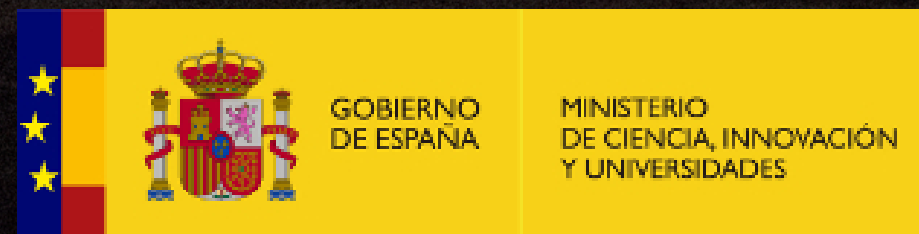


JPCam future call for proposals, observing strategies and tools

Javier Zaragoza Cardiel

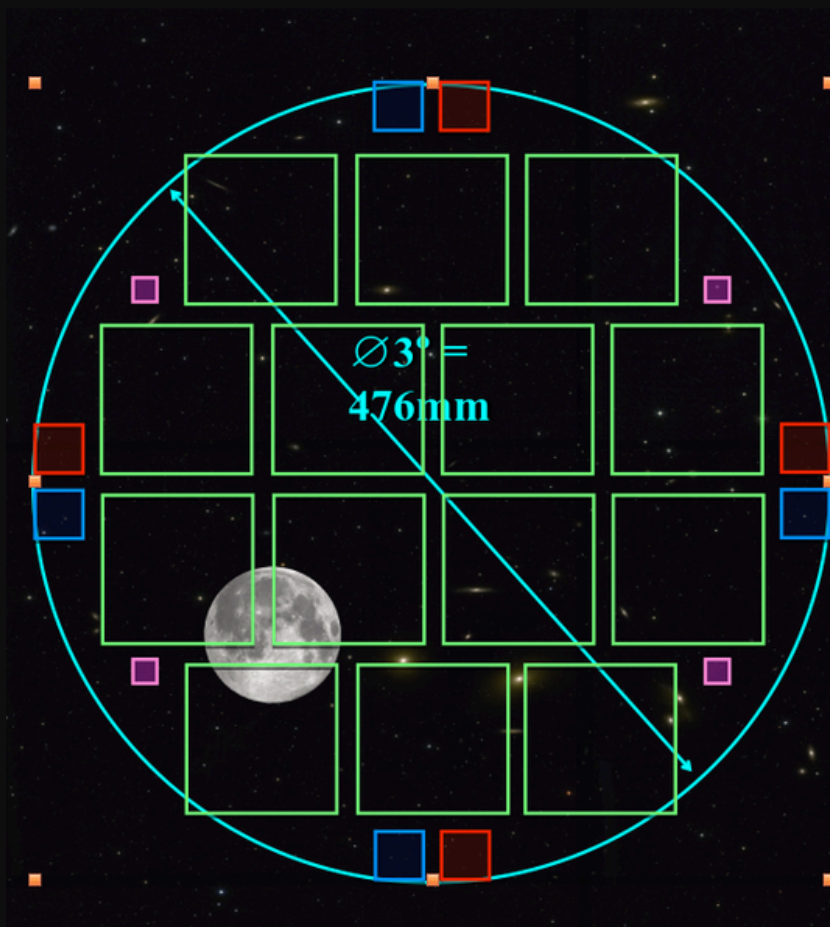


Observatorio Astrofísico de Javalambre

Javalambre Panoramic Camera (JPCam)



JPCam main characteristics



CCD format

**14x9216x9232, 10 μ m pix –1
1.2Gpix camera**

Pixel scale

0.2265 "/pix

Unvignetted FoV

3.4deg 2 – (14×) 0.48deg × 0.51deg

**Read out time (633kHz)
Read out noise (633kHz)**

**10.9 s (full frame) – 6.1 s (2x2 binning)
5.5 e – (RMS)**

**Read out time (400kHz)
Read out noise (400kHz)**

**16.4 s (full frame) – 8.9 s (2x2 binning)
4.3 e – (RMS)**

Gain

2.274 e – /ADU

Minimum exposure time

0.1 s

**Exposure homogeneity
Full well
Dark current**

**1 ms
> 125 000 e –
0.001 e – /pix/s**

Competitive approved projects being observed with JPCam

On February 2025 we released a CfP to observe with JPCam the semesters 2025B-2026A-2026B.

Six projects were approved:

- The Hercules cluster in J-PAS filters (PI S. Zarattini)
- J-ATLAS (PI B. Anguiano & A. del Pino)
- J-ARRAS: Asteroids with JPCam (PI D. Morate)
- STELLAR STREAMS IN SEXTANS SPHEROIDAL (PI D. Martínez-Delgado)
(CANCELED due to the maximum exposure time allowed)
- AURORA: time-domain in the Northern sky (PI A. Ederoclite)
- A stellar occultation by Haumea (PI JL Ortiz). FINISHED

JPCam Legacy Surveys Call for Proposals

- We will release a Call for Proposals (CfP) for Legacy Surveys with JPCam in July 2026.
- A total of 1200 hours will be offered over a five-year period (240 h/year). This time allocation includes all sky conditions: dark, grey, and bright time; photometric and non-photometric conditions; as well as good and poor seeing. Filler programs are welcome.
- The observing period will cover semesters 2027A–2031B.
- All filters will be offered: 54 narrow-band, 2 medium-band, 3 broad-band.
- Unfiltered* observations will also be available.
- The proposal submission deadline will be 15 September 2026.
- Open time will be available to the international community.
- Proposals must be submitted by the PIs via email using the provided document template.
- Projects will be evaluated by the OAJ-TAC based on their scientific merit.
- Approved programs are expected to start in January 2027.

Issues detected in the Letters sent

- The maximum exposure time at the beginning will be 100s, so please do not enter values larger than this in the exposure time box of the JPCam Exposure Time Calculator (JETC).
- Although the maximum time per project is 240 h/year, please carefully consider the observability and observing conditions required for your project.
- Please use the Project Total Time Estimation provided by the JETC to estimate the required observing time. This estimate includes telescope pointing, optical alignment, actuator movements, mosaic readout/download, and other operational overheads.
- This is not an issue, but it is a common request: observations without filter are possible, although technical approval from the observatory is required. Please note that this mode affects the optical quality of the images and the flat-field correction.

JPCam proposal submission

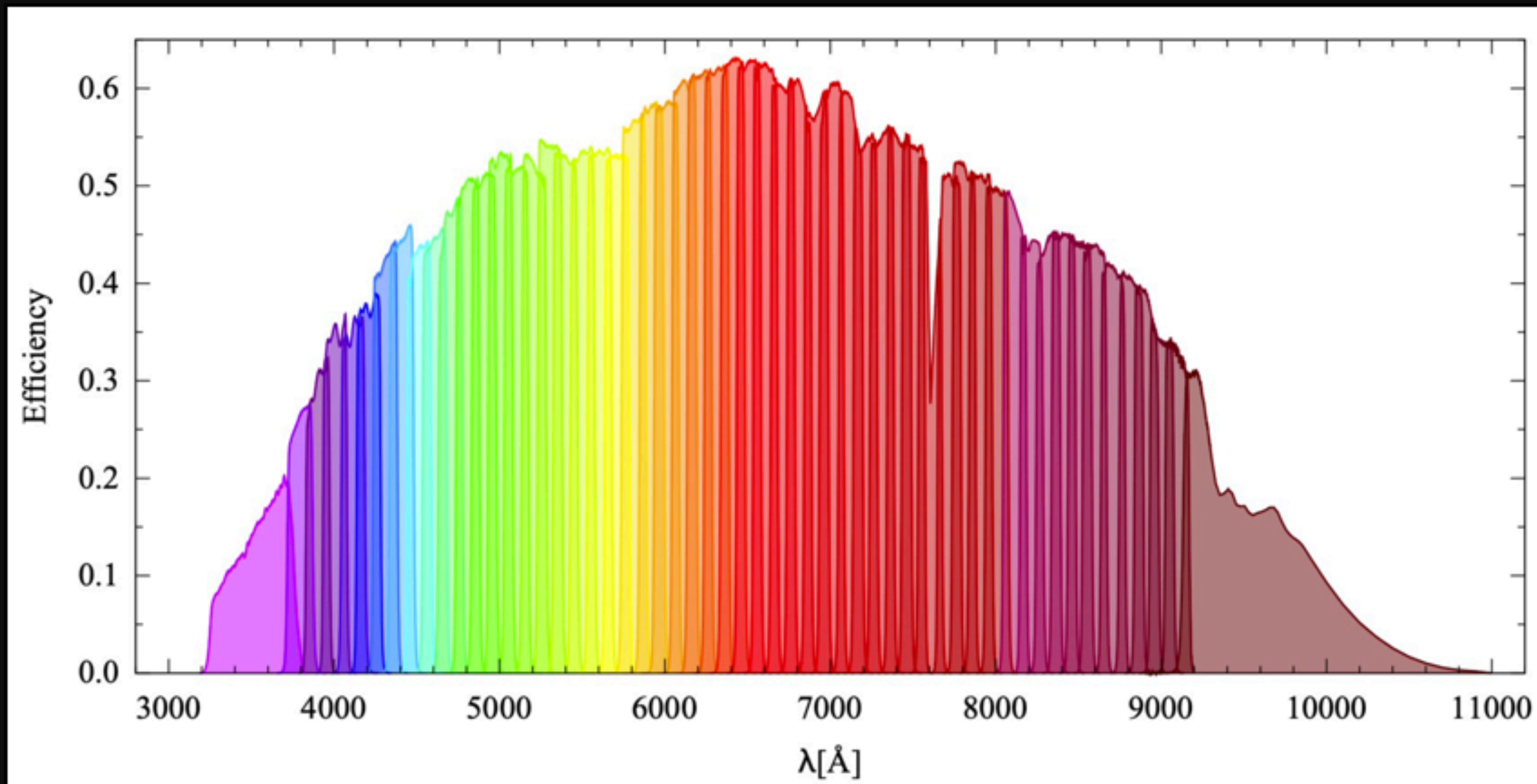
- Proposals will be submitted using the document template provided by the observatory.

Recommendations

- Maximum time per project is 240 h/year. Carefully consider the observability and observing conditions required for your project. On average, about 20 h/month/year will be available, distributed among dark/grey/bright time, photometric/non-photometric conditions, and different seeing ranges. If your project is observable only during a limited period (e.g. three months) and requests more time than is realistically available under specific observing conditions during that period, this will be taken into account during the evaluation process and may reduce the likelihood of approval.
- In the proposal is advisable to mention the minimum observing time required to produce scientific results.

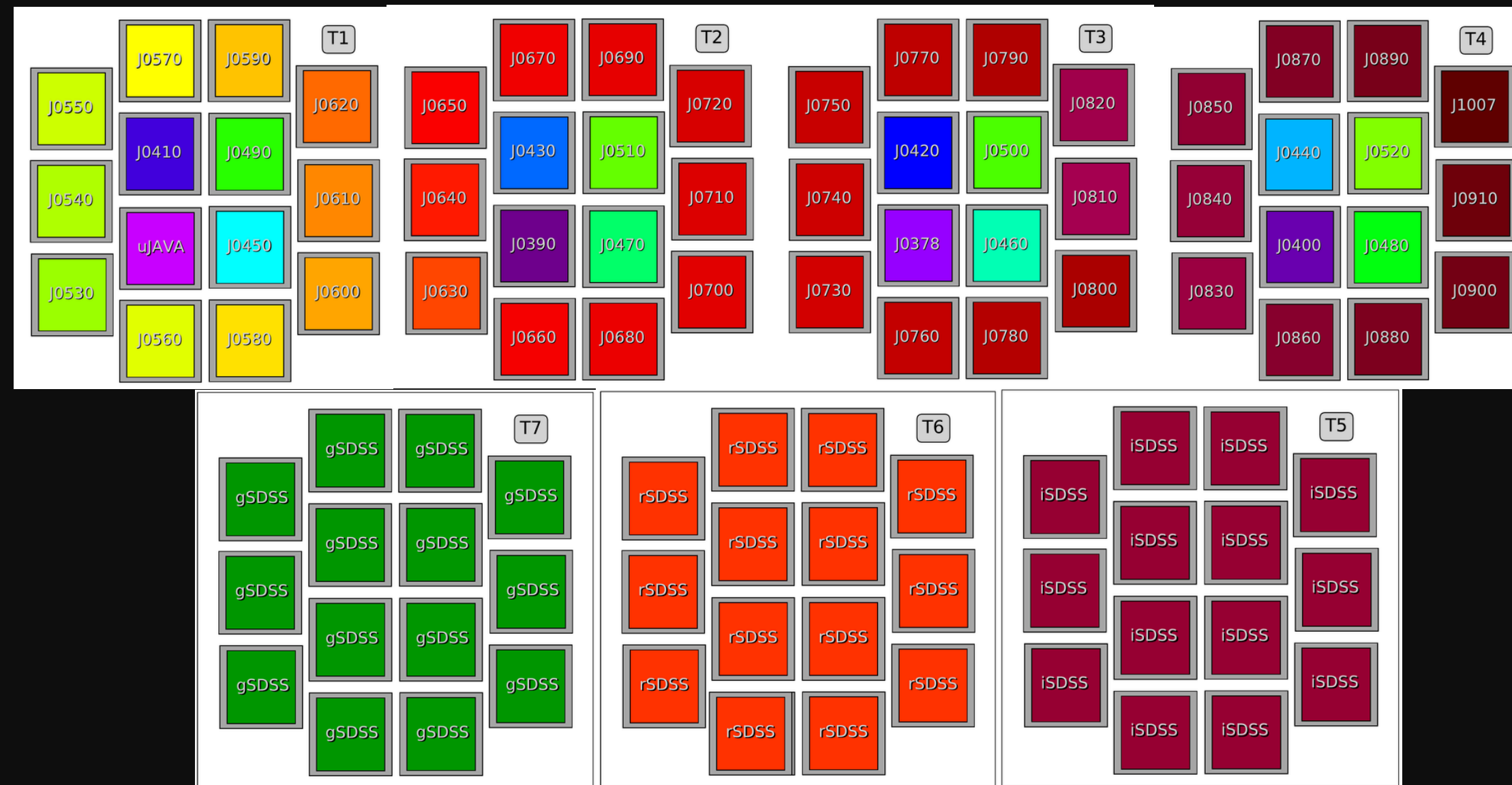
J-PAS filter system

- 54 narrow band, 2 medium band, 3 broad band (gri)



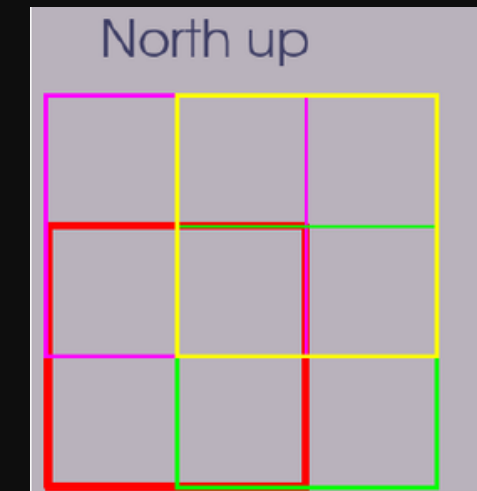
Observing Modes Offered

- All filters offered: 54 narrow band, 2 medium band, 3 broad band (g, r, and i)
- Distribution of filters can not be changed*.



	Mode 02	Mode 03
Filter Tray	T5, T6, T7 broad band (<i>gri</i>)	T1, T2, T3, T4 narrow band
Readout noise	5.5e ⁻	5.5e ⁻
Gain	2.274e ⁻ ADU ⁻¹	2.274e ⁻ ADU ⁻¹
Binning	1×1	2×2
Readout time	10.9s	6.1s

Dithering 850"
(0.5*CCD eff size)



Observing Modes Offered & Supported

- T1, T2, T3, T4 (narrow band trays) binning 2x2 (0.453"/pix)
- T5, T6, T7 (broad band trays) no binning (0.2265"/pix)
- 4 Dithers. 0.236 degrees shift recommended. This is the recommended/supported option. If background subtraction and flux calibration precision are not important this dither pattern can be relaxed.
- Pointings need to be defined using JOP <https://www.cefca.es/jop/plan/field.html>
- Minimum exposure time: 0.1 second (small exposure times <10s should be justified).
- Maximum exposure time: 100 seconds (per dither/exposure). If you need more time, just make more exposures, always a multiple of 4 in T1234 because of the dithering pattern needed.
- There is no minimum area.

Data products

- Raw scientific data, bias, darks, flatfields.
- Scientific data reduced in a standard way with pipelines developed by CEFC.
- Flux-calibrated precision $<1\%$ when standard supported mode is used.

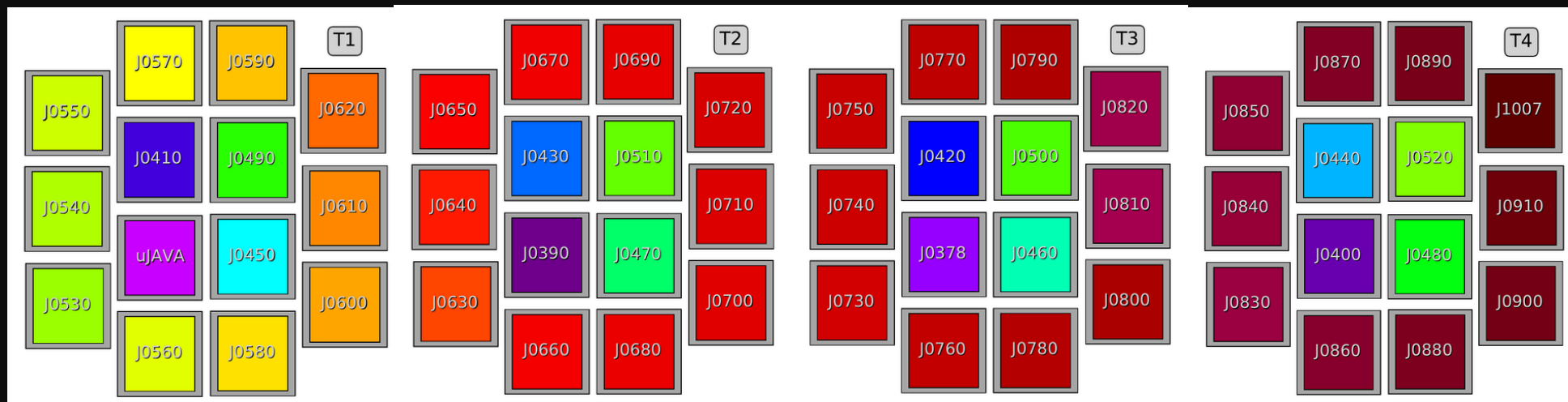
Non-standard observations

- Non-standard observations: different dither pattern, different pointings, different filter distribution, no filter, longer exposure times, different readout modes, etc.
- PI must obtain OAJ technical approval if non-standard observations are requested. This approval should be included in the technical justification of the proposal.
- Different dithering patterns could be proposed, but this can affect the quality of the offered data reduction (flux calibration and sky subtraction).

JPCam observational strategy

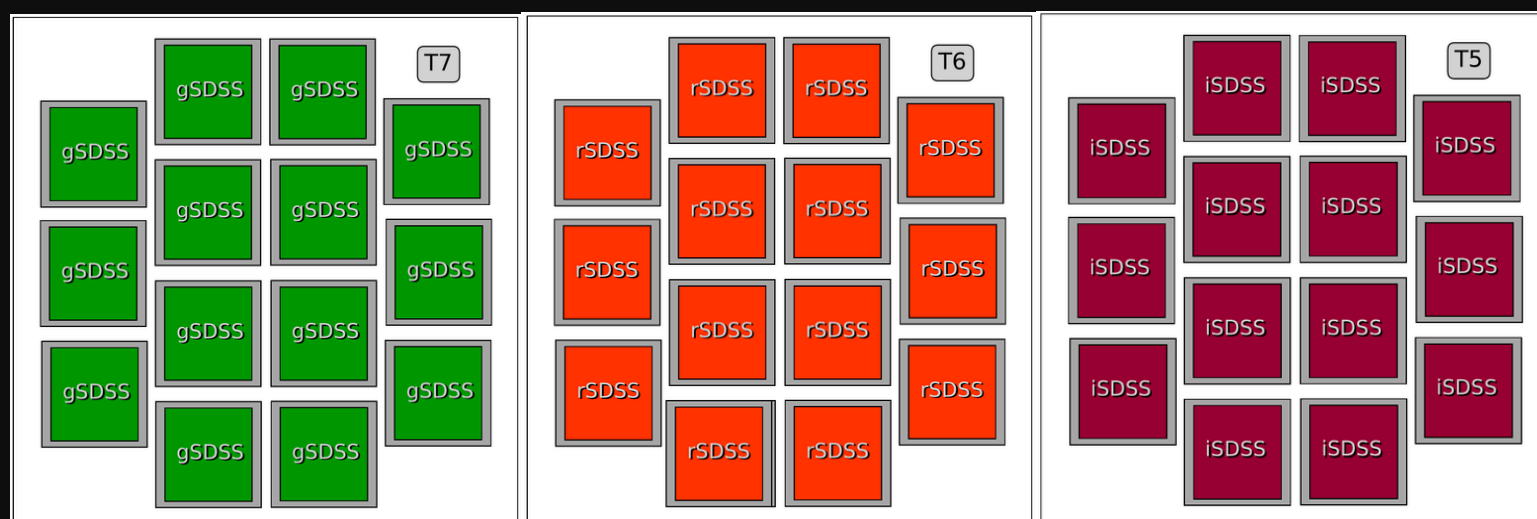
- JPCam has gaps between its CCDs, and the 14 CCDs can either share the same filter (for Broad Band observations) or use different filters (for Narrow Band observations).
- A specific strategy is needed to achieve a contiguous imaging area.
- Dithering is essential not only for accurate flux calibration but also for optimal sky background subtraction.
- Two observational strategies are offered:
 - Broad Band Strategy (T5, T6, T7, using gri filters, where all 14 CCDs share the same filter)
 - Narrow Band Strategy (T1, T2, T3, T4)

JPCam observational strategy



Narrow Band strategy

Spatial coverage is achieved by observing contiguous pointings, shifting each pointing by the effective (unvignetted) size of the CCD in both RA and Dec. Different CCDs exhibit varying spatial coverage, although there is a common central area that expands as more pointings are added.

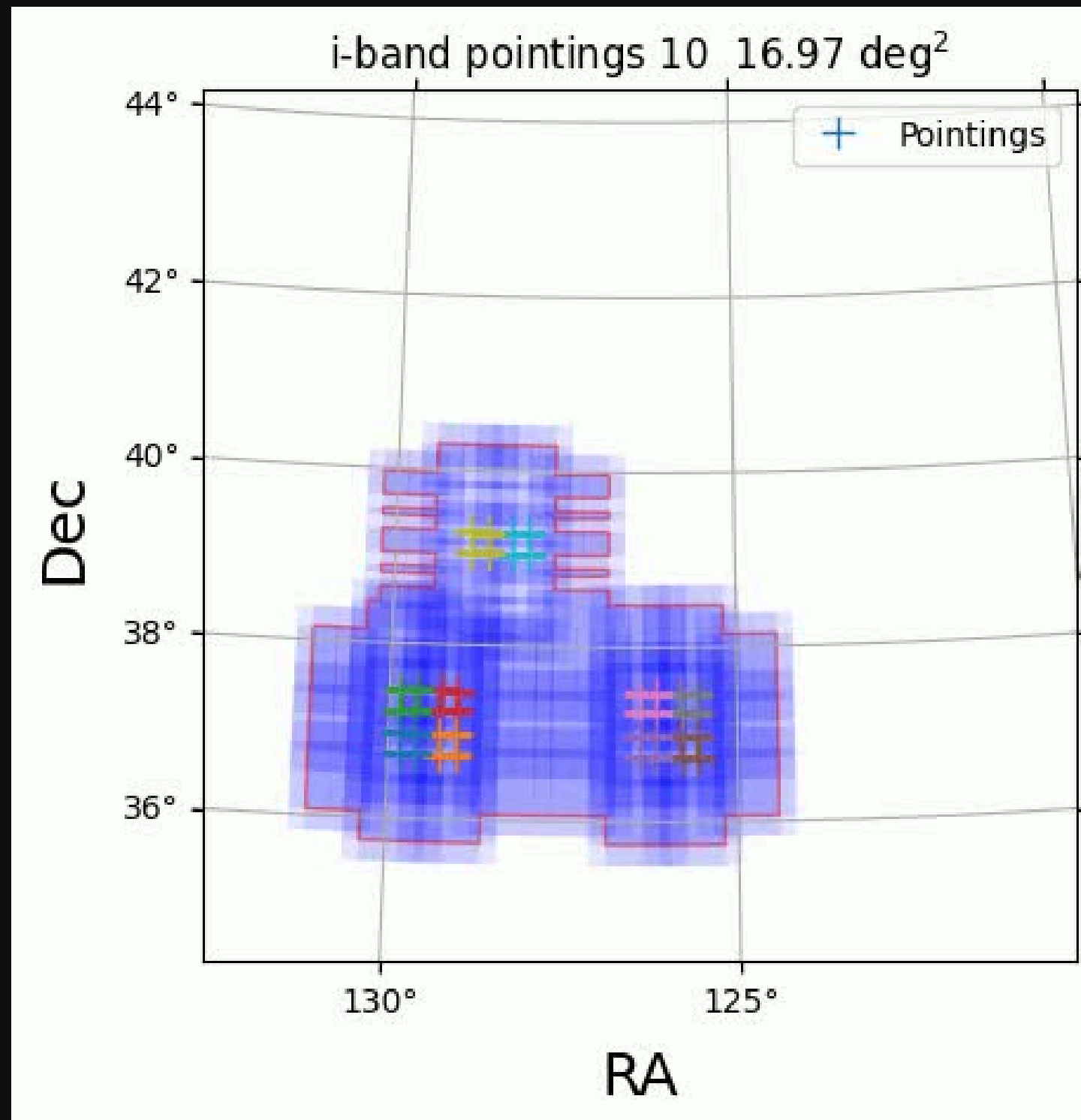


Broad Band strategy

The default (and recommended) strategy to observe a specific contiguous area is to observe a set of 4 pointings to fill the gaps between CCDs and then shift in RA and Dec (if needed) by the size of JPCam.

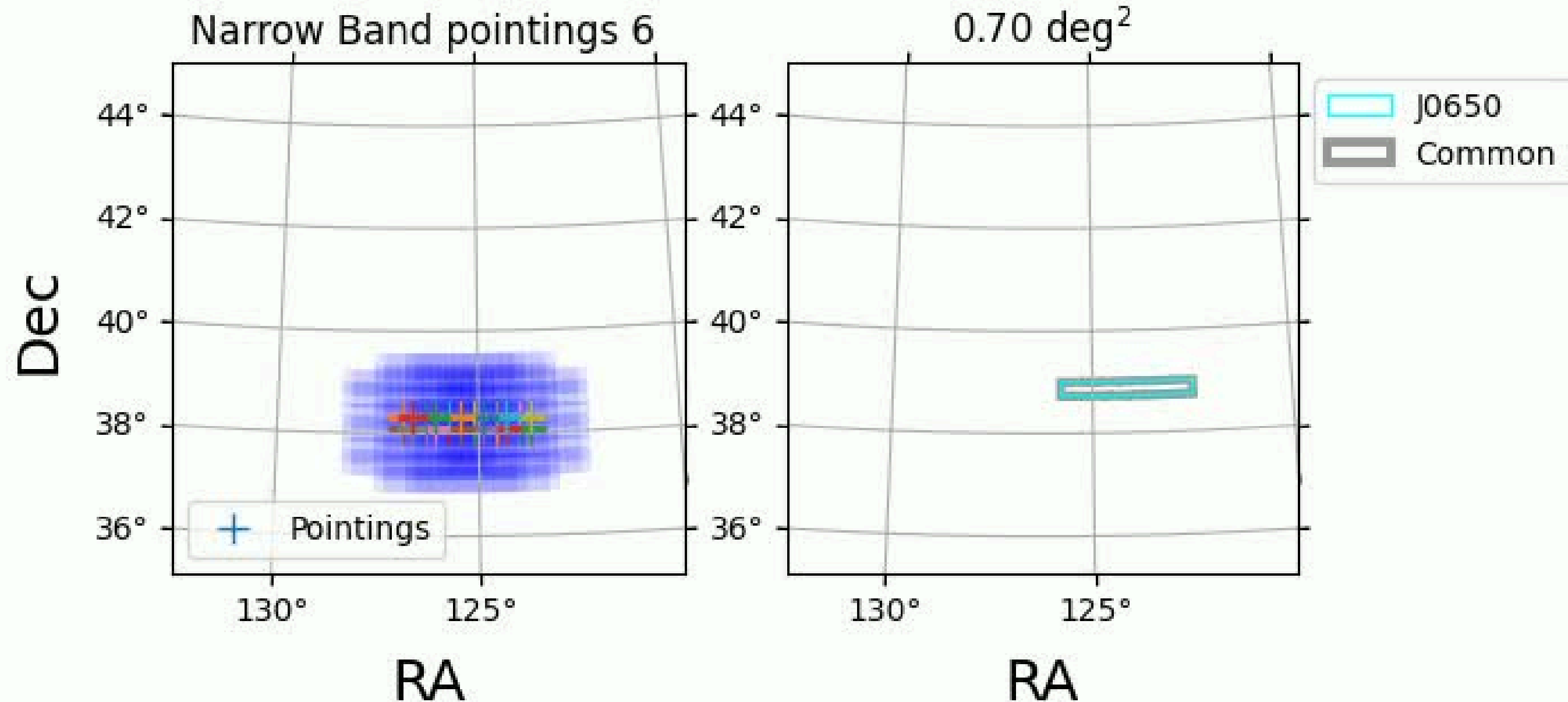
Dithering in both strategies needed

Dithering is needed for accurate flux calibration as well as optimal sky background subtraction.



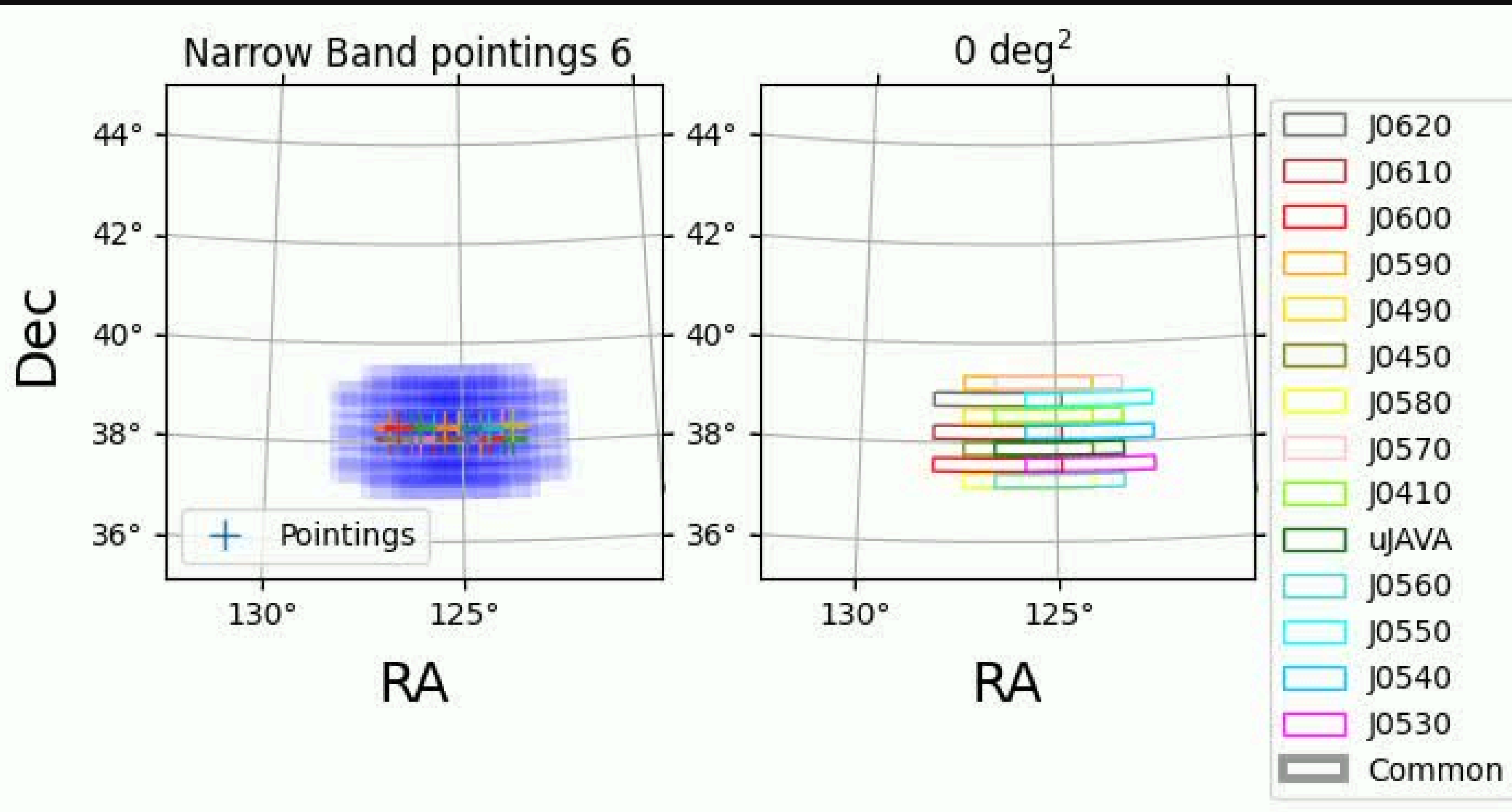
Broad Band strategy for gSDSS, rSDSS, iSDSS, and OPEN

The supported default (and recommended) strategy to observe a specific contiguous area is to observe a set of 4 pointings to fill the gaps between CCDs and then shift in RA and Dec (if needed) by the size of JPCam.



Narrow Band strategy

The supported default (and recommended) strategy to grow spatial coverage is achieved by observing contiguous pointings, shifting each pointing by the effective (unvignetted) size of the CCD in both RA and Dec.



Narrow Band strategy

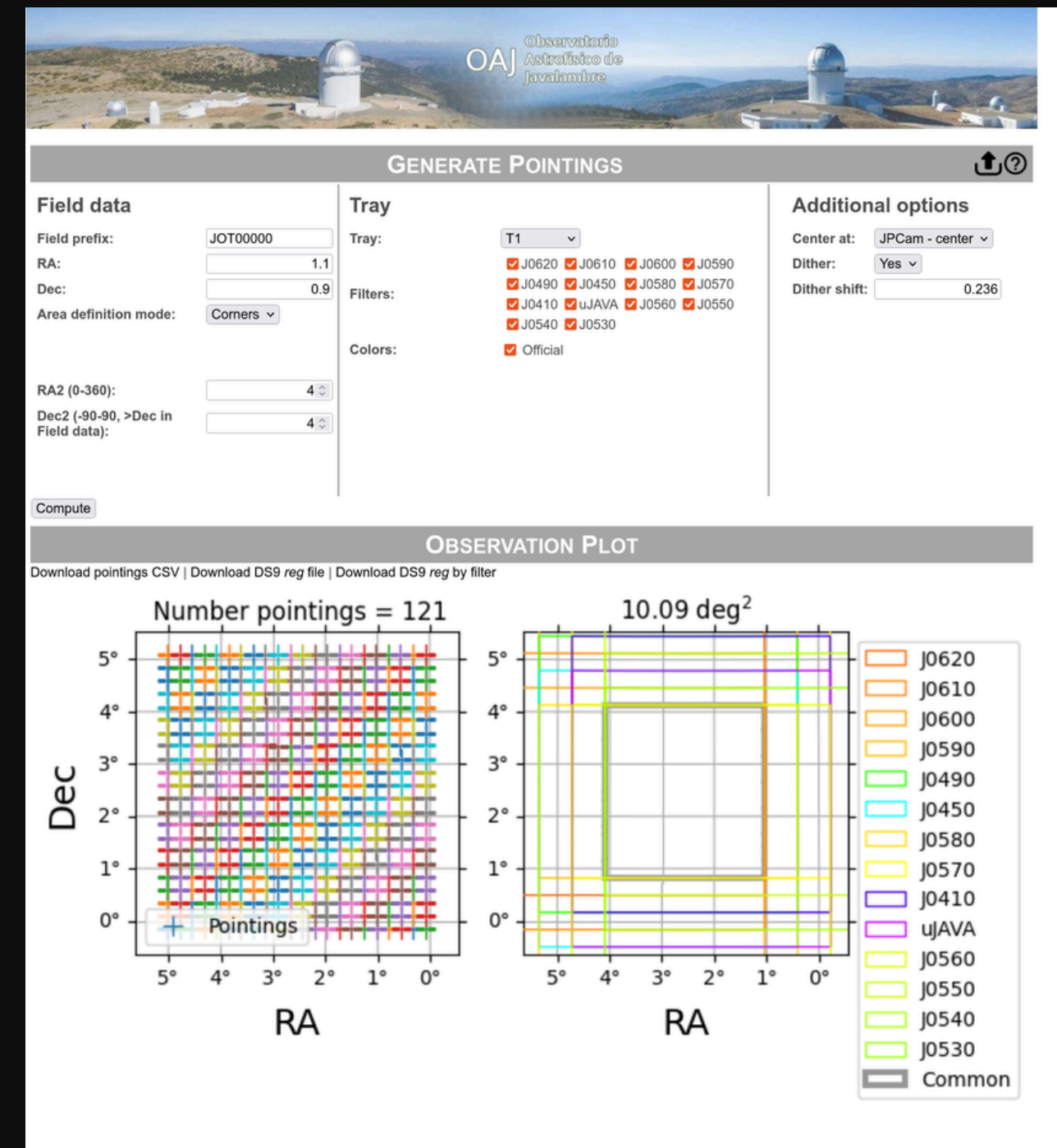
Different CCDs exhibit varying spatial coverage, although there is a common central area that expands as more pointings are added.

JPCam Observing Planner (JOP)

Plan the pointings to cover a specific rectangular area. Defined using one option:

- Corners
- Center + lengths
- Number of pointings in RA and Dec dimensions (NPs)

<https://www.cefca.es/jop/plan/field.html>

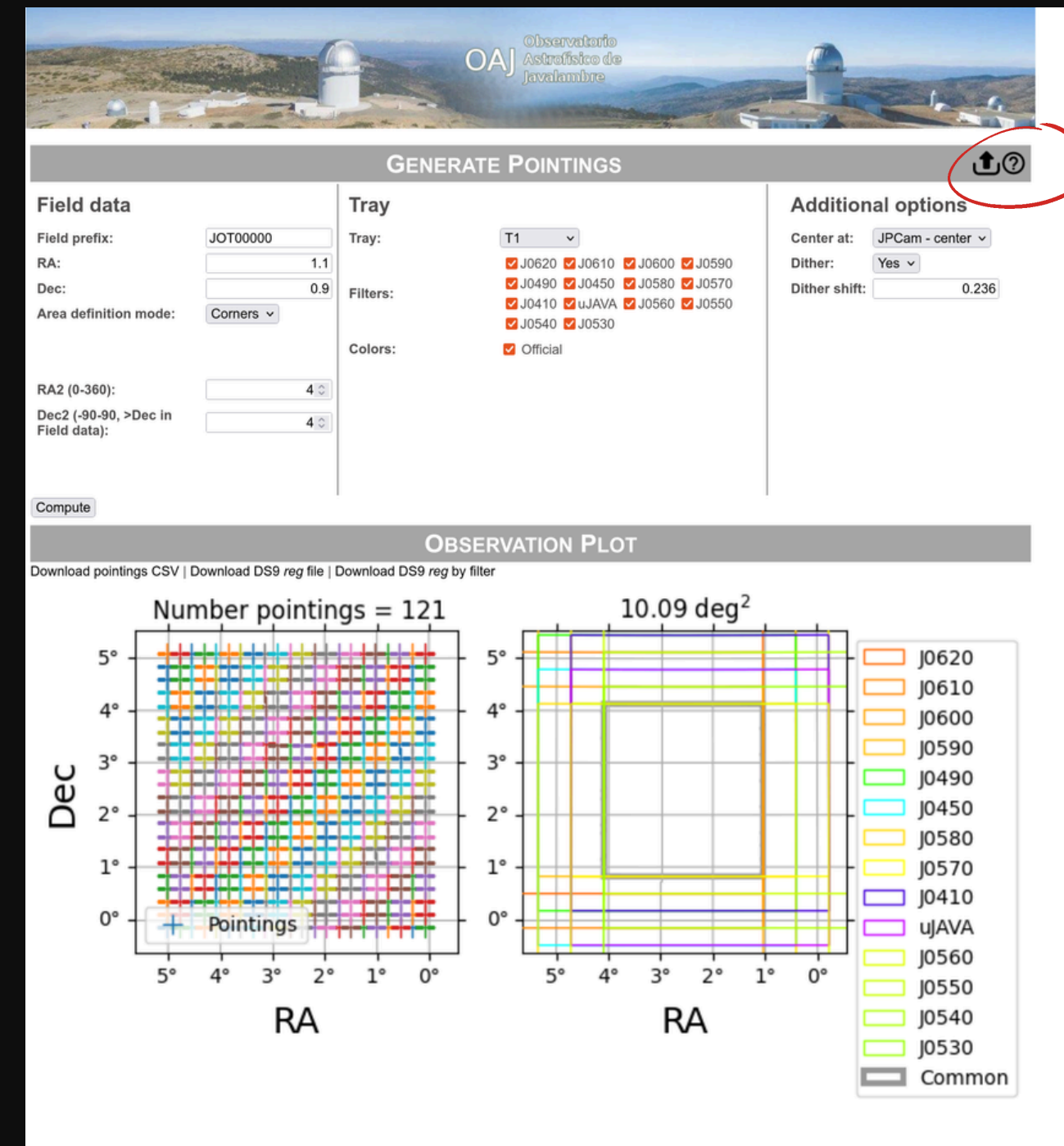


JPCam Observing Planner (JOP)

Plan the pointings to cover a specific rectangular area. Defined using one option:

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<https://www.cefca.es/jop/plan/field.html>

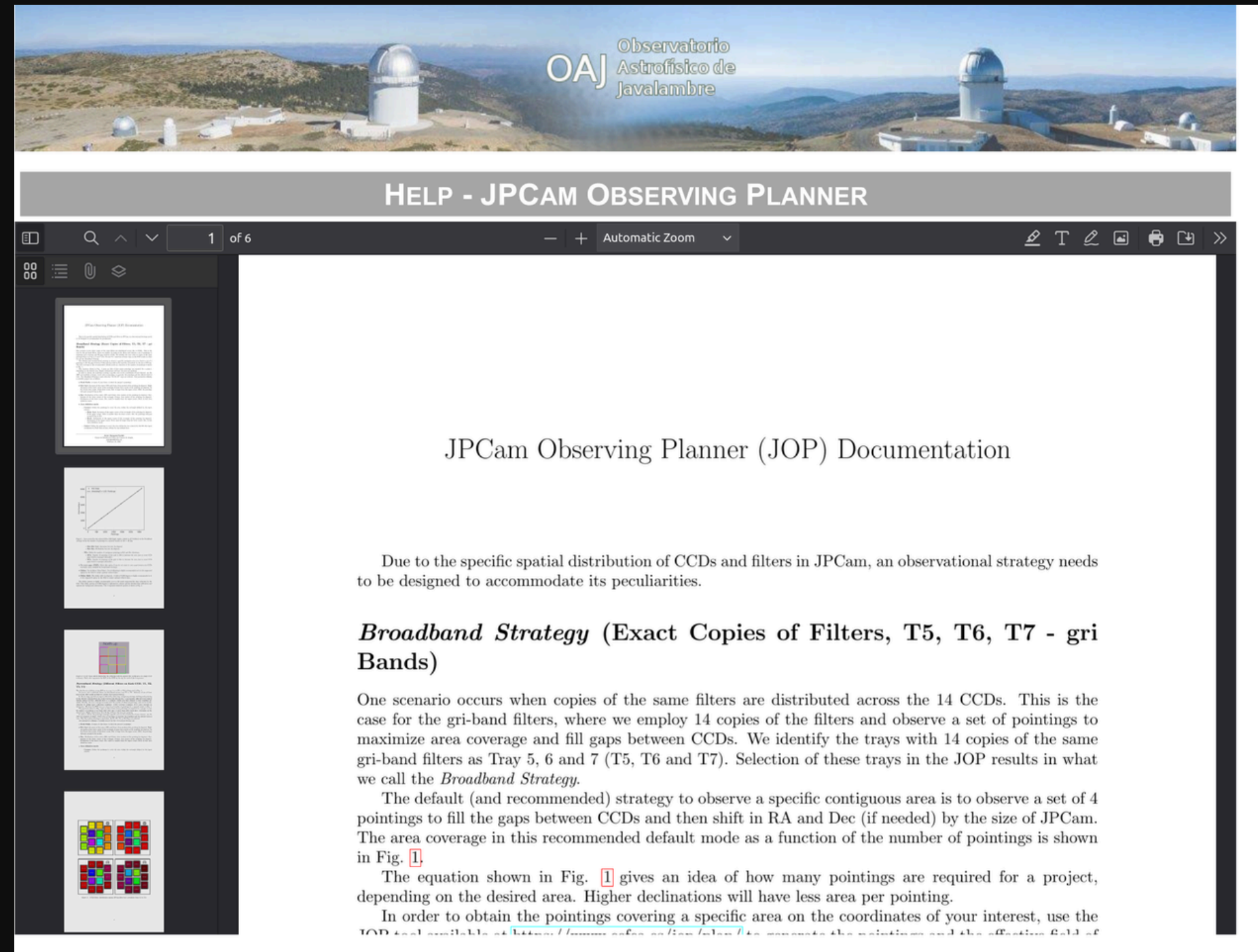


Help

Read the documentation...

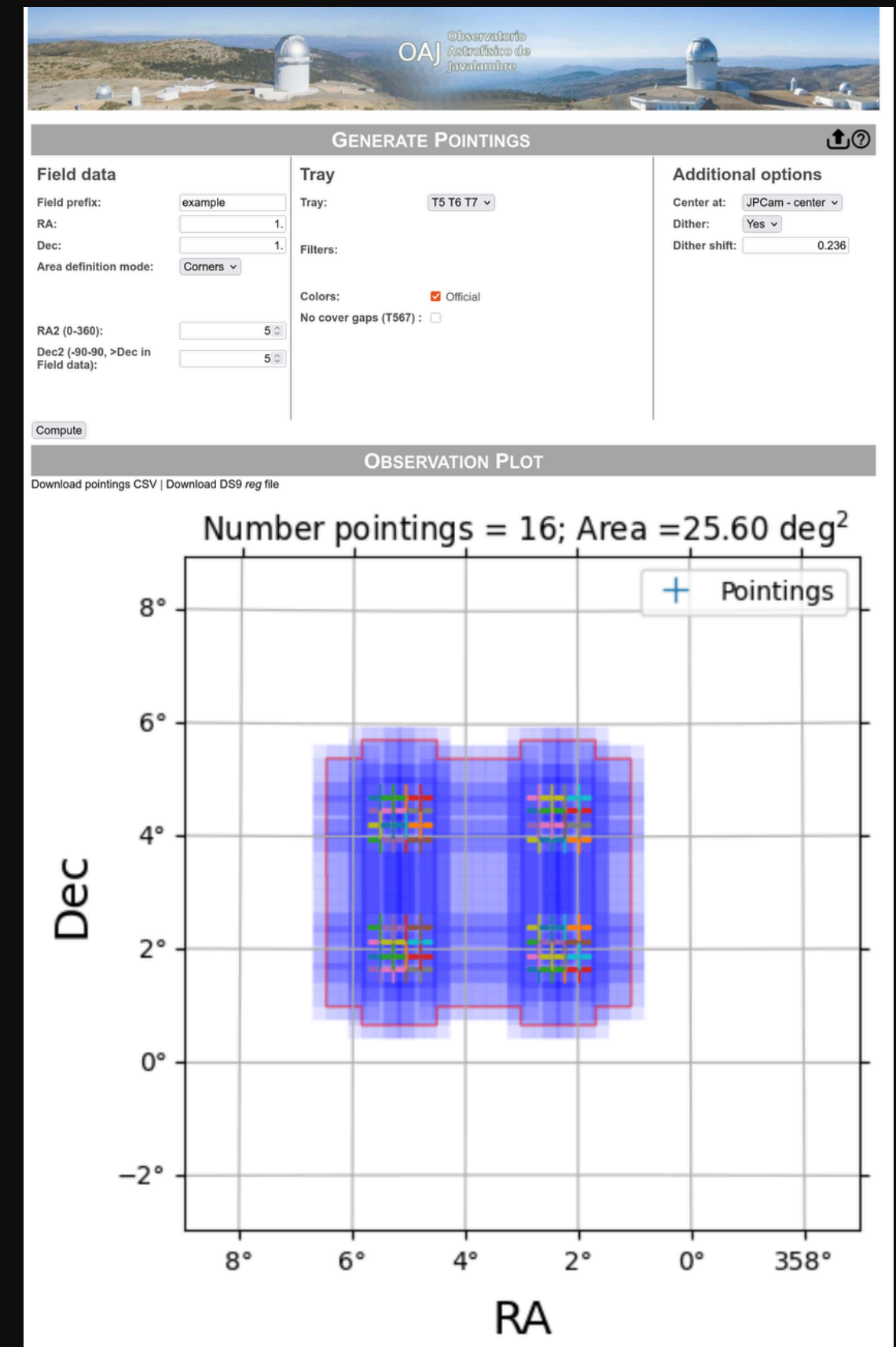
Here we will present the main points.

We will see specific example cases at the end.



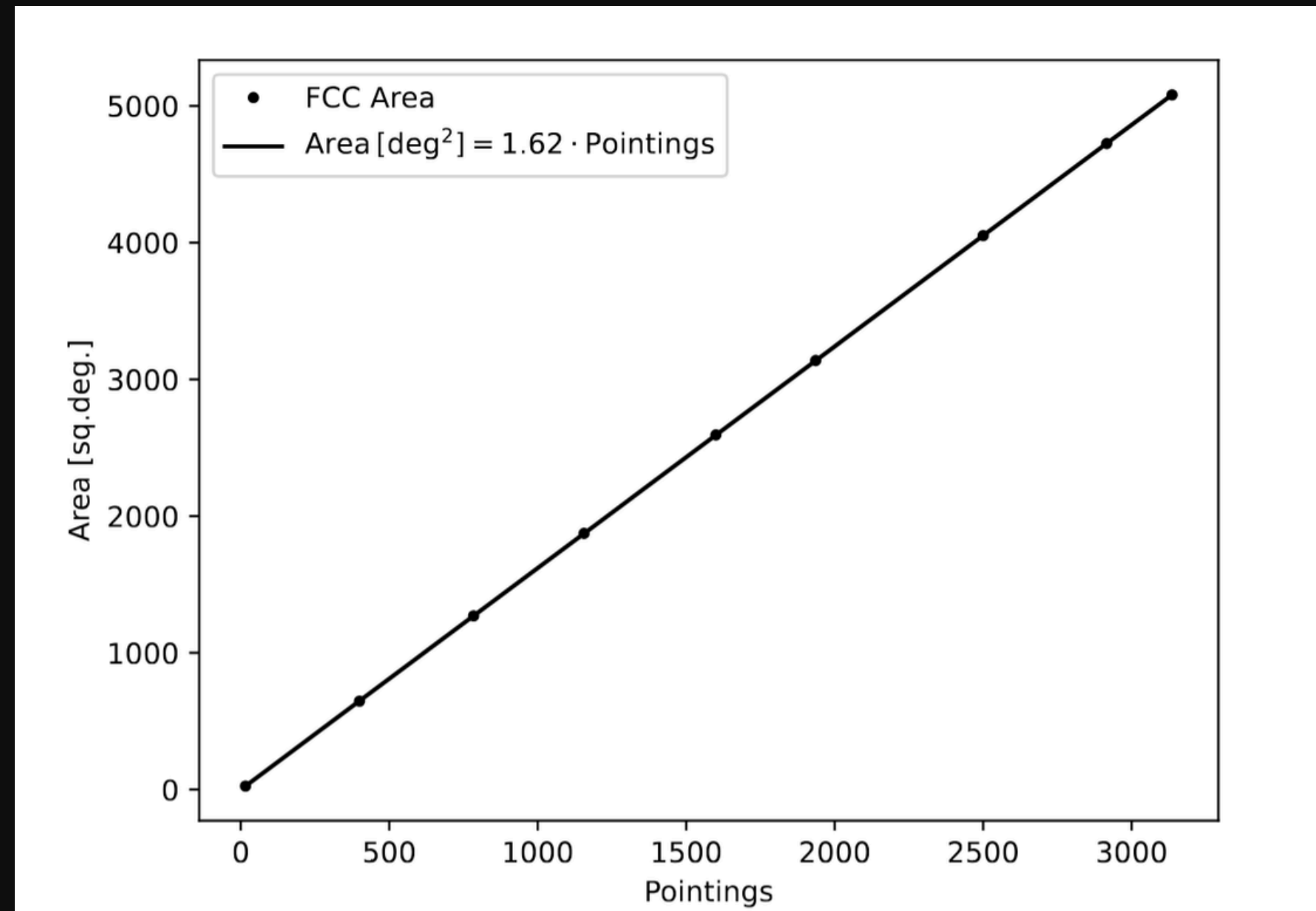
JOP Broad band strategy (T5, T6, T7)

- Field Prefix: A name of your choice.
- RA, Dec of the center of the pointing (NPs, Center Area modes) or the lower corner (Corner Area mode), in degrees. ☒
- Area definition mode: Corners, Center, NPs.
 - Corners: RA2, Dec2 (upper corner)
 - Center: Size RA, Size Dec. Box size.
 - NPs: NPx, NPy. Number of pointings of the grid in RA and Dec to increase the area (not to cover CCD gaps which is managed internally). ☒
- Dither: Use of dither (True/False). Use of dithering is highly recommended as it is the supported option by the OAJ to ensure optimal reduced data. ☒
- Dither Shift: The dither shift (in degrees). A shift of 0.236 degrees is the recommended option by the OAJ to ensure optimal reduced data.
- No cover gaps (T567): Select this option if you do not want to cover gaps between the CCDs internally (only available for broad-band strategy).



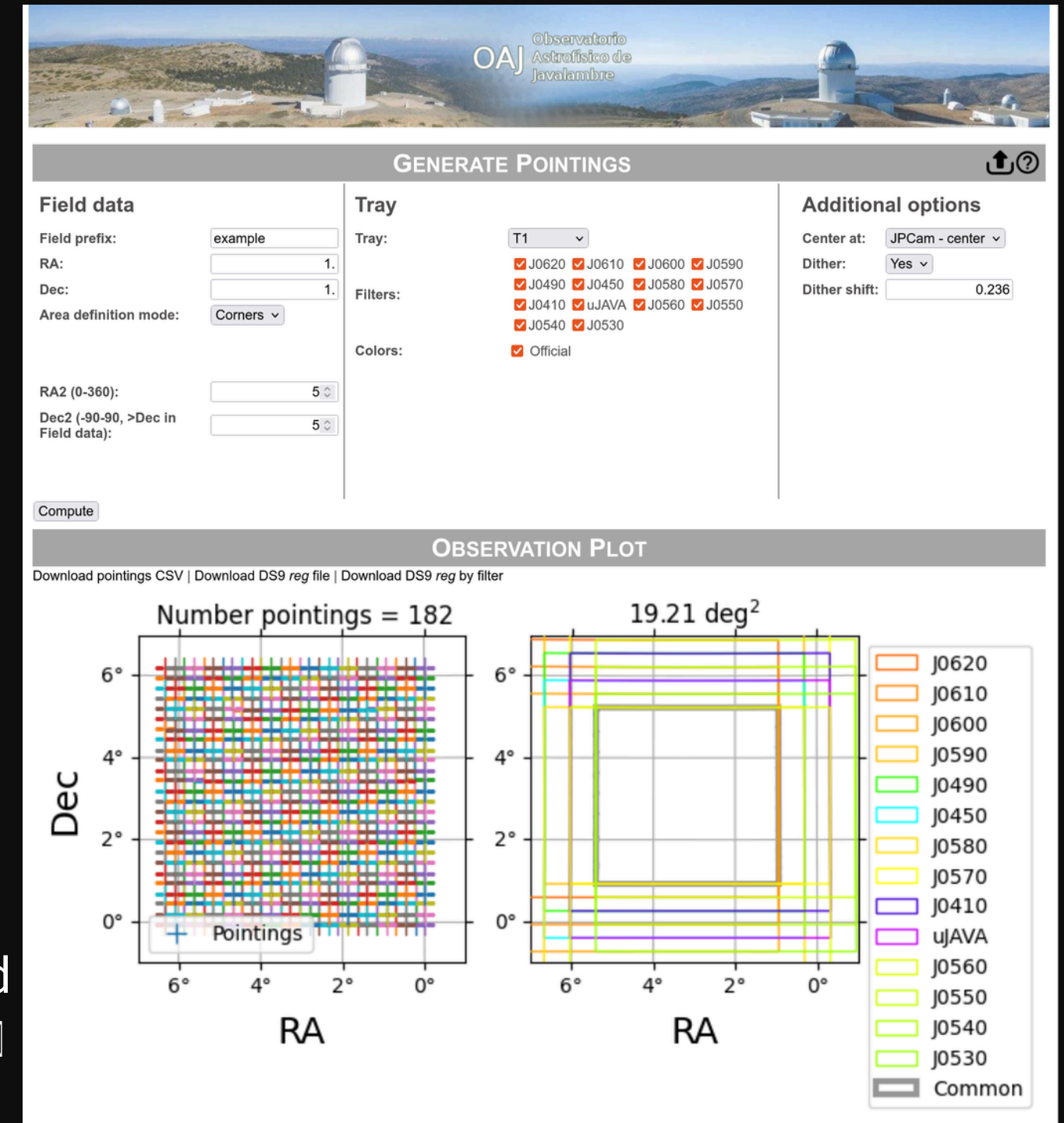
JOP Broad band strategy (T5, T6, T7) covered area

This area estimation is valid around Dec=20deg, for larger declinations area will decrease due to overlaps between CCDs.



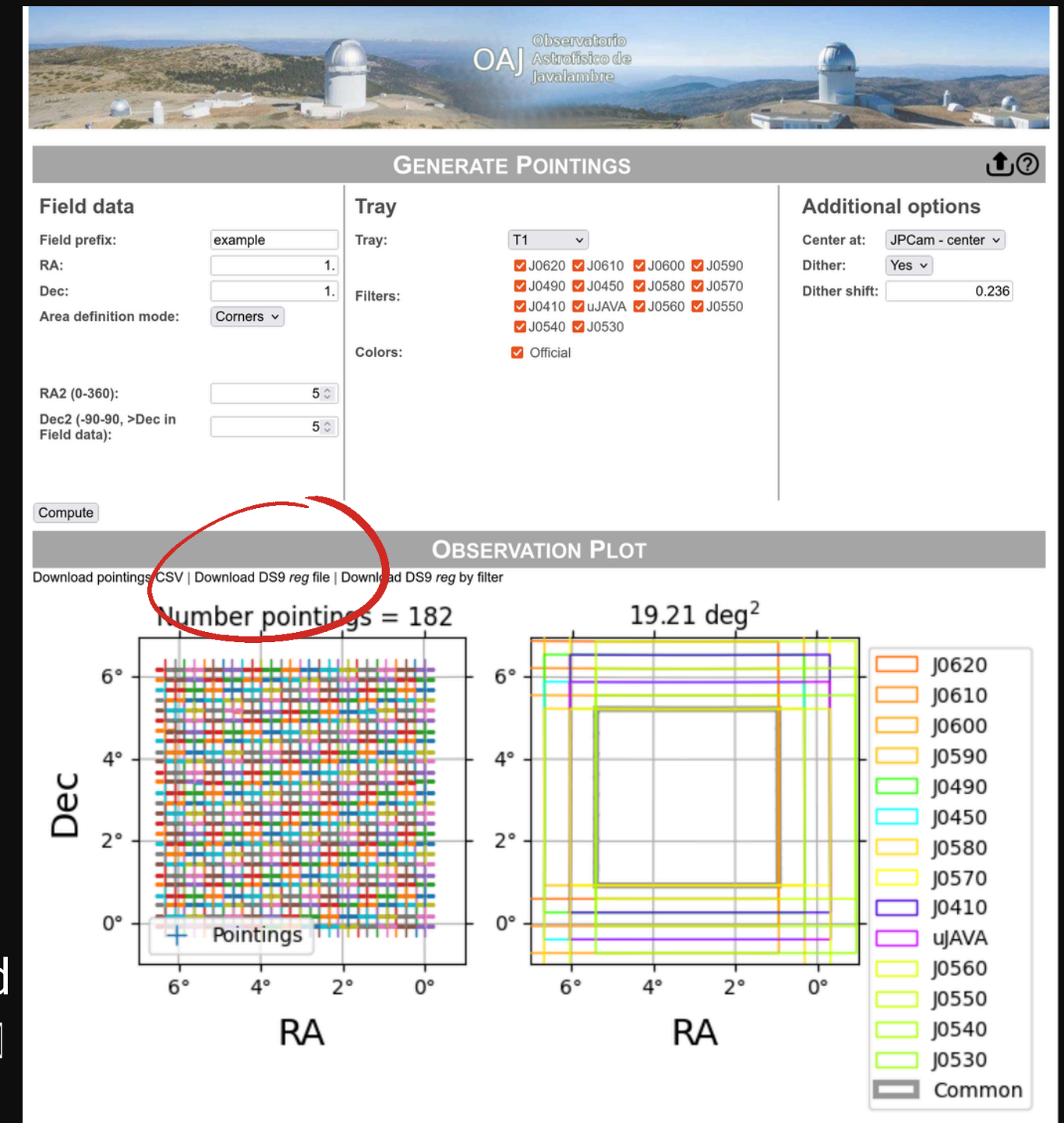
JOP Narrow band strategy (T1234)

- Field Prefix: A name of your choice.
- RA, Dec of the center of the pointing (NPs, Center Area modes) or the lower corner (Corner Area mode), in degrees. ☒
- Area definition mode: Corners, Center, NPs.
 - Corners: RA2, Dec2 (upper corner)
 - Center: Size RA, Size Dec. Box size.
 - NPs: NPx, NPy. Number of pointings of the grid in RA and Dec to increase the area (not to cover CCD gaps which is managed internally). ☒
- Tray: Values: 'T1', 'T2', 'T3', or 'T4'. Specific filters can be selected or deselected as desired.
- The use of official filter colors is optional; better color contrast can be obtained with non-official colors.
- Dither: Use of dither (True/False). Use of dithering is highly recommended as it is the supported option by the OAJ to ensure optimal reduced data. ☒
- Dither Shift: The dither shift (in degrees). A shift of 0.236 degrees is the recommended option by the OAJ to ensure optimal reduced data.



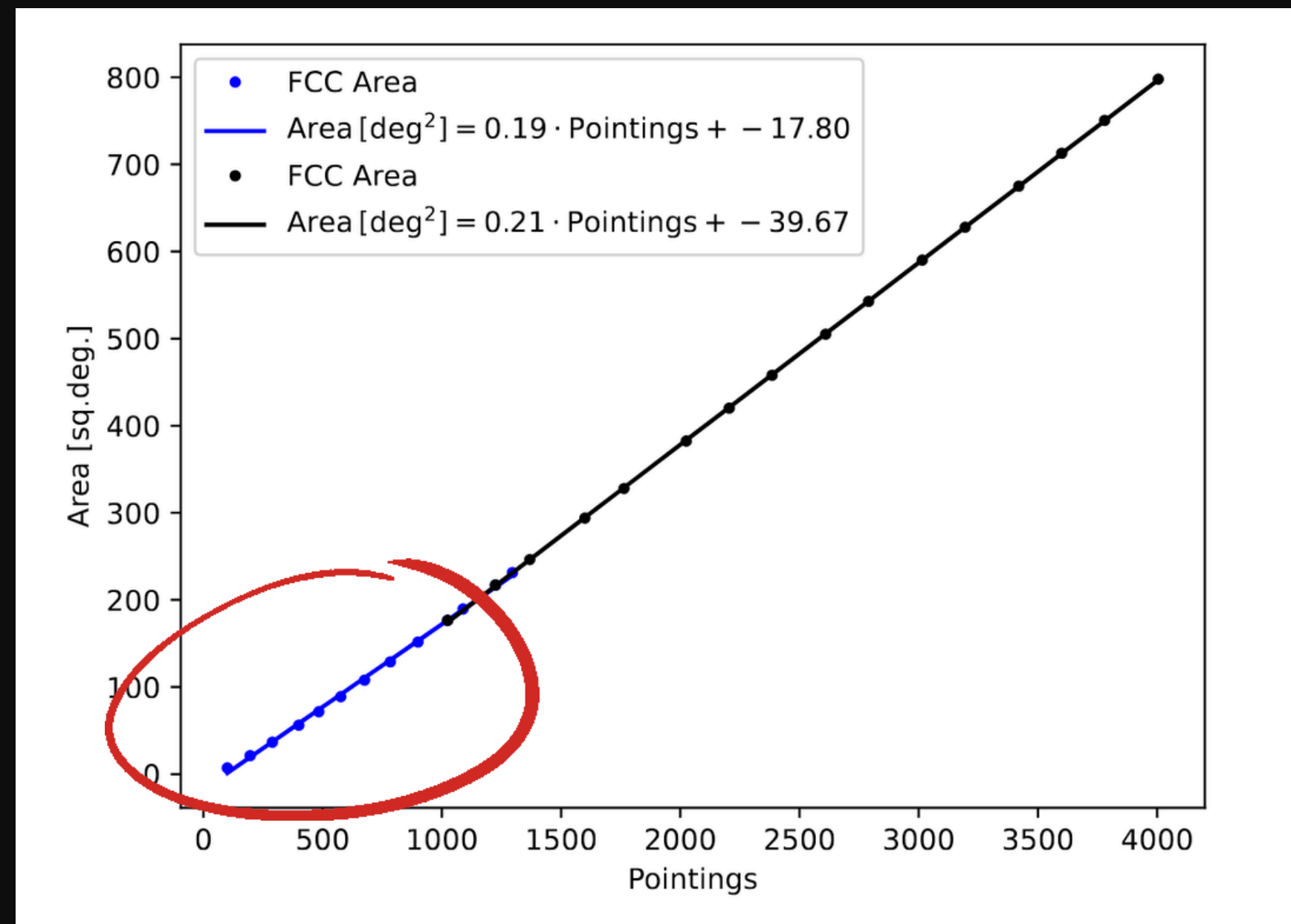
JOP Narrow band strategy (T1234)

- Field Prefix: A name of your choice.
- RA, Dec of the center of the pointing (NPs, Center Area modes) or the lower corner (Corner Area mode), in degrees. ☒
- Area definition mode: Corners, Center, NPs.
 - Corners: RA2, Dec2 (upper corner)
 - Center: Size RA, Size Dec. Box size.
 - NPs: NPx, NPy. Number of pointings of the grid in RA and Dec to increase the area (not to cover CCD gaps which is managed internally). ☒
- Tray: Values: 'T1', 'T2', 'T3', or 'T4'. Specific filters can be selected or deselected as desired.
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- Dither Shift: The dither shift (in degrees). A shift of 0.236 degrees is the recommended option by the OAJ to ensure optimal reduced data.



JOP Narrow band strategy (T1234) covered area

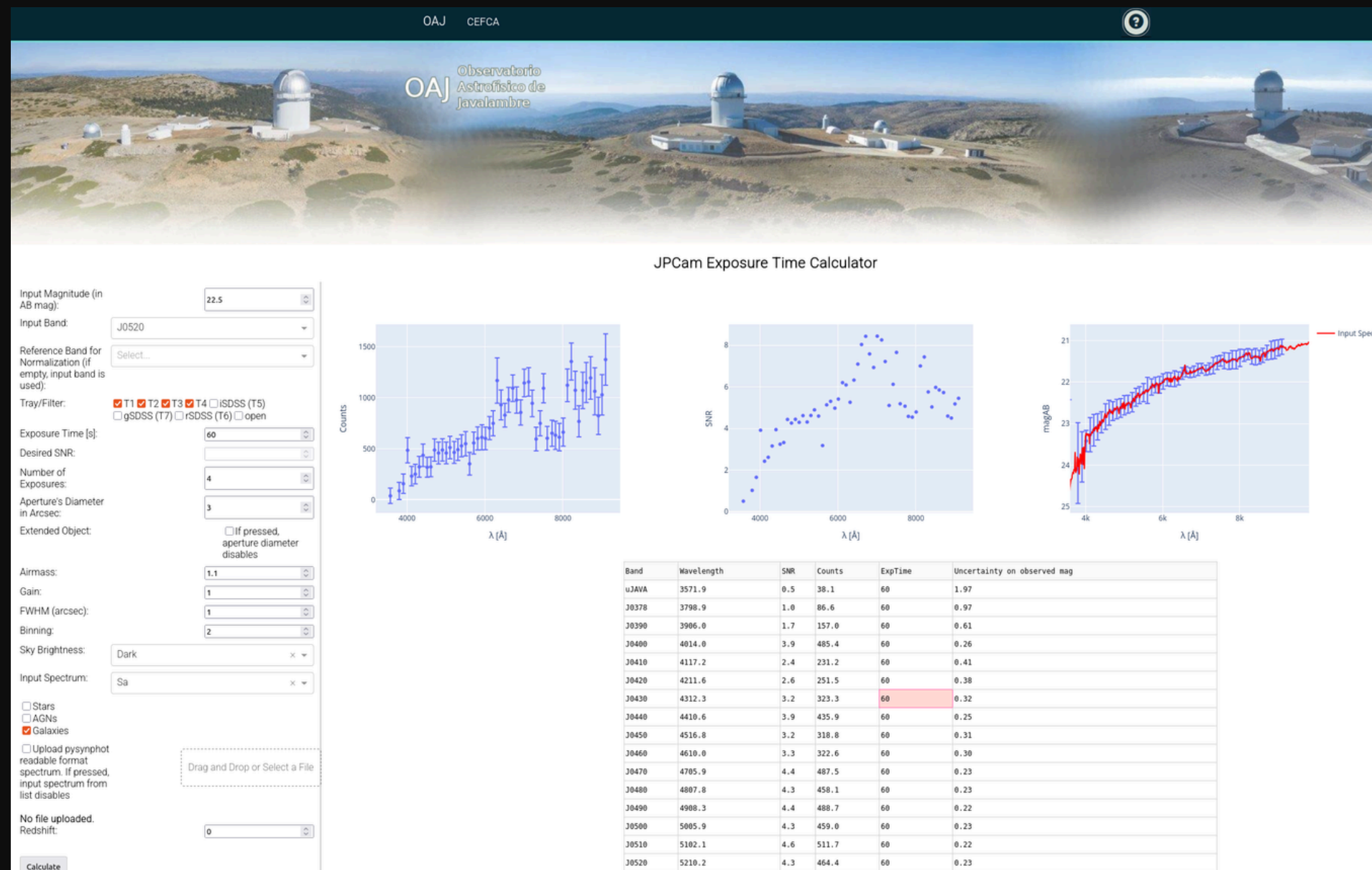
This area estimation is valid around Dec=20deg, for larger declinations area will decrease due to overlaps between CCDs.



JPCam Exposure Time Calculator (JETC)

<https://www.cefca.es/jop/>

- What is the time I need to reach my desired depth?

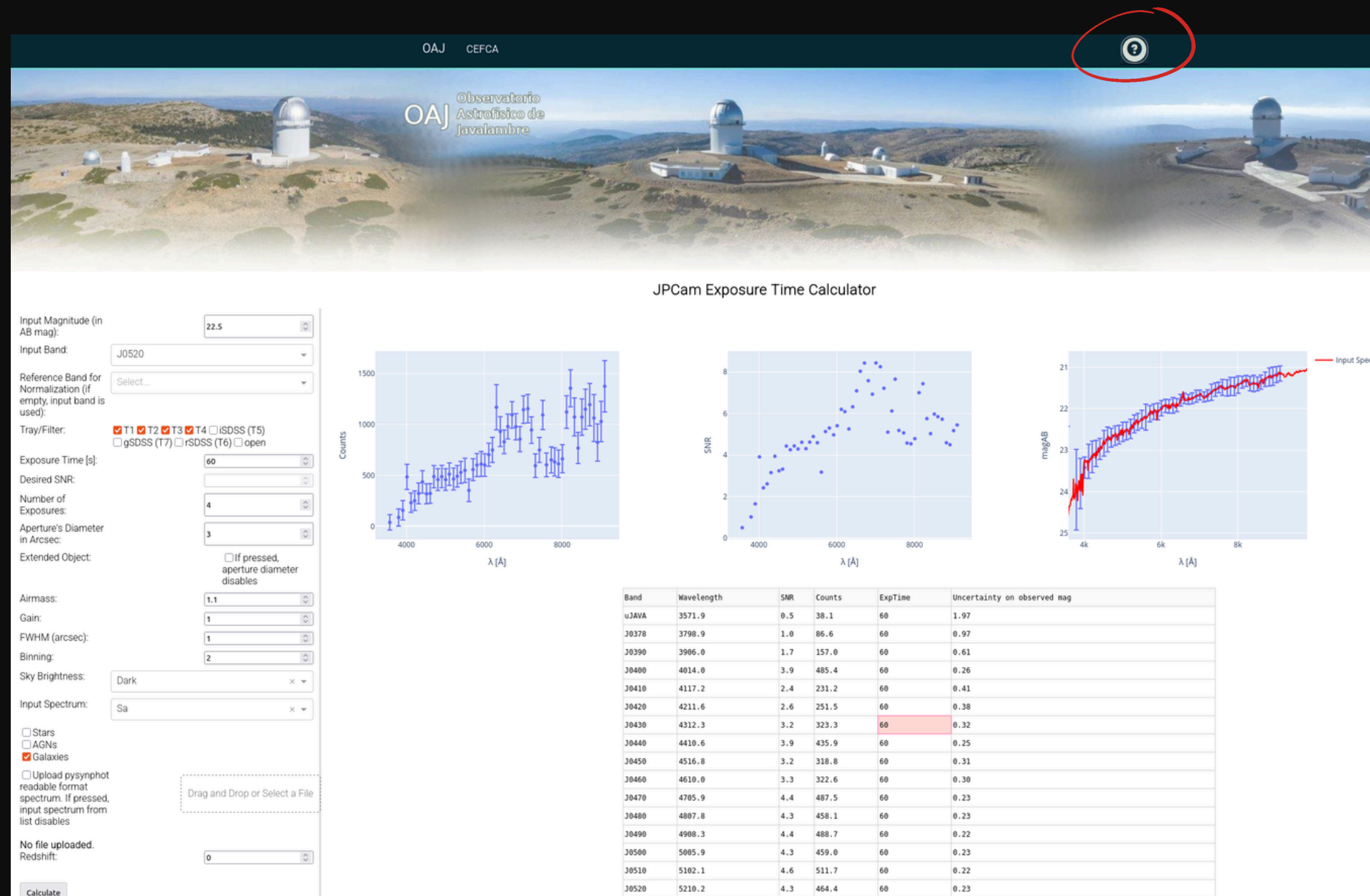


JPCam Exposure Time Calculator (JETC)

<https://www.cefca.es/jop/>

- What is the time I need to reach my desired depth?

Read the help!



JPCam Exposure Time Calculator JETC

- Here we will present the main points.
- We will see specific example cases later.

OAJ CEFCA

OAJ Observatorio
Astrofísico de
Javalambre

JPCam Exposure Time Calculator - Help Page

<< Back to JPCam Exposure Time Calculator

Input Descriptions

Input Magnitude (in AB mag):
The apparent magnitude in the AB magnitude system.

Input Band:
The photometric band in which the main calculation is going to be performed.

Reference Band for Normalization (if empty, input band is used):
An optional field to specify the band to normalize to the input magnitude value, which can be different as the 'input band' if input spectrum data is introduced below from predefined available options, or user defined ones.

Tray/Filter:
Tray or filter to be used during observation. This includes specific filter distribution like in T1, T2, T3, T4, and the trays where copy of all filters are available: gSDSS, iSDSS, and rSDSS. No filter (open) is also available.

T1

J0570	J0590	J0620
J0550	J0410	J0490
J0540	UJAVA	J0450
J0530	J0550	J0580
J0610	J0600	

T2

J0670	J0690	J0720
J0650	J0430	J0510
J0640	J0390	J0470
J0630	J0660	J0680
J0700		

JETC

- Input Magnitude (in AB mag)
- Input Band: The photometric band in which the main calculation is going to be performed.
- Reference Band for Normalization (if empty, input band is used, optional).
- Tray/Filter: Tray or filter to estimate output. No filter (open) is also available.
- Exposure Time [s]: Exposure time for each exposure (maximum 100s). If defined, "Desired SNR" is disabled. This box will be enable only if desired SNR is empty.
- Desired SNR: The desired Signal-to-Noise Ratio (SNR) for the observation. If defined, Exposure time is disabled. This box will be enable only if Exposure Time is empty.
- Number of Exposures: The number of exposures to be taken. The supported value is 4 or multiples of 4 for narrow band strategy, since this is the value entirely supported by the OAJ in order to perform the optimized dither pattern (4 exposures) and deliver reduced images.
- Aperture's Diameter in Arcsec.
- Extended Object: If selected, the aperture's diameter will be disabled and output information, Counts and SNR, are defined within a pixel, while input magnitudes are defined in mag/arcsec².
- FWHM (arcsec).
- Binning: The binning factor of the CCD detector. Supported modes are binning 1 for iSDSS, gSDSS, rSDSS, and OPEN, while 2 for T1, T2, T3, and T4.
- Sky Brightness: Sky brightness during observation: Dark, Gray, or Bright.
- Input Spectrum from different options or Upload own spectrum in pysynphot readable format.
- Redshift: The redshift value for the object.

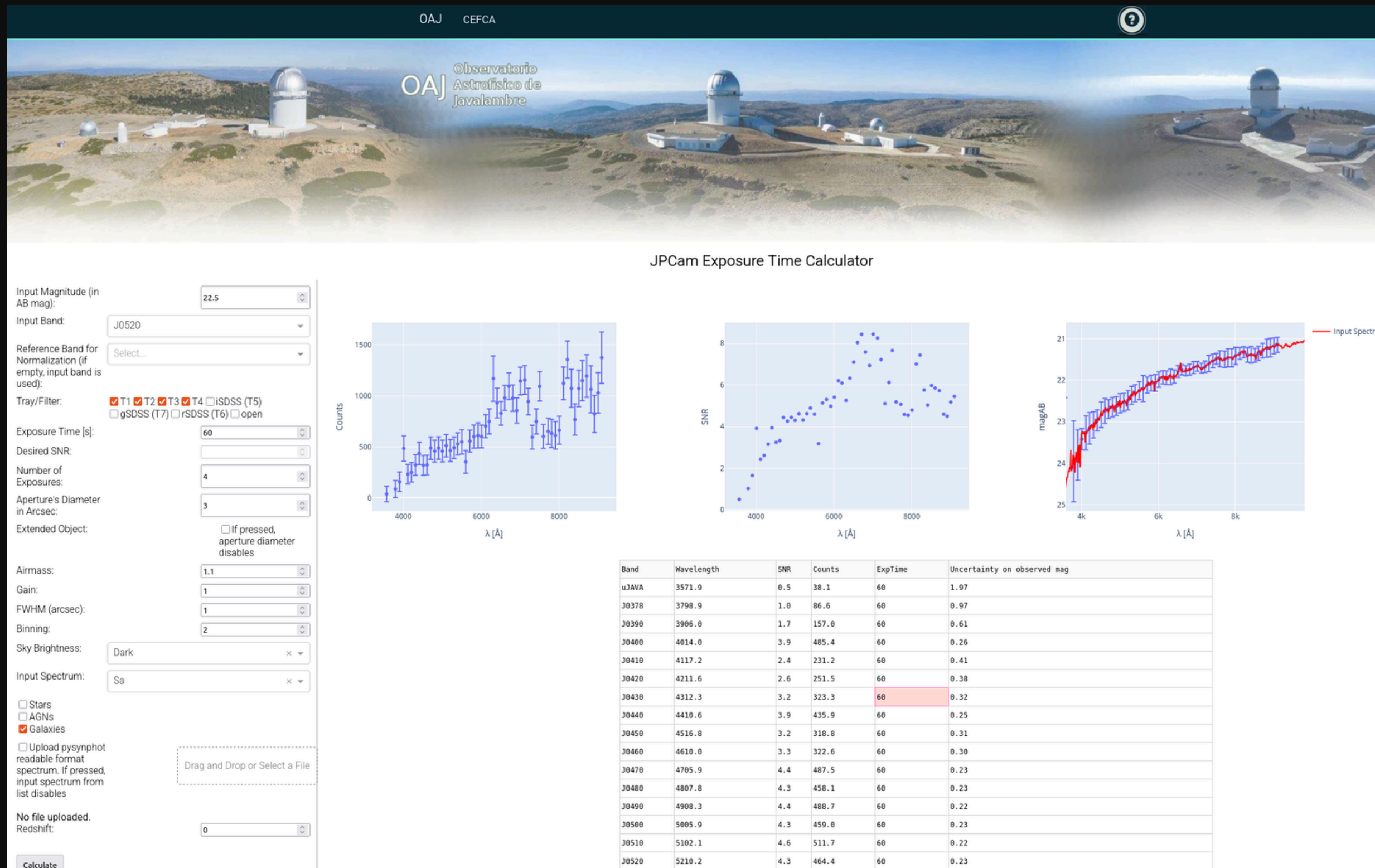
JETC

- Input Magnitude (in AB mag)
- Input Band: The photometric band in which the main calculation is going to be performed.
- Reference Band for Normalization (if empty, input band is used, optional).
- Tray/Filter: Tray or filter to estimate output. No filter (open) is also available.
- **Exposure Time [s]: Exposure time for each exposure (maximum 100s). If defined, “Desired SNR” is disabled. This box will be enable only if desired SNR is empty.**
- Desired SNR: The desired Signal-to-Noise Ratio (SNR) for the observation. If defined, Exposure time is disabled. This box will be enable only if Exposure Time is empty.
- Number of Exposures: The number of exposures to be taken. The supported value is 4 or multiples of 4 for narrow band strategy, since this is the value entirely supported by the OAJ in order to perform the optimized dither pattern (4 exposures) and deliver reduced images.
- Aperture's Diameter in Arcsec.
- Extended Object: If selected, the aperture's diameter will be disabled and output information, Counts and SNR, are defined within a pixel, while input magnitudes are defined in mag/arcsec².
- FWHM (arcsec).
- **Binning: The binning factor of the CCD detector. Supported modes are binning 1 for iSDSS, gSDSS, rSDSS, and OPEN, while 2 for T1, T2, T3, and T4.**
- Sky Brightness: Sky brightness during observation: Dark, Gray, or Bright.
- Input Spectrum from different options or Upload own spectrum in pysynphot readable format.
- Redshift: The redshift value for the object.

IMPORTANT!!!

- The maximum exposure time is currently 100s.
- This limit may be increased during the survey execution phase, when guiding sensors are commissioned. It is not yet known when this might happen.
- If a project requires deeper observations, the number of exposures should be increased, ideally in multiples of 4 to allow for dithering.

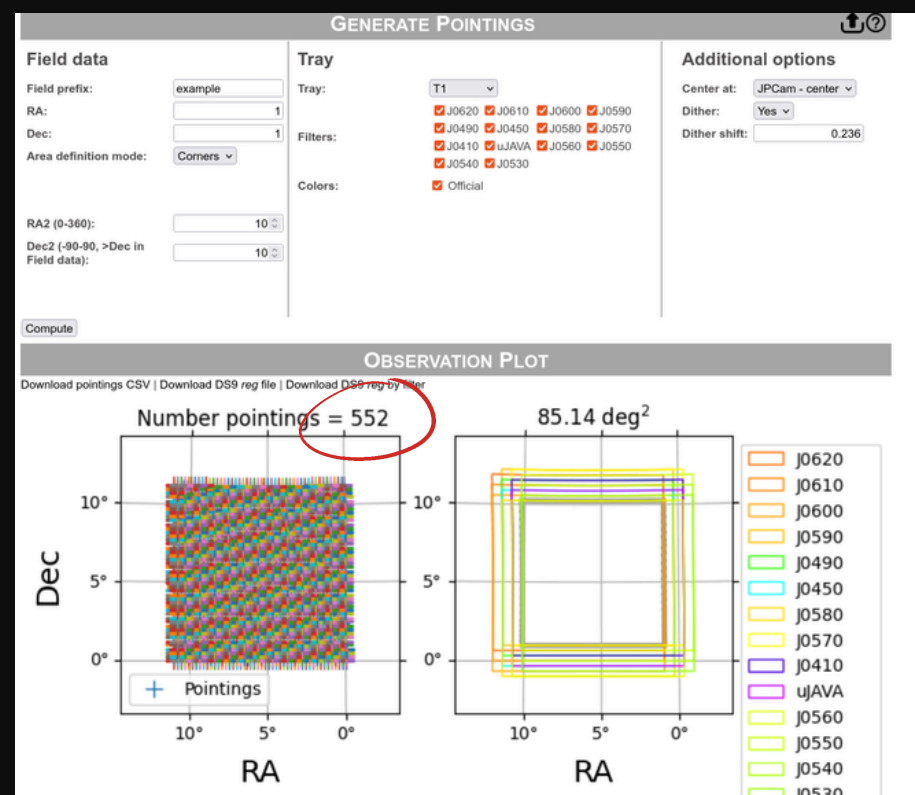
JETC



JETC Project total time

- Once you have decided the Trays you want to observe and the exposure times for each Tray, the total time of the project can be estimated.
- N. Points is the total number of pointings (the one in the figure title in JOP) for each Tray i.
- ExpTime is the exposure time for each exposure for the Tray i.
- N. Exp is the number of exposures to take in Tray i.

IMPORTANT!!!!!!! Maximum time per exposure is 100s



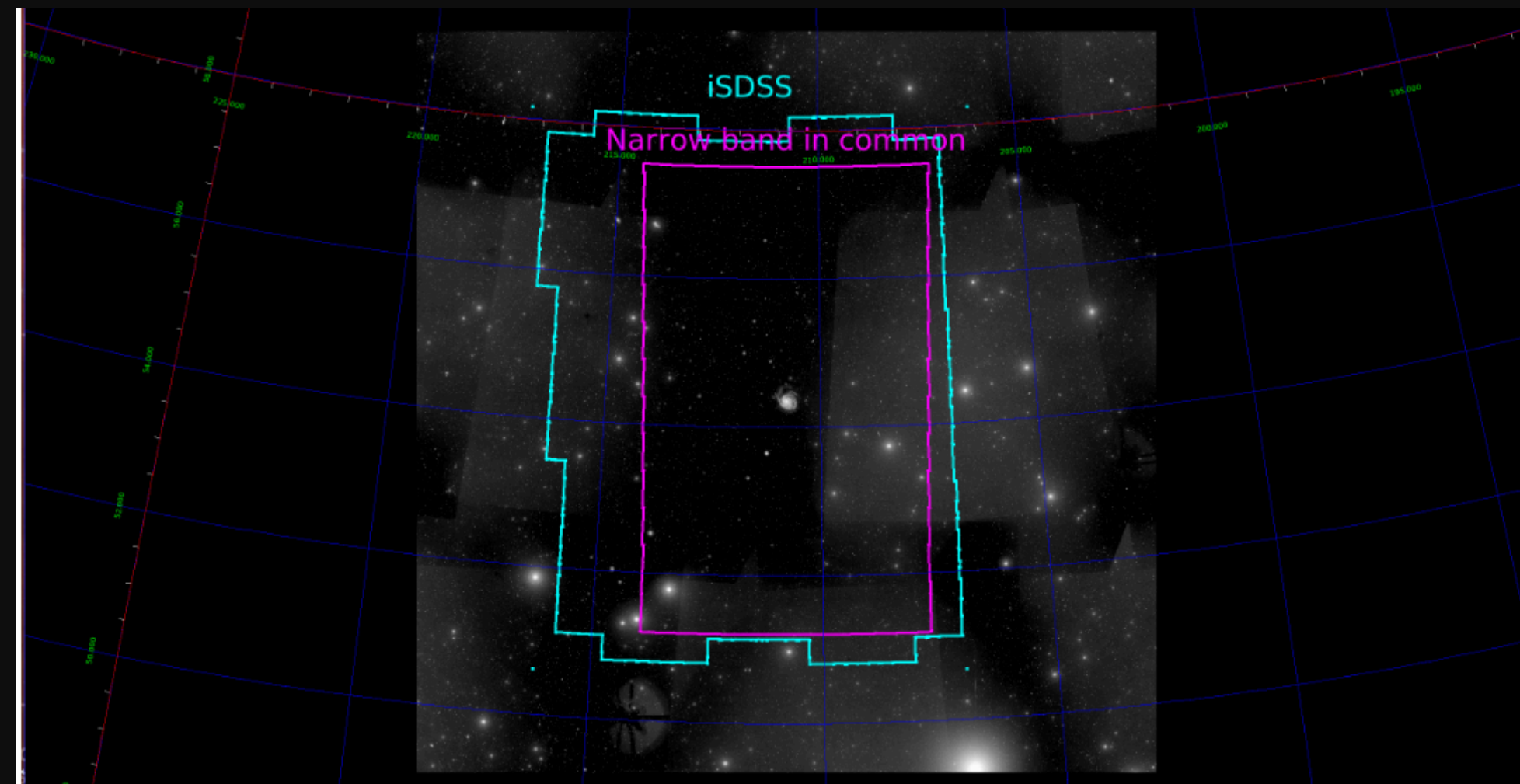
Project Total Time

T1:		
N. Points T1:	ExpTime T1 [s]:	N. Exp T1:
552	60	4
T2:		
N. Points T2:	ExpTime T2 [s]:	N. Exp T2:
552	60	4
T3:		
N. Points T3:	ExpTime T3 [s]:	N. Exp T3:
552	60	4
T4:		
N. Points T4:	ExpTime T4 [s]:	N. Exp T4:
552	60	4
gSDSS (T7):		
N. Points gSDSS:	ExpTime gSDSS [s]:	N. Exp gSDSS:
0	0	0
rSDSS (T6):		
N. Points rSDSS:	ExpTime rSDSS [s]:	N. Exp rSDSS:
0	0	0
iSDSS (T5):		
N. Points iSDSS:	ExpTime iSDSS [s]:	N. Exp iSDSS:
0	0	0
Open:		
N. Points open:	ExpTime open [s]:	N. Exp open:
0	0	0
<button>Calculate total time</button>		
The total time for your project is: 205.95 h		

How can I plan a specific observation?

Example Case: Observe M101 with J-PAS strategy

Use of JOP and JETC to obtain the pointings, area covered, exposure times, and total project time.



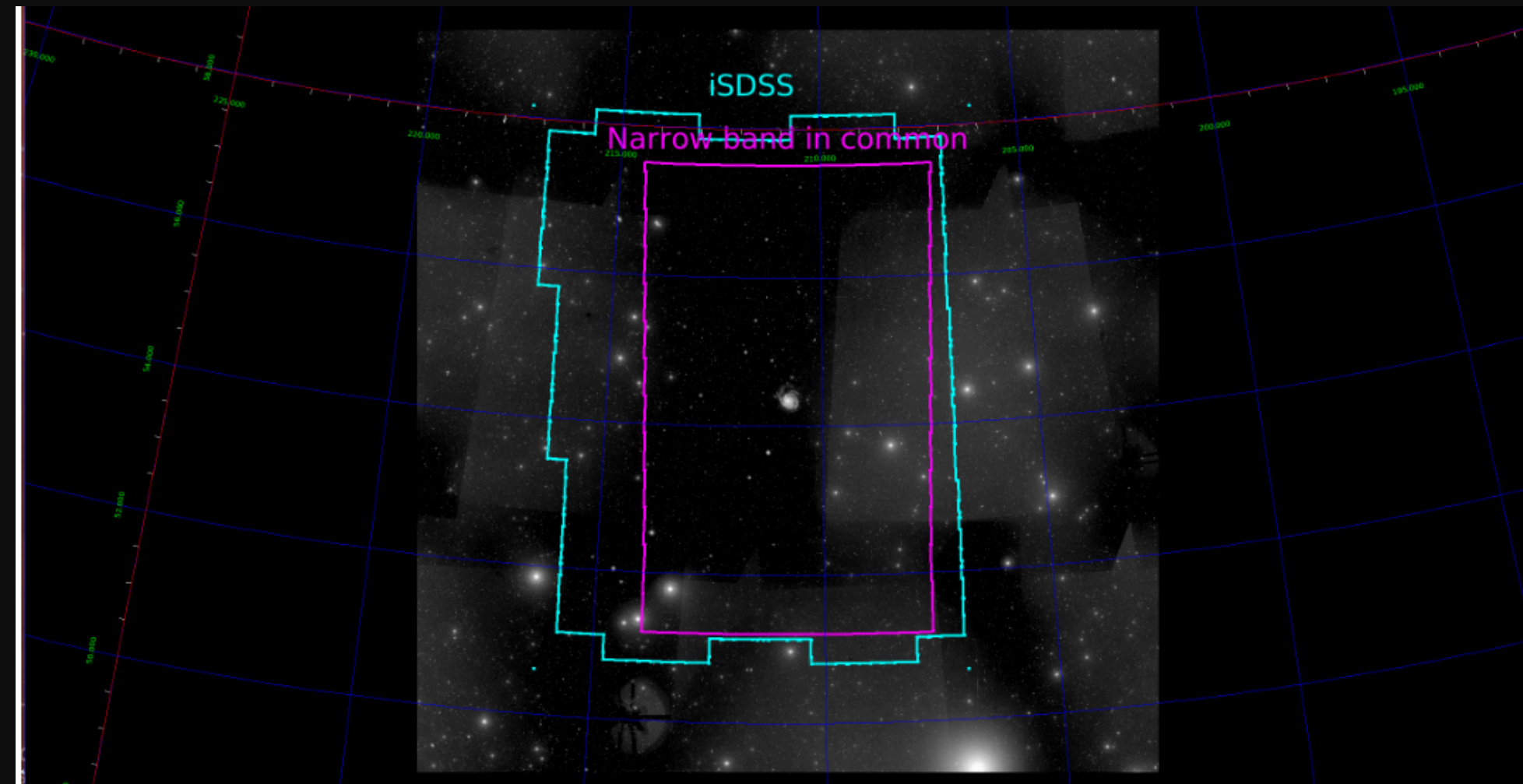
https://oajweb.cefca.es/observingtime/observing_tools

https://oajweb.cefca.es/doc/tac/observingtools/example_case.pdf

How can I plan a specific observation?

Example Case

We will see specific example cases later.



https://oajweb.cefca.es/observingtime/observing_tools

https://oajweb.cefca.es/doc/tac/observingtools/example_case.pdf

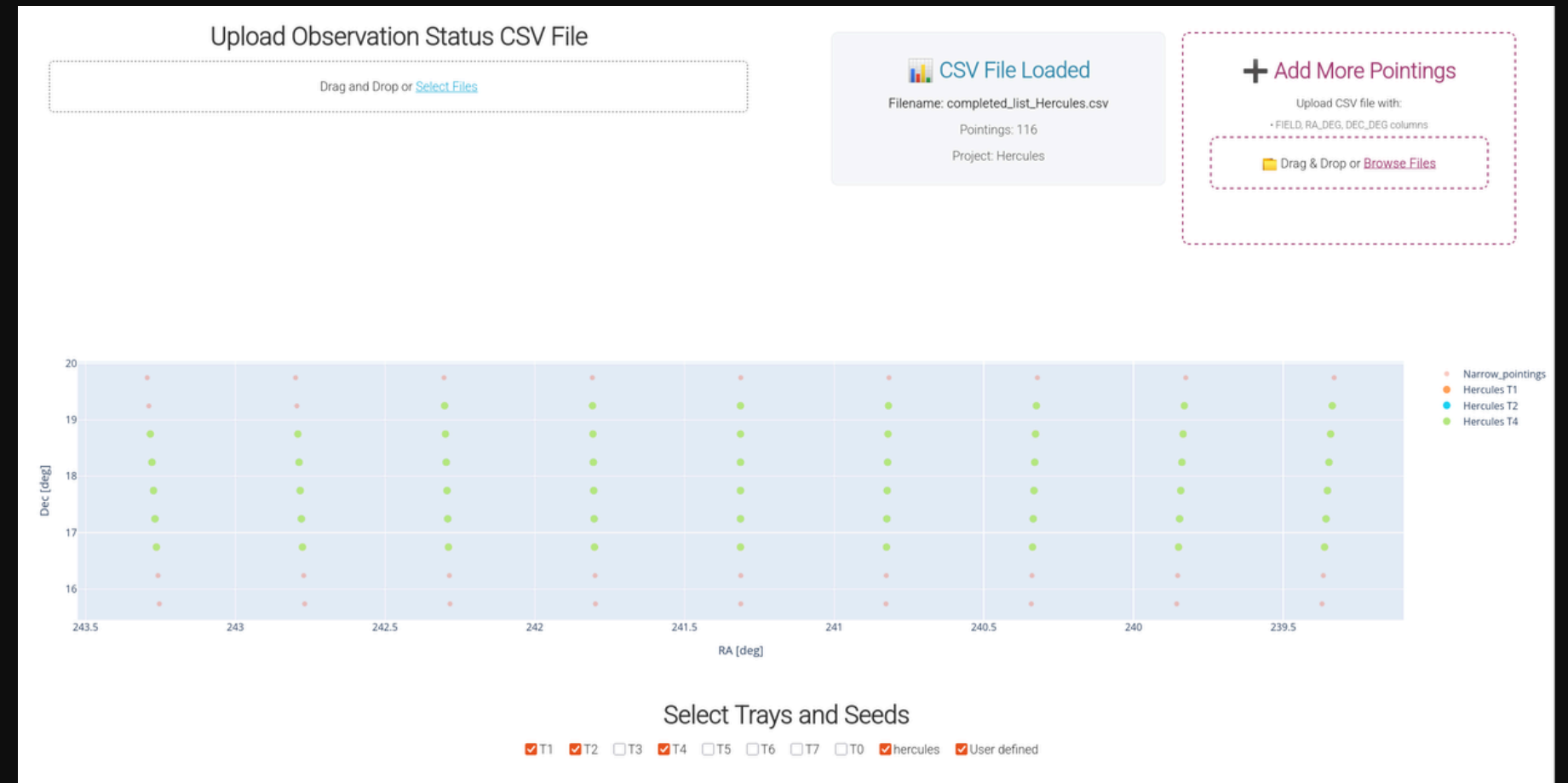
JPCam Phase2

Once a project is approved it is necessary to submit the Phase2.

<https://www.cefca.es/jop/phase2/>

JPCam Tracking tool

Once a project began to be observed, the status can be checked via Tracking Tool.



<https://www.cefca.es/jop/track/>

Summary

- Open call for Legacy Survey proposals to observe with JPCam at the JST250 expected in July 2026.
- JPCam, with a FoV of 3.4 sq. deg. (14×0.48 deg $\times 0.51$ deg), combined with its filter system, offers unique capabilities.
- Observations will be carried out over five years (2027A–2031B). A total of 1200 hours will be allocated to open-time legacy projects.
- Available observing tools include:
 - the pointing planner (JOP)
 - the exposure time calculator (JETC)
- Default dithering pattern mode and pointings given by JOP are recommended.
- All 59 filters will be offered.
- More information and submission details will be published at https://oajweb.cefca.es/observingtime/applying_observing_time
- Expected **Deadline for submission: 15 September 2026 at 23:59 CEST**
- **Questions? Need Help? Email us to oaj-support@cefca.es**

Thanks

Discussion

- Synergies between groups. Two (or more?) PIs will be allowed.
 - Galaxy clusters, UV, Hercules, ...
 - Galactic anticenter
- J-PAS footprint
 - ET field. 2028 covered by J-PAS? Probably not with the current plan.
- Please consider the sky conditions. 240h/year during 5 year. 120h/year dark, 60h/year grey, 60h/year bright.
~~~60% of this time photometric.
- Different strategies involving different areas or total time are highly recommended
  - For example: 3 months of observations corresponds on average to ~ 27 hours dark+grey & photometric. In 5 years 135h in total (not all of them with good seeing, although almost).
  - If you ask for more time than available per month, you will compete with all the projects in all the RAs. If you ask for the time available per month, you will compete with the projects asking for the same RAs.
- JOP is not mandatory to plan your pointings, although it is recommended.
- Filler. Consider asking for bright time and/or non-photometric.
  - 480h non-photometric, 96h/year, 8h/month.
  - 200h bright. 60h/year. 5h/month.
- Data processing. Do you need any non-standard reduction or product?
- Observing within J-PAS footprint, or in already available data. If in J-PAS, collaboration policy applies, if not, use public data freely!



# JPCam CfP, observing strategies and tools

# JPCam CfP, observing strategies and tools



# JPCam CfP, observing strategies and tools

# JPCam CfP, observing strategies and tools