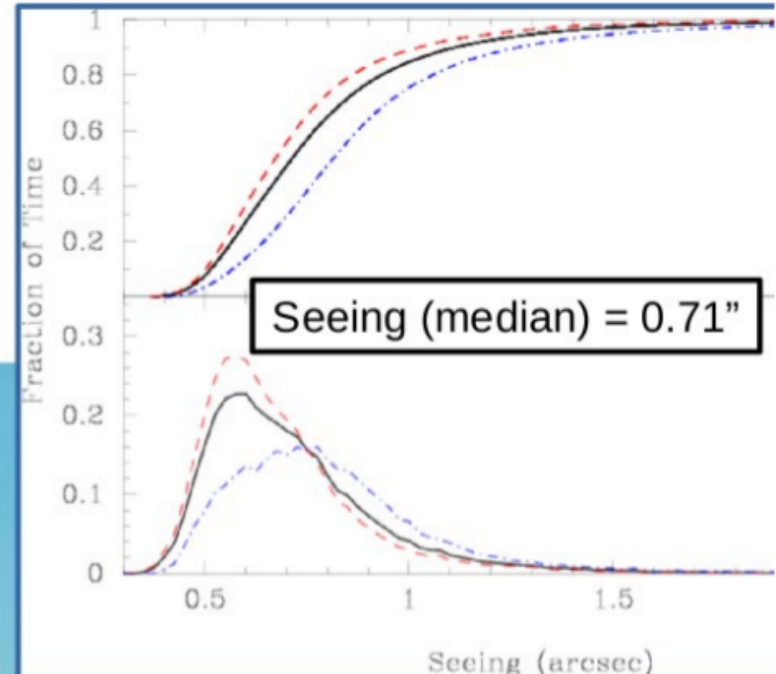
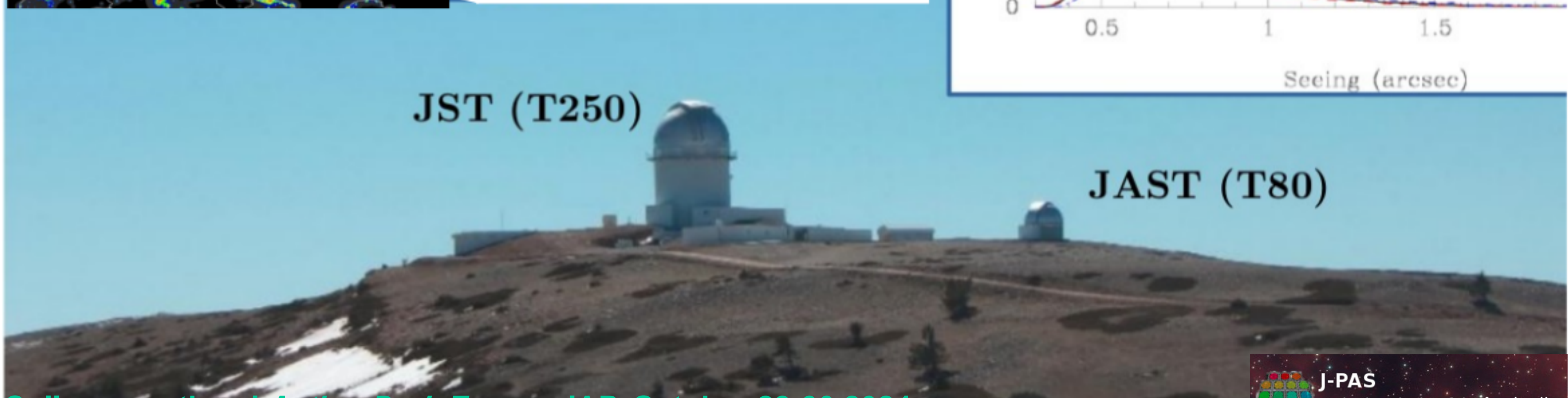
The Javalambre Observatory (OAJ)

In the “Sierra de Javalambre” @1960m

now officially a Spanish “scientific and technical facility” (20% available for open-time)







The OAJ exploits the niche of a site and instrumentation devoted to **spectro-photometric** surveys: telescopes with **wide field-of-views** and **multi-narrow band filter** systems

The Telescopes

M1 (Ø) = 2.55 m
FoV (Ø) = 3 deg = 476 mm at FP
Etendue = 27.5 $m^2 deg^2$

Currently equipped with the “pathfinder” camera

M1 (Ø) = 0.8 m
FoV (Ø)) = 2 deg

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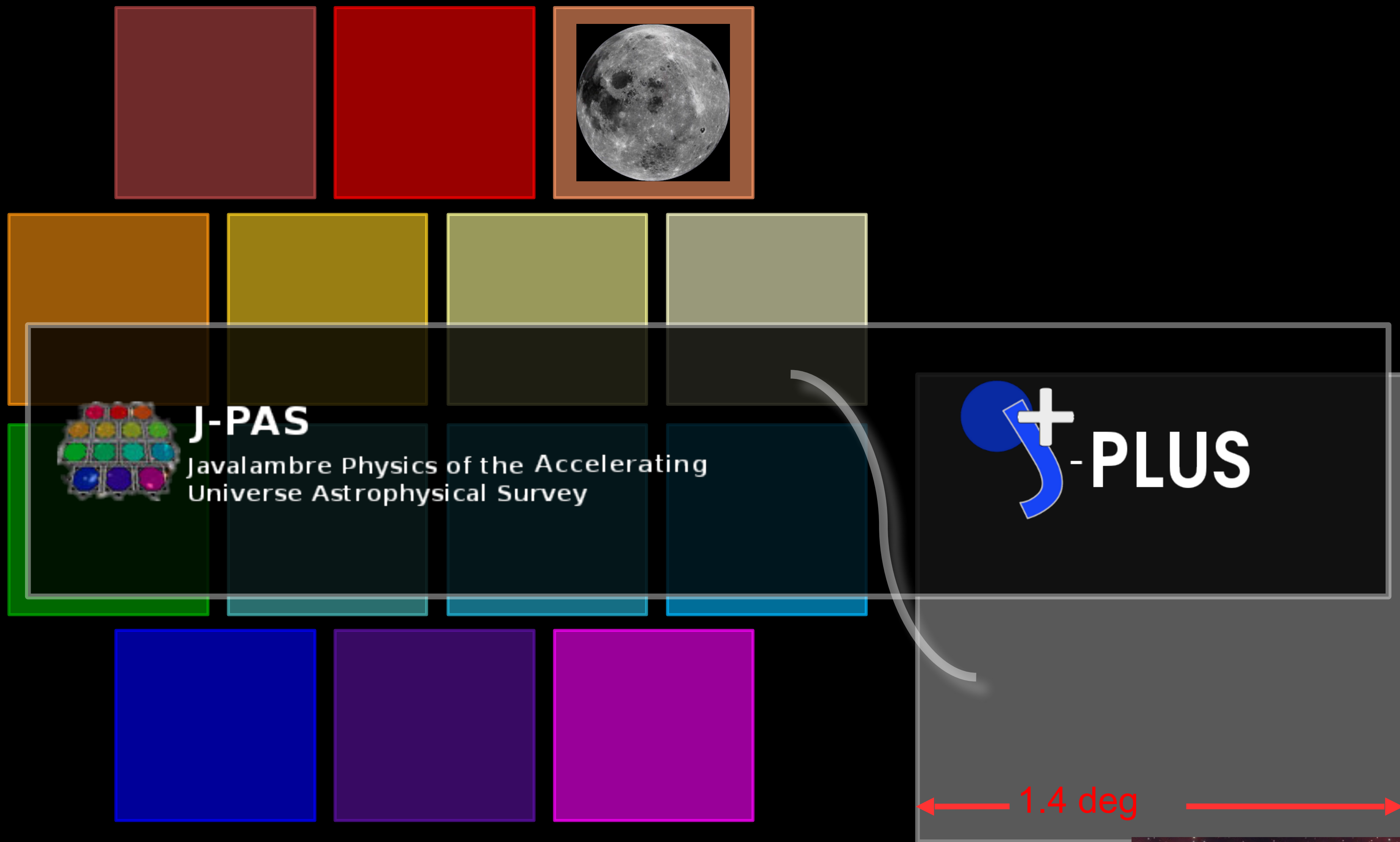
JPCam

T80Cam



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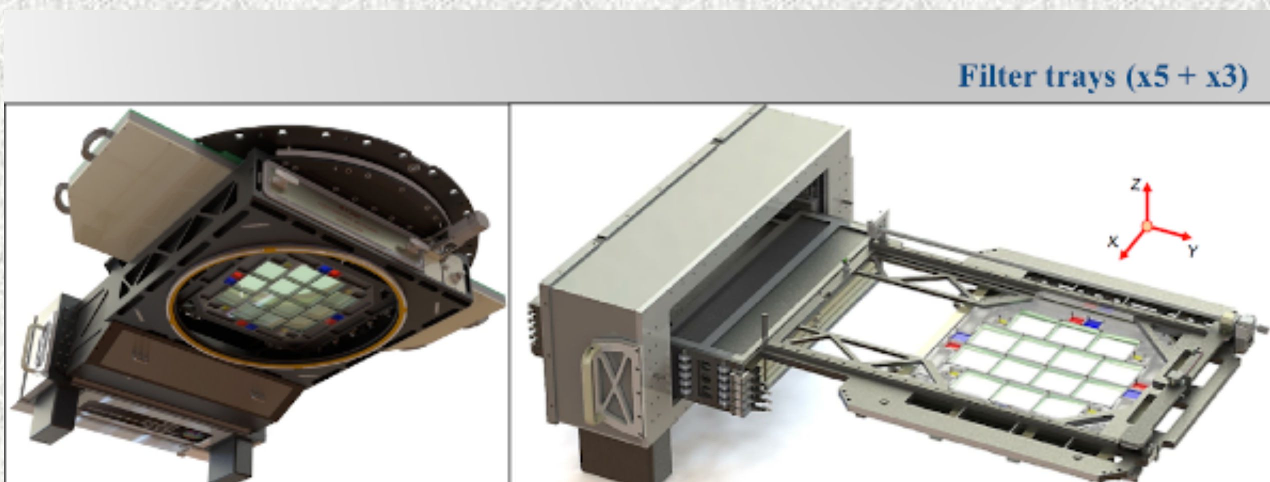
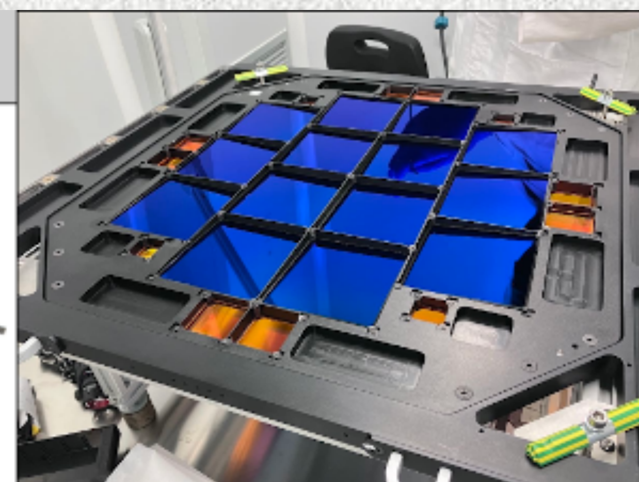
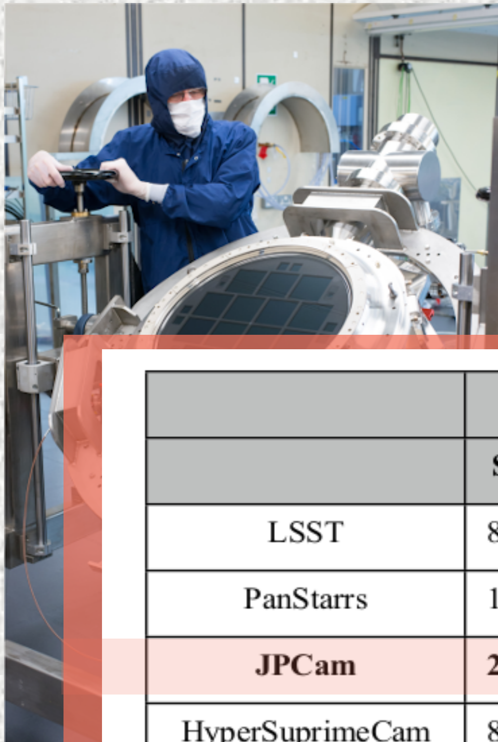
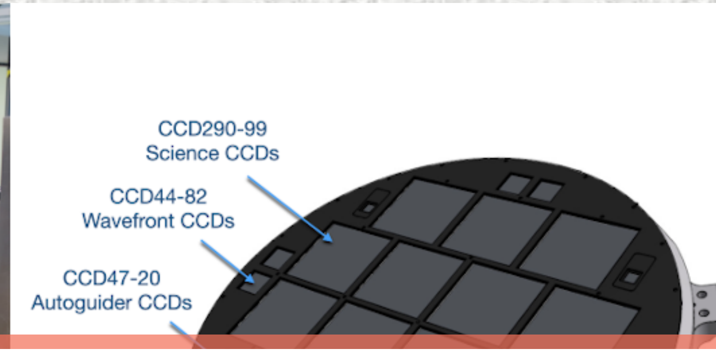
The camera JPCam

1.2 Giga pixels
(14 CCD of 9200x9200)
0.22 arcsec/pixel
4.5 deg^2









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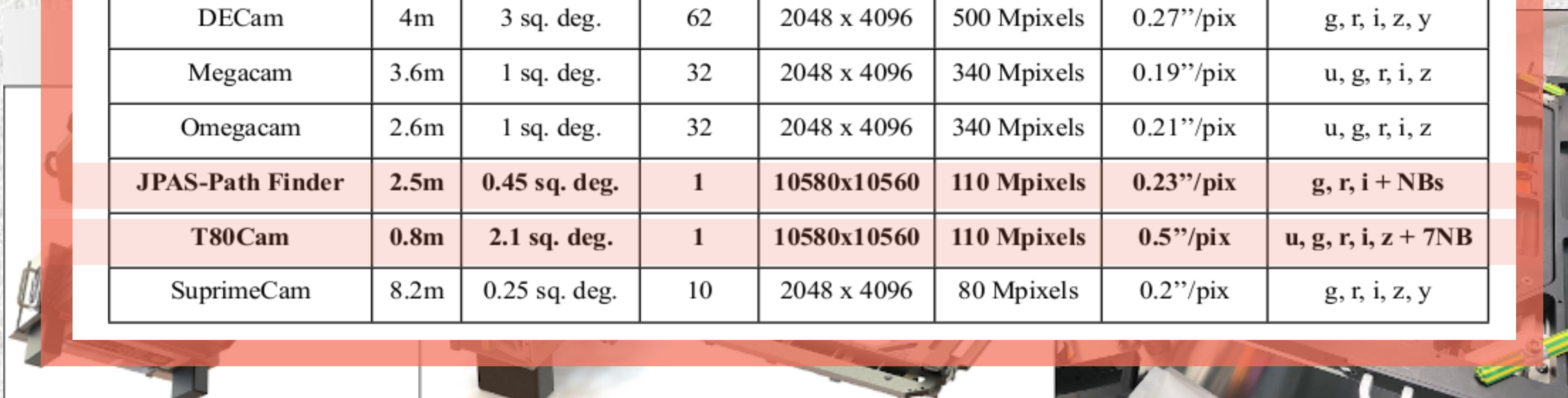
The camera JPCam

	Telescope		Camera					
	Size	FoV	# CCDs	CCD format	# of pixels	Resolution	Filters
LSST	8.4m	9.6 sq. deg.	189	4096 x 4096	3.2 Gpixels	0.2''/pix	u, g, r, i, z, y
PanStarrs	1.8m	6.7 sq. deg.	60	4600 x 4600	1.3 Gpixels	0.26''/pix	g, r, i, z, y
JPCam	**2.5m**	**4.9 sq. deg.**	**14**	**9231 x 9216**	**1.2 Gpixels**	**0.23''/pix**	**54NB + 2BB**
HyperSuprimeCam	8.2m	1.8 sq. deg.	112	2048 x 4096	940 Mpixels	0.18''/pix	r, i, z, y
VIS (Euclid)	1.2m	0.5 sq. deg.	36	4096 x 4096	520 Mpixels	0.1''/pix	R, I, Z
DECam	4m	3 sq. deg.	62	2048 x 4096	500 Mpixels	0.27''/pix	g, r, i, z, y
Megacam	3.6m	1 sq. deg.	32	2048 x 4096	340 Mpixels	0.19''/pix	u, g, r, i, z
Omegacam	2.6m	1 sq. deg.	32	2048 x 4096	340 Mpixels	0.21''/pix	u, g, r, i, z
JPAS-Path Finder	**2.5m**	**0.45 sq. deg.**	**1**	**10580x10560**	**110 Mpixels**	**0.23''/pix**	**g, r, i + NBs**
T80Cam	**0.8m**	**2.1 sq. deg.**	**1**	**10580x10560**	**110 Mpixels**	**0.5''/pix**	**u, g, r, i, z + 7NB**
SuprimeCam	8.2m	0.25 sq. deg.	10	2048 x 4096	80 Mpixels	0.2''/pix	g, r, i, z, y



J-PAS filter system

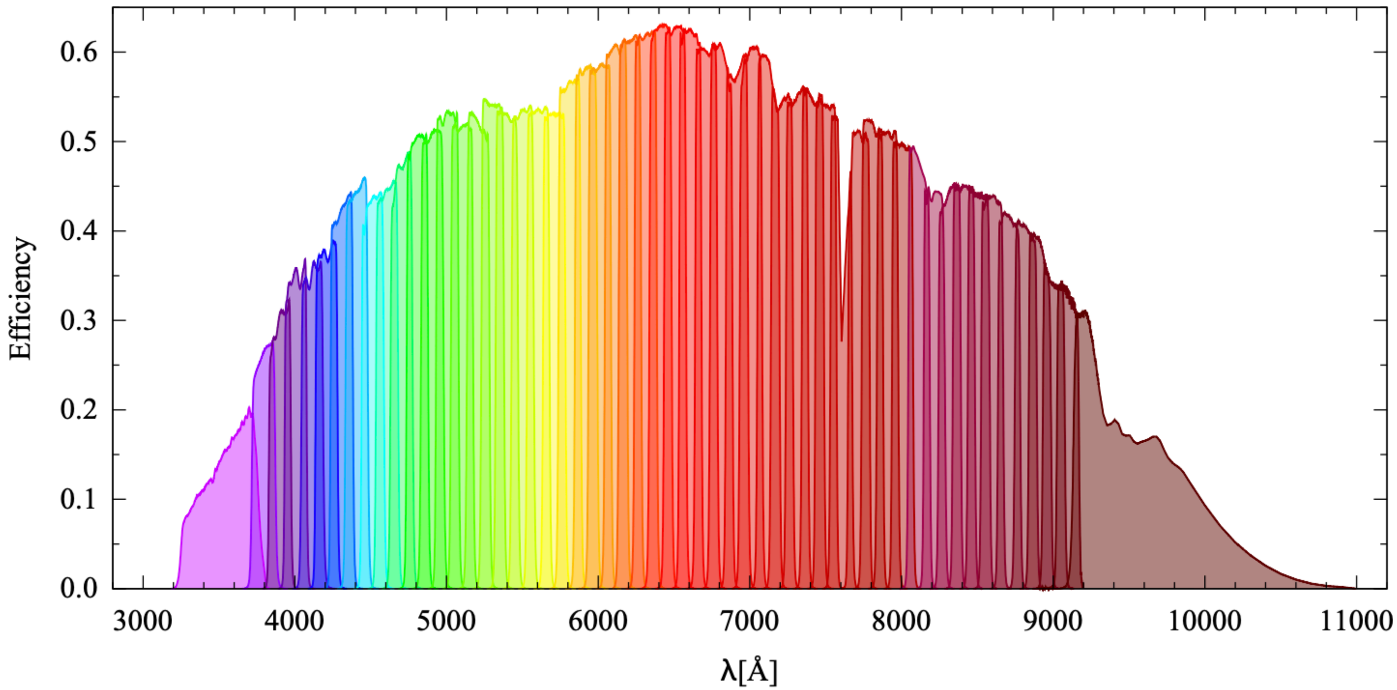


Fig. 2: The measured transmission curves of the J-PAS filters. Effects of the CCD quantum efficiency, the entire optical system of the JST/T250 telescope and sky absorption are included. The HTML color representation of each filter is provided in the miniJPAS database in the table `minijpas.Filter`.

Table 3: Filter system main characteristics. The full table is available in the miniJPAS database in the ADQL table `minijpas.Filter`.

Filter #	Filter name	Central Wavelength [Å]	FWHM [Å]
1	*uJAVA*	3497	495
2	*J0378*	3782	155
3	*J0390*	3904	145
4	*J0400*	3996	145
5	*J0410*	4110	145
...	...	...	...
54	*J0900*	9000	145
55	*J0910*	9107	145
56	*J1007*	9316	*High-pass filter*

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The filter system

J-PAS
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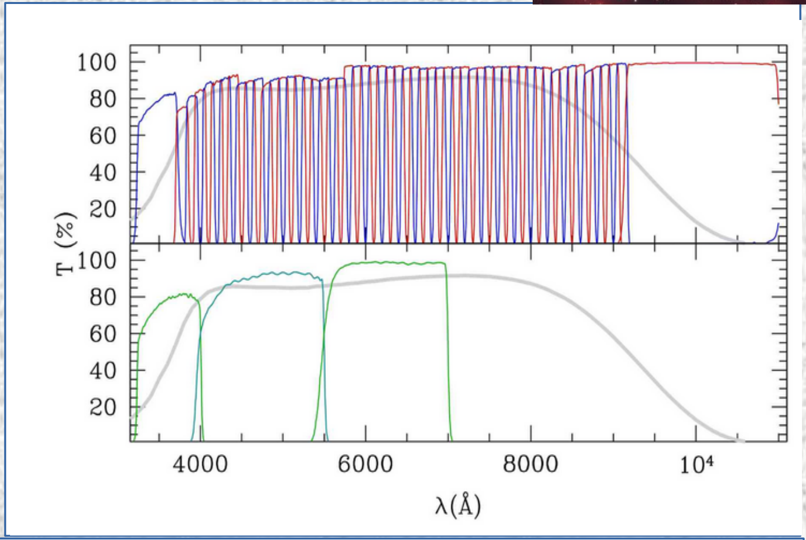
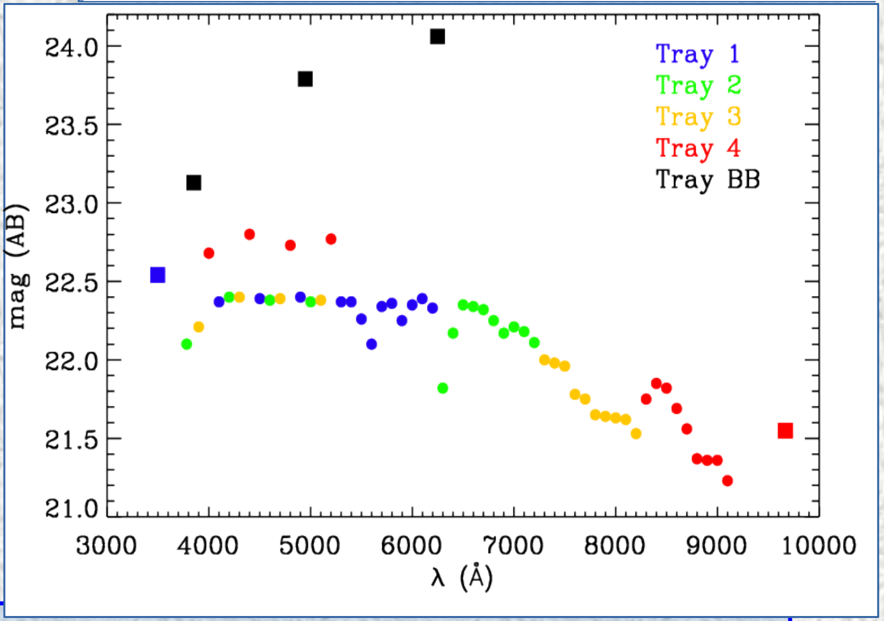
- **- 54 NB filters** (FWHM~145Å; $\Delta\lambda$~10nm) From 3785Å to 9100Å

- **- 1 Blue MB filter** (FWHM~260Å; λ_c~3600Å)

- **- 1 Red BB filter** (FWHM~620Å; λ_c~9500Å)

- **- Sloan *i-band***

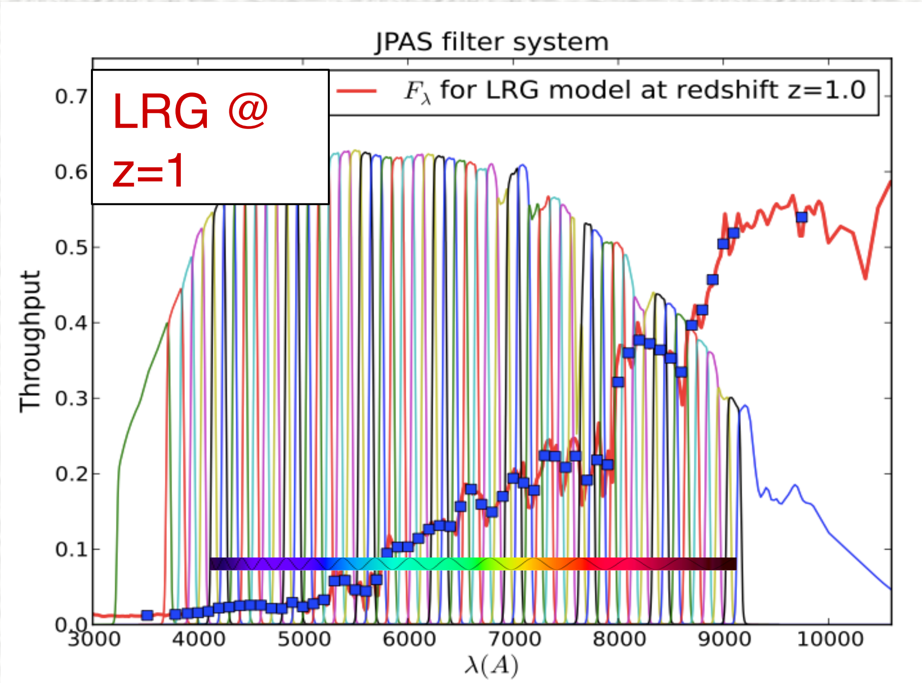




5σ
3”
aperture

Pseudo-spectrum (R~50) for every pixel of the sky

The filter system



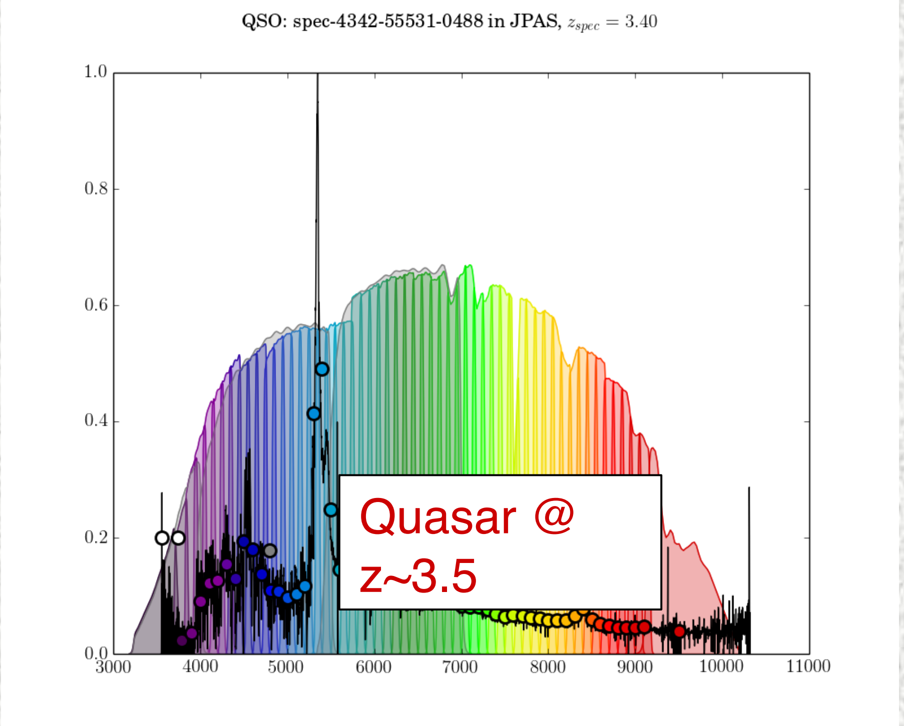


Photo-z precision as good as 0.003(1+z)

The camera + filters

J-PAS
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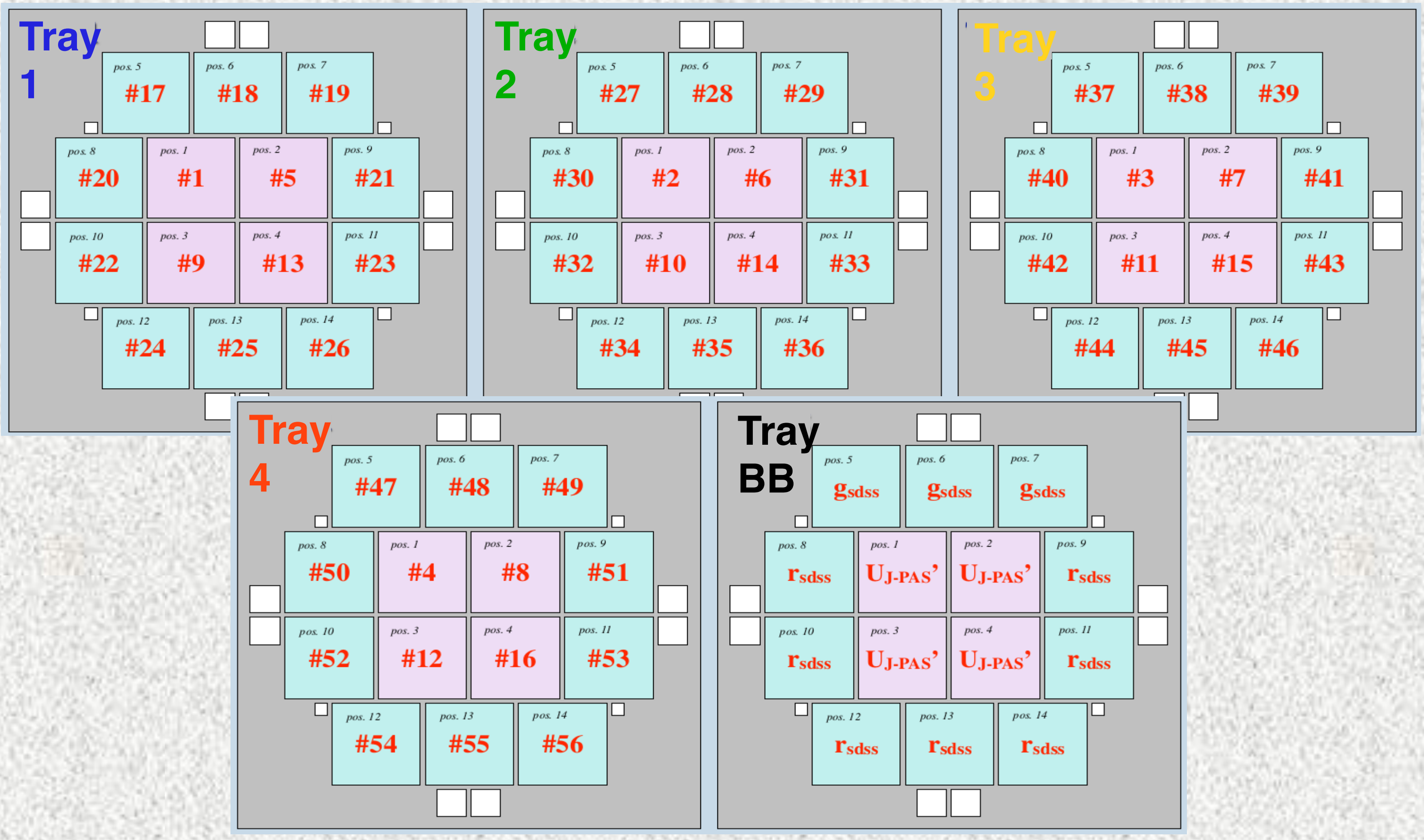

Footprint

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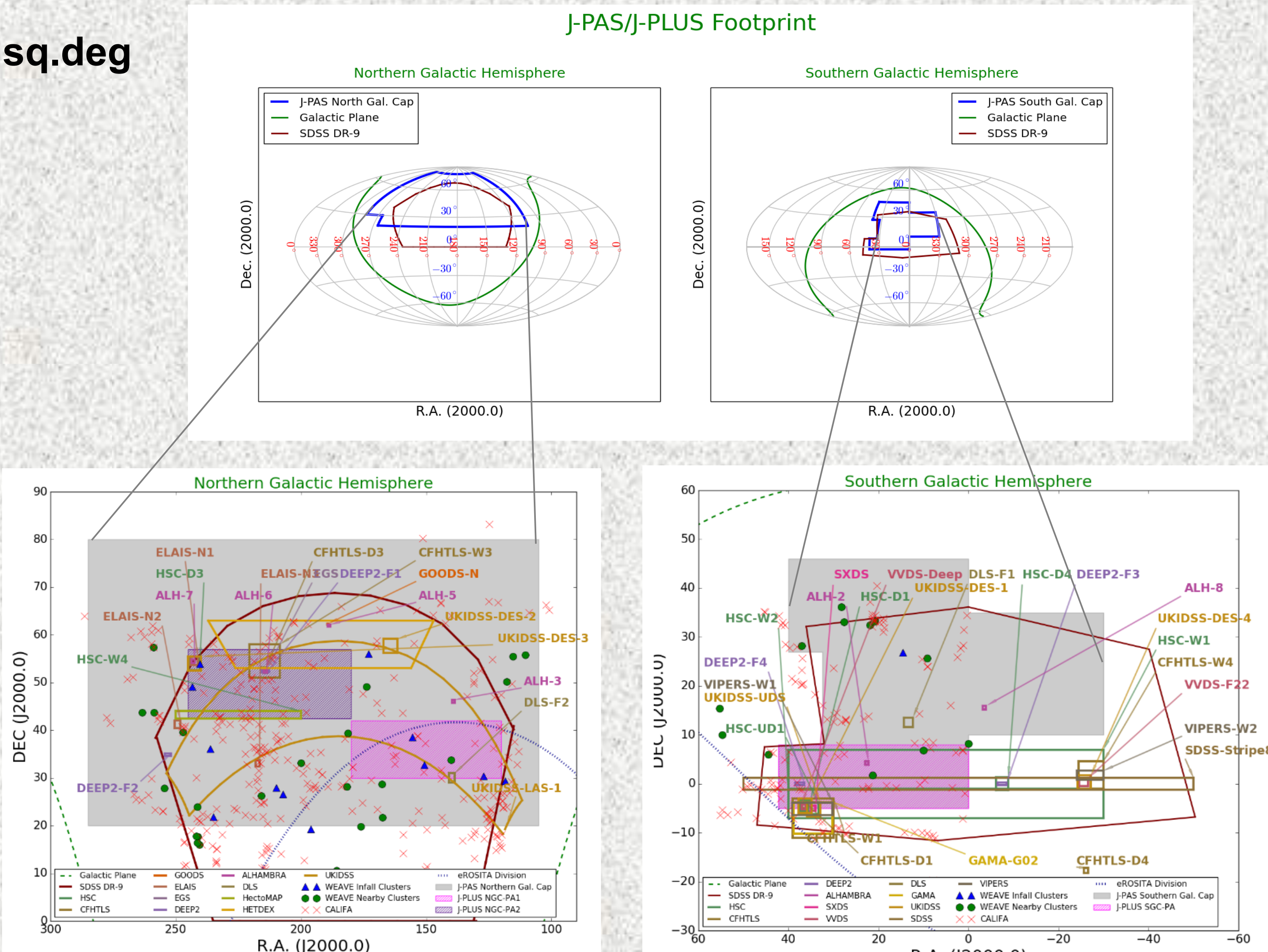
~8,500 sq.deg

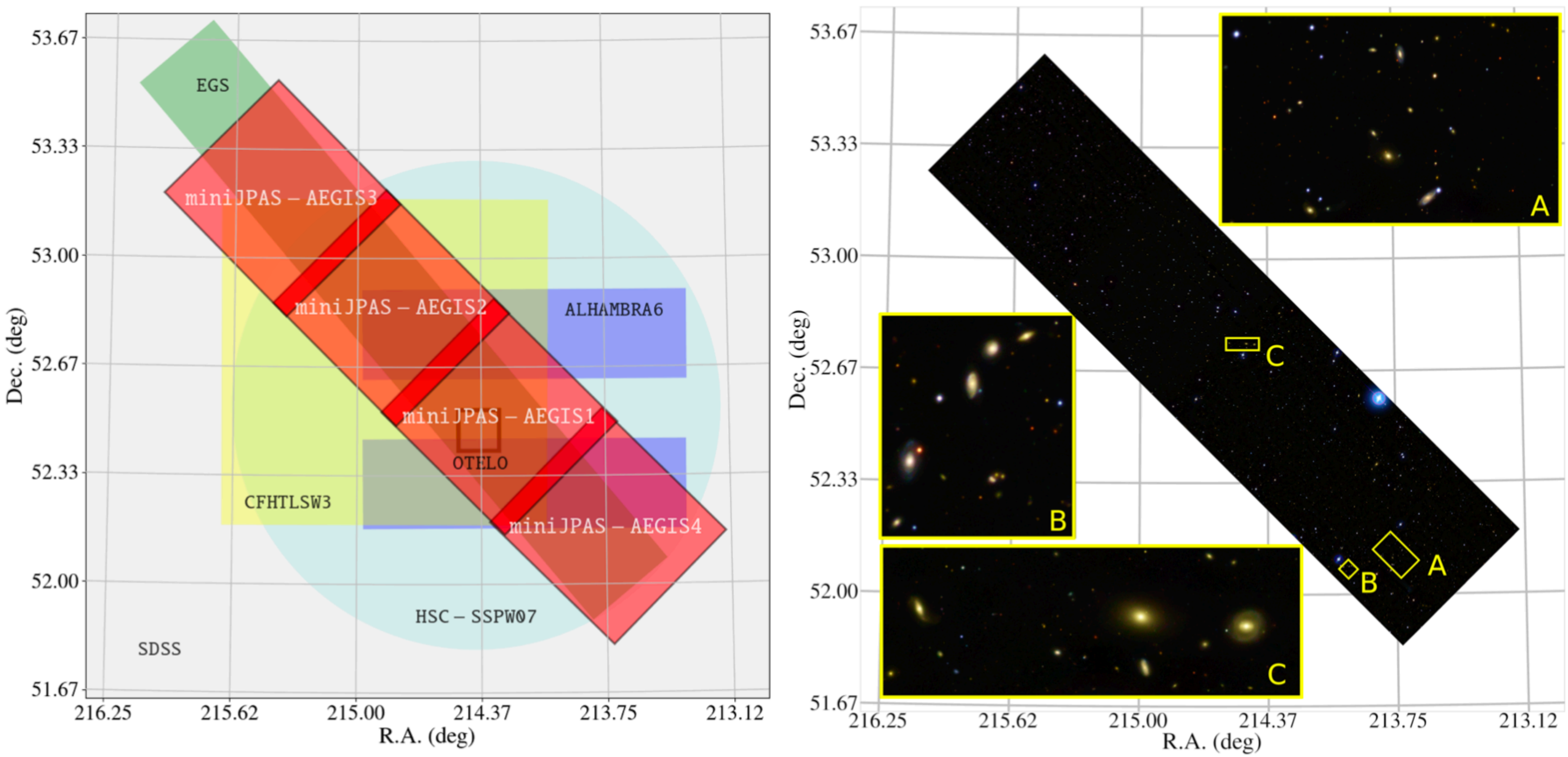


The first areas covered by J-PAS: miniJPAS and J-NEP

miniJPAS AEGIS fields (~1 sq.deg)

Bonoli + J-PAS Collab. 2021

A&A proofs: manuscript no. mini_jpas



Astronomy & Astrophysics manuscript no. mini_jpas
July 10, 2020

miniJPAS data publicly available!
https://archive.cefca.es/catalogues

The miniJPAS survey: a preview of the Universe in 56 colours

S. Bonoli[1,2,3⋆], A. Marín-Franch[4], J. Varela[4], H. Vázquez Ramió[4], L. R. Abramo[5], A. J. Cenarro[4], R. A. Dupke[6,31,32⋆⋆], J. M. Vílchez[7], D. Cristóbal-Hornillos[1], R. M. González Delgado[7], C. Hernández-Monteagudo[4], C. López-Sanjuan[4], D. J. Muniesa[1], T. Civera[1], A. Ederoclite[13], A. Hernán-Caballero[1], V. Marra[8], P.O. Baqui[8], A. Cortesi[20], E.S. Cypriano[13], S. Daflon[6], A. L. de Amorim[24], L. A. Díaz-García[11], J. M. Diego[12], G. Martínez-Solaeche[7], E. Pérez[7], V. M. Placco[17,18], F. Prada[7], C. Queiroz[5], J. Alcaniz[6,45], A. Alvarez-Candal[22,6], J. Cepa[41,42], A. L. Maroto[23], F. Roig[6], B. B. Siffert[15], K. Taylor[34], N. Benitez[7], M. Moles[1,7], L. Sodré Jr.[13], S. Carneiro[10], C. Mendes de Oliveira[13], E. Abdalla[5], R. E. Angulo[2,3], M. Aparicio Resco[23], A. Balaguera-Antolínez[41,42], F. J. Ballesteros[50], D. Brito-Silva[13], T. Broadhurst[2,3,40], E. R. Carrasco[48], T. Castro[25,26,27,28], R. Cid Fernandes[24], P. Coelho[13], R. B. de Melo[6,32], L. Doubrawa[13], A. Fernandez-Soto[12,39], F. Ferrari[14], A. Finoguenov[37], R. García-Benito[7], J. Iglesias-Páramo[7], Y. Jiménez-Teja[7], F. S. Kitaura[41,42], J. Laur[29], P. A. A. Lopes[20], G. Lucatelli[14], V. J. Martínez[39,50,51], M. Maturi[35,36], M. Quartin[19,20], C. Pigozzo[10], J. E. Rodrìguez-Martìn[7], V. Salzano[58], A. Tamm[29], E. Tempel[29], K. Umetsu[11], L. Valdivielso[1], R. von Marttens[6], A. Zitrin[16], M. C. Díaz-Martín[1], G. López-Alegre[1], A. López-Sainz[1], A. Yanes-Díaz[1], F. Rueda-Teruel[1], S. Rueda-Teruel[1], J. Abril Ibañez[1,30], J.L Antón Bravo[1], R. Bello Ferrer[1], S. Bielsa[1], J. M. Casino[1], J. Castillo[1], S. Chueca[1], L. Cuesta[1], J. Garzarán Calderaro[1], R. Iglesias-Marzoa[1], C. Íniguez[1], J. L. Lamadrid Gutierrez[1], F. Lopez-Martinez[1], D. Lozano-Pérez[1], N. Maícas Sacristán[1], E. L. Molina-Ibáñez[1], A. Moreno-Signes[1], S. Rodríguez Llano[1], M. Royo Navarro[1], V. Tilve Rua[1], U. Andrade[6], E. J. Alfaro[7], S. Akras[14], P. Arnalte-Mur[50,51], B. Ascaso[55], C. E. Barbosa[13], J. Beltrán Jiménez[63], M. Benetti[59,60], C. A. P. Bengaly[6], A. Bernui[6], J. J. Blanco-Pillado[3,40], M. Borges Fernandes[6], J. N. Bregman[31], G. Bruzual[53], G. Calderone[26], J. M. Carvano[6], L. Casarini[9], A. L Chies-Santos[45], G. Coutinho de Carvalho[49], P. Dimauro[6], S. Duarte Puertas[7], D. Figueruelo[63], J. I. González-Serrano[12], M. A. Guerrero[7], S. Gurung-López[1,47], D. Herranz[12], M. Huertas-Company[41,42,43,44], J. A. Irwin[32], D. Izquierdo-Villalba[1], A. Kanaan[24], C. Kehrig[7], C. C. Kirkpatrick[37], J. Lim[56], A. R. Lopes[6], R. Lopes de Oliveira[9,6], A. Marcos-Caballero[40], D. Martínez-Delgado[7], E. Martínez-González[12], G. Martínez-Somonte[12,62], N. Oliveira[6], A. A. Orsi[1], R. A. Overzier[6], M. Penna-Lima[33], R. R. R. Reis[19,20], D. Spinoso[1], S. Tsujikawa[61], P. Vielva[12], A. Z. Vitorelli[13], J. Q. Xia[21], H. B. Yuan[21], A. Arroyo-Polonio[7], M. L. L. Dantas[13], C. A. Galarza[6], D. R. Gonçalves[20], R. S. Gonçalves[6], J. E. Gonzalez[6,45], A. H. Gonzalez[54], N. Greisel[1], R. G. Landim[38], D. Lazzaro[6], G. Magris[52], R. Monteiro-Oliveira[13], C.B. Pereira[6], M. J. Rebouças[57], J. M. Rodriguez-Espinosa[42], S. Santos da Costa[6], E. Telles[6]

(Affiliations can be found after the references)

July 10, 2020

Bonoli et al. 2021

The miniJPAS depth and FWHM values

Bonoli + J-PAS Collab. 2021

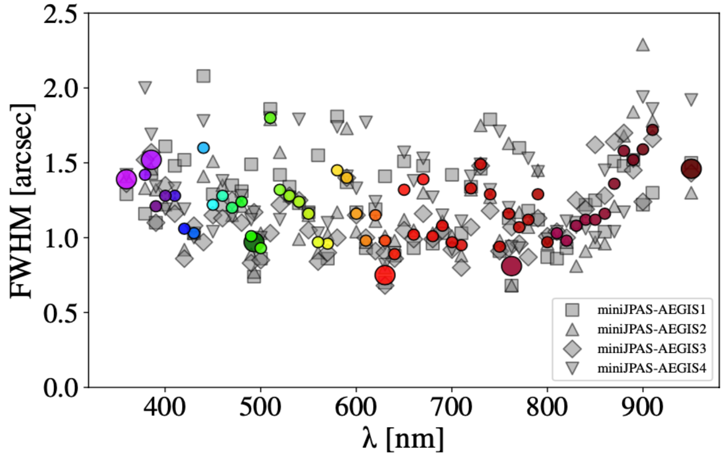


Fig. 5: Statistics of the PSF FWHM. The coloured symbols represent the average values for each filter, while the gray ones are the value for each pointing. The larger symbols indicate the FWHM of the the broad bands.

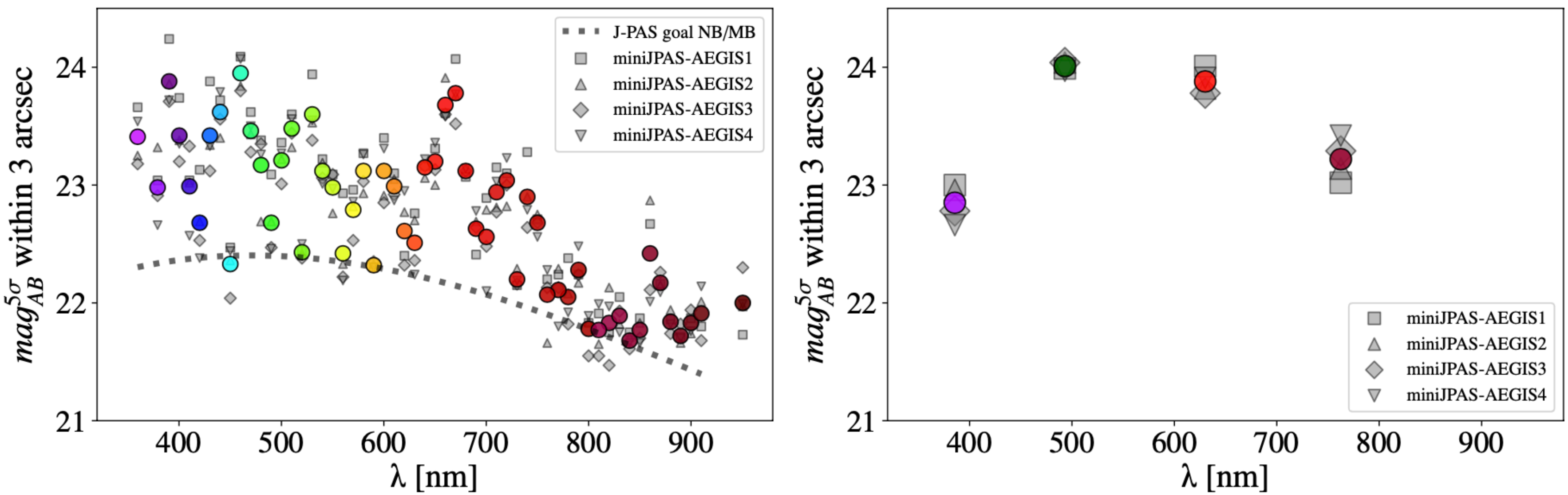
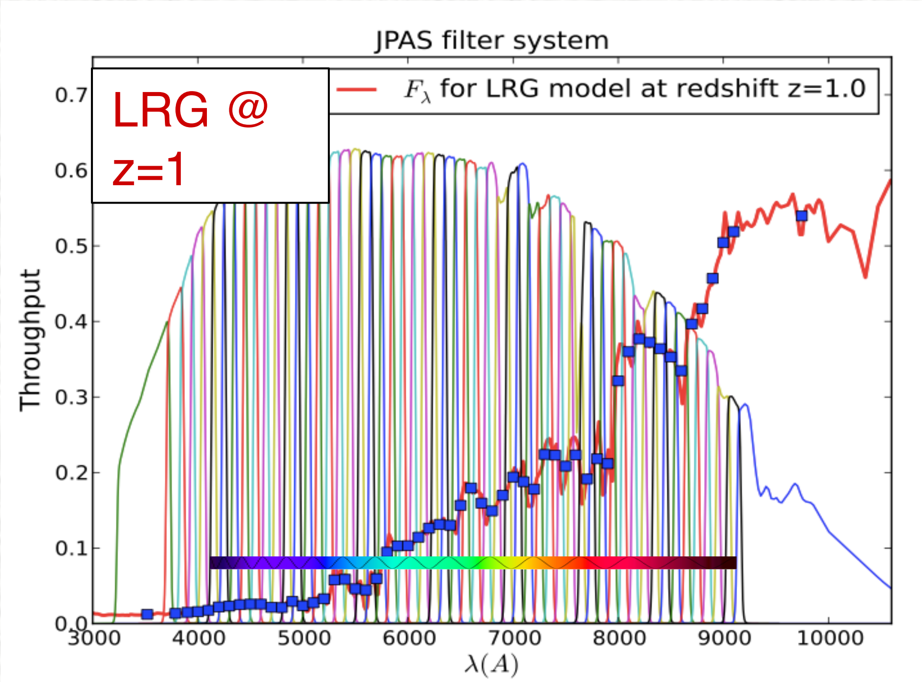
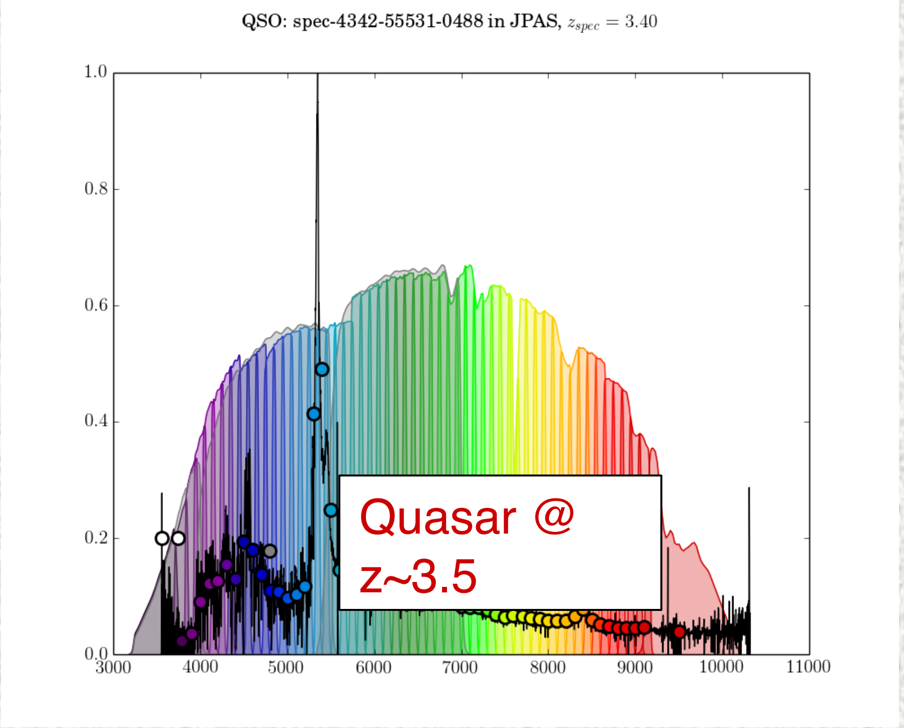
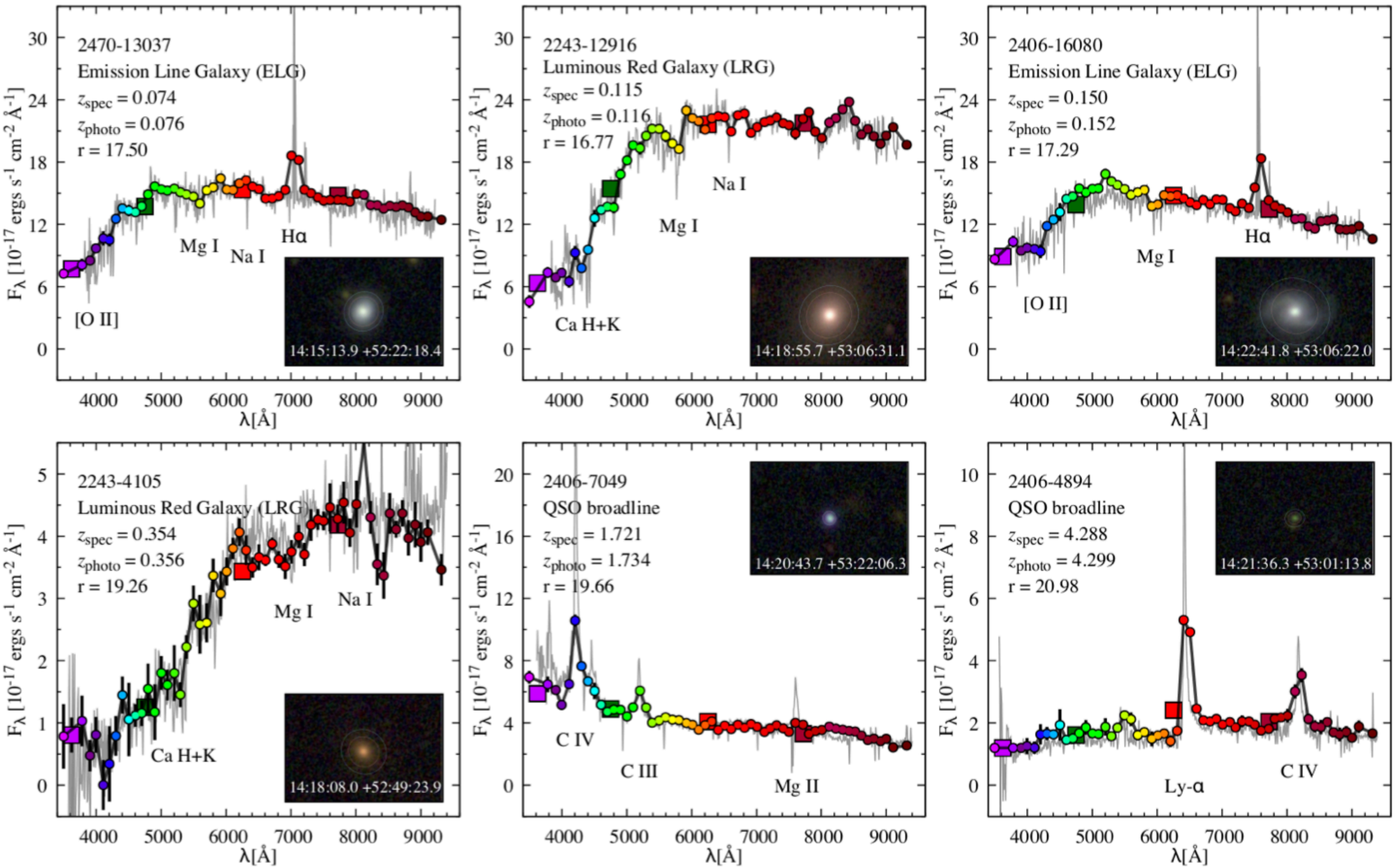


Fig. 4: Estimated depths (5σ at 3 arcsec aperture), computed from the noise in each tile, for the narrow bands (left) and broad bands (right). The coloured symbols show the average values for each filter, while the gray ones are the values for the co-added images of each pointing. For the narrow bands, the dashed gray line indicates the approximate targeted minimum depth, as defined in Benítez et al. (2014).


JPAS filter system
F_λ for LRG model at redshift z=1.0
LRG @
z=1
Throughput
$\lambda(A)$
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
3000
4000
5000
6000
7000
8000
9000
10000


QSO: spec-4342-55531-0488 in JPAS, $z_{spec} = 3.40$
Quasar @
z~3.5
0.0
0.2
0.4
0.6
0.8
1.0
3000
4000
5000
6000
7000
8000
9000
10000
11000

Bonoli + J-PAS Collab. 2021 **ELGs, LRGs, and QSOs**



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Bonoli + J-PAS Collab. 2021 **Stars**

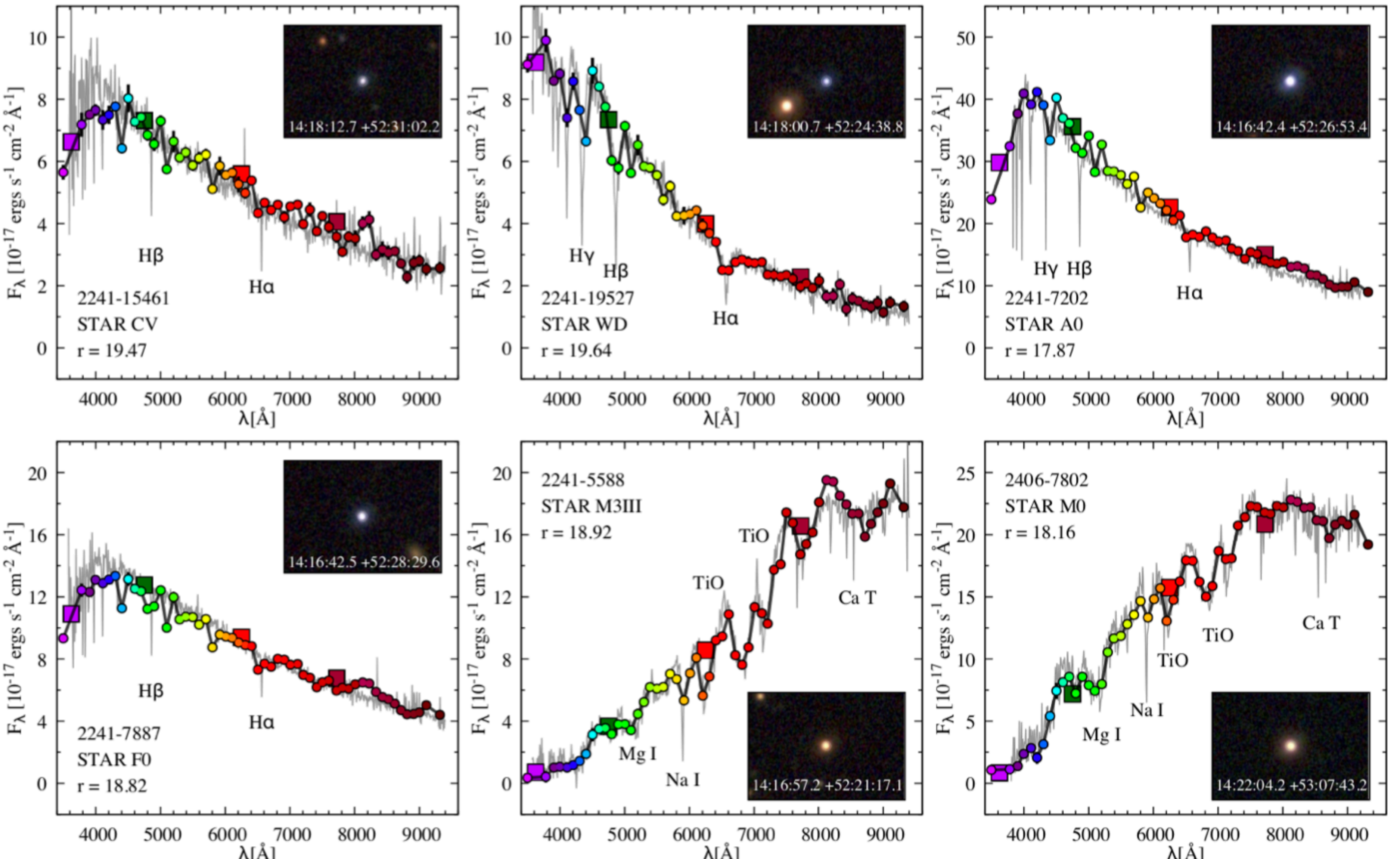
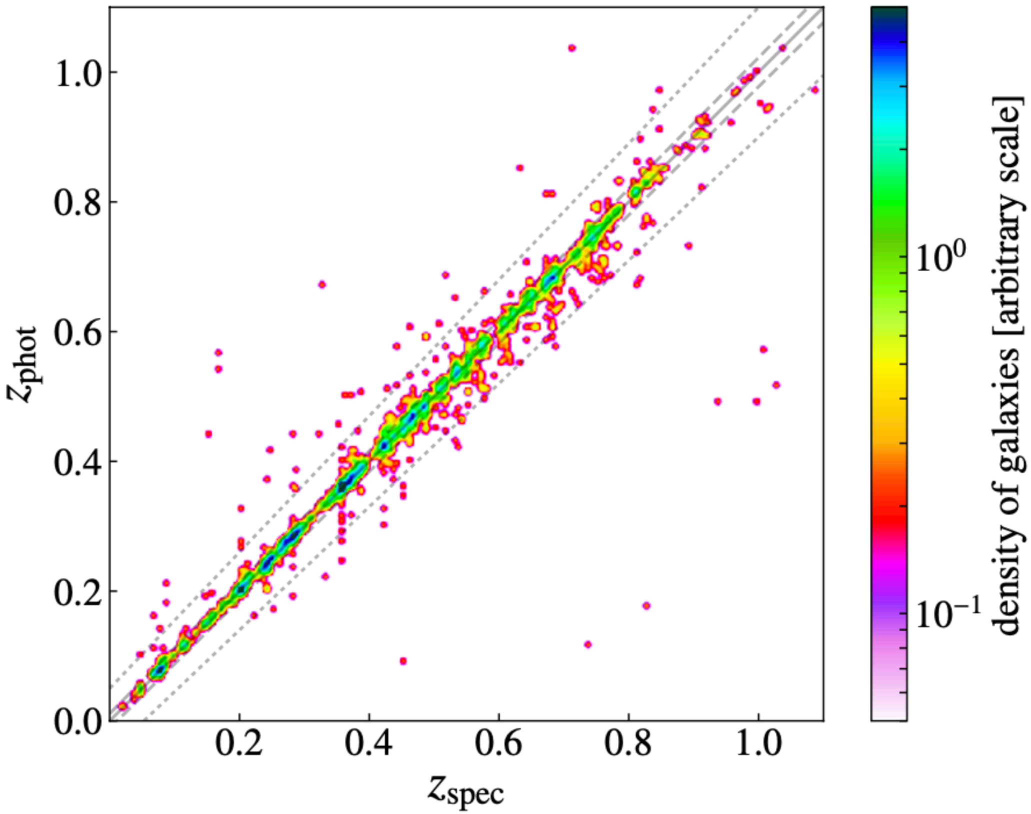
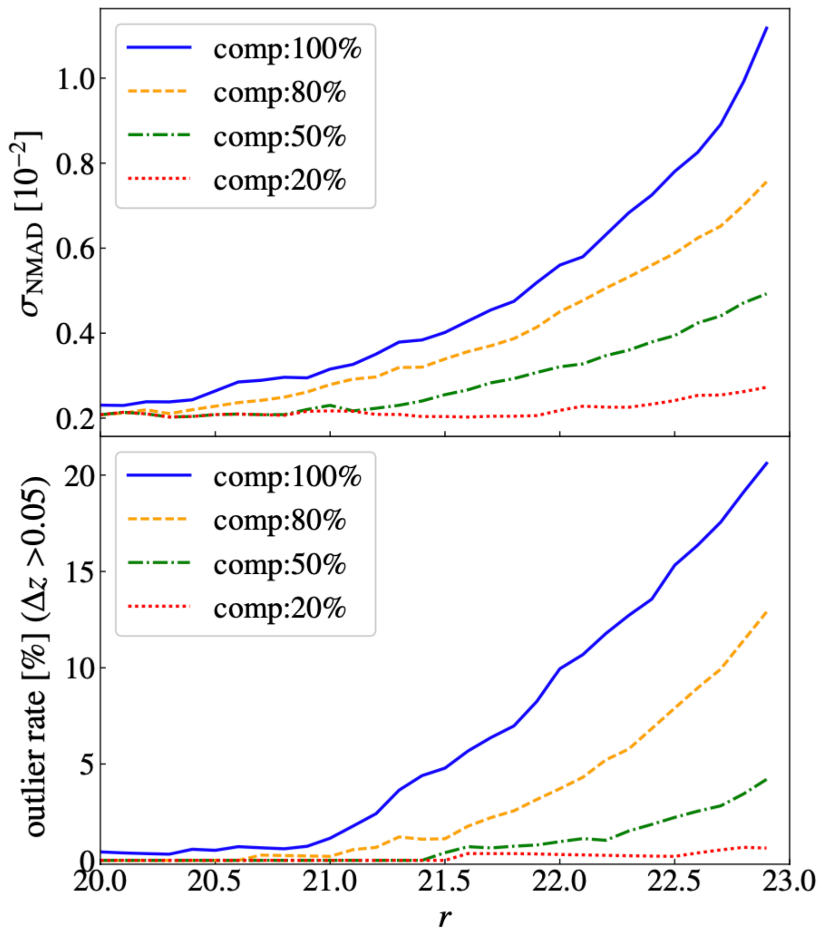


Photo-z precision as good as 0.003(1+z)

Photo-z precision as good as 0.003(1+z)





Hernán-Caballero +J-PAS, 2021,2023

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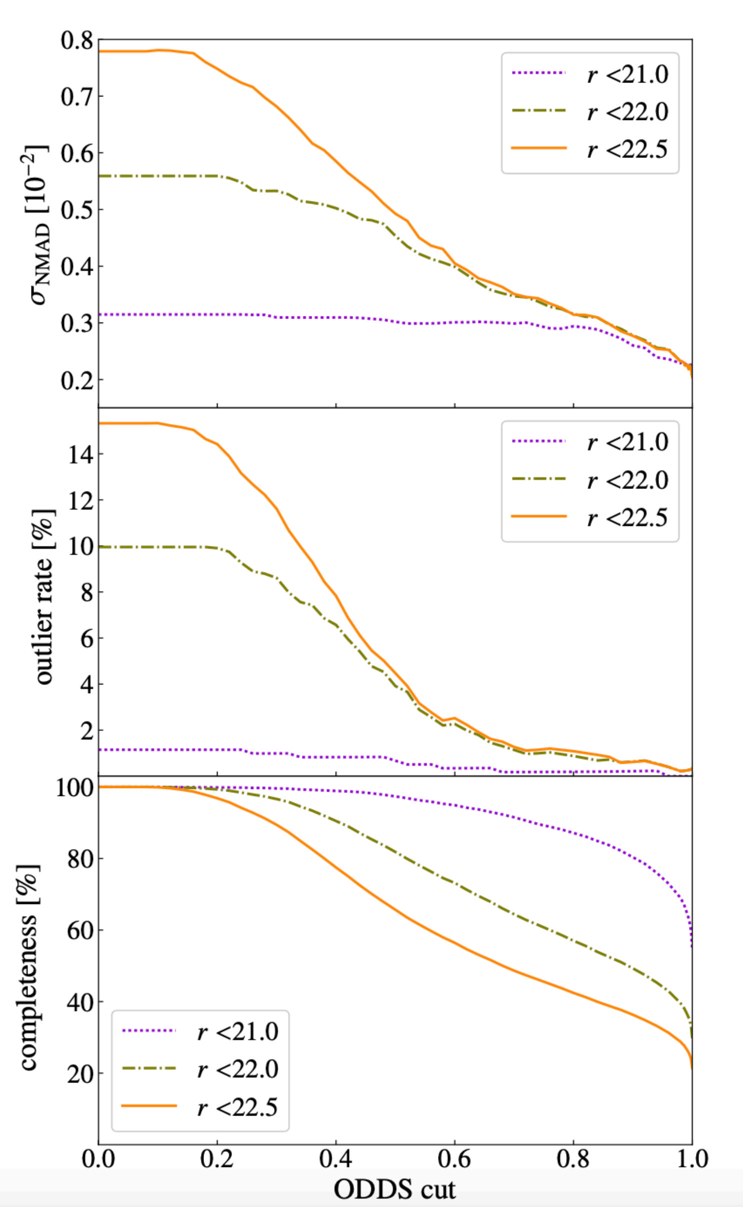
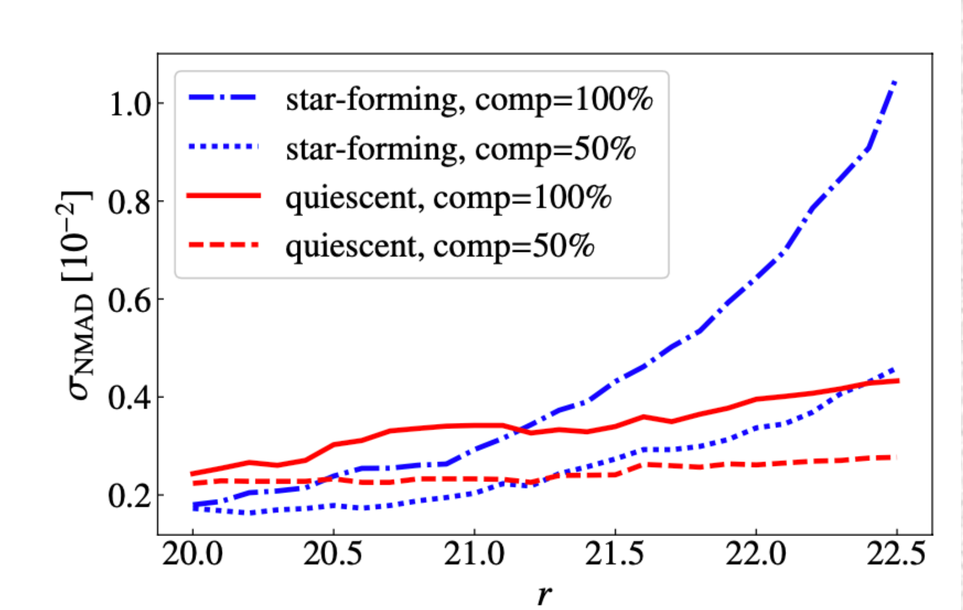
Photo-z precision as good as 0.003(1+z)



Hernán-Caballero +J-PAS, 2021,2023

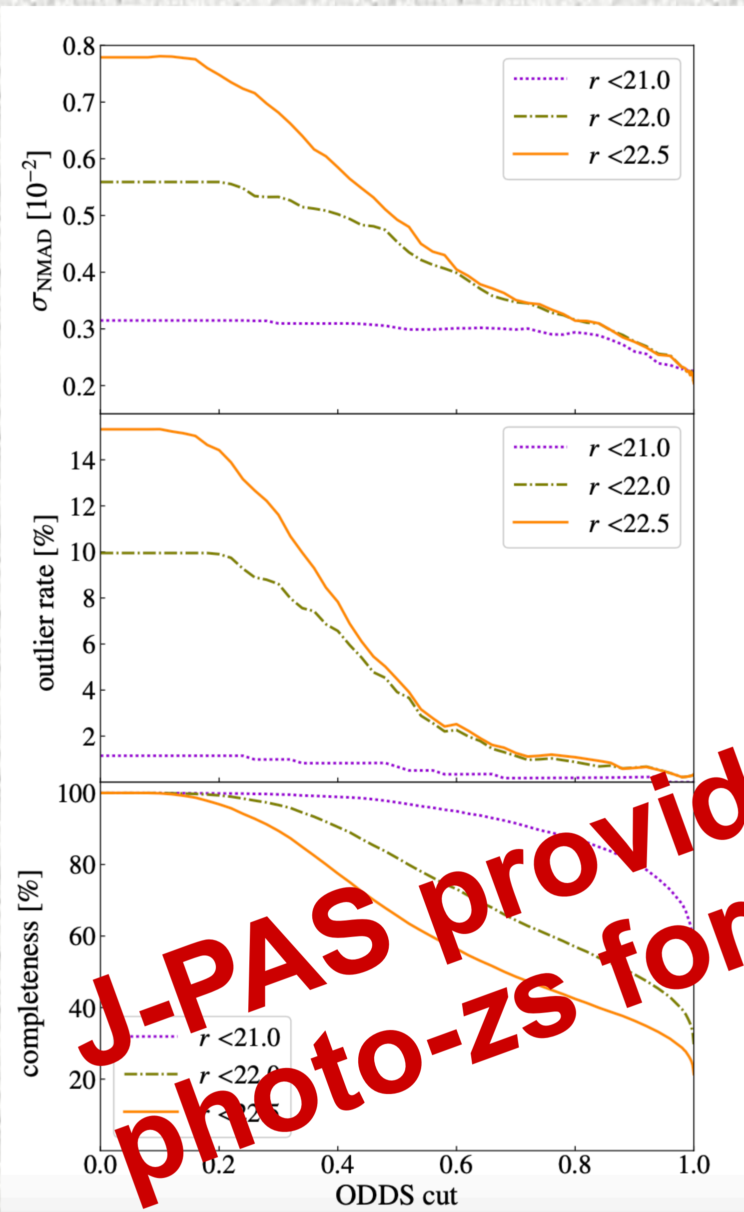


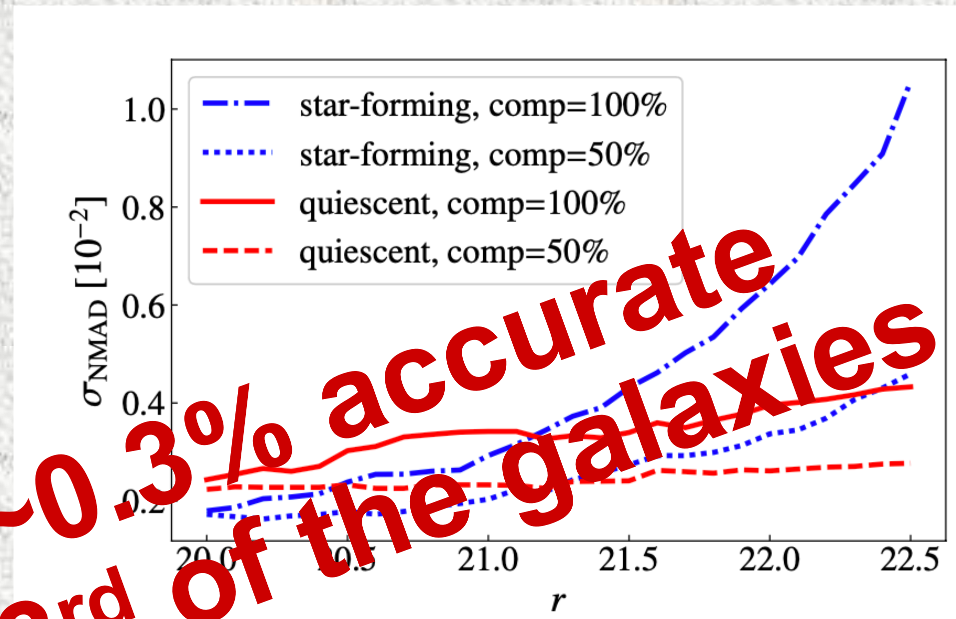
$$odds = \int_{z_{\rm phot}-d}^{z_{\rm phot}+d} P(z)dz, \qquad d = 0.03(1 + z_{\rm phot})$$

The ***odds*** parameter ***captures*** the precision of the photo-z *independently* of galaxy's magnitude or type: selections must be done in ***odds***

Photo-z precision as good as 0.003(1+z)

Hernán-Caballero +J-PAS, 2021,2023





J-PAS provides ~0.3% accurate photo-zs for ~1/3rd of the galaxies

$$odds = \int_{z_{\mathrm{phot}}-d}^{z_{\mathrm{phot}}+d} P(z)dz, \qquad d = 0.03(1 + z_{\mathrm{phot}})$$

The ***odds*** parameter ***captures*** the precision of the photo-*z* *independently* of galaxy's magnitude or type: selections must be done in ***odds***

J-PAS LSS Cosmological probes of Dark Energy

QSO science

- ~1 M QSOs with photo-z precision of 0.3% or better SNIa
- MoU with WEAVE-QSO to conduct Ly-α forest science using WEAVE MOS.

Clustering

- 90M galaxies (LRG, ELG) with photo-*z* precision of 0.3%
- ks LAE

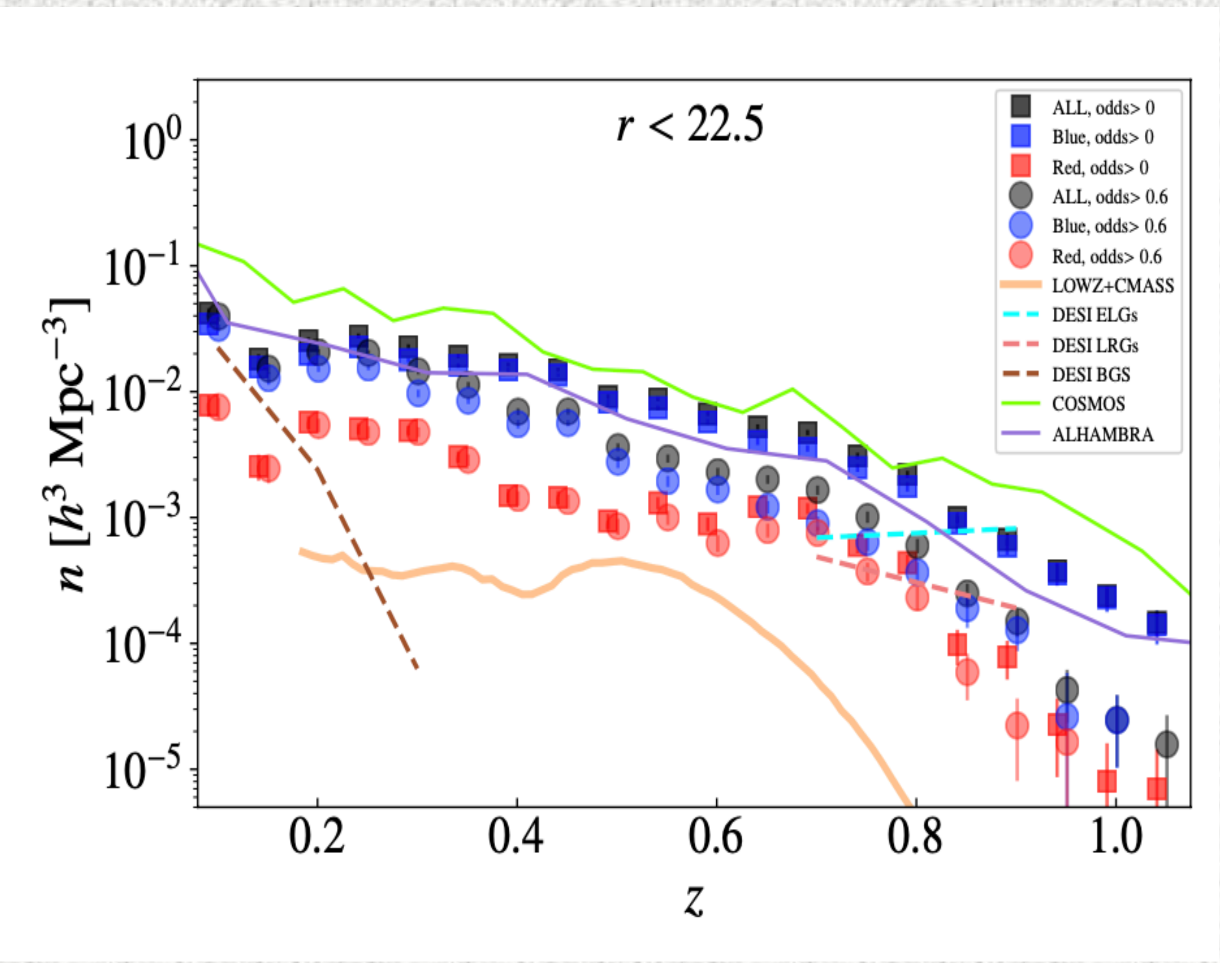
Clusters

- 700k clusters with more than 10 members – down to ~few $\times 10^{13} M_{\odot}$
- Combine lensing and optical richness for mass calibration

Lensing

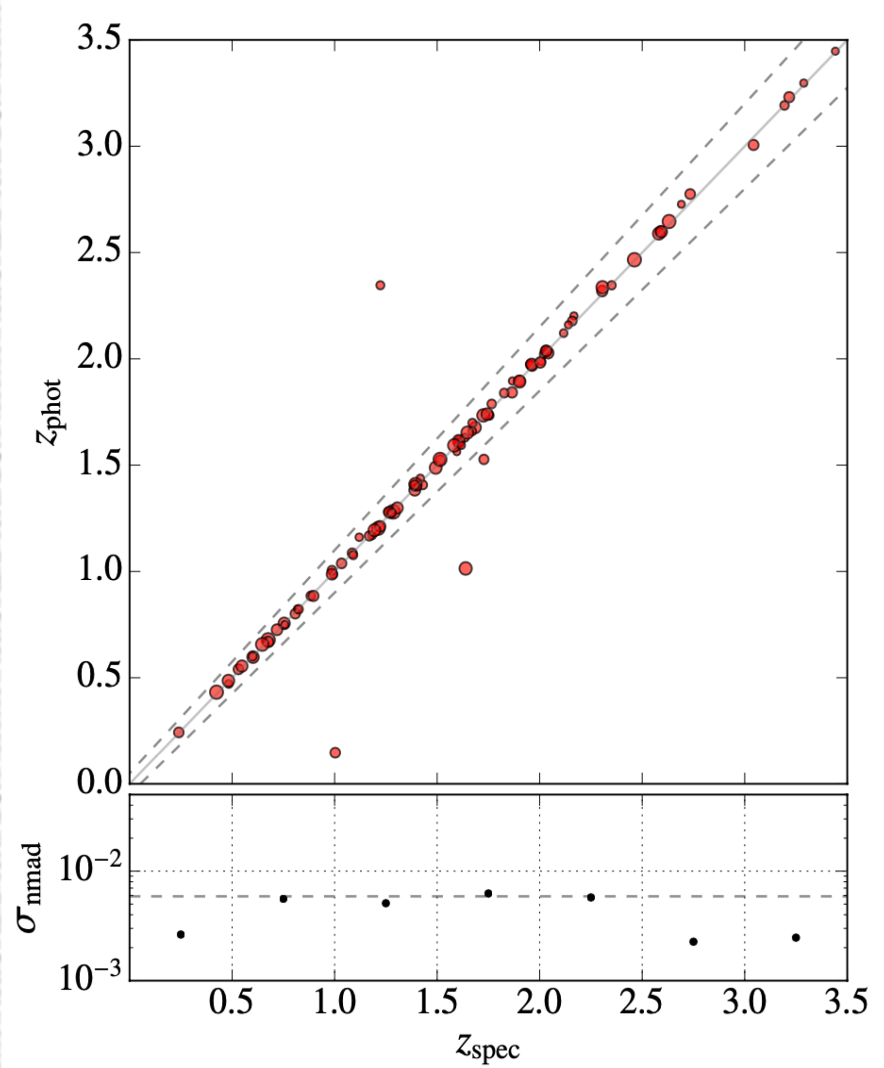
- Optimization of BB observations in the best nights
- Redshift precision for lenses and background galaxies

LSS in miniJPAS

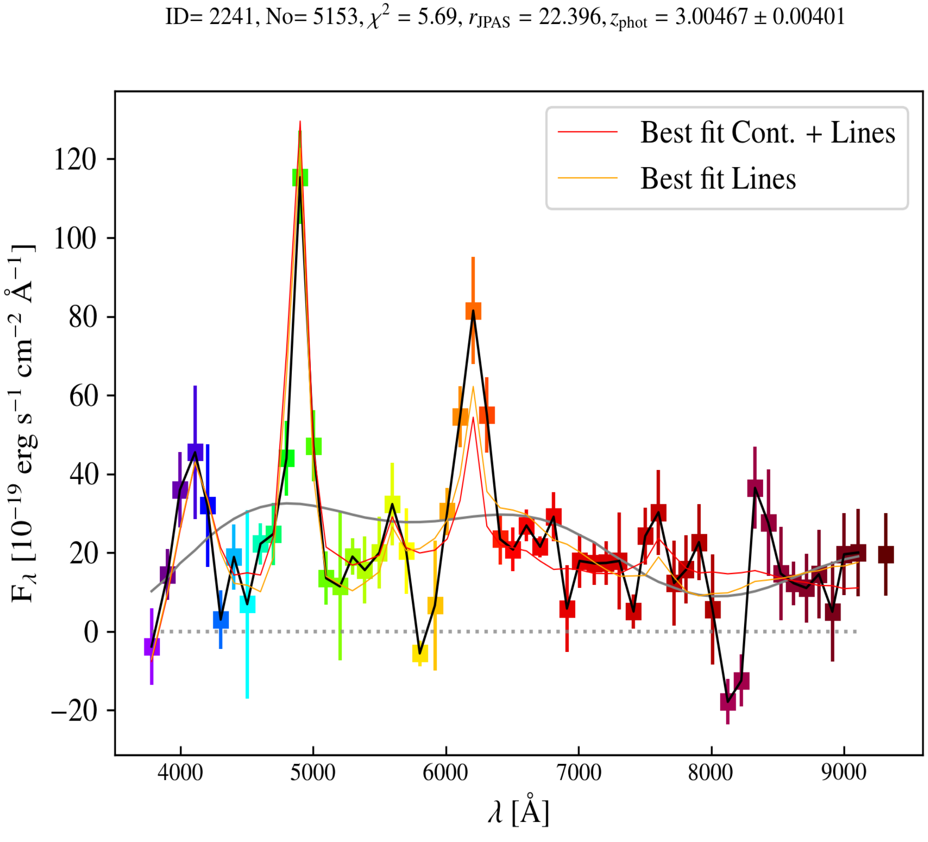


- **High quality** photo-zs for **all red galaxies up to *z~0.9***
- **High quality** photo-zs for a **large fraction of blue galaxies up to *z~0.9***
- **Multi-tracer** science enabled in a very wide redshift range *z ~ [0,1]*
- Clustering science cases augmented after the inclusion of the **J-PAS QSO** population (~1.5 M) sampling the redshift interval *z ~[1,3.5]*
- Further science cases after obtaining spectra with **WEAVE-QSO**

QSOs in J-PAS



For **QSOs** we can recover very accurate and precise photo-z as well !!



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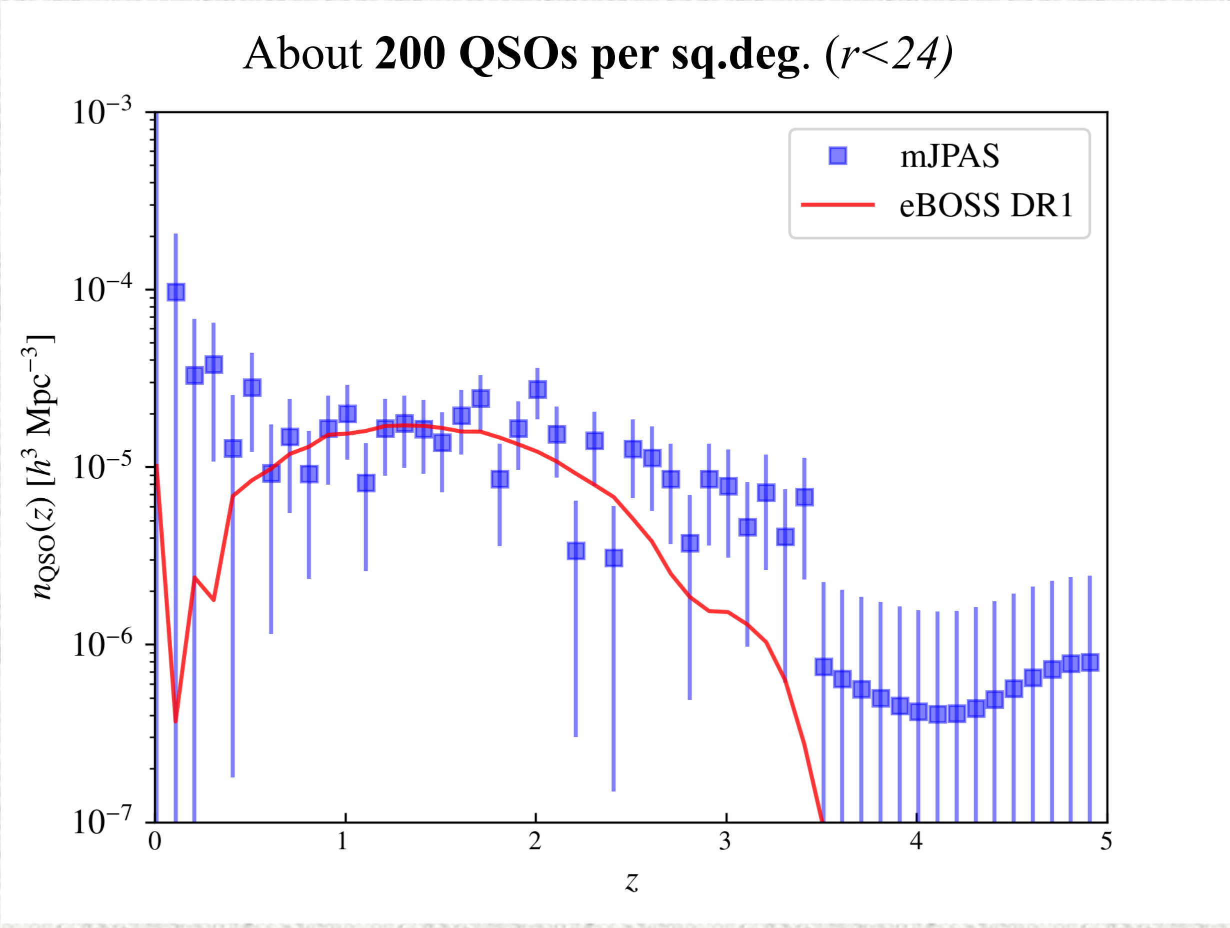
NUMBER DENSITY OF **QSO** CANDIDATES FROM **miniJPAS**



Ongoing program with **WEAVE QSO**: about **~700 sq.deg** per year of our **QSO candidates** will be covered with their fibers, enabling **Lyman-alpha science**

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How's the impact of miniJPAS photo-z errors in clustering analysis?

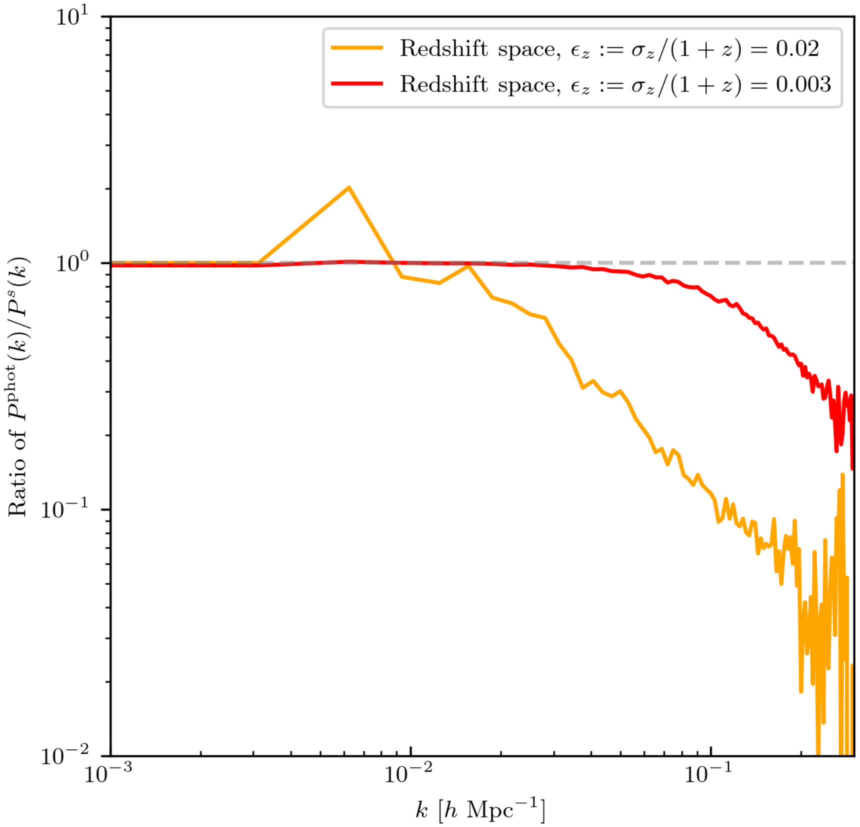
Projections of miniJPAS on LSS clustering

Ratio of $P_0(k)$s:

$$P_{0,\mathrm{photo}}(k) \,/\, P_{0,\mathrm{spec}}(k)$$

Obtained from **ideal**, **Gaussian Photo-z errors** at the targetted level of J-PAS

Forecasts on sensitivity of J-PAS to the **dark sector** (interacting dark matter and dark energy, exotic dark energy models) and **modified gravity** can be found in Salzano et al., 2021, Figueruelo et al. 2021, Aparicio-Resco et al. 2020, Costa et al. 2019.



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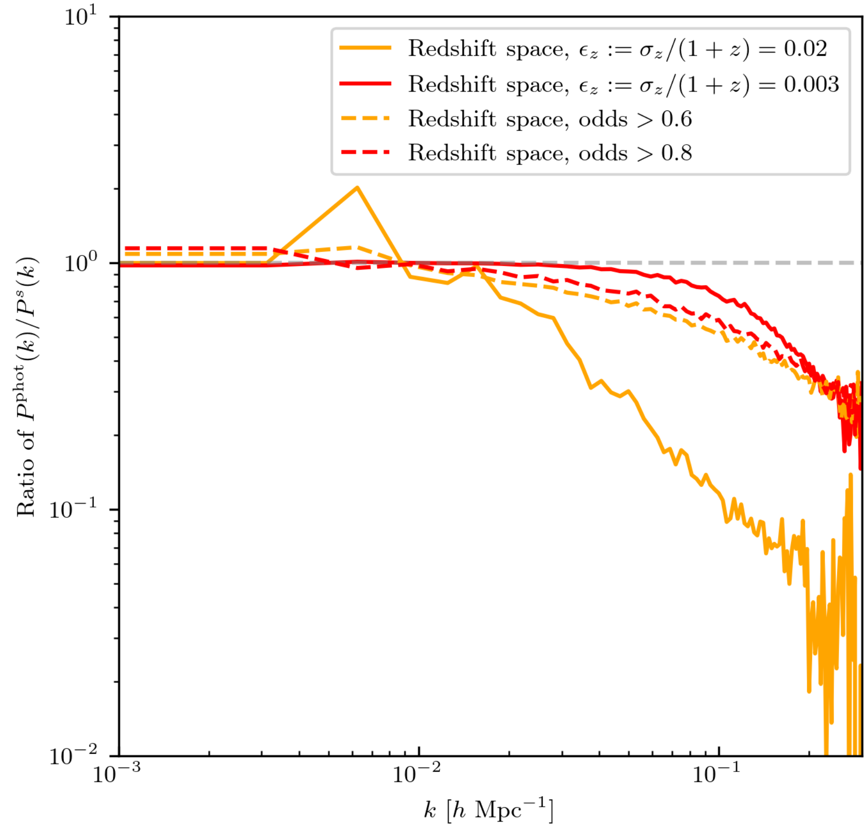
Projections of miniJPAS on LSS clustering

Ratio of $P_0(k)$s:

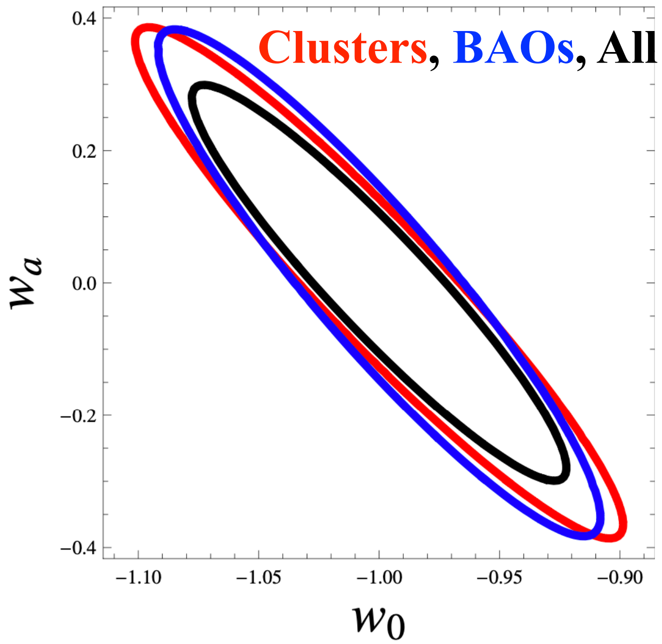
$$\mathbf{P_{0,photo}(k) \,/\, P_{0,spec}(k)}$$

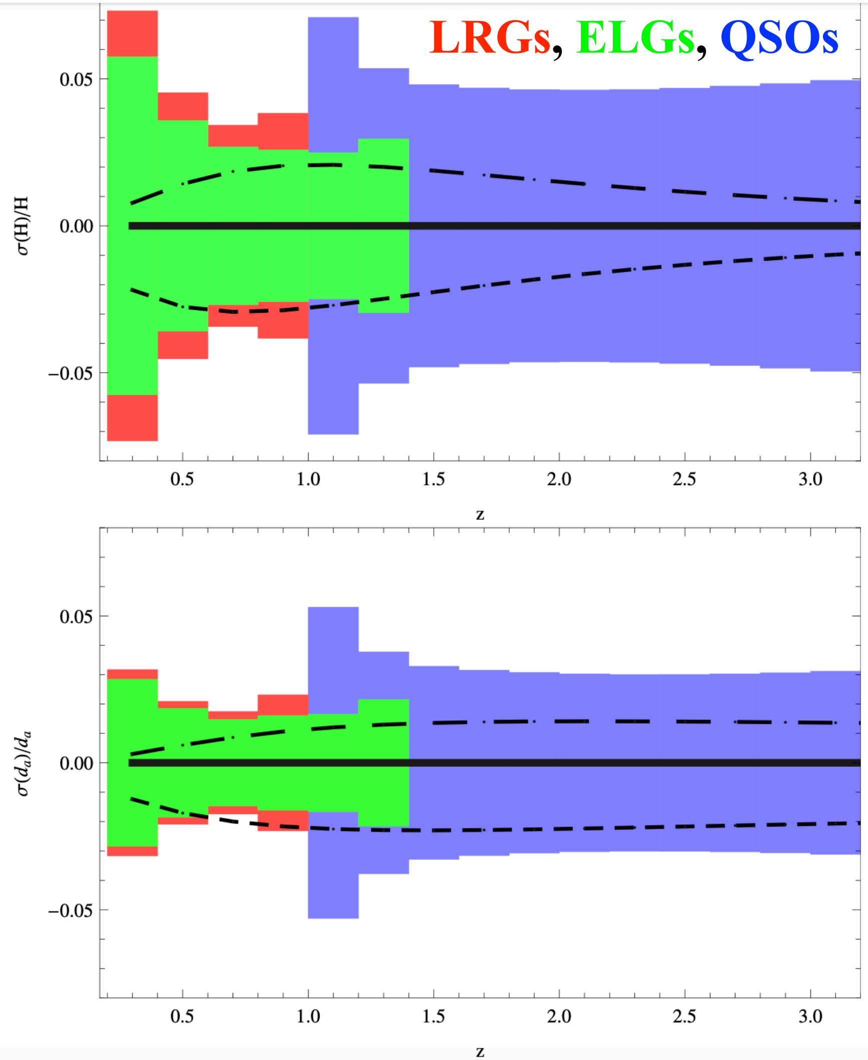
Obtained from **real photo-z PDFs** obtained from **miniJPAS** data

Forecasts on sensitivity of J-PAS to the **dark sector** (interacting dark matter and dark energy, exotic dark energy models) and **modified gravity** can be found in Salzano et al., 2021, Figueruelo et al. 2021, Aparicio-Resco et al. 2020, Costa et al. 2019.



J-PAS Fisher forecasts from Benitez+2014





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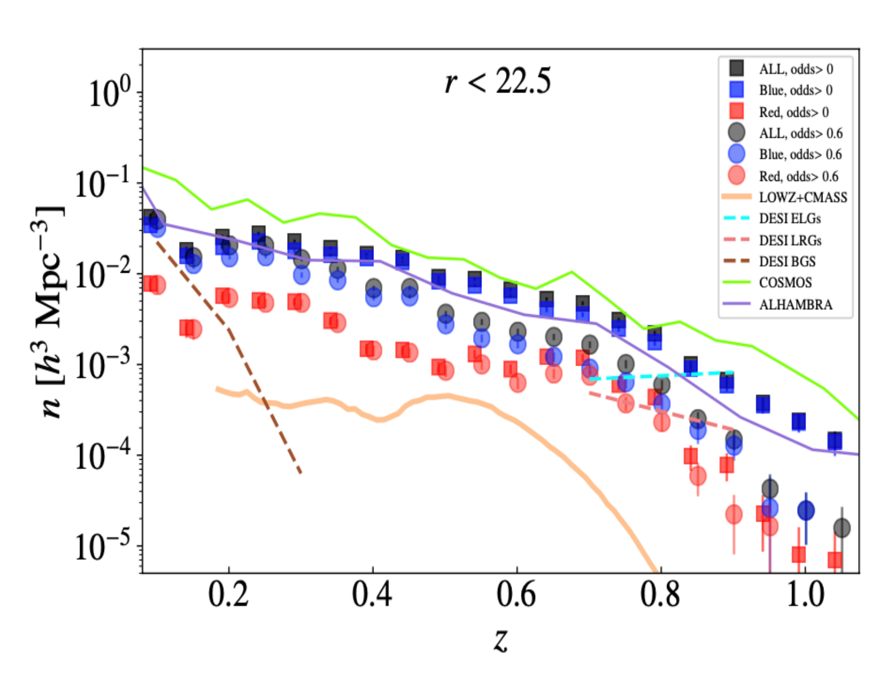

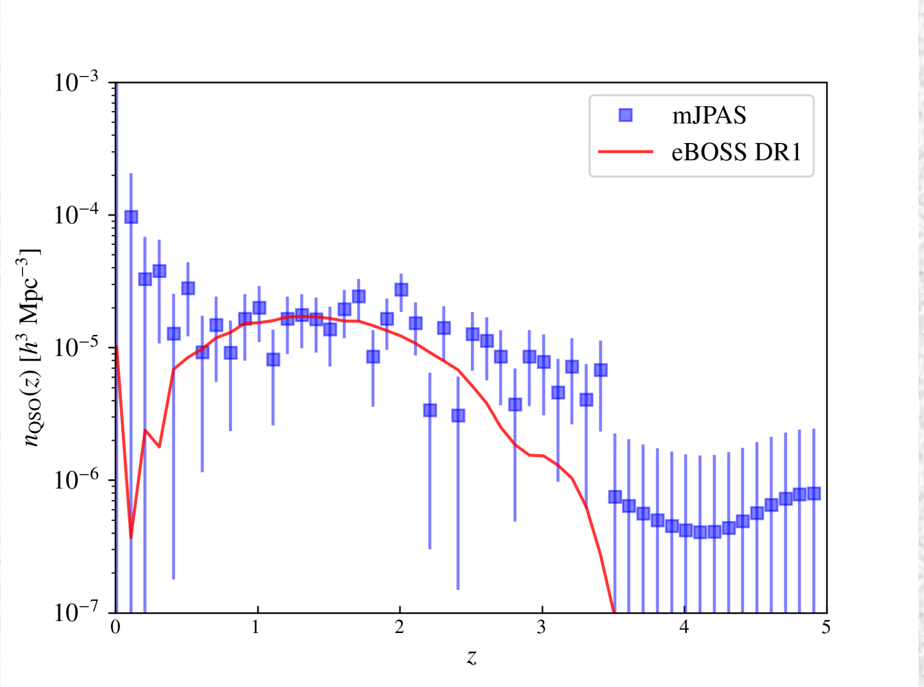

- Forecasts show that J-PAS should recover practically all the information on **linear** cosmological scales on a very wide redshift range $z \in [0,3.5]$.

- Measured miniJPAS galaxy and QSO number densities yield typically low(er) values for shot noise, **but,**

- The recovery of mildly to highly non-linear scales is compromised/ hampered by photo-z errors, deeming it challenging …

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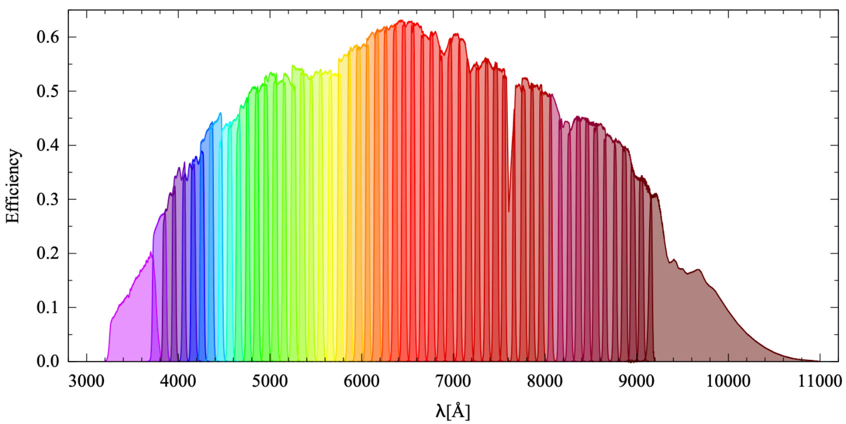
A low redshift example: tomographic analysis of J-PLUS

J-PLUS DR3 (~3,000 sq.deg)

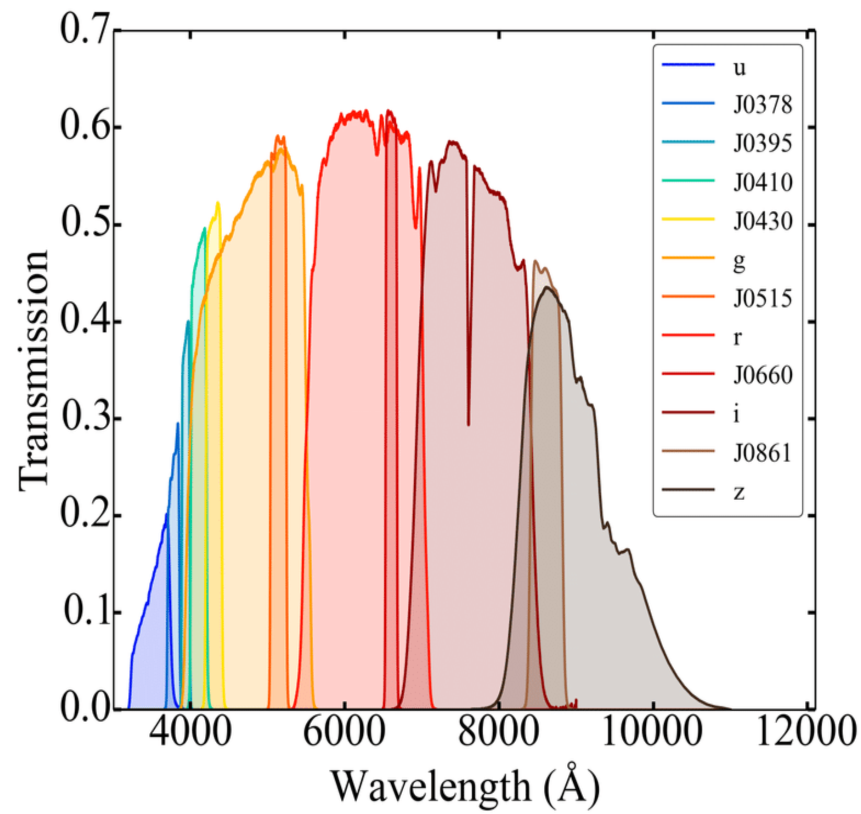
57 vs 12 filters …

J-PAS

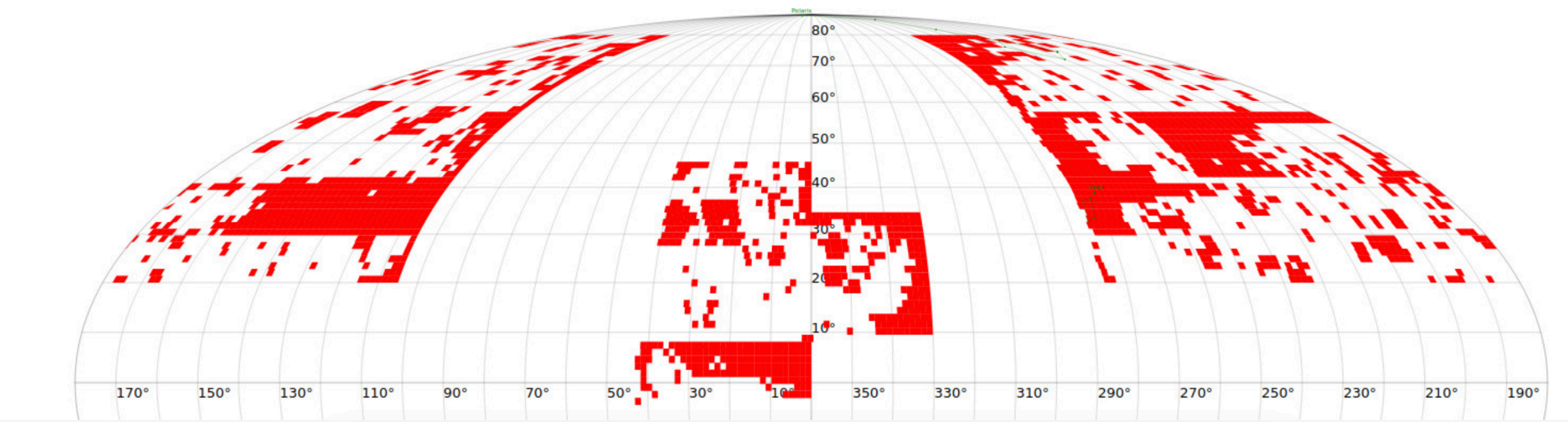


measured transmission curves of the J-PAS filters. Effects of the CCD quantum efficiency, the entire optical system of
0 telescope and sky absorption are included. The HTML color representation of each filter is provided in the miniJPAS
the table `minijpas.Filter`.

J-PLUS



J-PLUS DR3 samples



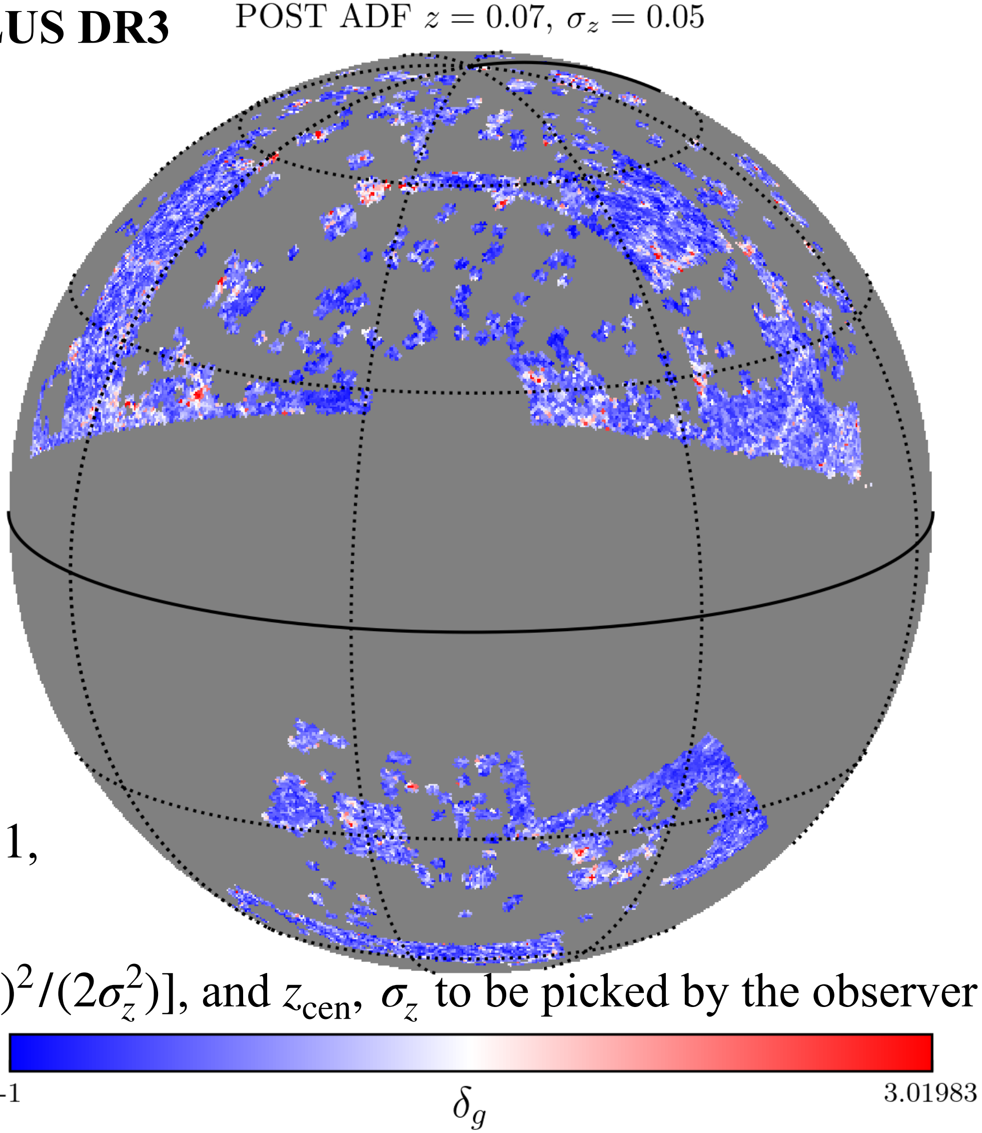
Total area covered	3192 deg^2 (~2881 deg^2 after masking)
Image size	9500x9500 pixels (~2 deg^2)
Image pixel scale	0.555 arcsec
Total number of fields	1642
Number of objects in dual catalogue	~47.4 million (~29.8 million with MAG_AUTO(rSDSS)≤21)
Number of objects with estimations of photo-z (with their full PDFs)	~44.1 million
Number of detections in single catalogue	~338.4 million
Size of the database	~373 GB
Number of Single Frames	62310
Tile Images Total Size (compressed)	~962.1 GB
Single Frames Total Size (compressed)	~4.46 TB

odds>0.8, $r < 21$, $\sigma_{\mathrm{Err},\,z} \simeq 0.014$

XGBoost

2D clustering, source counts in footprint, **angular density fluctuations (ADF)**

An example from **J-PLUS DR3**



$$\delta_g(\hat{\mathbf{n}}) = \frac{\sum_{j \in \hat{\mathbf{n}}} W_j}{\langle \sum_{i \in \hat{\mathbf{n}}} W_i \rangle_{\hat{\mathbf{n}}}} - 1,$$

$W_j := \exp[-(z_j - z_{\mathrm{cen}})^2/(2\sigma_z^2)]$, and z_{cen}, σ_z to be picked by the observer

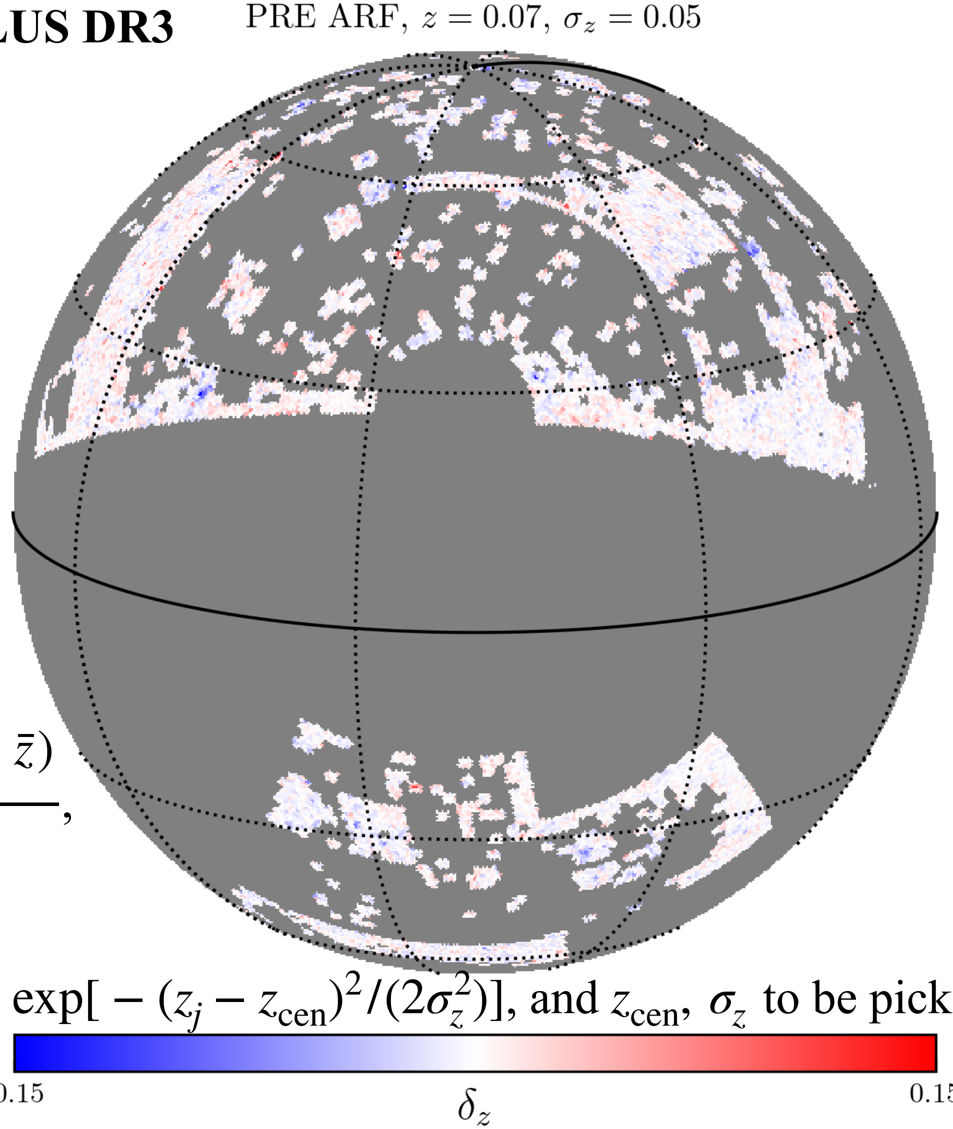
CHM+, in prep.

odds>0.8, $r < 21$, $\sigma_{\mathrm{Err},\,z} \simeq 0.014$

XGBoost

Angular redshift fluctuations (ARF)
(Under any given redshift shell, a by construction much more Gaussian observable)

An example from **J-PLUS DR3**



$$\delta z(\hat{\mathbf{n}}) = \frac{\sum_{j\in\hat{\mathbf{n}}} W_j \ (z_j - \bar{z})}{\langle \sum_{i\in\hat{\mathbf{n}}} W_i \rangle_{\hat{\mathbf{n}}}},$$

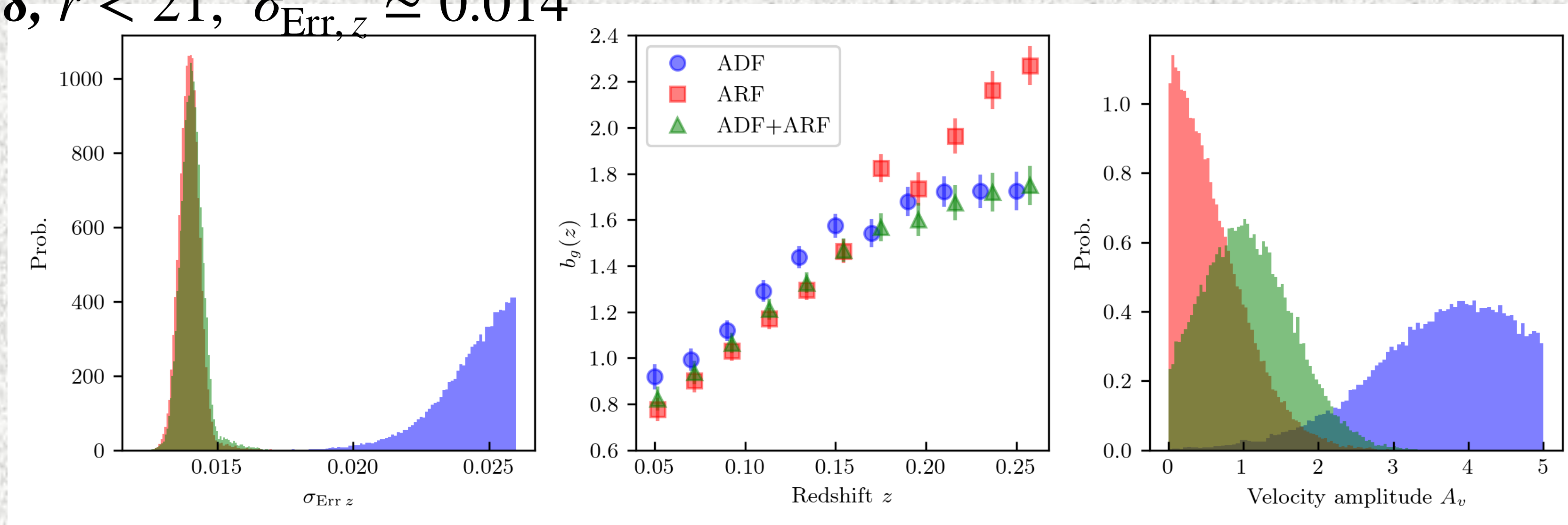
$\bar{z} := \frac{\sum_j W_j z_j}{\sum_j W_j}$; $W_j := \exp[-(z_j - z_{\mathrm{cen}})^2/(2\sigma_z^2)]$, and z_{cen}, σ_z to be picked by the observer

CHM+, in prep.

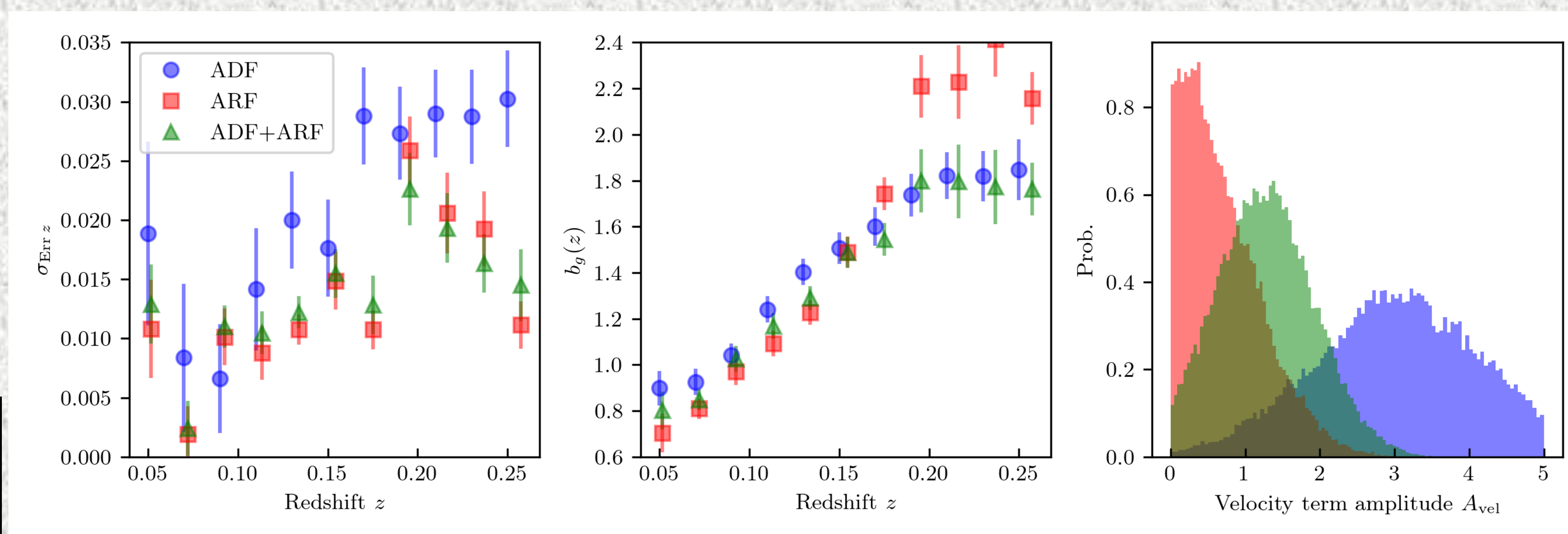
J-PLUS

Unique σ_{Err} for all redshift shells: $\{\sigma_{\mathrm{Err}}, b_{i=1,\mathrm{nshells}}, \mathscr{A}_v\}$

odds>0.8, $r < 21$, $\sigma_{\mathrm{Err},z} \simeq 0.014$

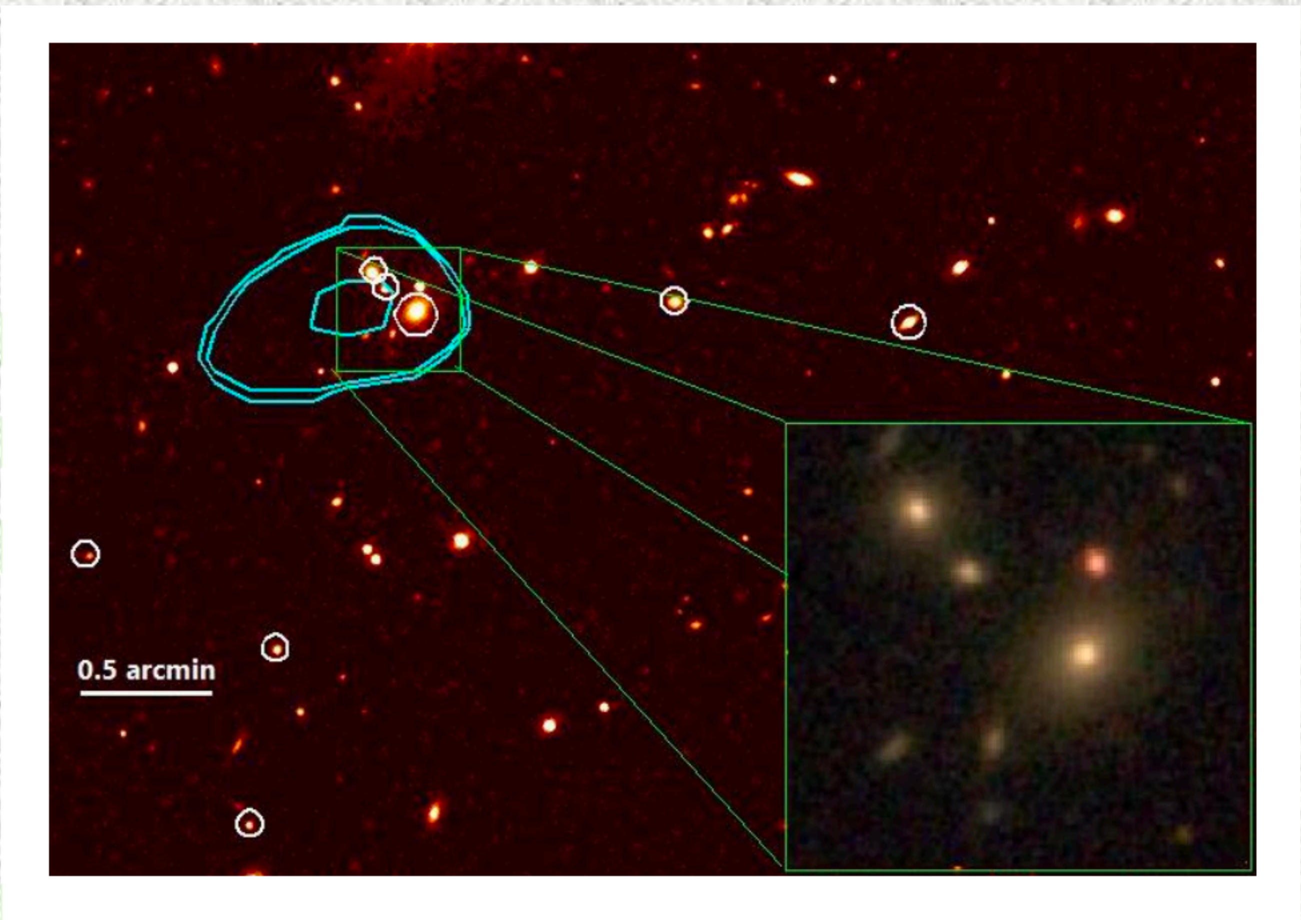


Different σ_{Err} for *each* redshift shells: $\{\sigma_{\mathrm{Err},\,i=1,\mathrm{nshells}}, b_{i=1,\mathrm{nshells}}, \mathscr{A}_v\}$



Clusters in miniJPAS

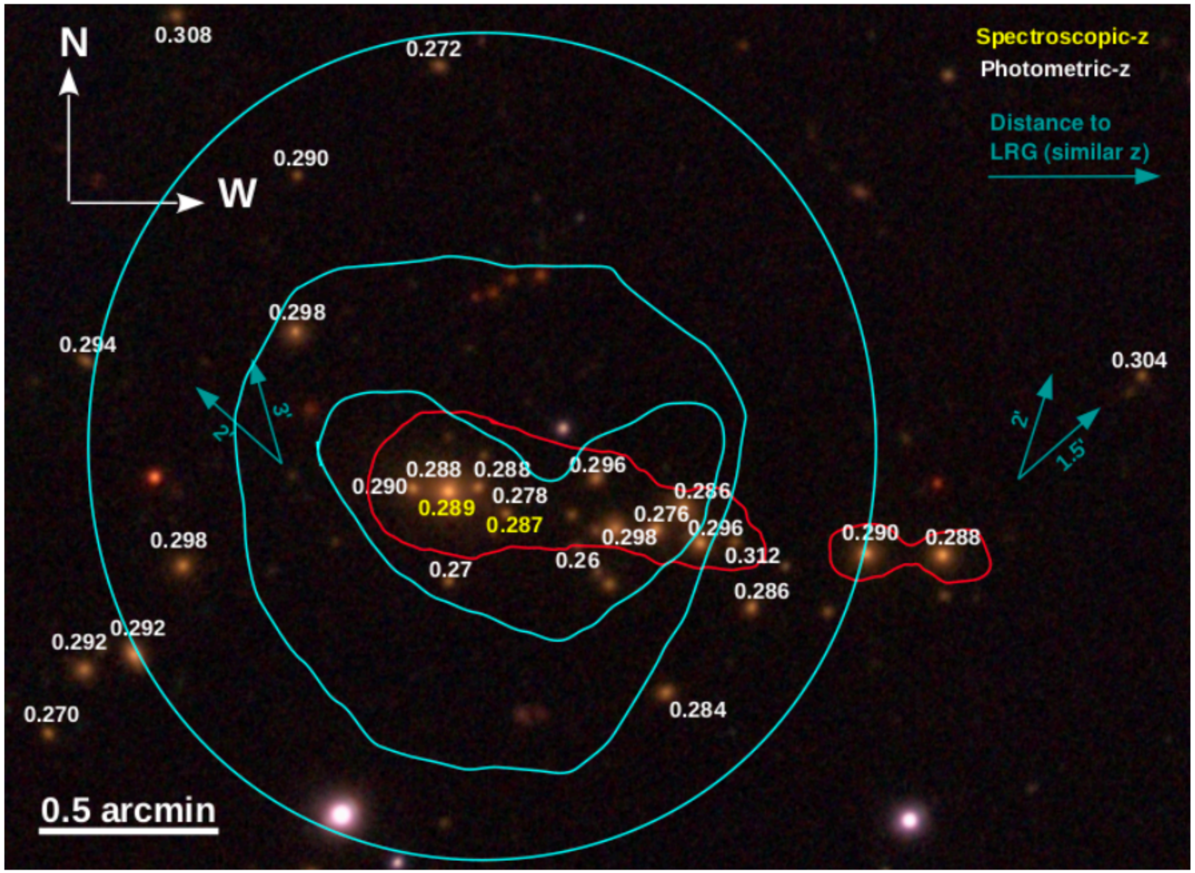
Clusters in miniJPAS



Currently two cluster finders in place:

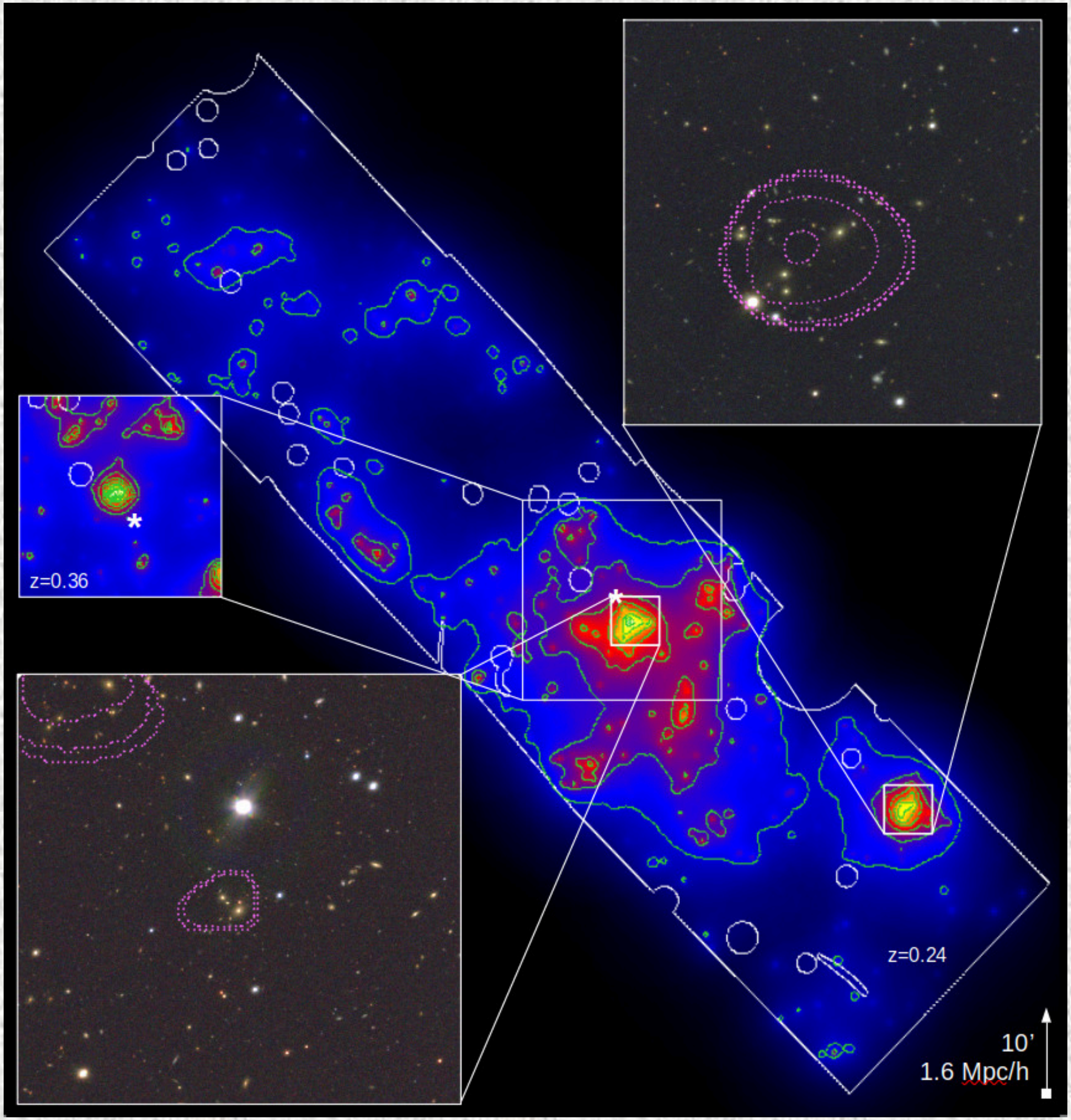
AMICO (Maturi+ 2023) and **PzWav** (Doubrawa+2023)

Clusters in miniJPAS



Bonoli et al., 2021.

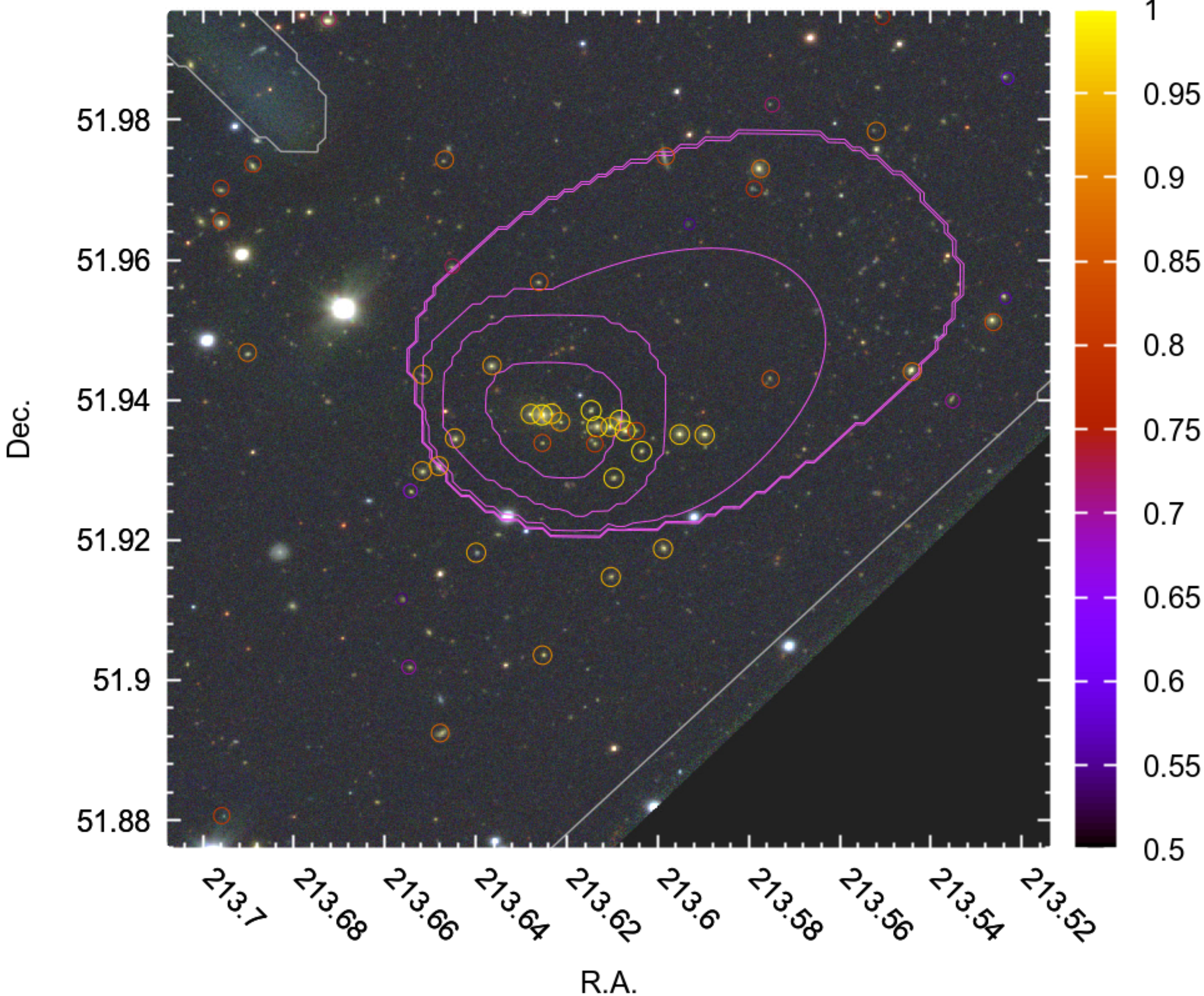
Fig. 27: The most massive cluster found in the miniJPAS footprint, centred at RA=213.6254, DEC=51.9379. This cluster is also part of the `redMaPPer` catalogue where it is listed as a clu-
ter with richness λ = 33. The brightest galaxy has a spectr



AMICO response to a redshift slice on ***z~0.24,*** dashed iso-contours correspond to **X-ray data**

Maturi et al. 2023.

Maturi et al. 2023.



Contours are provided by **X-ray** data, color bar renders **membership probability** for each galaxy assigned by **AMICO**

From ***membership*** we can assign total **luminosities** and **stellar masses** to clusters

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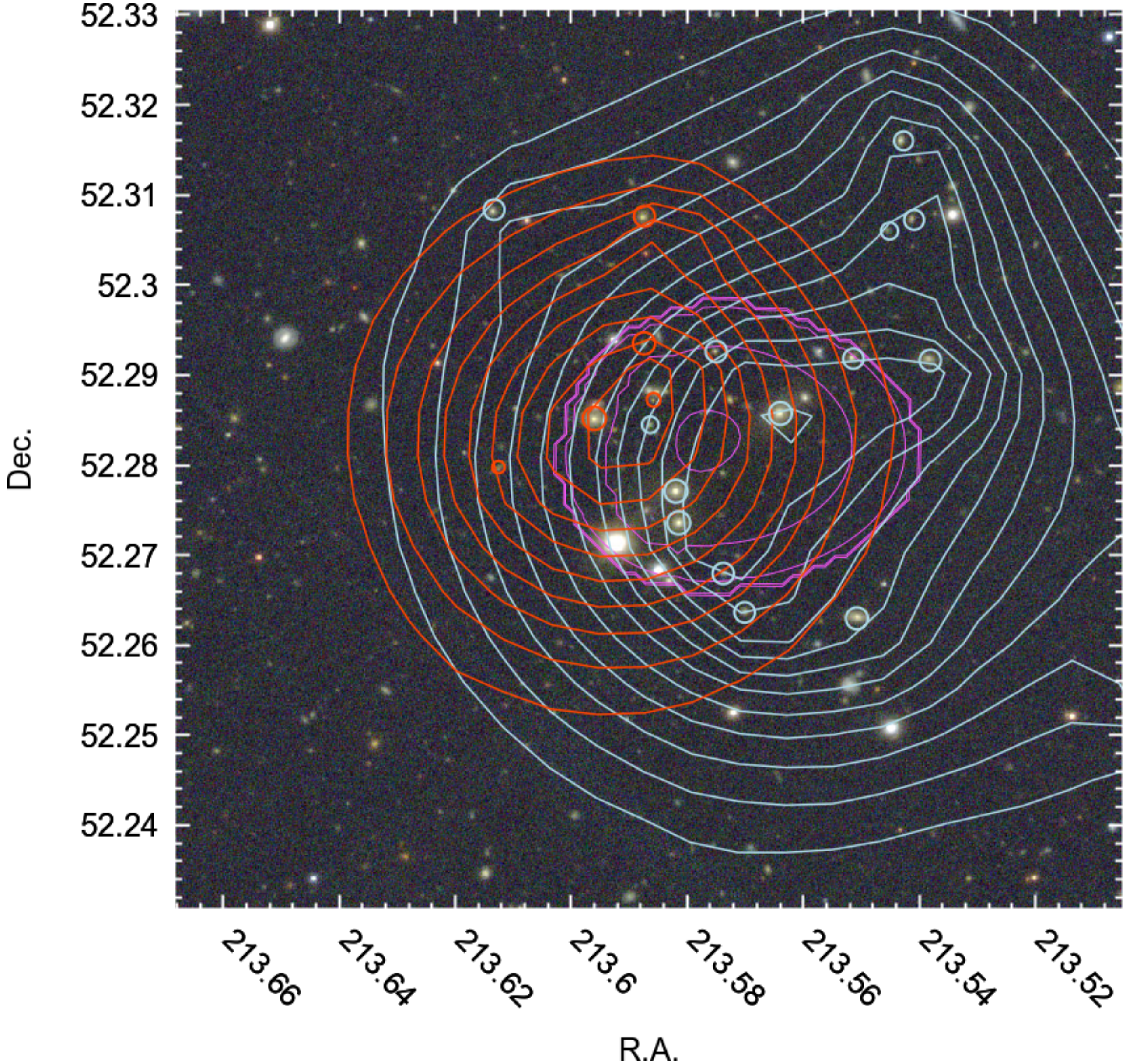
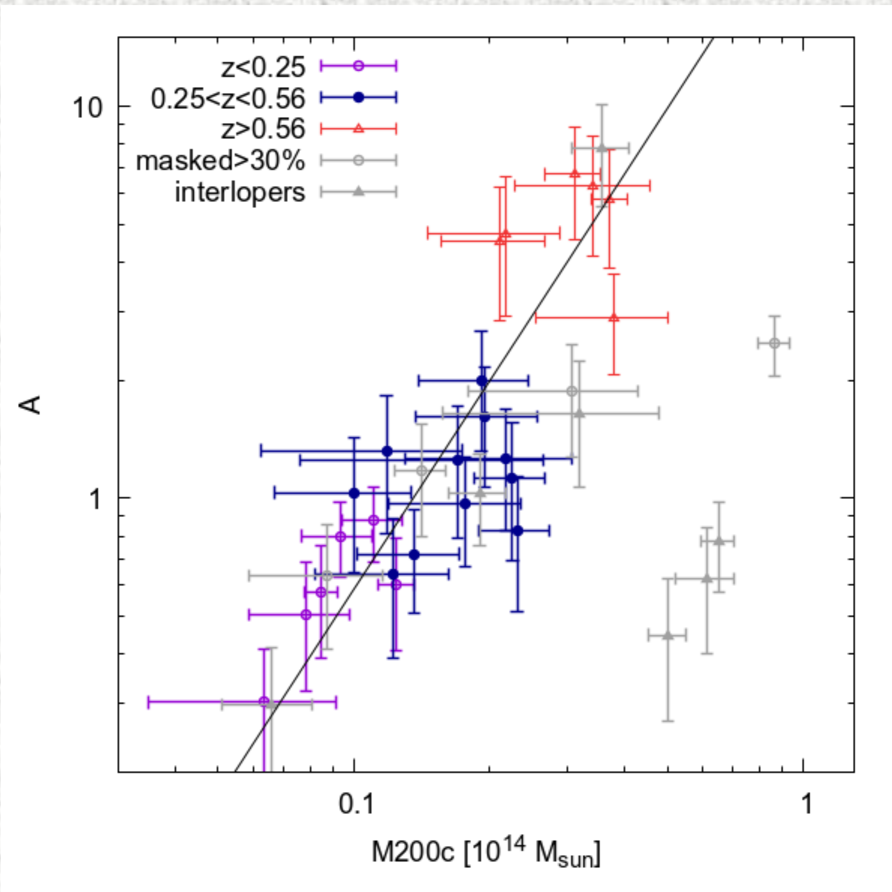
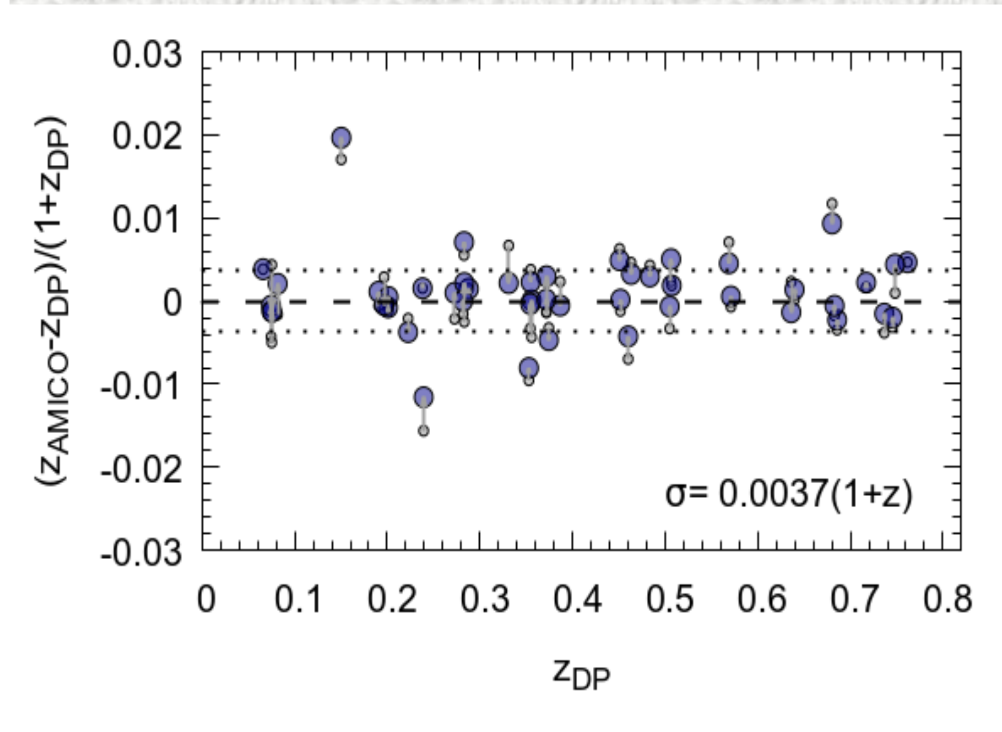
Maturi et al. 2023.



We can **distinguish interloping** clusters/groups along **very similar** lines of sight...

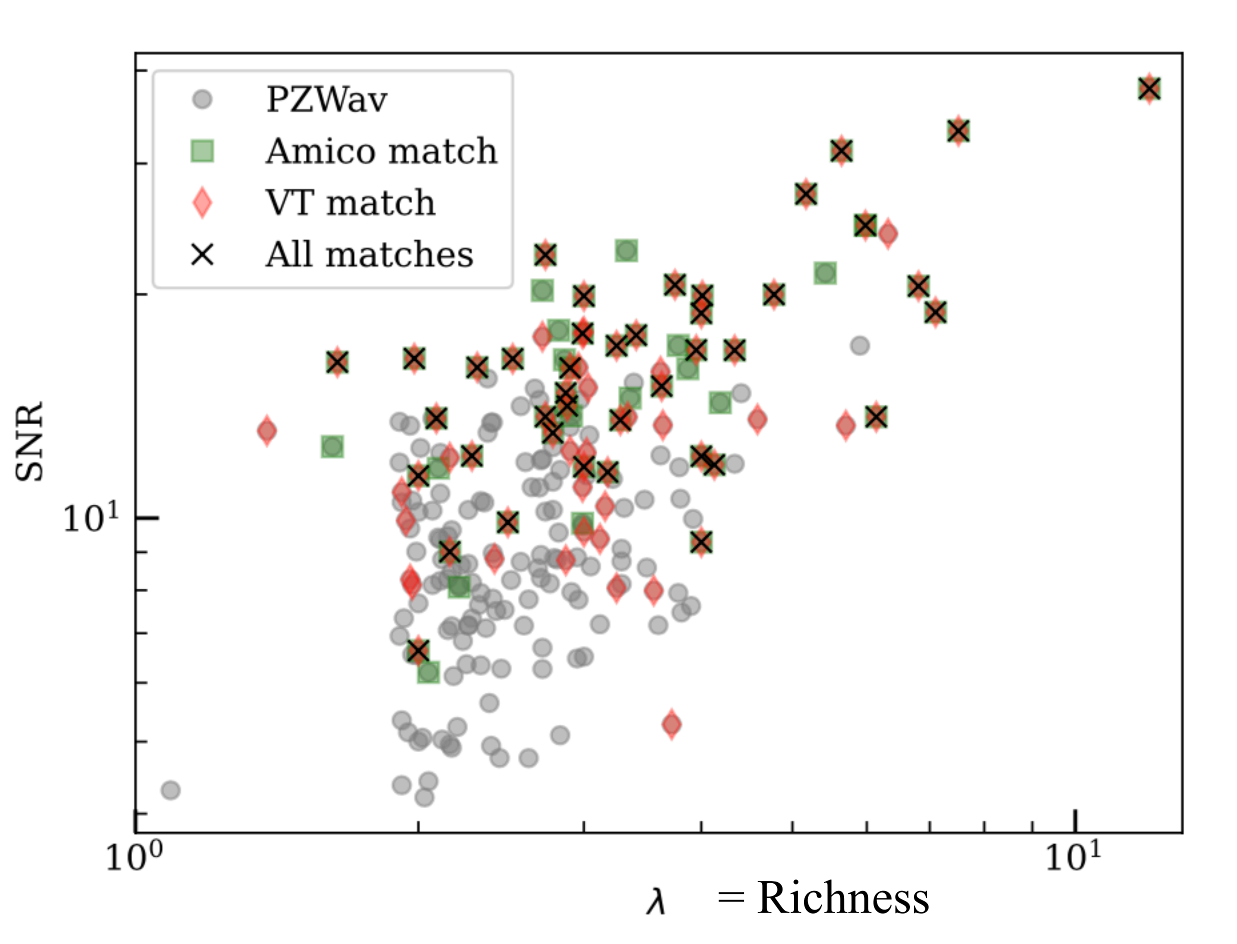
Maturi et al. 2023.





Low scatter in mass proxy – mass relation for Individual clusters (no binning/stacking)

Very **accurate & precise** redshift determination for clusters:
We shall be able to conduct **galaxy cluster clustering**



Doubrawa+ 2023: Comparing **different group finders**: **Voronoi Tesselation (VT), AMICO, and PzWav**.

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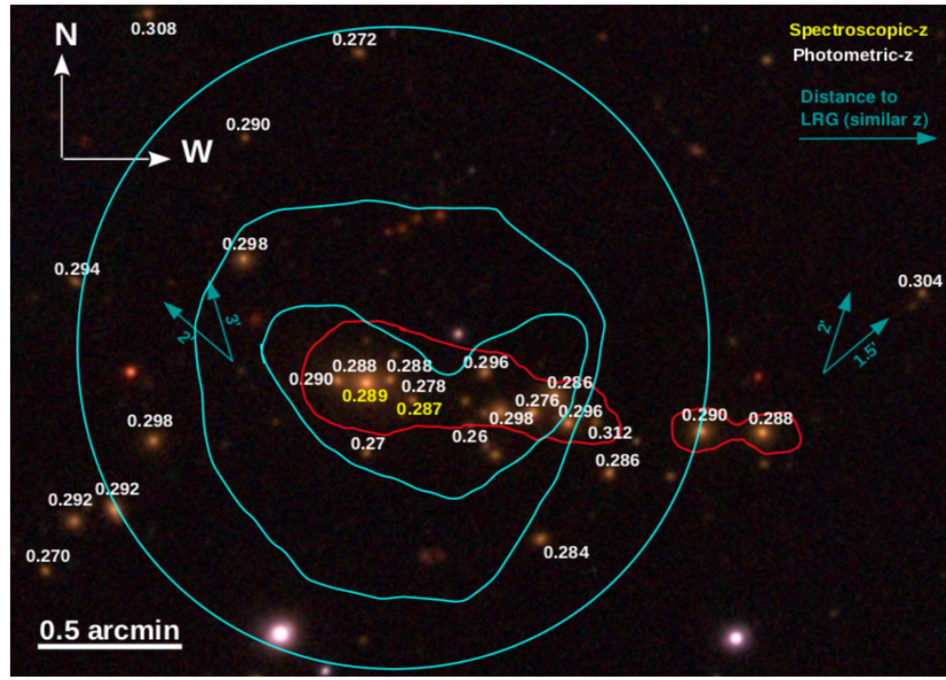
Clusters in miniJPAS

- **~95 groups** with $M_{200} > 10^{13} M_{\odot}$ in **~1 sq.deg** with high levels of purity and completeness up to *z~0.4*
- Internal weak lensing cluster mass estimates expected to give $\Delta \log M \sim 3\,\%$ or $\Delta\sigma_8 \sim 1.5\,\%$
- Current work towards establishing **density-based membership assignments** as a proxy for **optical mass**



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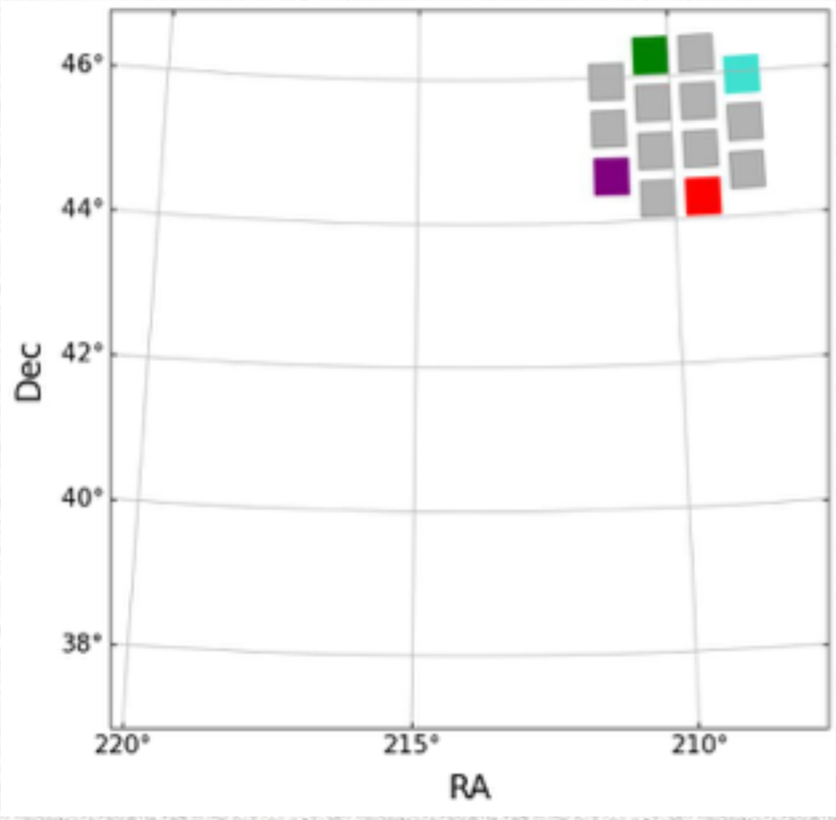
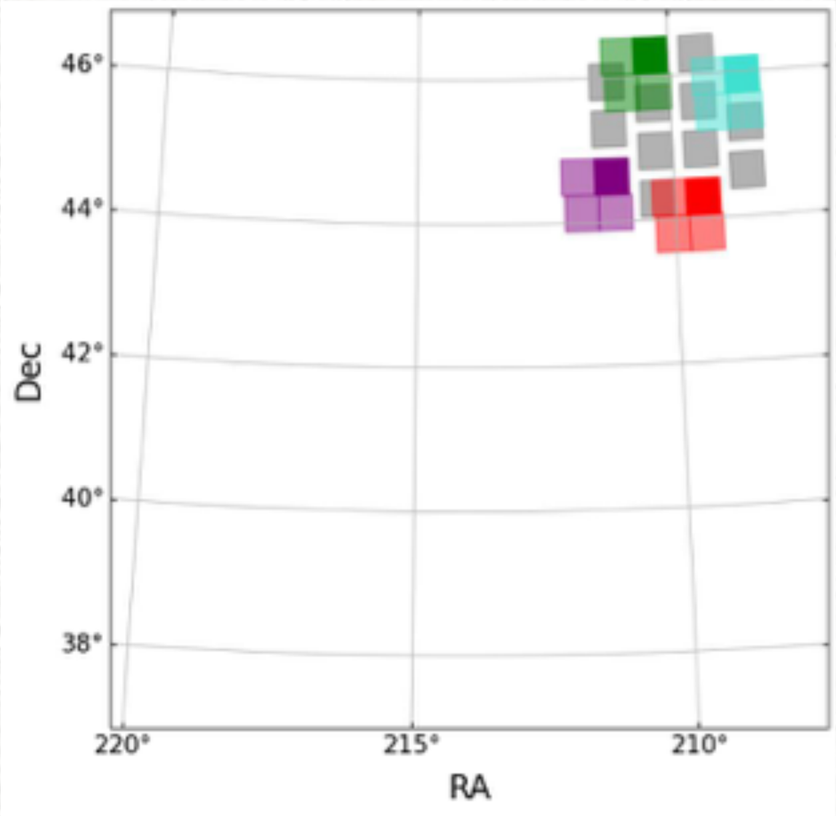
Bonoli et al. 2021

Current status and future prospects

Growth of area covered in all filters



Growth of area covered in all filters



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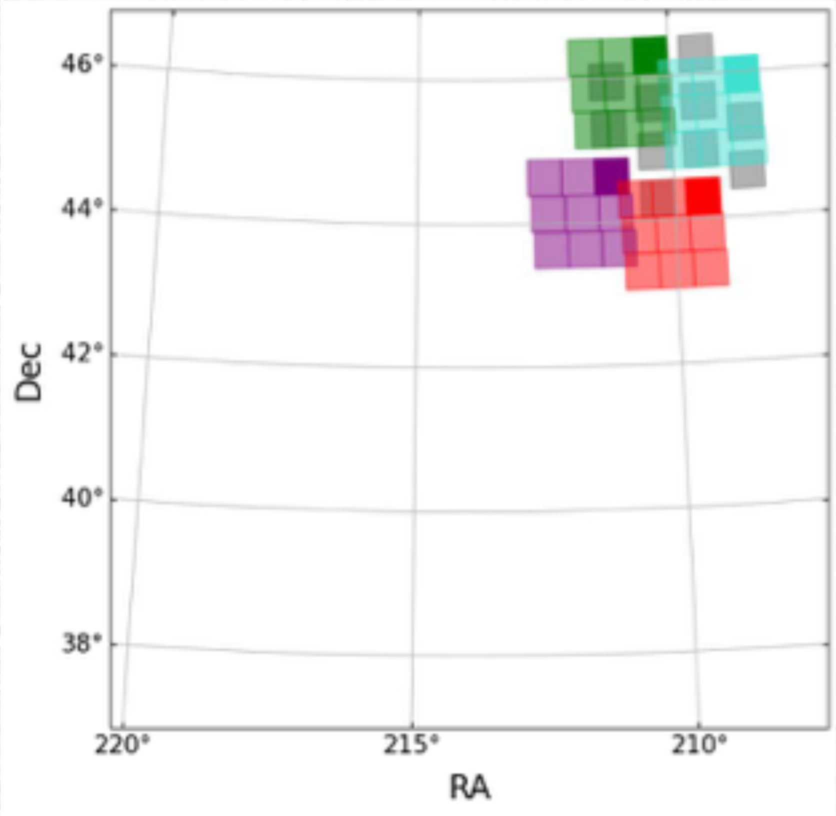

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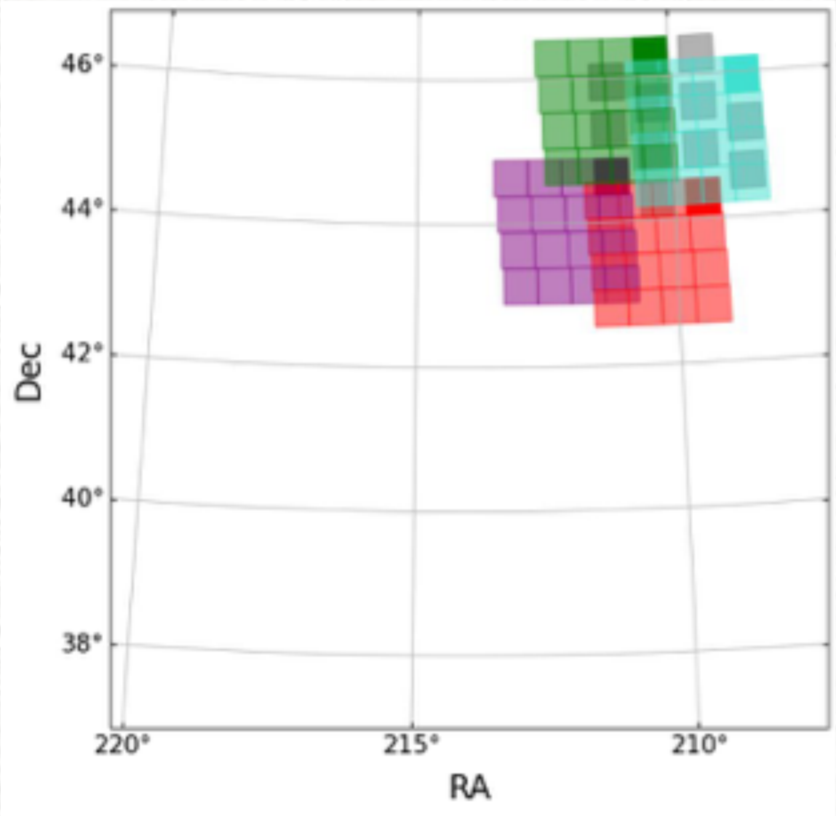

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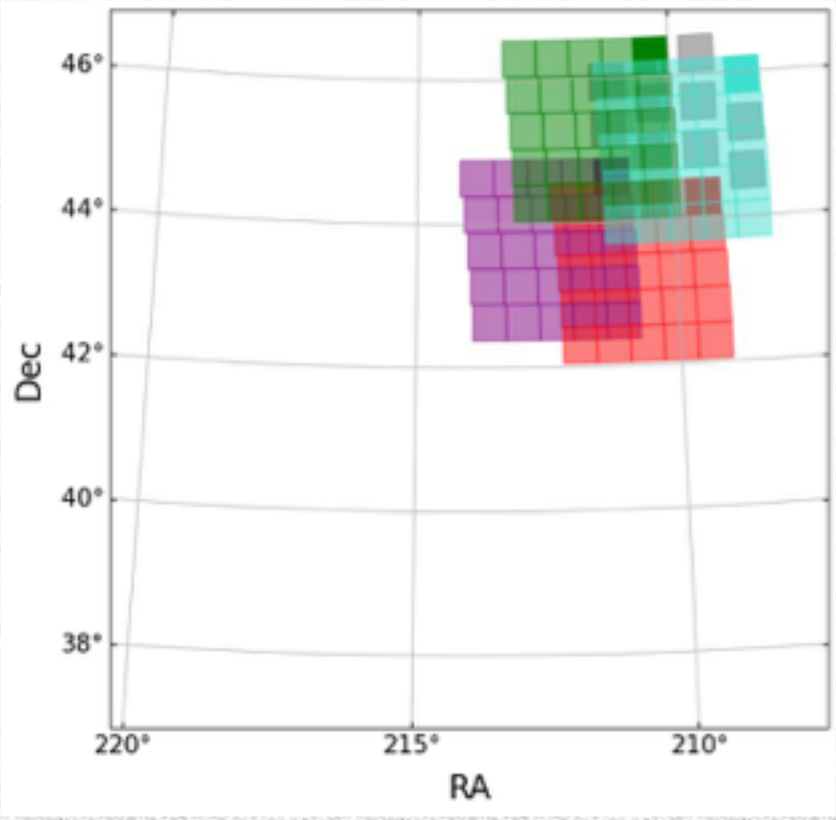

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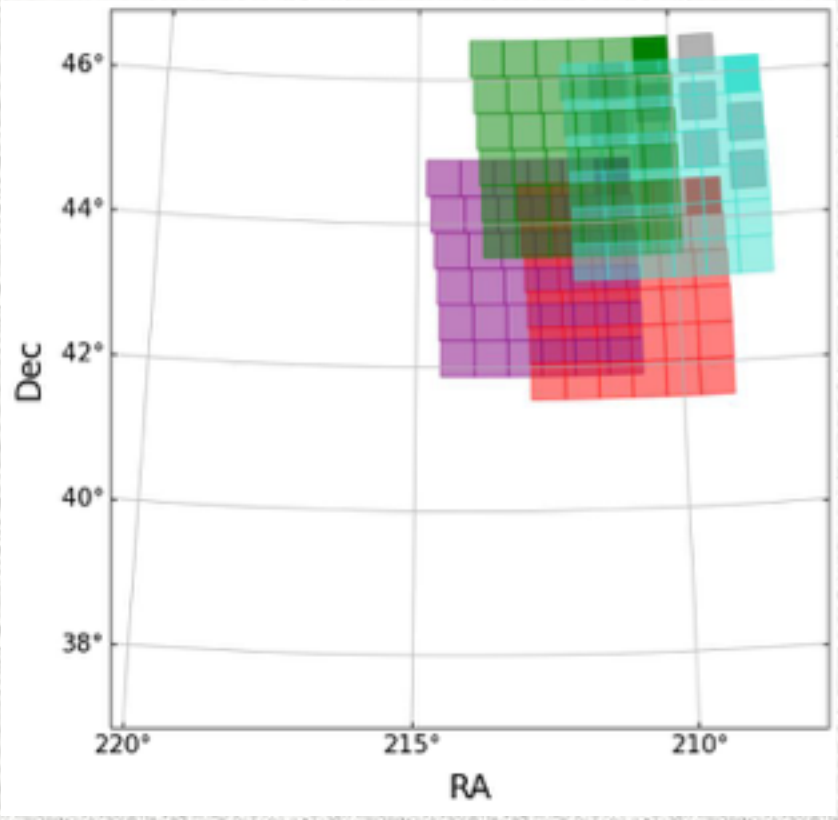

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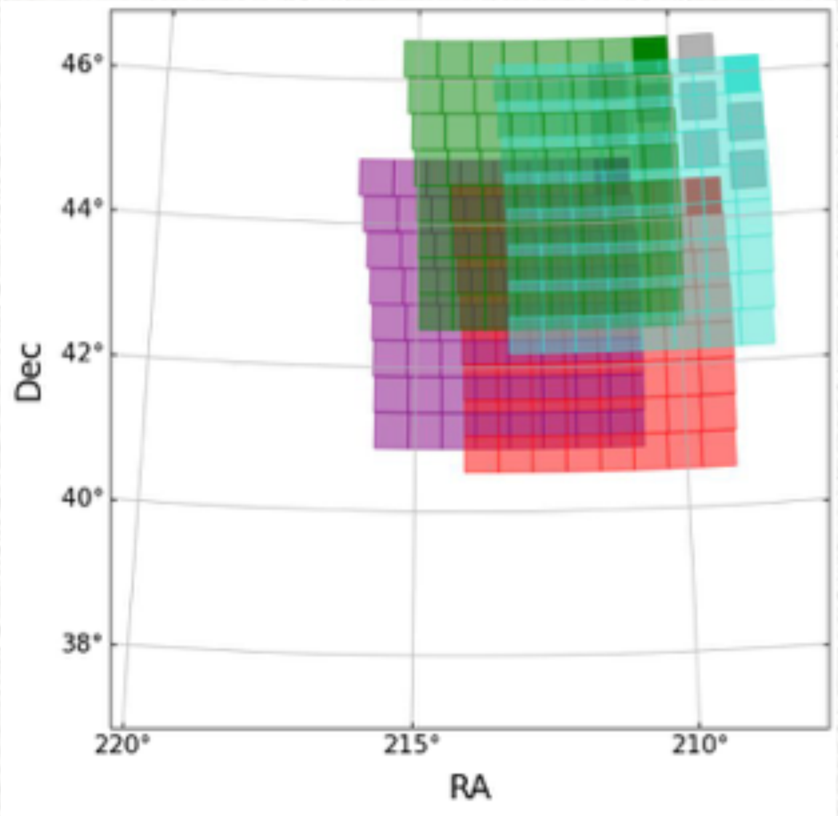

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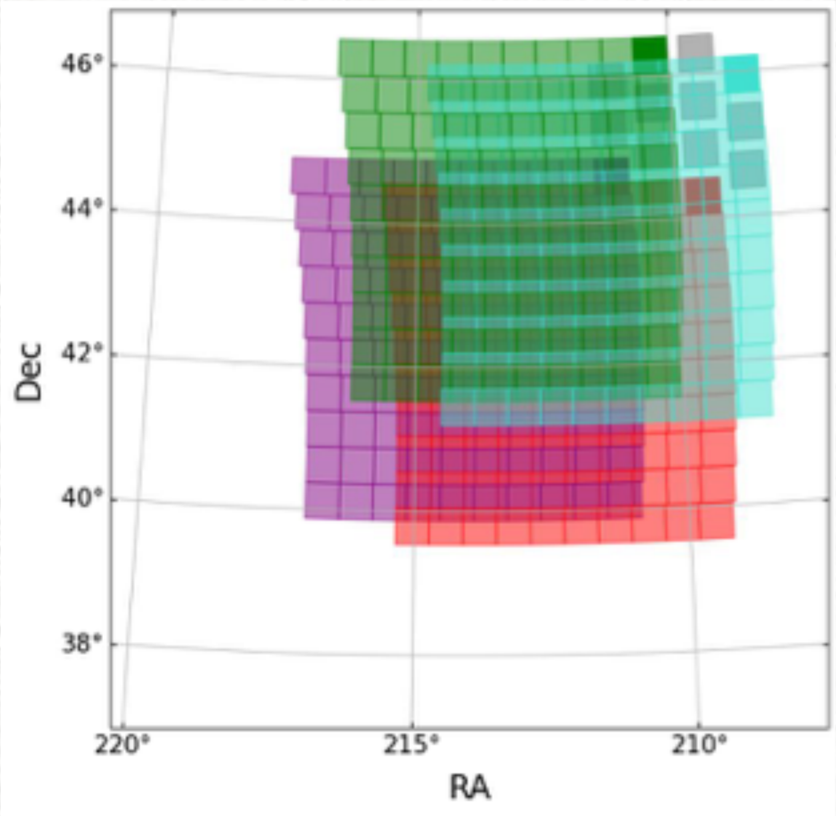
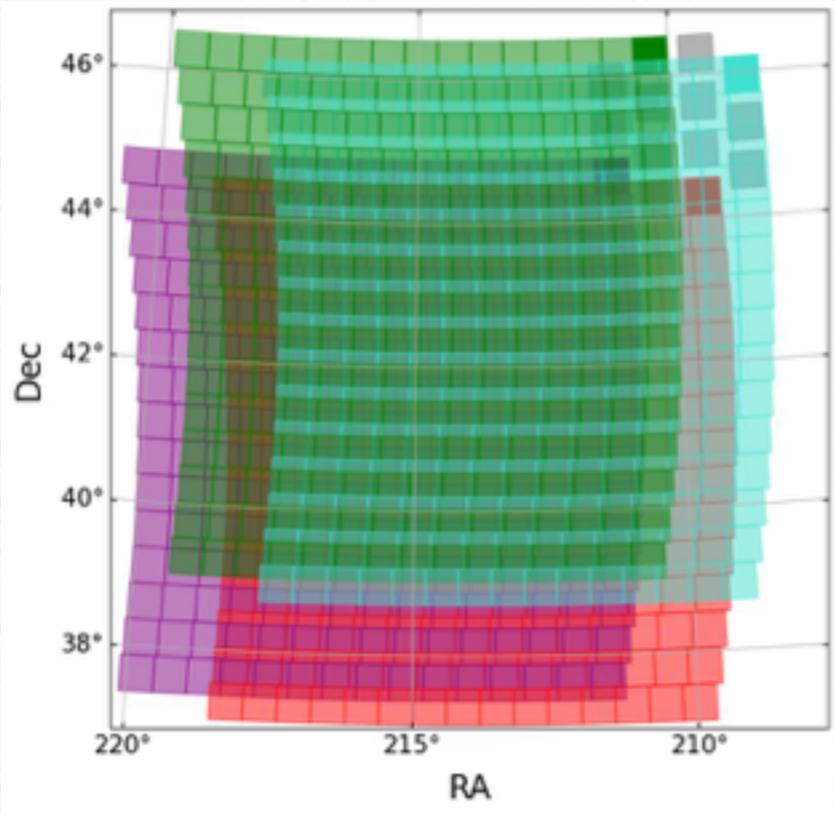
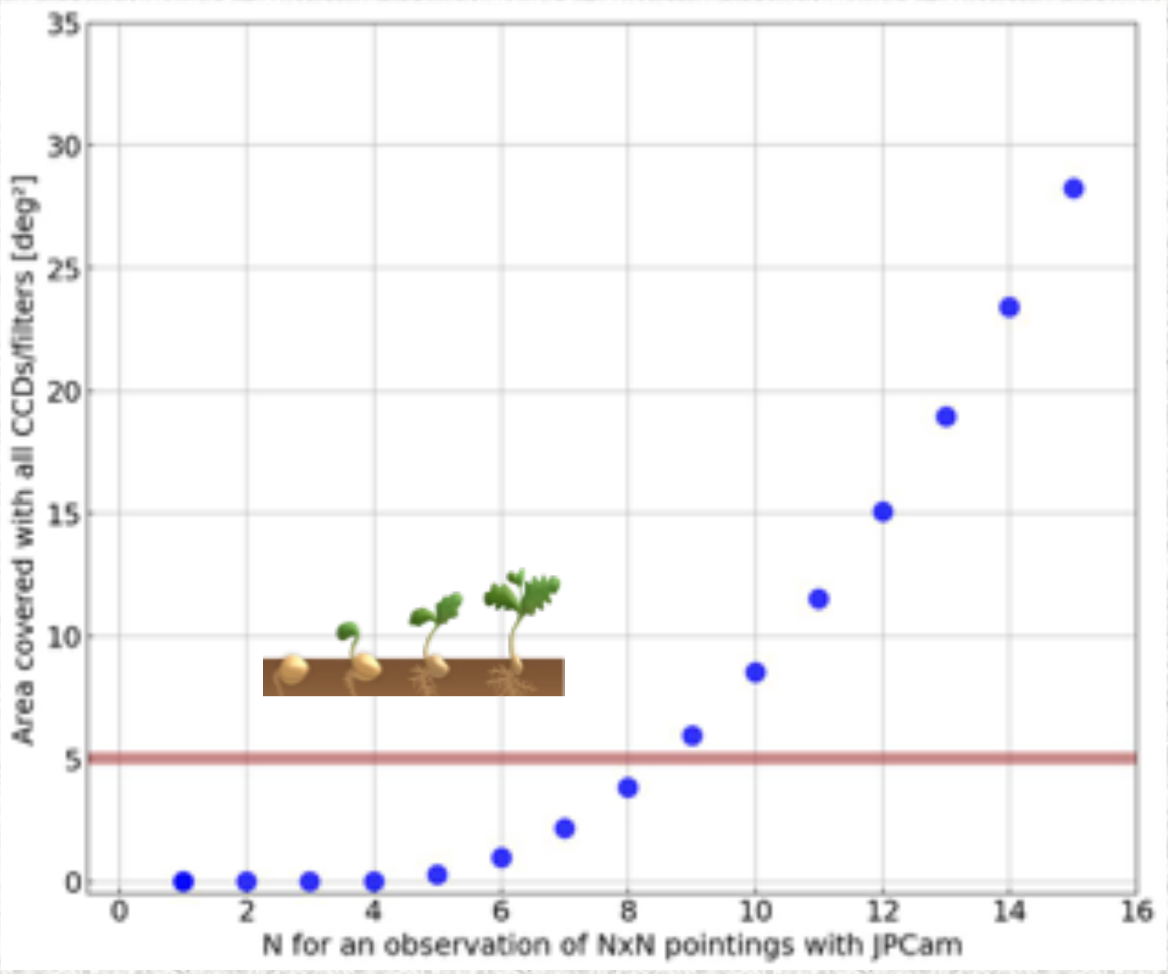


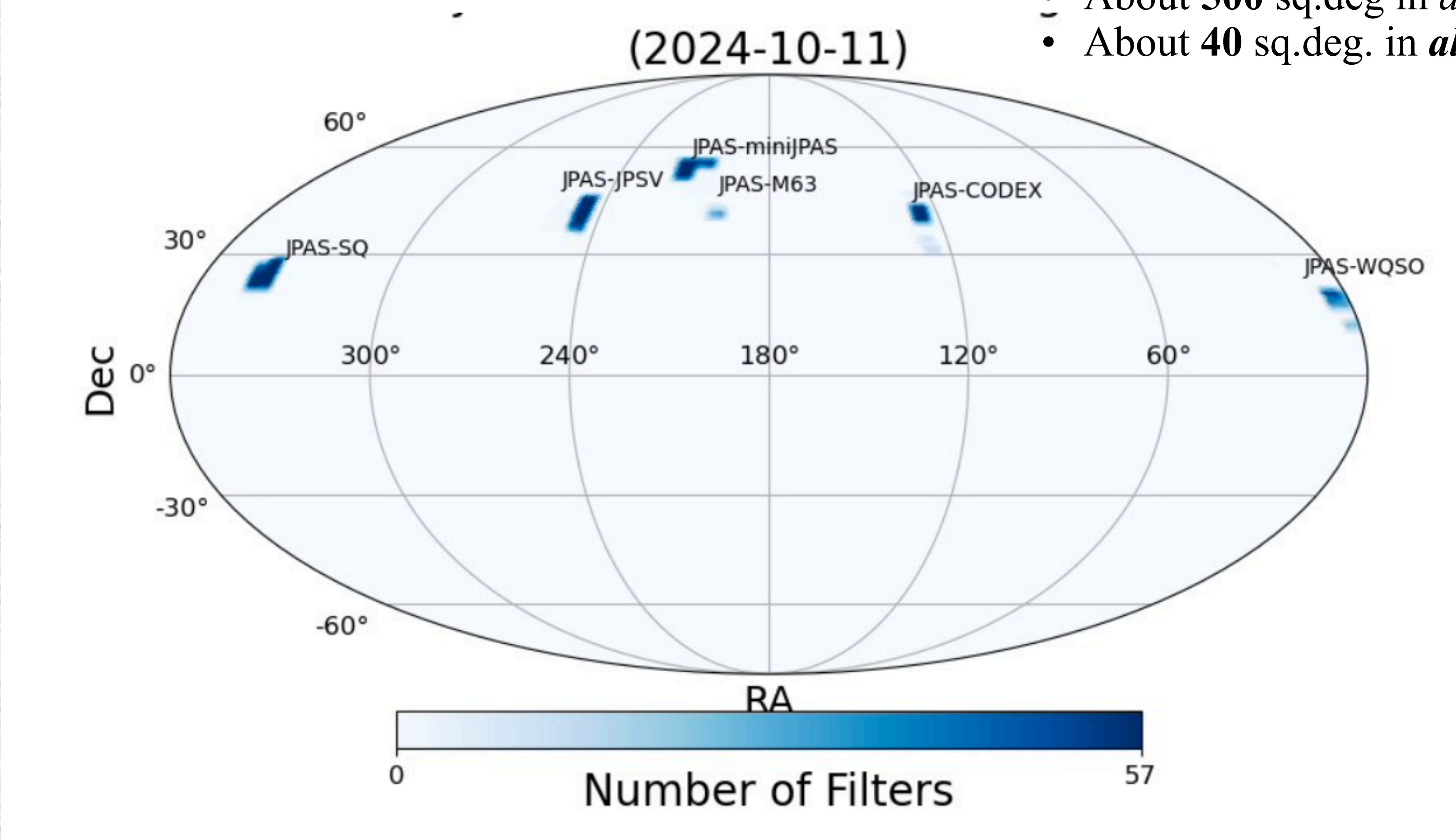
Growth of area covered in all filters



Growth of area covered in all filters

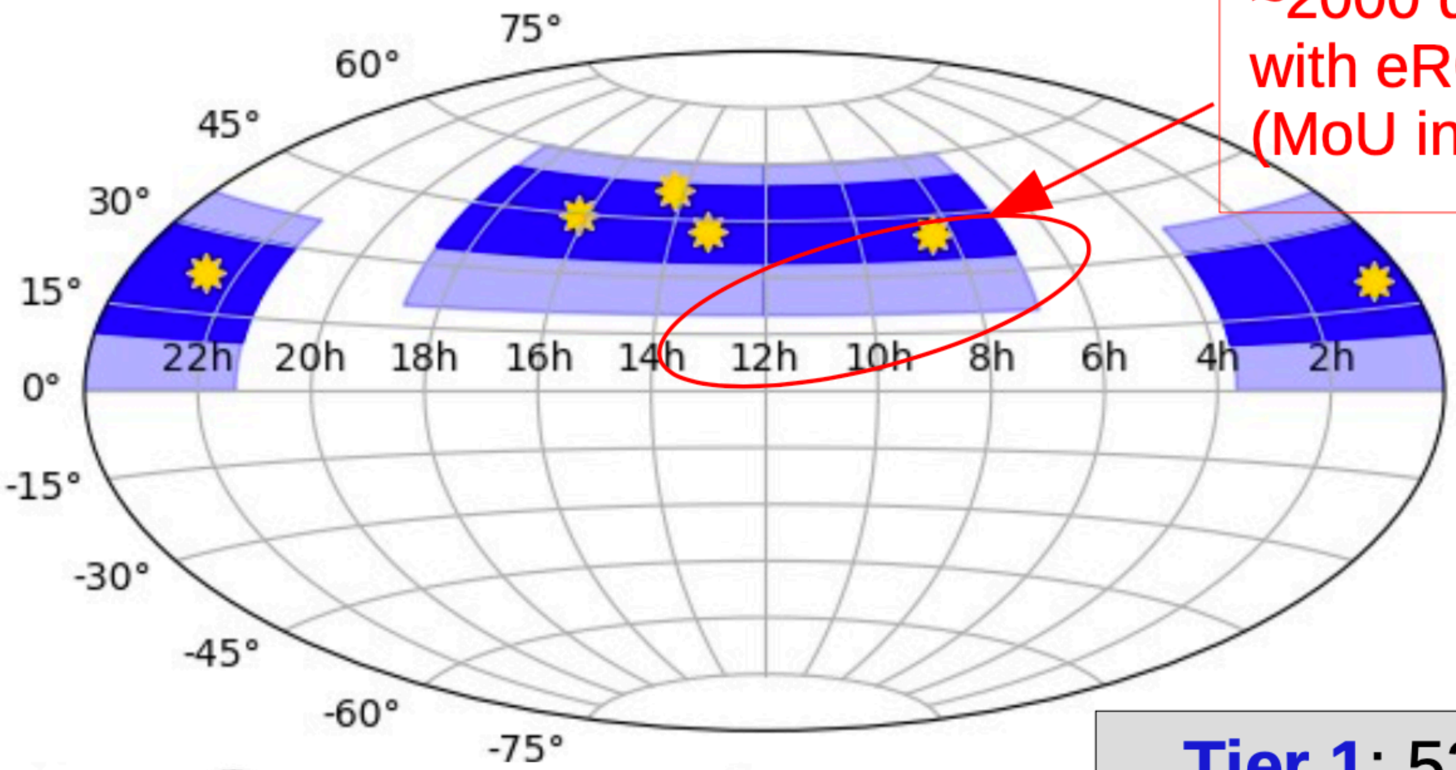


Current status



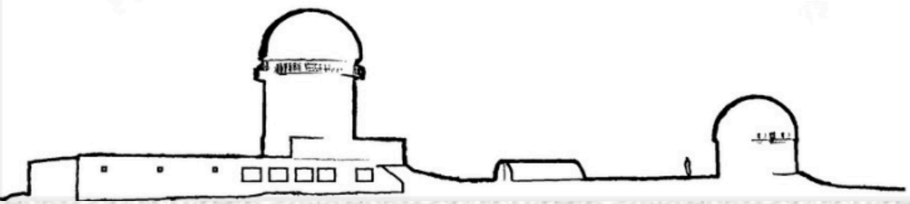
- About **500** sq.deg in *any* band
- About **40** sq.deg. in ***all*** bands

Survey growing around 6 ***seeds***



~2000 deg² overlap with eROSITA-DE (MoU in place)

Tier 1: 5200 deg^2
Tier 2: 8500 deg^2



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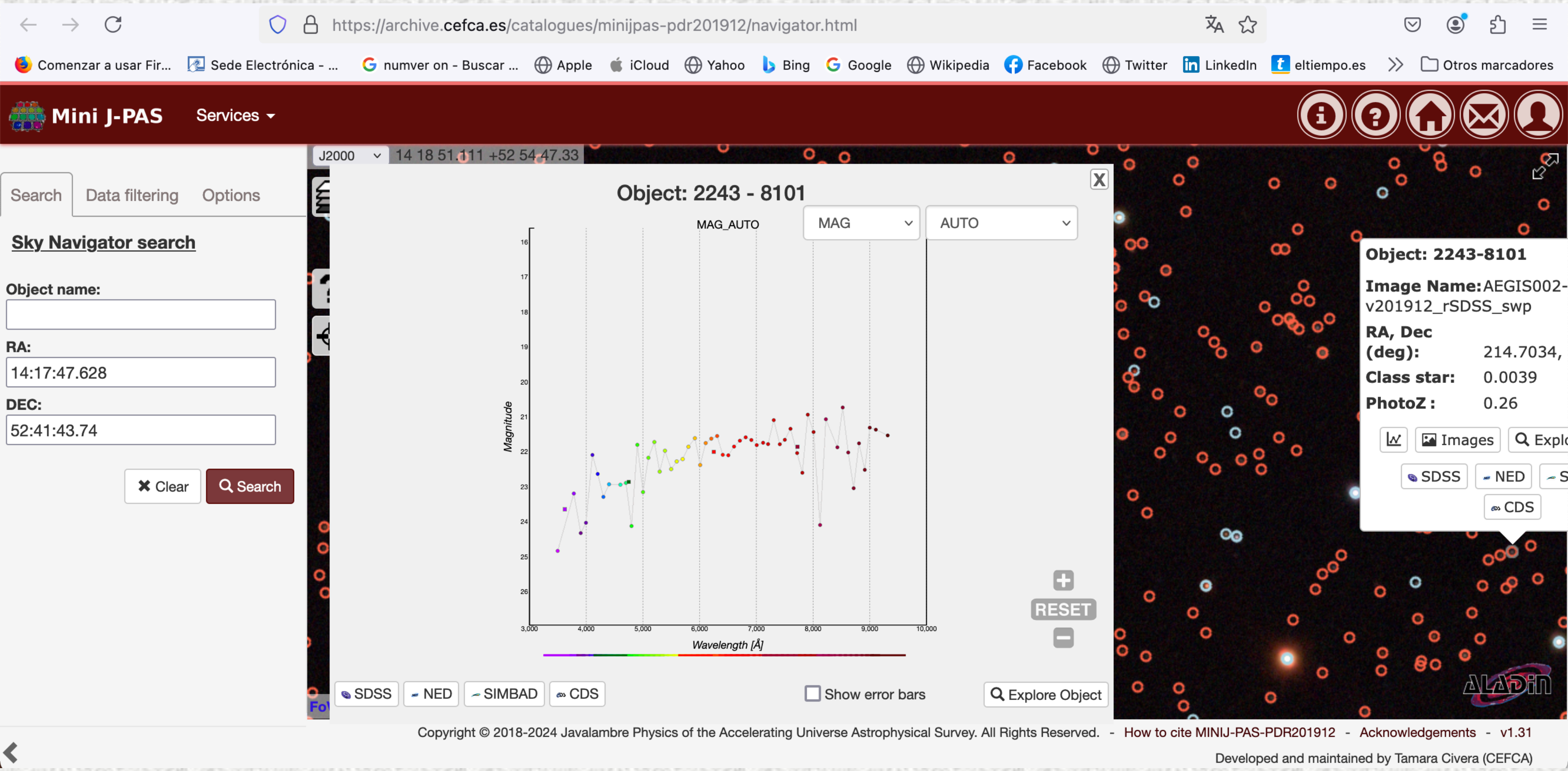
Take Home messages

- **54** NB + **3** MB/BB filters over ~8,500 sq.deg
- **4.5** deg^2 FoV
- Up to mag~ **24.5 in BB filters, ~ 22.5 in NB ones**
- 90M ELG and LRG
- Reaching **~0.3% photo-z precision for ~1/3rd of galaxies**
- Millions of QSOs at similar level of precision (**~0.3—0.5%**)
- 200M of galaxies
- **~700K of groups and clusters** with accurate photo-*z* and memberships
- **~10 sq.deg of J-PAS data** to be public in **November 2024**

- **You can already access real miniJPAS & J-NEP data at https://archive.cefca.es/catalogues**
- http://www.j-pas.org

https://archive.cefca.es/catalogues



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Merci bien !

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