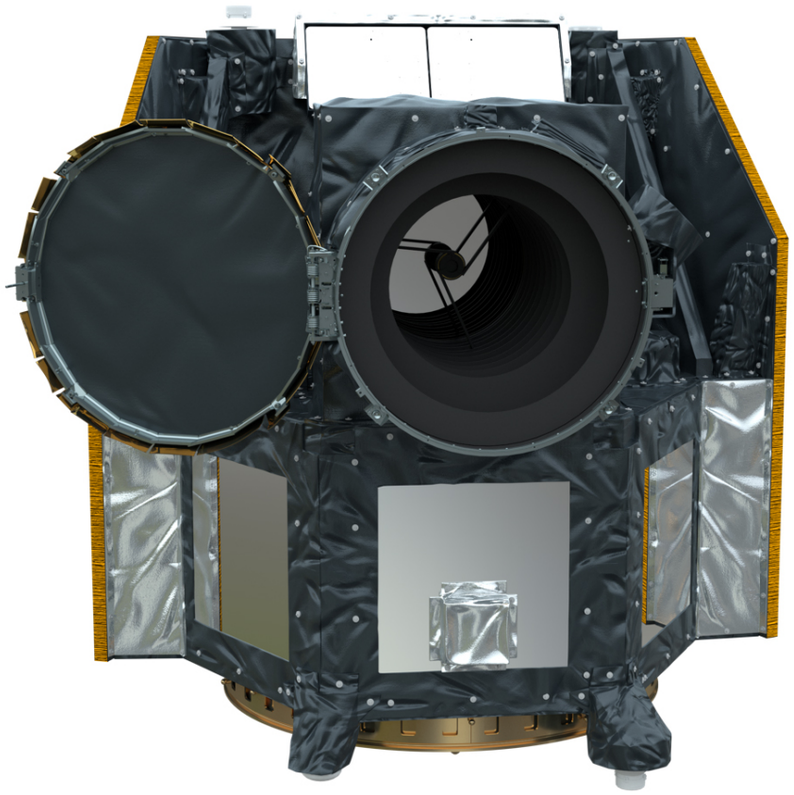
CHEOPS

CHARACTERISING EXOPLANET SATELLITE



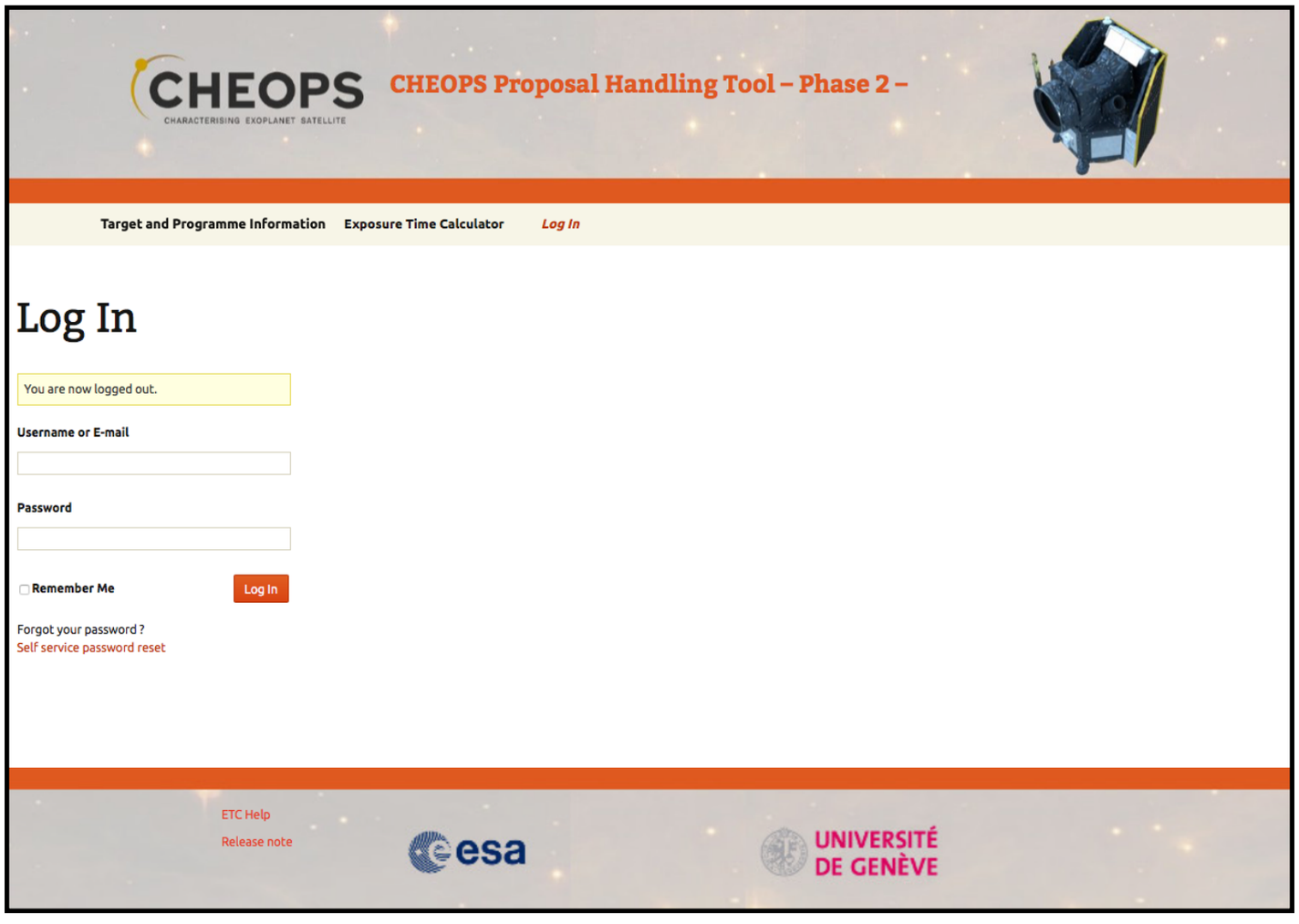
CHEOPS Proposal Handling Tool - Phase 2 - (PHT-2) Guidelines

(v_1.6, March 2025)

*Prepared by Nicolas BILLOT, Anja BEKKELIEN, Alexis HEITZMANN and Adrien DELINE on behalf of the CHEOPS **S**cience **O**perations **C**enter*

Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

URL: https://cheops.unige.ch/pht2/



Note: PHT2 was tested on Chrome, Safari and Firefox web browsers.

Please consult the ***CHEOPS Observers Manual*** for details on how to observe with CHEOPS

Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Please login
with username and password
received from SOC

Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

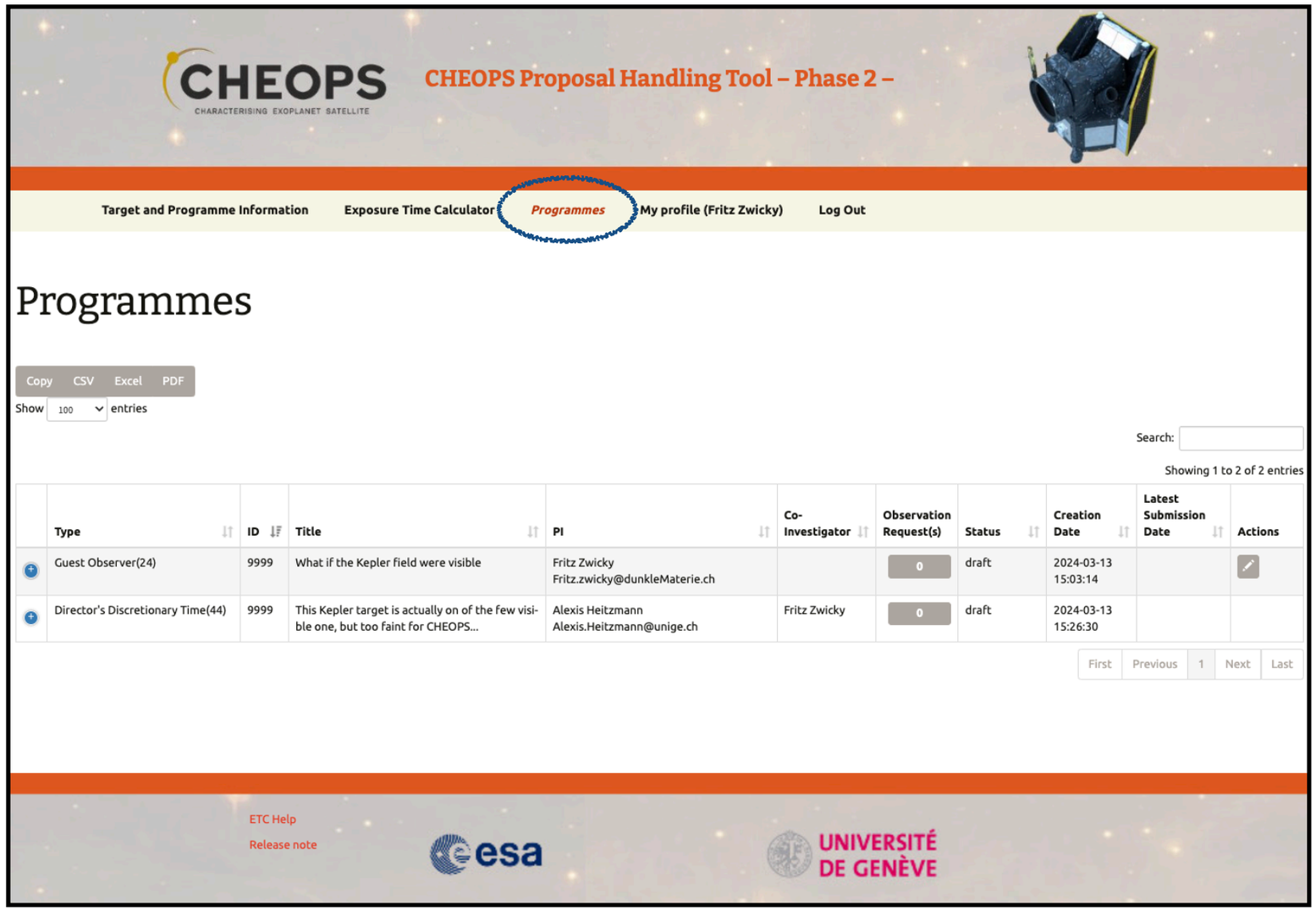
Your accepted "Programmes"

PHT2 programme = CHEOPS Proposal submitted to ESA

List of ***accepted*** GO and DDT programmes on which *you are the PI or the additional Co-I*

Pre-filled information ingested from Phase-1 stage (e.g. title)

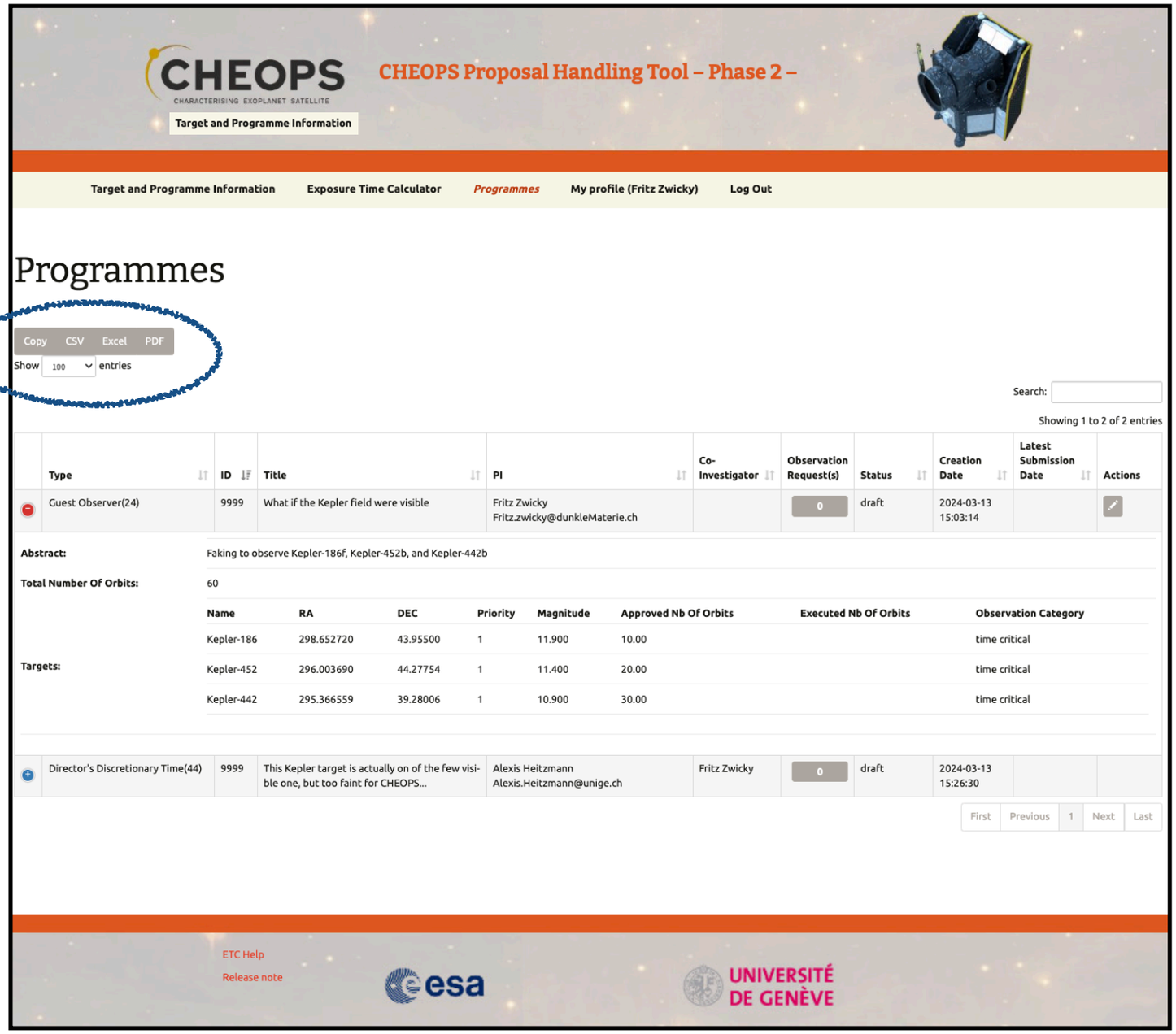
You see only proposals for which you are either the PI or the additional co-I as noted in the Phase I Proposal Handling Tool web inputs



Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Your accepted “Programmes”

Programmes list can be exported in various formats for convenience.

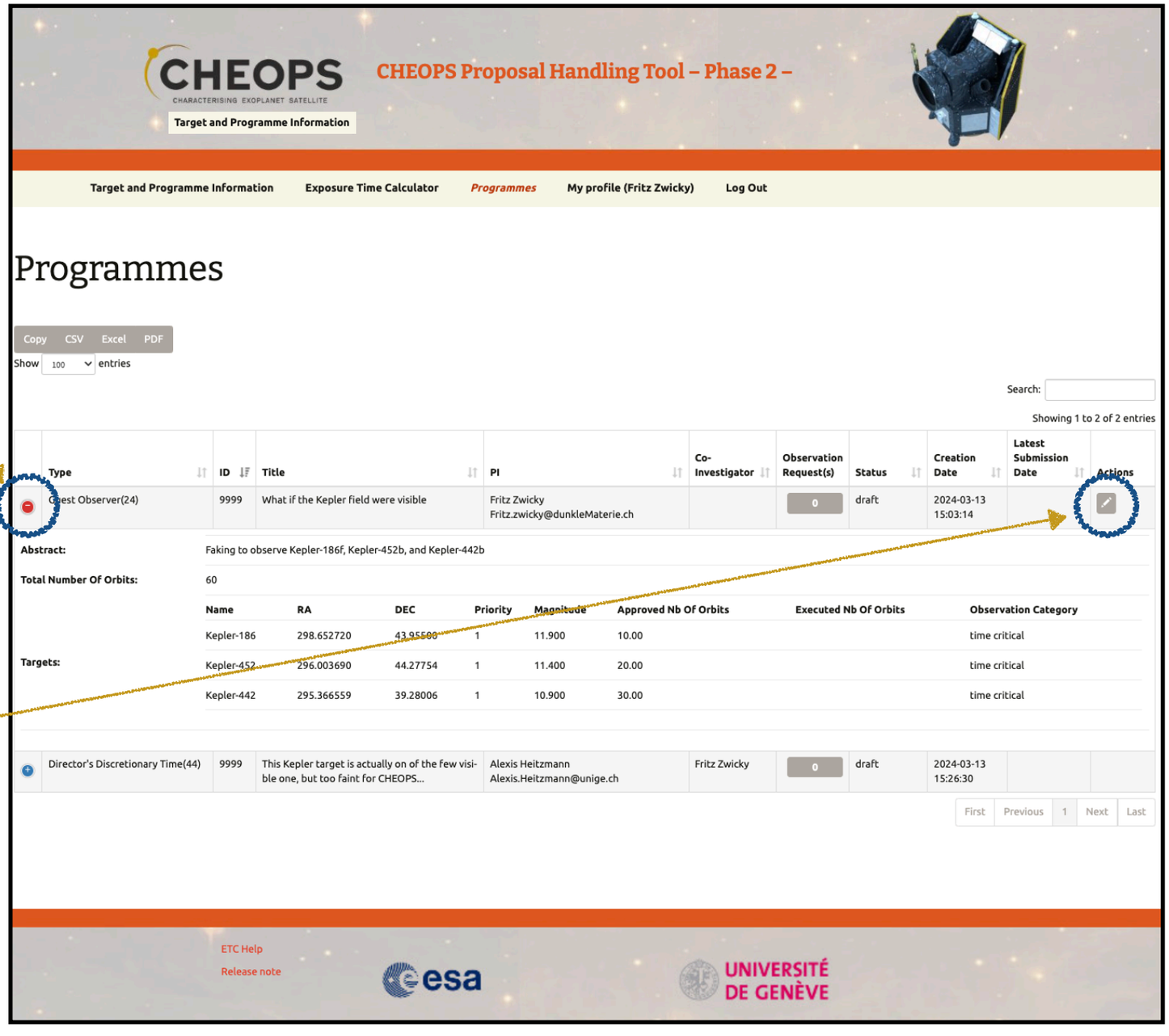


Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Your accepted "Programmes"

Explore Programme summary
- Accepted targets
- Accepted telescope time
- ESA-assigned Science priority

Programme-level information cannot be edited, except for *Title,Abstract,* and *Description of observations* using the icon

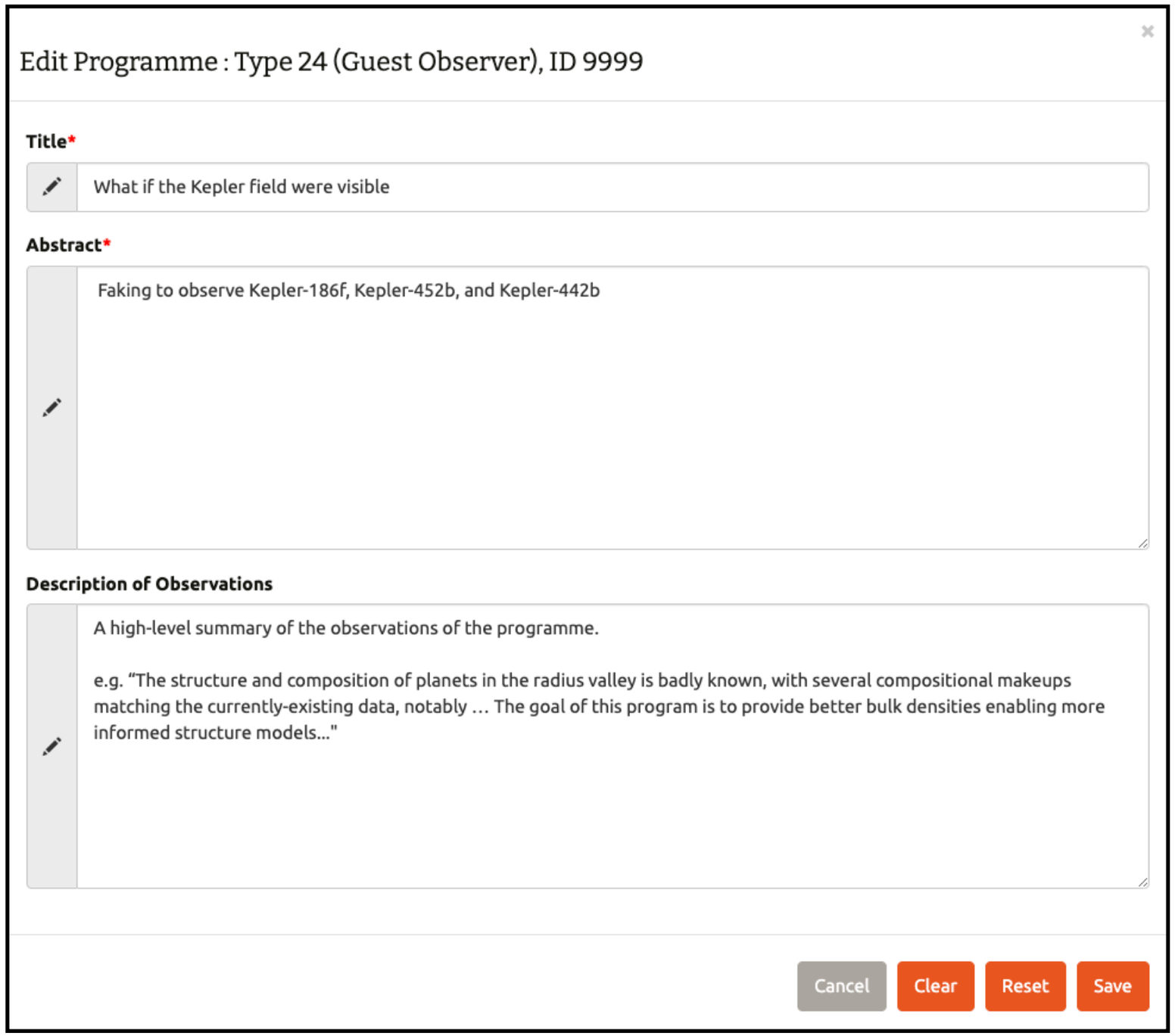


Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Your accepted “Programmes”

Please fill the field *Description of observations.* This helps all aspiring observers to gauge what is already done and where there might be potential for collaboration on given targets.

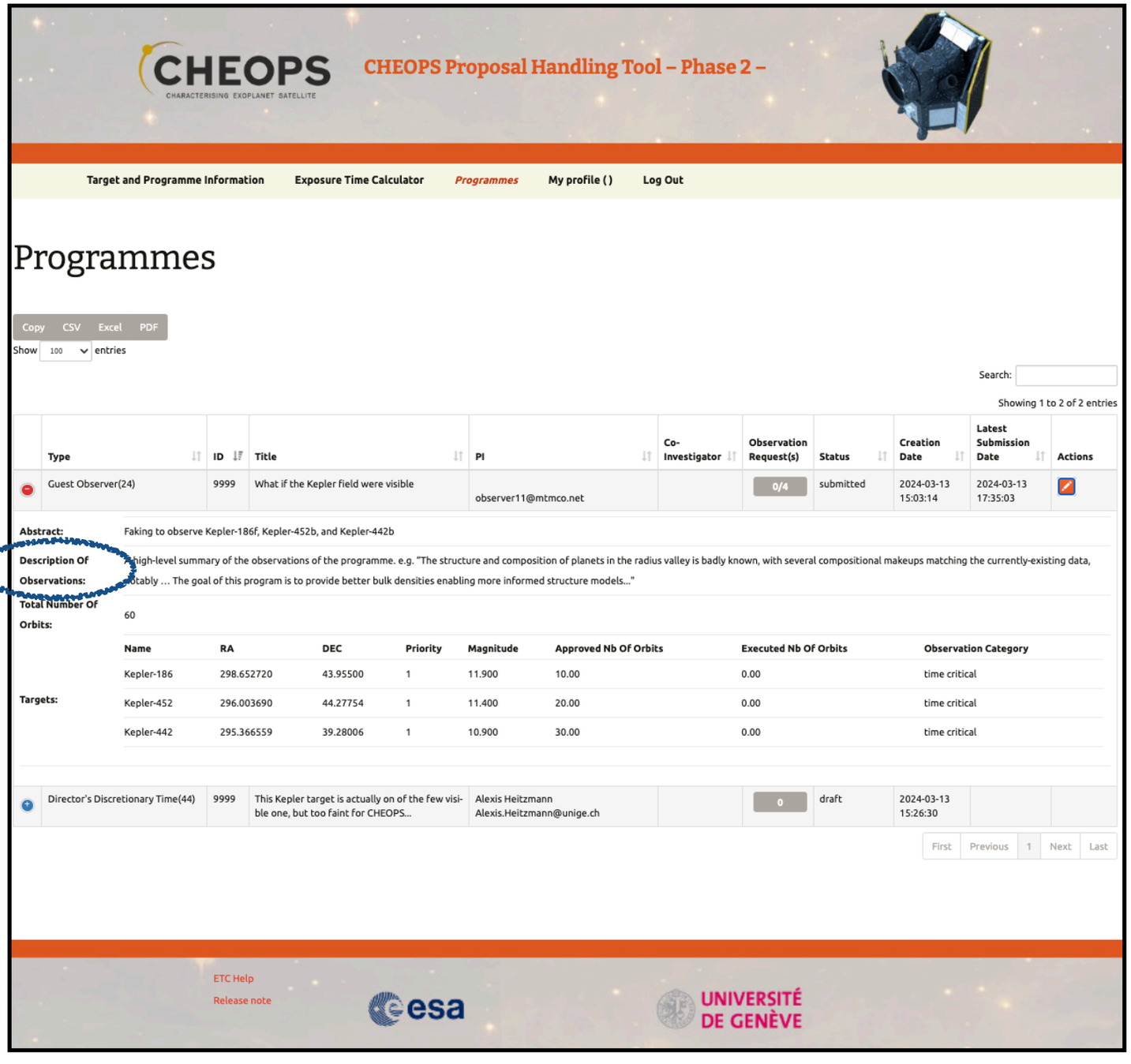
Please do not modify the *Title* and *Abstract* fields.



Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

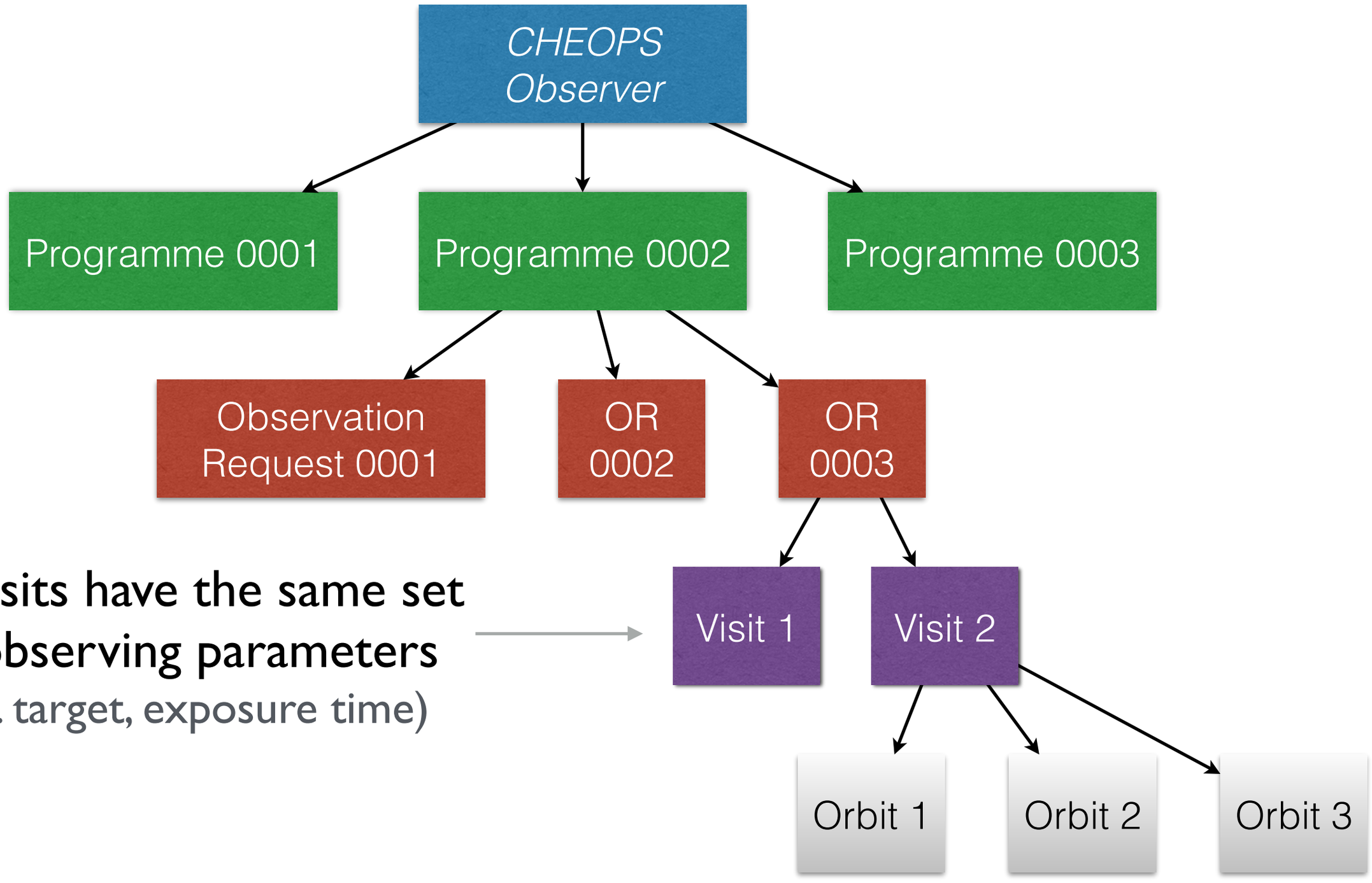
Your accepted "Programmes"

Your *Description of observations* now appears below the *Abstract*



Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Recap on observations hierarchy



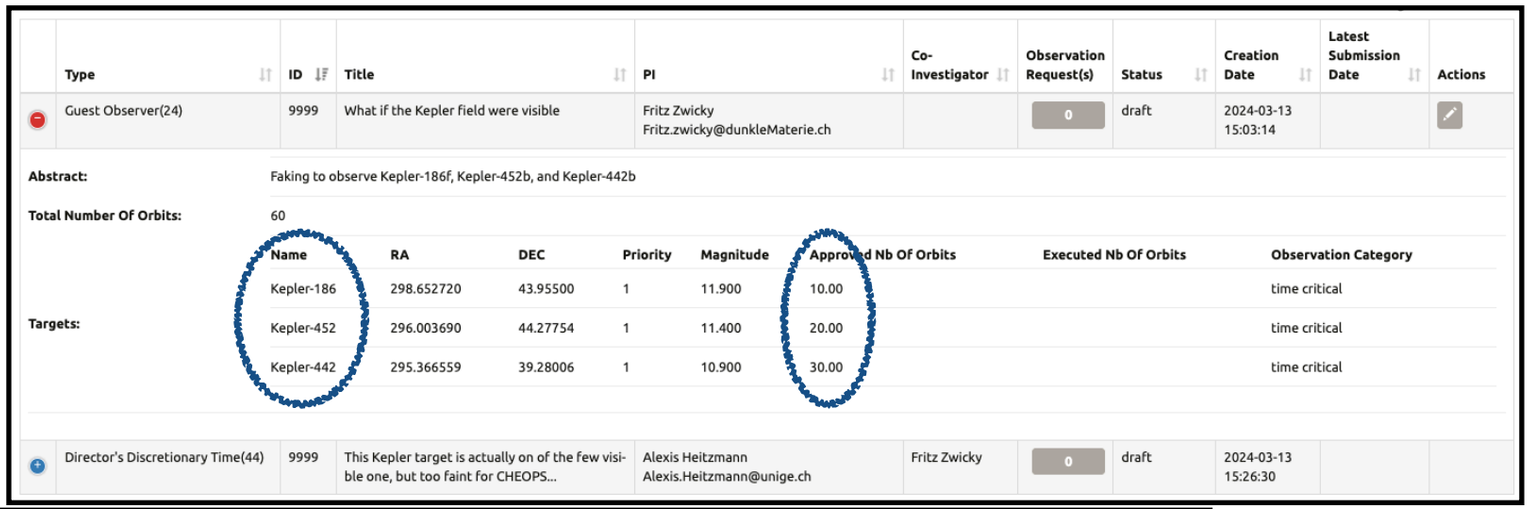
All visits have the same set of observing parameters

(e.g. target, exposure time)

Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Create an Observation Request

Take the following example of 3 targets, with respectively 10, 20 and 30 accepted orbits.



	Type	ID	Title	PI	Co-Investigator	Observation Request(s)	Status	Creation Date	Latest Submission Date	Actions
⊖	Guest Observer(24)	9999	What if the Kepler field were visible	Fritz Zwicky Fritz.zwicky@dunkleMaterie.ch		0	draft	2024-03-13 15:03:14		

Abstract: Faking to observe Kepler-186f, Kepler-452b, and Kepler-442b

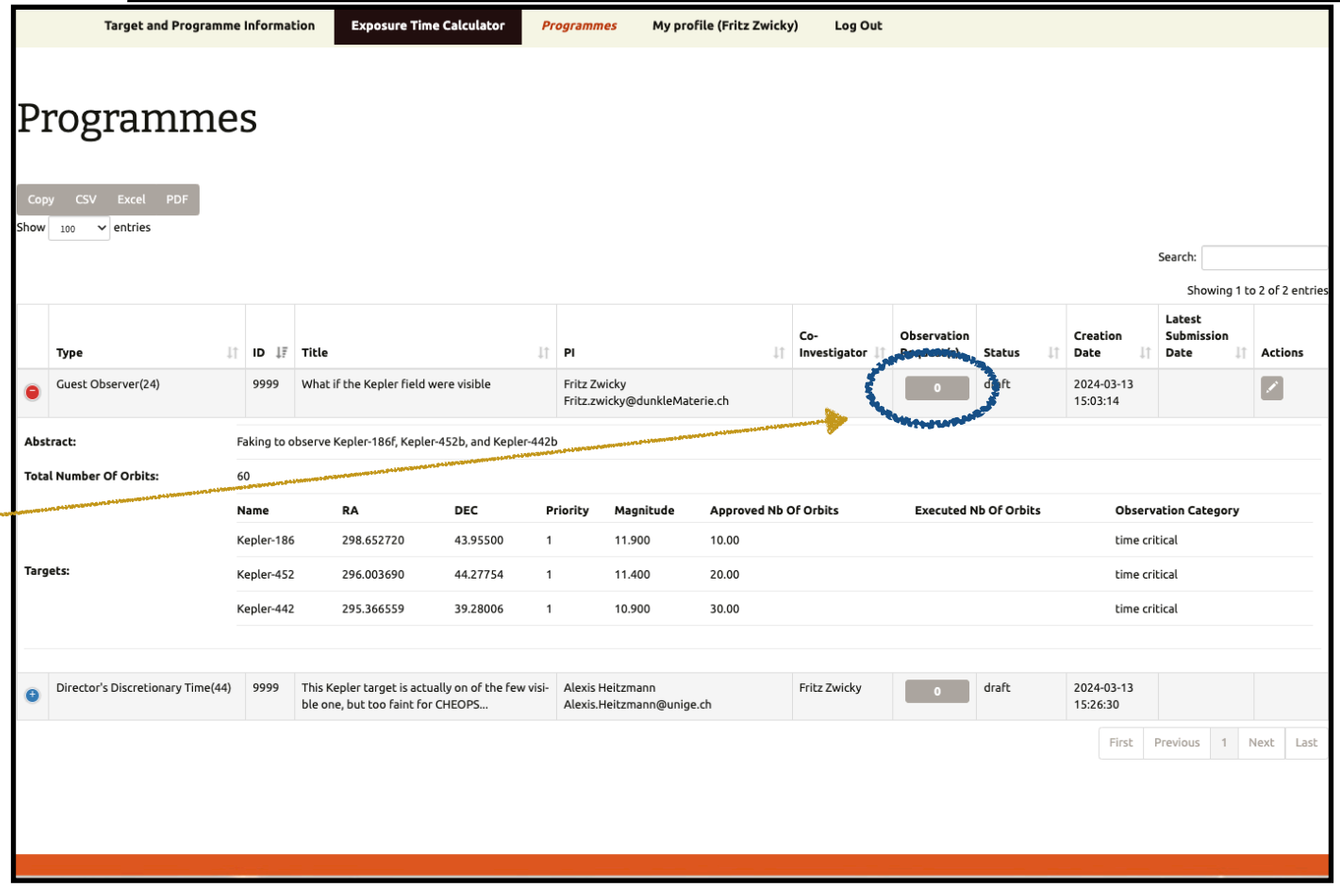
Total Number Of Orbits: 60

Targets:

Name	RA	DEC	Priority	Magnitude	Approved Nb Of Orbits	Executed Nb Of Orbits	Observation Category
Kepler-186	298.652720	43.95500	1	11.900	10.00		time critical
Kepler-452	296.003690	44.27754	1	11.400	20.00		time critical
Kepler-442	295.366559	39.28006	1	10.900	30.00		time critical

⊕	Director's Discretionary Time(44)	9999	This Kepler target is actually on of the few visible one, but too faint for CHEOPS...	Alexis Heitzmann Alexis.Heitzmann@unige.ch	Fritz Zwicky	0	draft	2024-03-13 15:26:30	

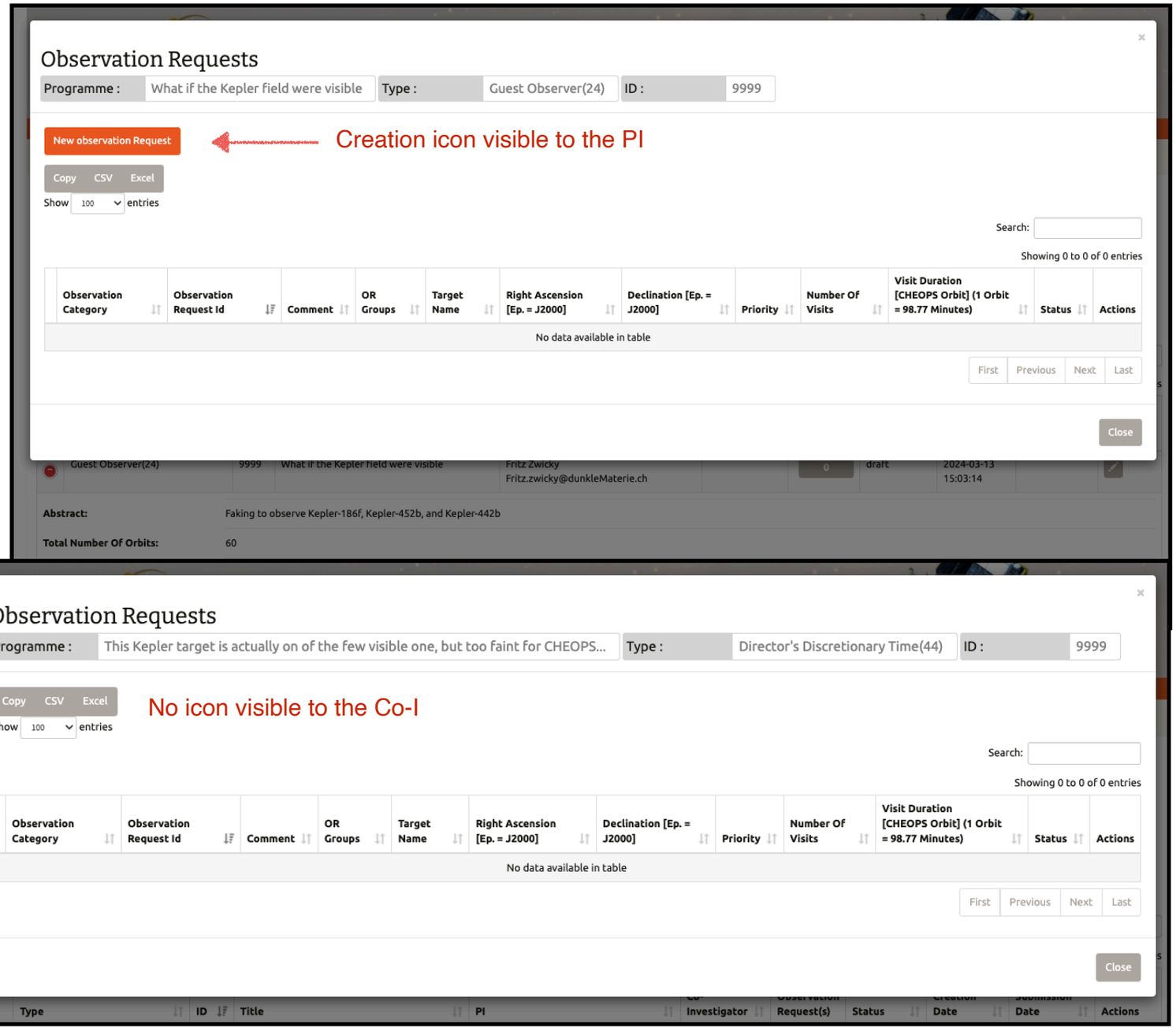
Click the observation request icon to create one.



Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Create an Observation Request

The PI owns the programme and can create / edit / delete observation requests.



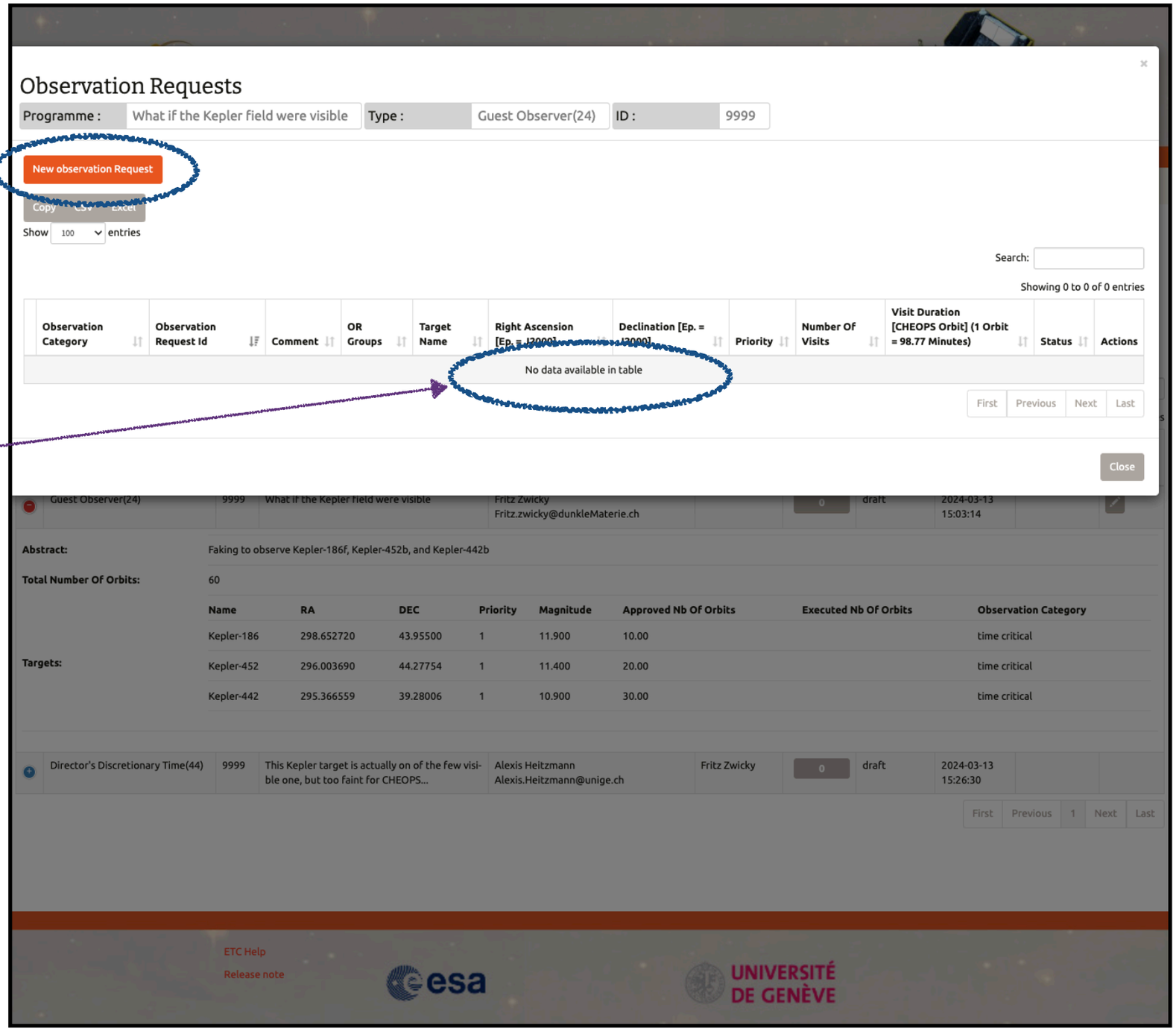
Co-Is can only consult observation requests, not edit them.

Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Create an Observation Request

Click on ‘New observation Request’ to create your first observation request (OR)

List of Observation Request is empty at this stage



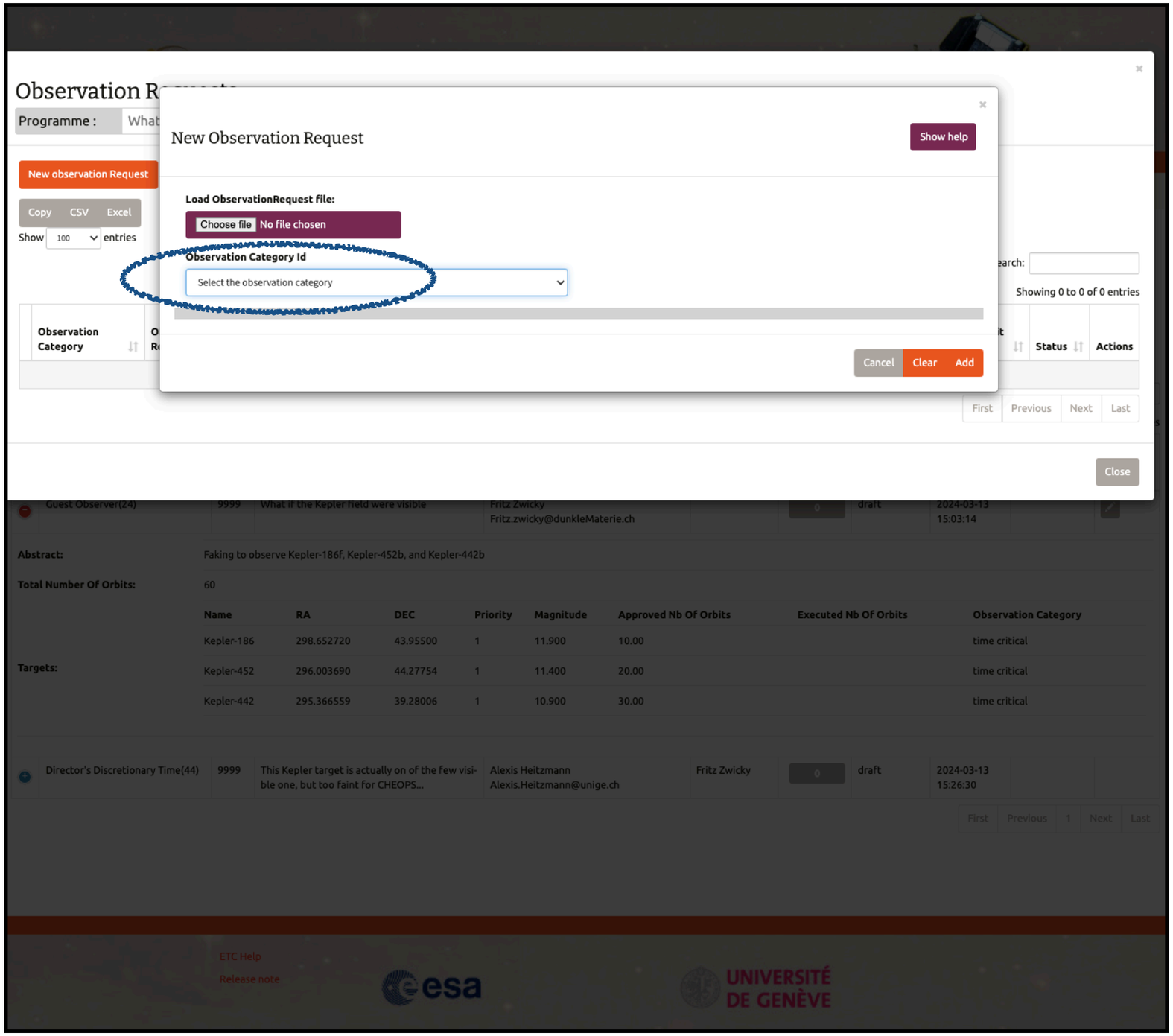
Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Create an Observation Request

Select the observation category:

- Time-Critical:
  Observation associated with a transit (more generally any periodic event)

- Non-Time-Critical:
  Observation **not** associated with a periodic event, typically for phase curves or other filler programmes

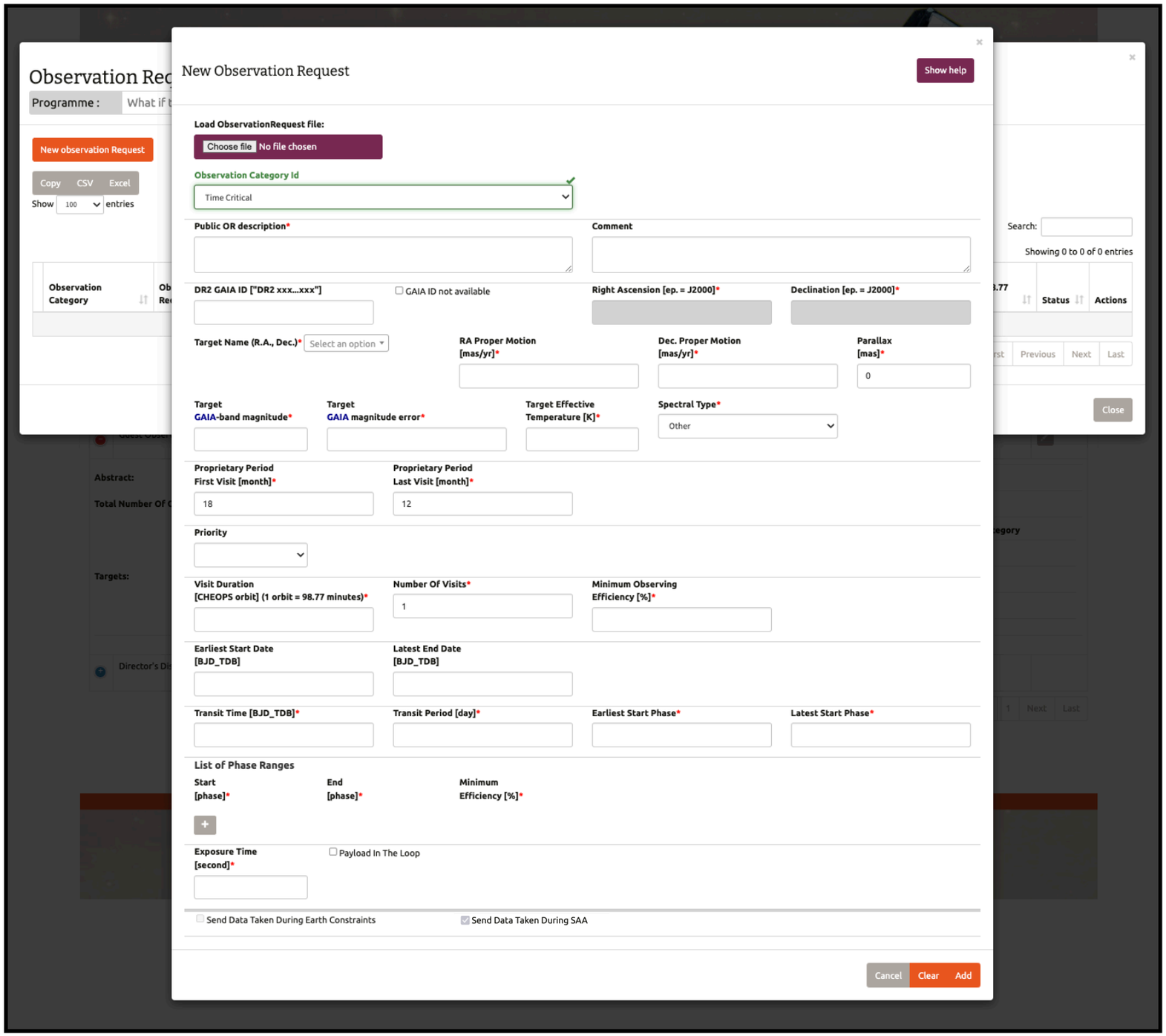


Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Fill in the Observation Request

Define the parameters of your observation

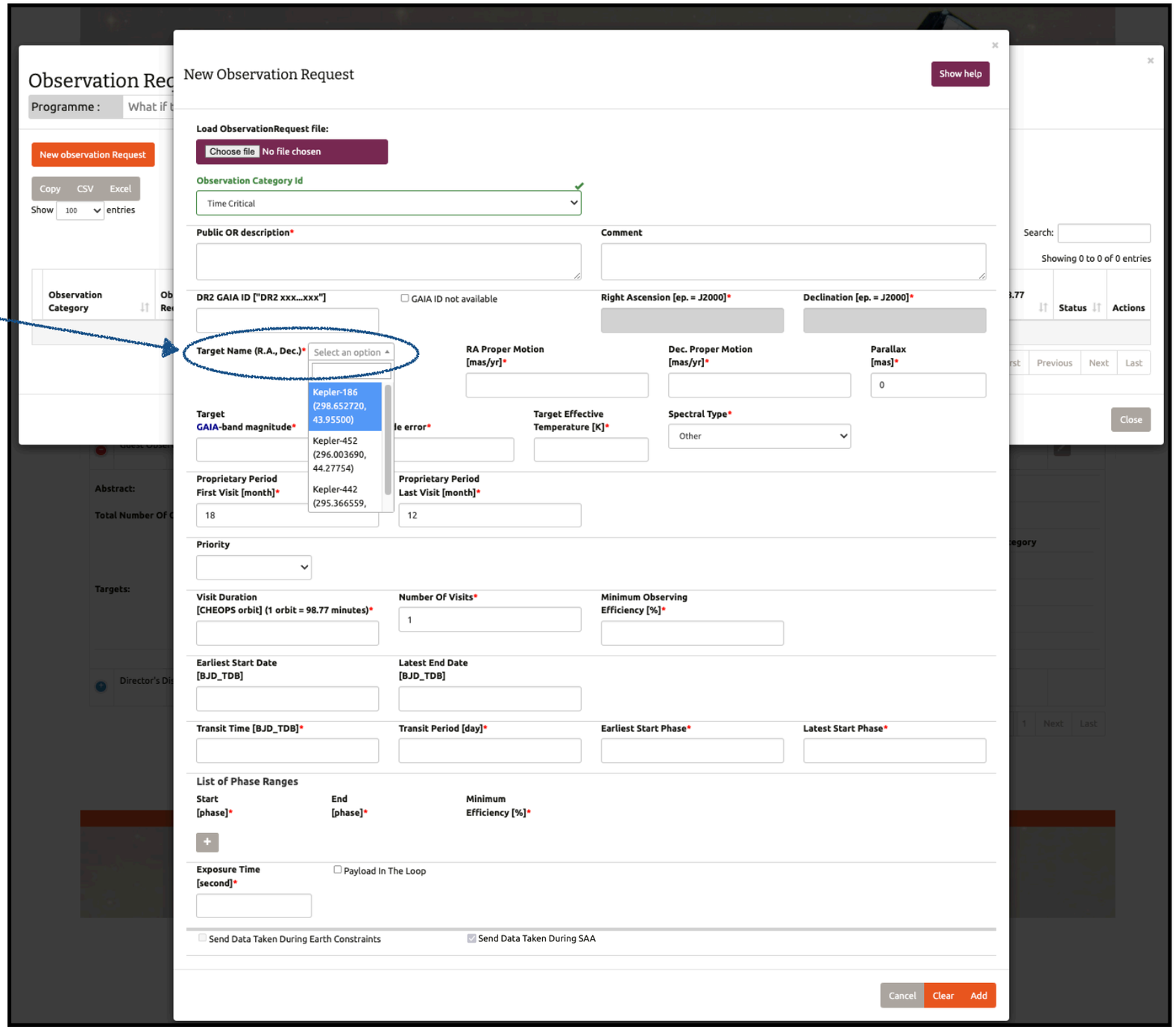
Some parameters are mandatory (indicated with a *)



Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Fill in the Observation Request

First select a target star from the scroll-down menu
(only targets accepted by the ESA TAC show in the menu)

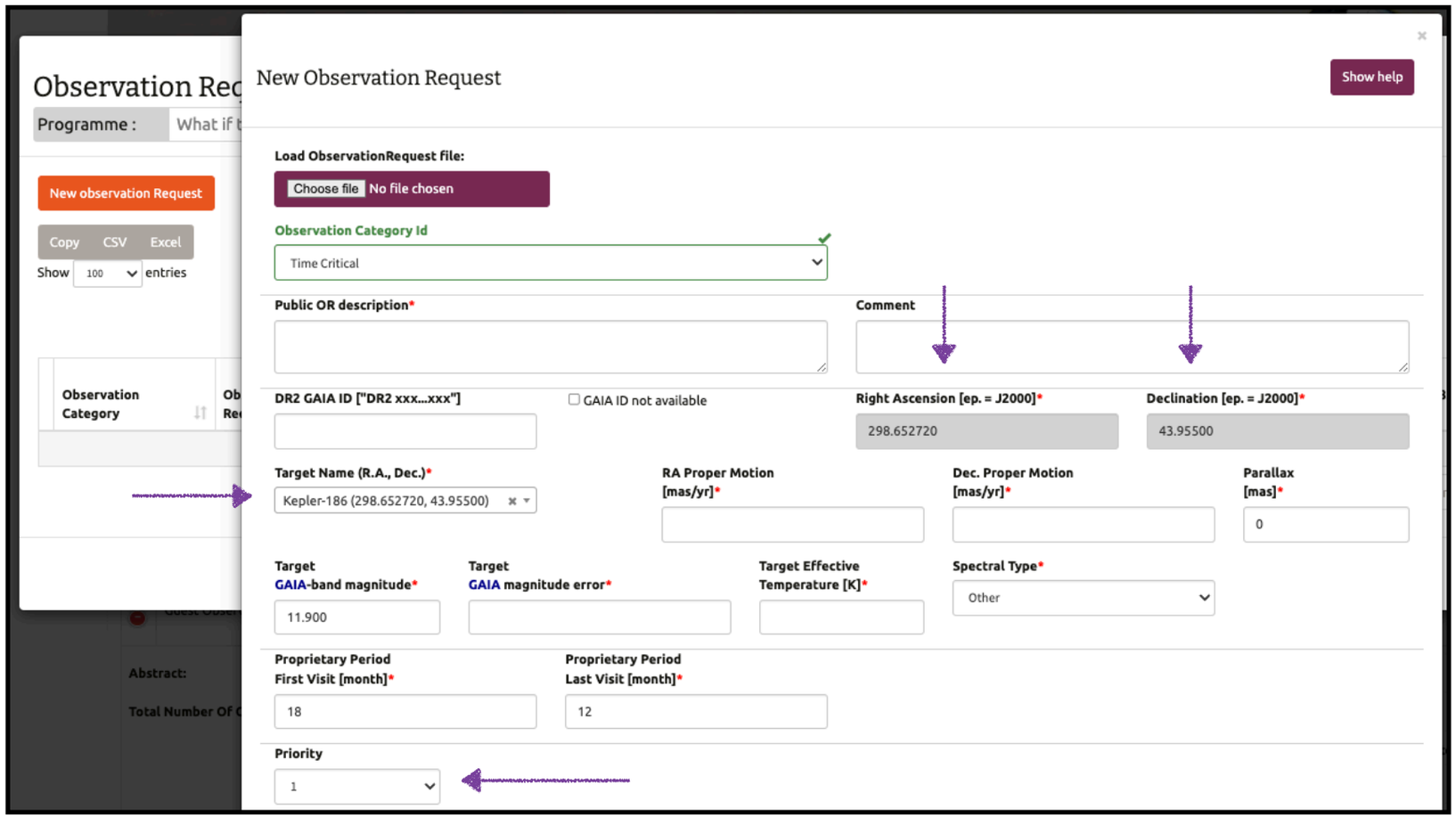


Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Fill in the Observation Request

Target coordinates (*RA/Dec*) are pre-filled with user-defined values from PHT-1

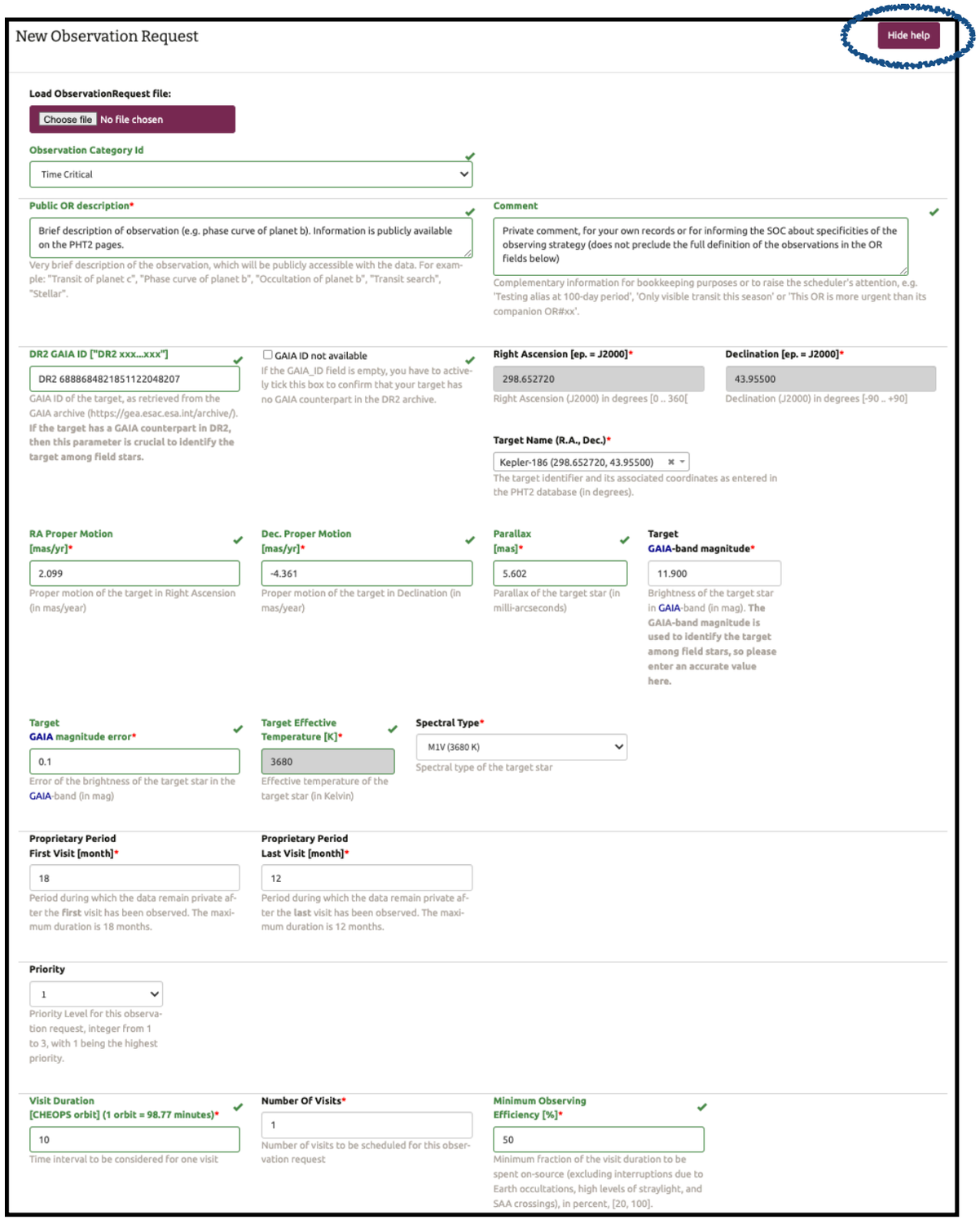
Priority field is pre-filled with the ESA-assigned priority for this target



Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Fill in the Observation Request

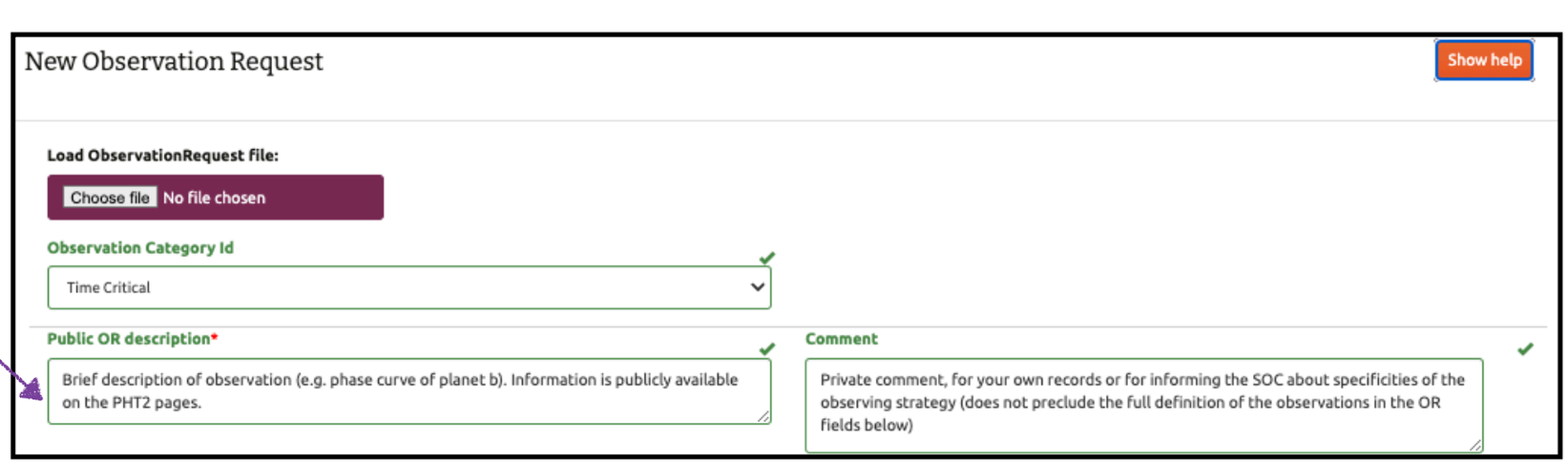
Click on the "*Show/Hide help*" button to show/hide additional information that will guide you to fill in individual fields.



Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Fill in the Observation Request

- *Public OR description* is a mandatory field. Please add a very brief description of the observation, which will be publicly accessible with the data. For example: "Transit of planet c", "Phase curve of planet b", "Occultation of planet b", "Transit search", “Stellar”



- *Comment* field may be useful for your own record, or for describing the observing strategy to the SOC / Mission planner.

Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

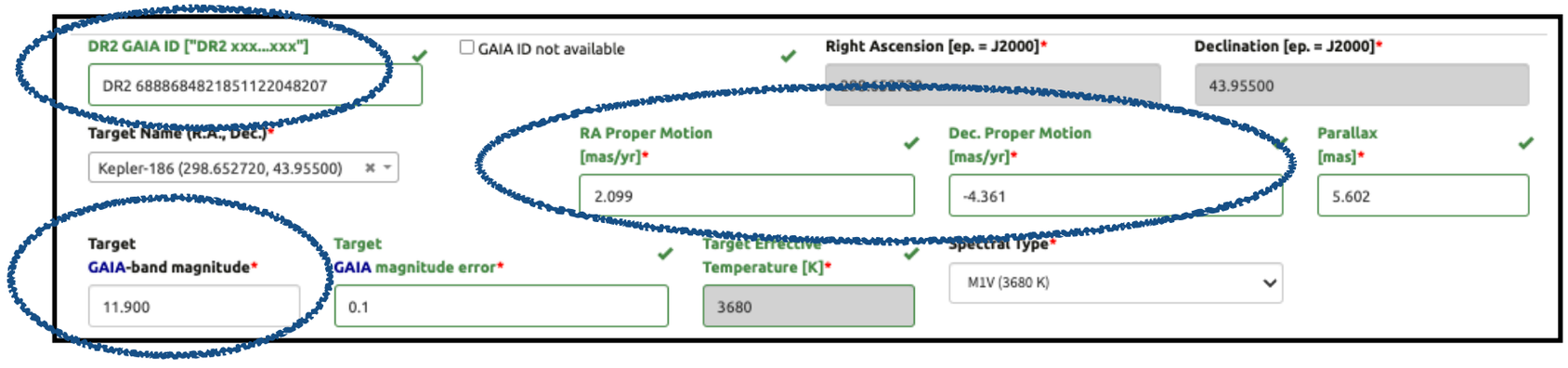
Fill in the Observation Request

- Fill in the missing target information:

- *DR2 GAIA ID* is critical for on-board target identification. Field must start with “**DR2** xxxxxxxx”. GAIA ID can be fetched from the GAIA Archive

- *Proper motion* may be critical for on-board target identification. Can be fetched from SIMBAD

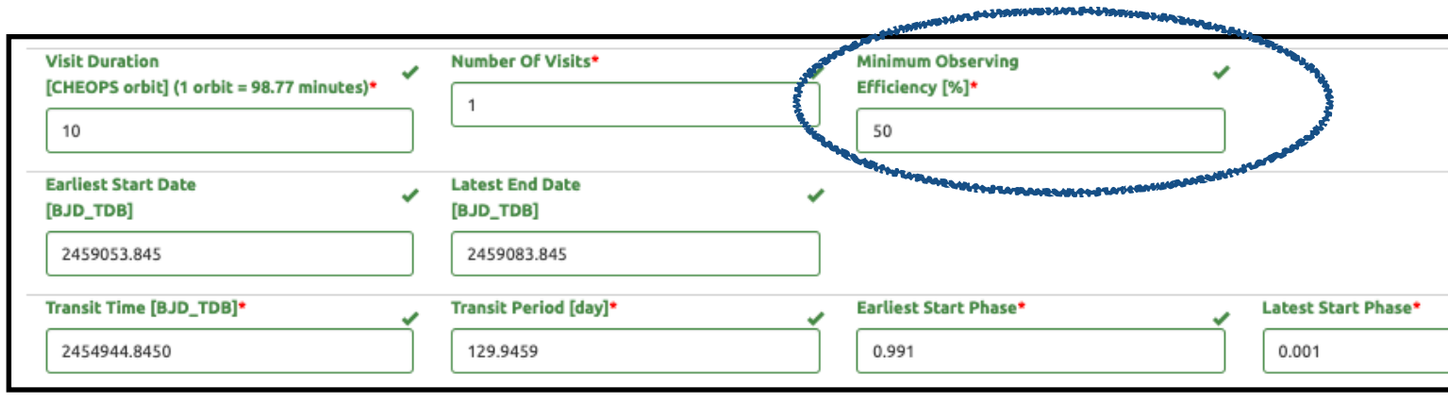
- GAIA-band m*agnitude* may also be critical for on-board target identification. Can be fetched from SIMBAD



Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Fill in the Observation Request

- ***Minimum observing efficiency*** is a critical element for the schedulability of your observation. Expected observing efficiency can be checked with the Science Feasibility Checker (Phase-1).



Notes from the template observationRequest file that you have used for preparing the Phase-1 (feasibility check):

```
<!-- This parameter defines the minimum on-source time relative to the visit duration                    -->
<!--      (excluding interruptions due to the SAA, Earth Occultations, and straylight constraints)       -->
<!-- NOTE: For visits with scheduling flexibility, especially those shorter than 3 orbits, the effective -->
<!--      observing efficiency may end up to be lower than the requested value by up to ~ 15%.          -->
<!--      This may happen under special circumstances, typically when the scheduleSolver algorithm adjusts -->
<!--      the visit start time to optimise the overall schedule, which may result in a visit being shifted -->
<!--      toward the SAA, Earth occultations or straylight regions.                                     -->
```

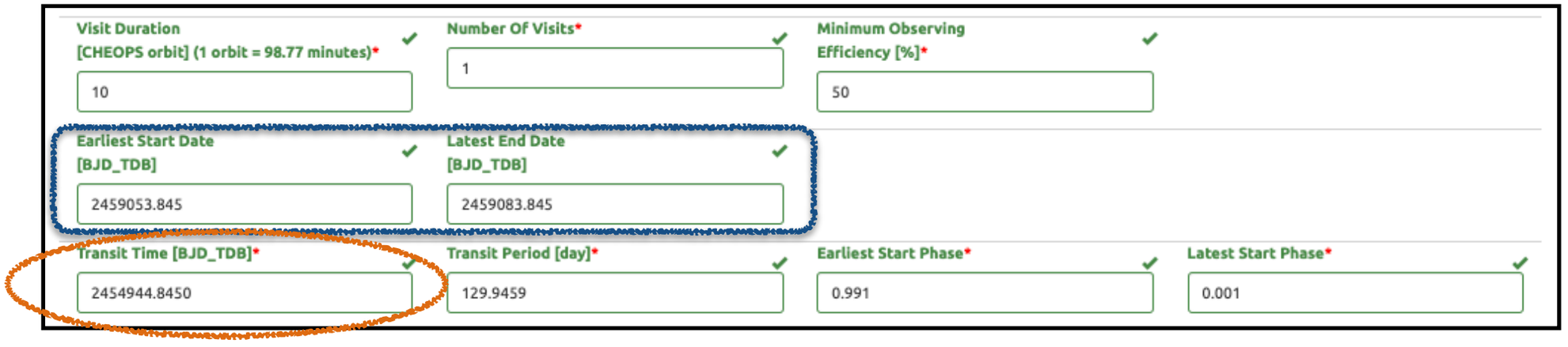
As the observing efficiency is mainly driven by the target location in the sky, it is highly *recommended* to set the requested observing efficiency to a rather low value, *typically 50%*, for all targets, except if the science case requires very high observing efficiency (assuming this efficiency is reachable for at least one visit)

Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Fill in the Observation Request

- Use **time bracketing** ***(Earliest Start Date and Latest End Date)*** to constrain the scheduling dates of your observations.

  This might be useful for “catching” specific transits, typically for TTVs.This parameter is optional.

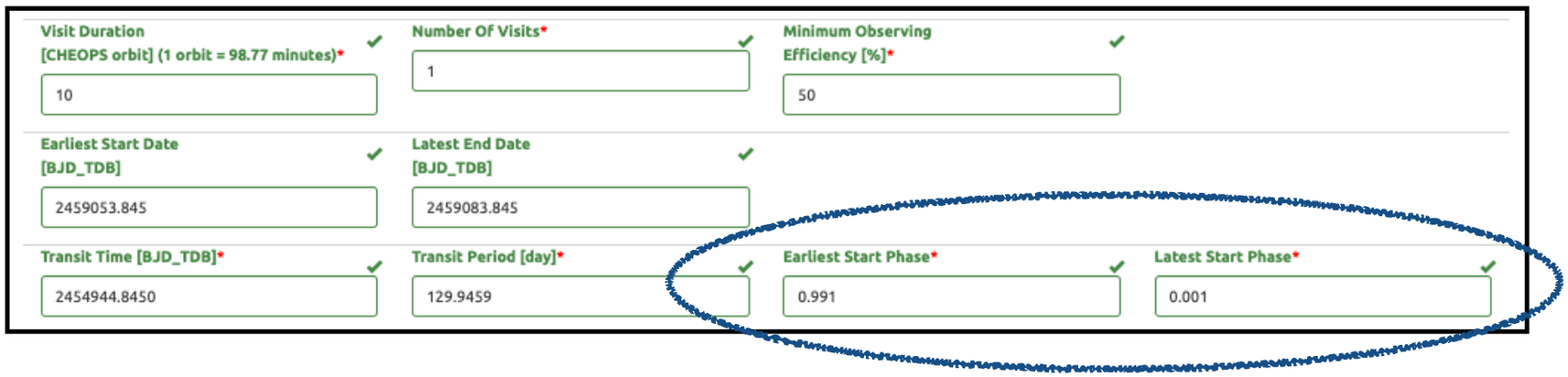


- Note that **the Transit Time is NOT the time of observation** but the mid-transit time from which the time of observation is computed (propagated using the given Transit Period).

  Only the Earliest Start Date and Latest Start Date must be used to constrain a specific date/time of observation.

Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Fill in the Observation Request



- ***Earliest/Latest Start Phase*** parameters are used to define the allowed start time of *time-critical* visits.

Notes from the template observationRequest file that you have used for preparing the Phase-1 (feasibility check):

```
<!--  This parameter defines the flexibility of a visit start time in units of planetary orbital phase.                    -->
<!--        Two values are defined to bound the allowed start time of the visit.                                            -->
<!--  NOTE: Leaving no slack for the observation start time reduces the chance of being scheduled                           -->
<!--  NOTE: Requesting flexibility on the start time implies that the effective observing efficiency may in some rare cases -->
<!--        be lower than the requested value (see comment above in <Minimum_Effective_Duration>)                           -->
```

The start_phase slack allows for some scheduling flexibility. Be careful however that the slack is commensurate with the visit duration, i.e. that the visit covers the intended time period, typically the transit, for any start time during the start_phase slack.

The Mission Planning System does not support cases where the visit duration is longer than the transit period

Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Fill in the Observation Request

Non-time-critical observations can be scheduled at any time between the Earliest Start Date and the Latest End Date if provided, any time if not.

One must note that the Mission Planning System can only schedule **one non-time critical visit per 48 hours for a given OR**.

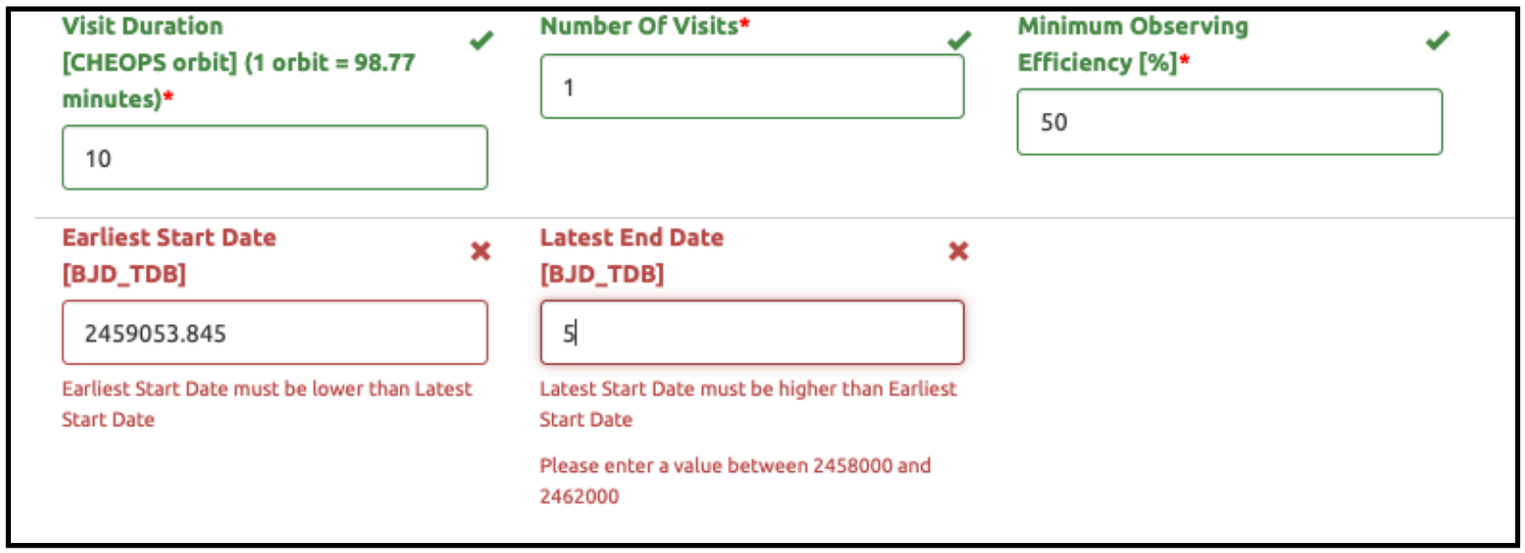
Therefore, to get non-time critical observations scheduled at a **faster rate, one must create a few (typically 3) duplicate ORs with the exact same parameters.**

This way the Mission Planning System will be able to pick visits from these different ORs and schedule them within 48 hours.

Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Fill in the Observation Request

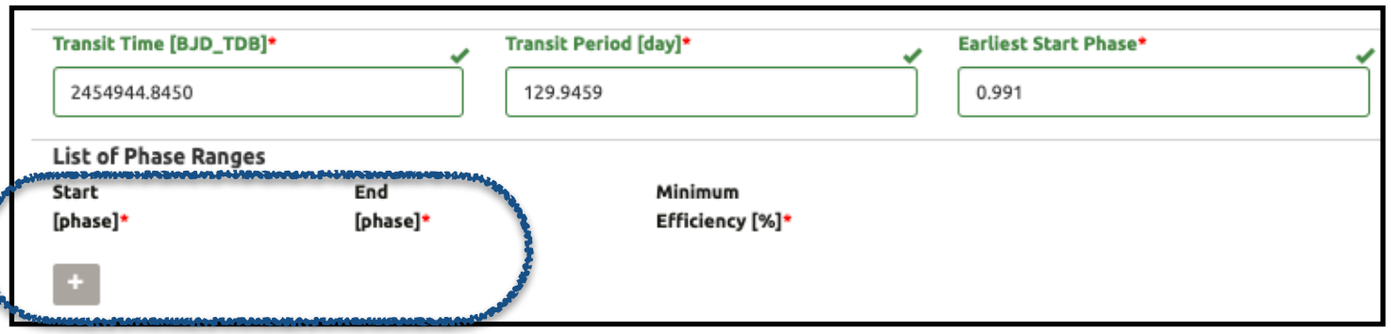
Valid and invalid entries are identified as such in the form.



Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Fill in the Observation Request

For *time-critical* observations only, you may define *critical phase ranges*, i.e. specific time periods within the visit with an increased requested observing efficiency.



As those put stringent constraints on the schedulability of your observations, they should be used ***only*** if justified by the science case.

Please make sure that the *requested critical phase ranges are always contained within the visit*, for all possible start times defined by the *Earliest/Latest Start Phase* parameters.

Notes from the template observationRequest file that you have used for preparing the Phase-1 (feasibility check):

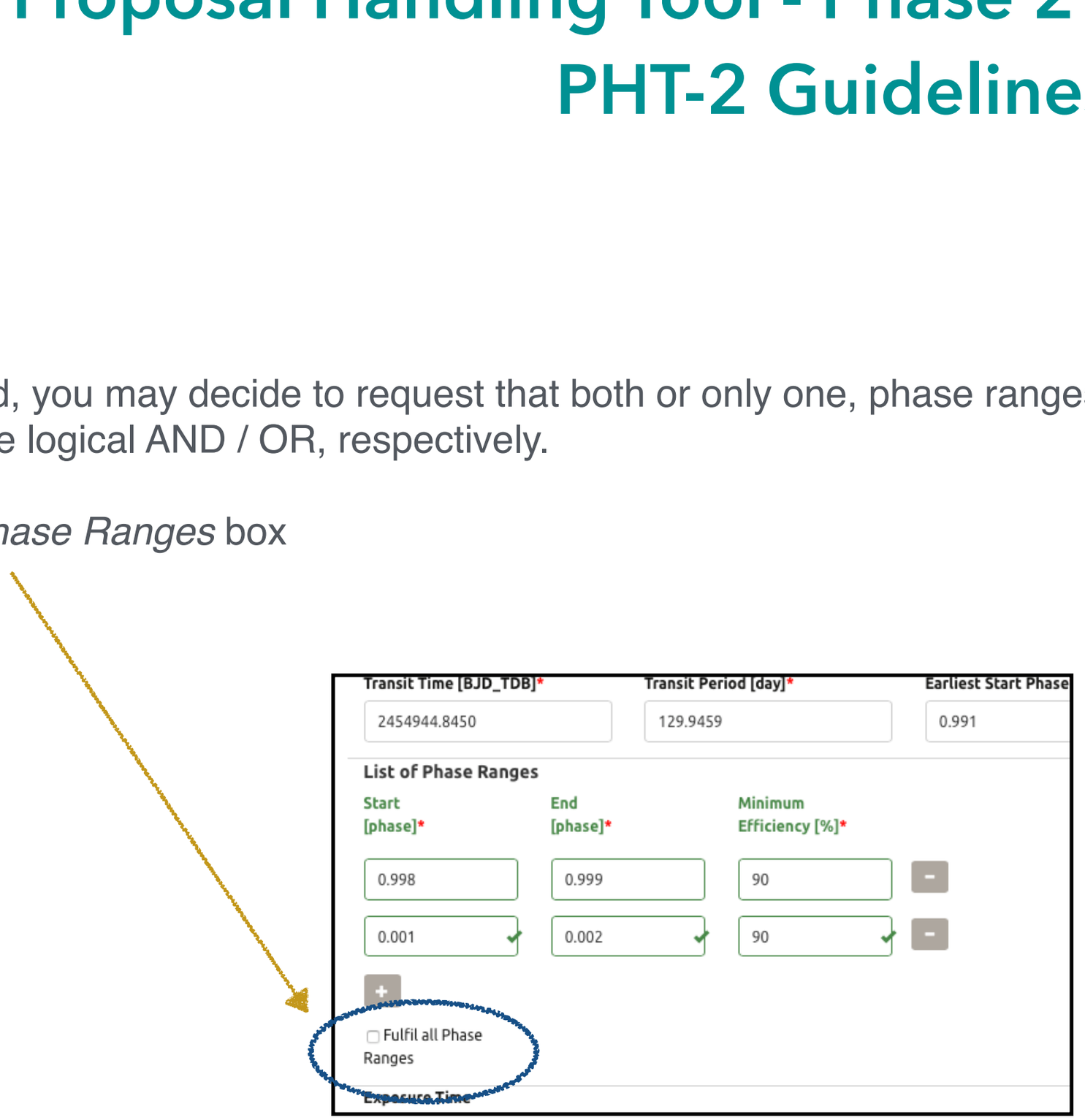
```
<!--  The set of parameters below is used to define specific (orbital) phase ranges                    -->
<!--        within which the observing efficiency may be increased to a specific value                 -->
<!--        Convention is that the transit is at phase=0 (or equivalently 1)                           -->
<!--        This can be seen as a local requirement on the observing efficiency (e.g. egresses)        -->
<!--  NOTE: Requiring critical phase ranges is an additional constraint that will result in lower chances of being scheduled  -->
```

Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Fill in the Observation Request

When two phase ranges are specified, you may decide to request that both or only one, phase ranges are observed. This is equivalent to the logical AND / OR, respectively.

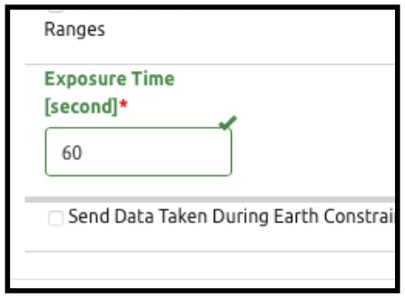
This is done by ticking the *Fulfil all Phase Ranges* box



Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Fill in the Observation Request

- ***Exposure Time*** is critical for the technical validity of your observations.

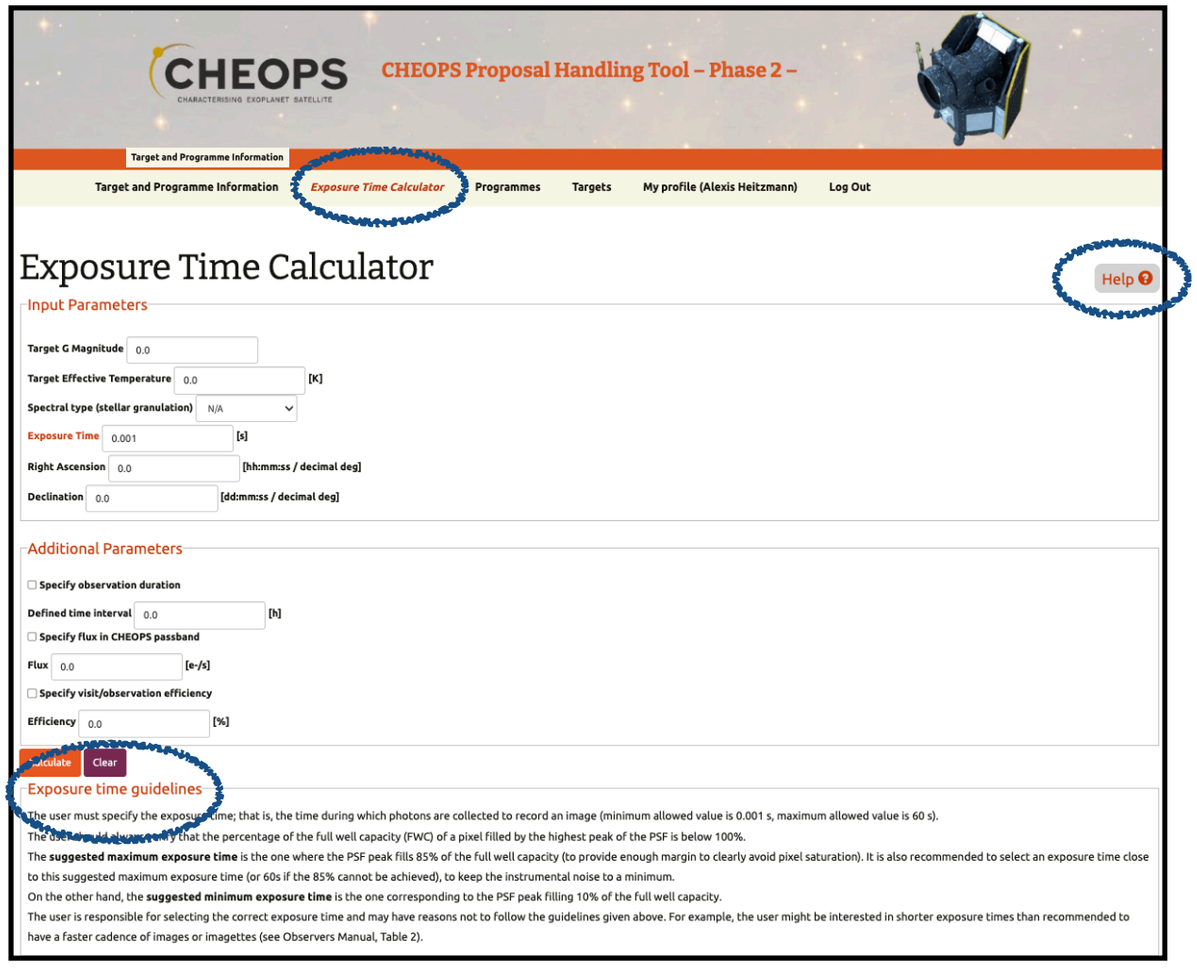


Please consult the ***CHEOPS Observers Manual*** to understand the impact of the exposure time on the on-board image stacking strategy.

Table 2: Image and imagette stacking order, image cadence and duty cycle as a function of the exposure time. An image cadence of f means that one image is recorded every f seconds. In ULTRABRIGHT read-out mode (shaded rows), the detector has to be read-out sequentially and not in parallel to the exposition, introducing a significant decrease of the duty cycle, calculated as d = t_{exp} / (t_{exp} + 1.1 s). See Table 1 for details. Mind the gap in duty cycle between exposure times of 1 s and 1.05 s!

Exposure time (s)	Image stacking order	Imagette stacking order	Stacked image cadence (s)	Duty cycle (%)
t_{exp}< 0.1	40	4	f < 48	d < 8.3
0.1 ≤ t_{exp} < 0.15	39	3	46.8 ≤ f < 48.8	8.3 ≤ d < 12
0.15 ≤ t_{exp} < 0.2	36	3	45 ≤ f < 46.8	12 ≤ d < 15.4
0.2 ≤ t_{exp} < 0.4	33	3	42.9 ≤ f < 49.5	15.4 ≤ d < 26.7

Please follow the guidelines from the Exposure Time Calculator to set up the exposure time.



Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

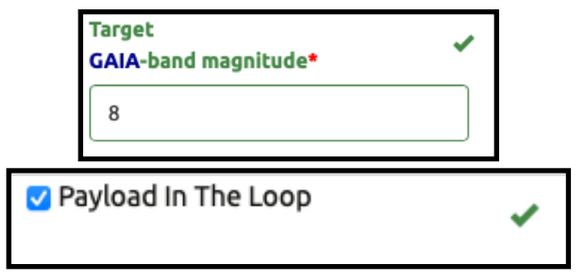
Fill in the Observation Request

Payload-In-The-Loop (PITL) configuration:

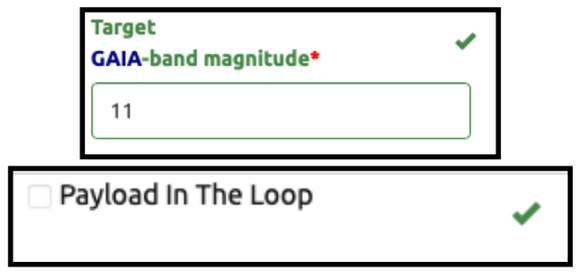
- PITL active: spacecraft pointing is locked on the science target
- PITL inactive: spacecraft pointing solely relying on star trackers
- See CHEOPS Observers Manual for more details

The PHT2 automatically sets the PITL configuration to:

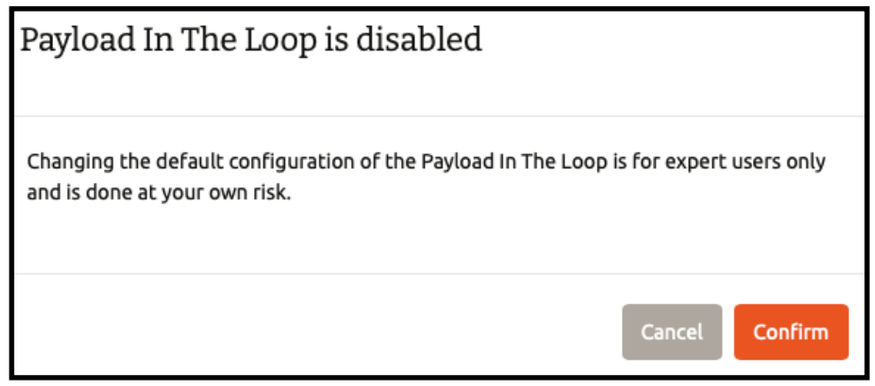
Active, on targets brighter than Gmag=11



Inactive, on targets fainter than Gmag=11



The PI can request to disable the PITL for bright targets, typically in case of close and bright contaminants that could degrade the pointing performance if the PITL were active.
This setting is meant for experts and at the observer's own risk.



Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Fill in the Observation Request

Options on *data downlink* are not editable for nominal science users.

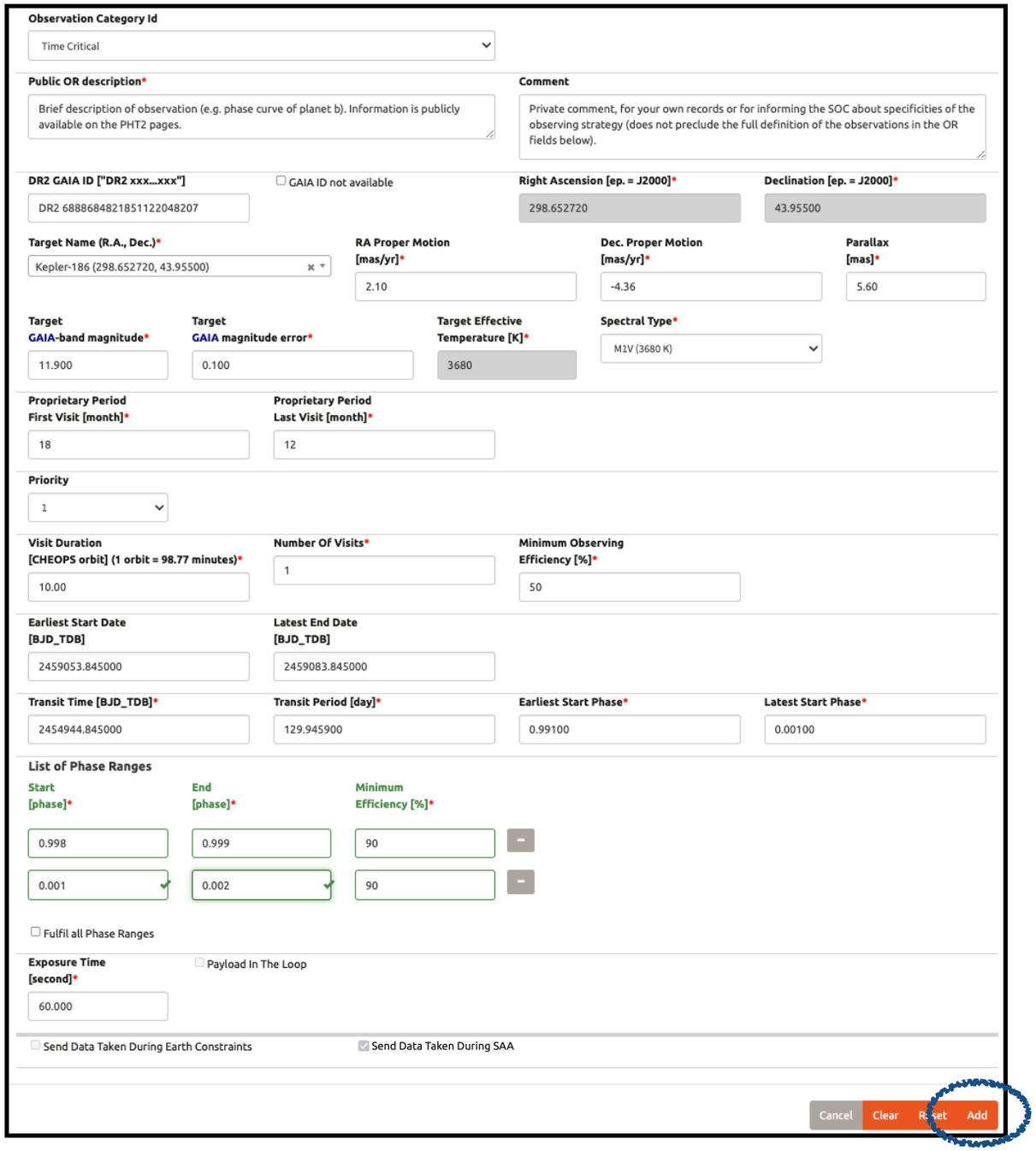
Radio buttons indicate whether data recorded on-board during SAA crossings or during Earth constraints (hard occultation and high-levels of straylight) will be downlinked.

Their current default values for nominal science are:
- False for Earth constraints, i.e. data not downlinked during Earth occultations,
- True for the SAA, i.e. data is downlinked (but flagged) during SAA crossings.

Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Finalise the Observation Request

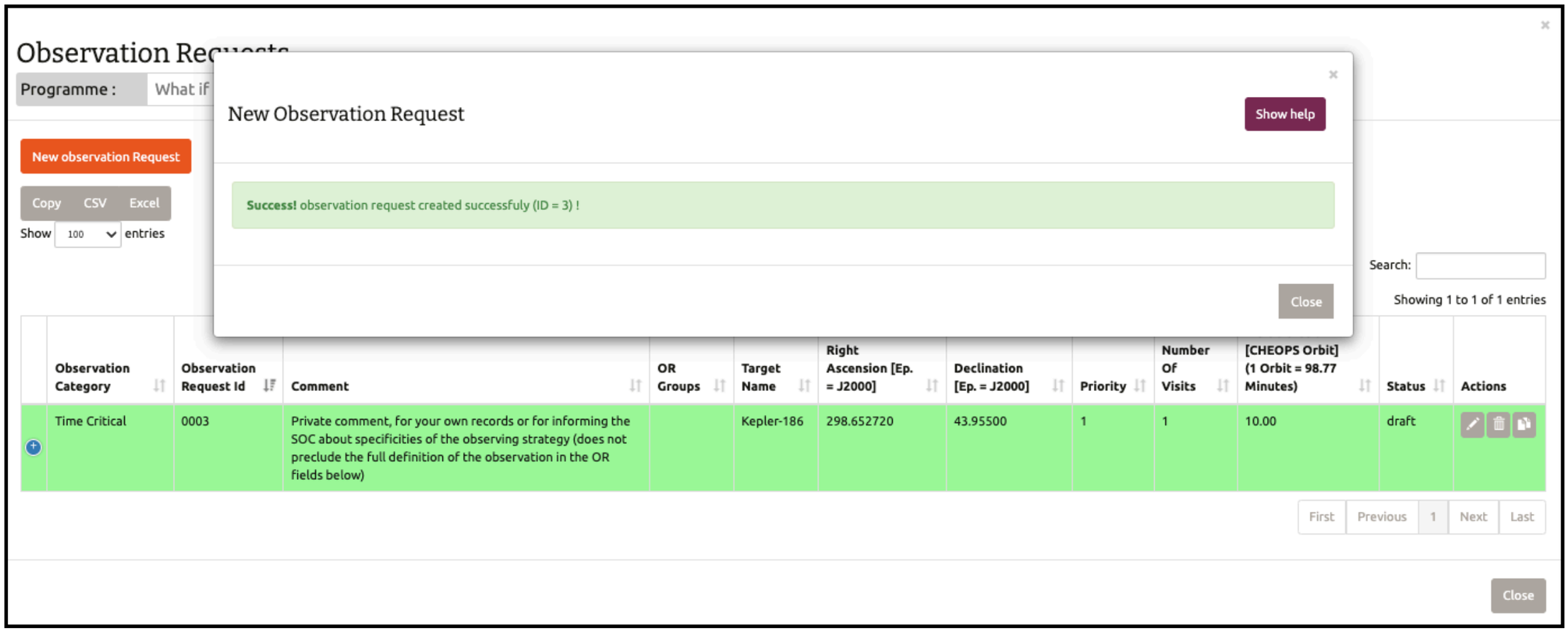
Once your observation request is complete, please click on “Add”



Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Finalise the Observation Request

The new Observation Request now appears in the list

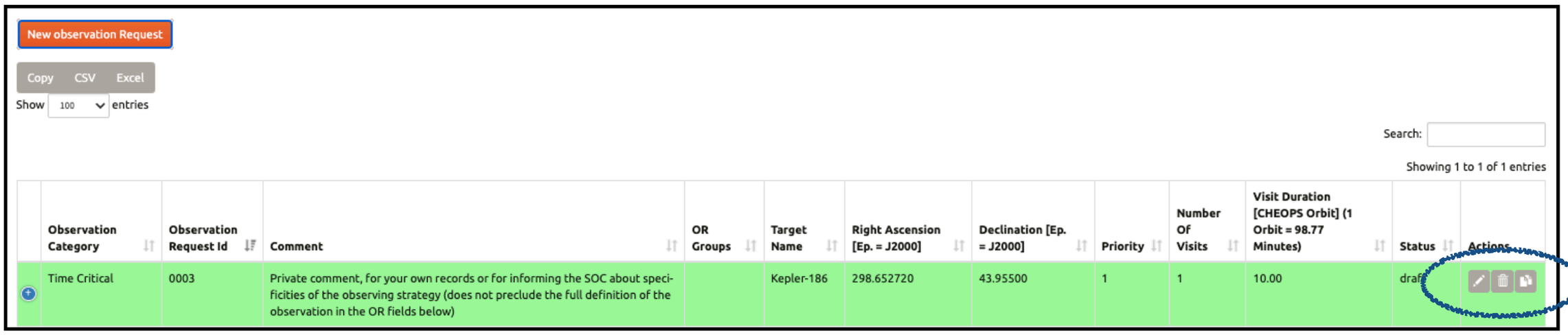


Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Complete your programme

Your newly created Observation Request now appears in the list

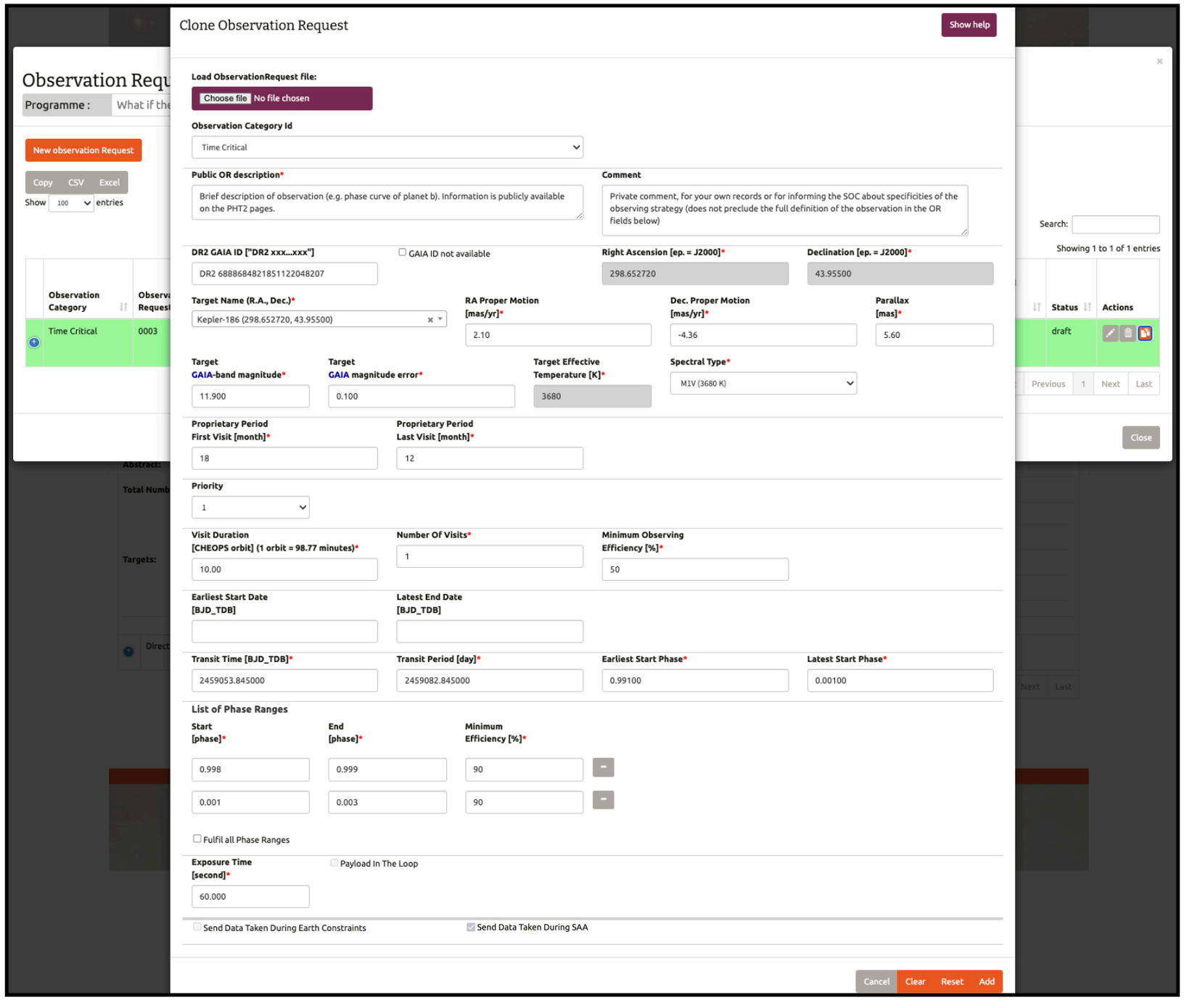
You can **Edit** , **Delete** , **or Clone** your observation requests



Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Complete your programme

Cloning an observation request creates a new observation request (new ID) with fields pre-filled with values from the parent request.
This may be used to speed up the creation of observation requests if only a few parameters change with respect to existing requests.

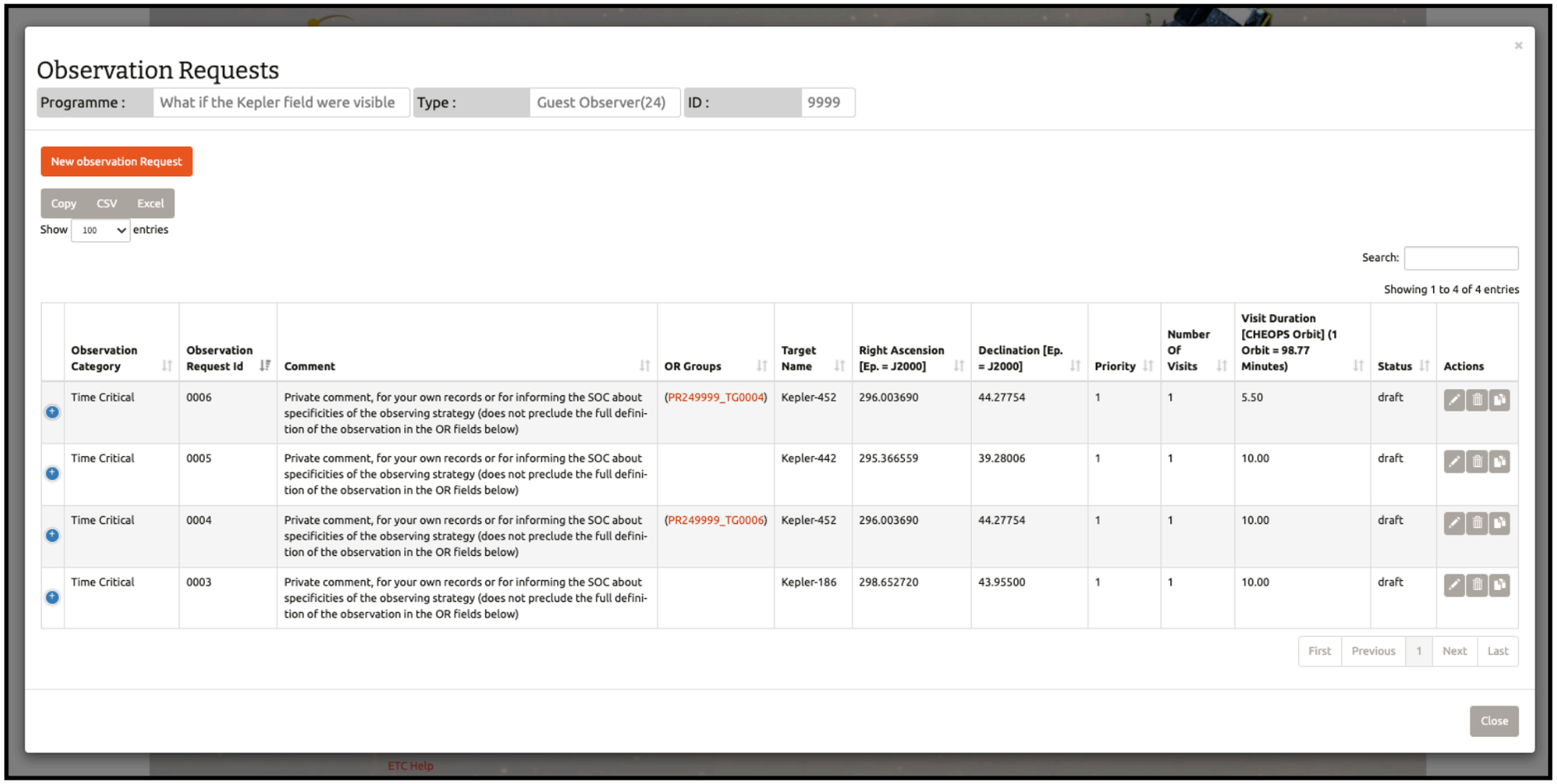


Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Complete your programme

Every new Observation Request appears in the list of observations in your programme.

The total time required to execute all observation requests in a given programme must remain within the time allocated by the ESA TAC



Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

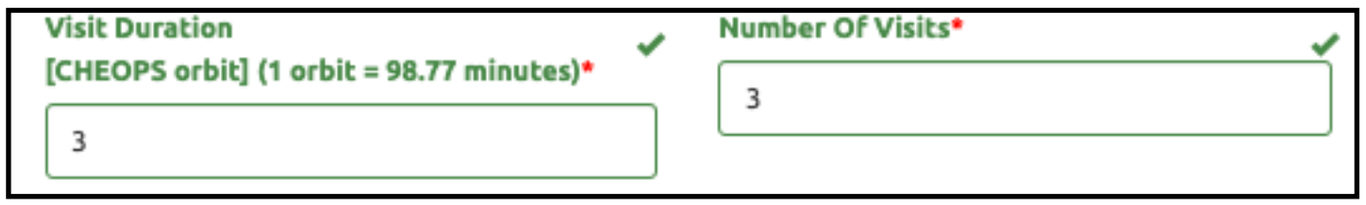
Complete your programme

You cannot exceed the number of accepted orbits for a given target.

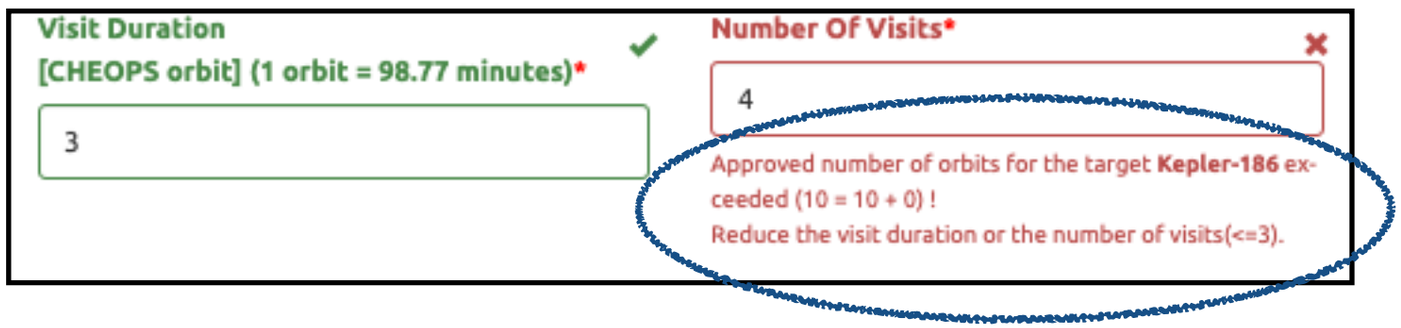
This example is for a target with only 10 orbits left to be allocated.

10 x 1 = 10 — OK

3 x 3 ≤ 10 — OK



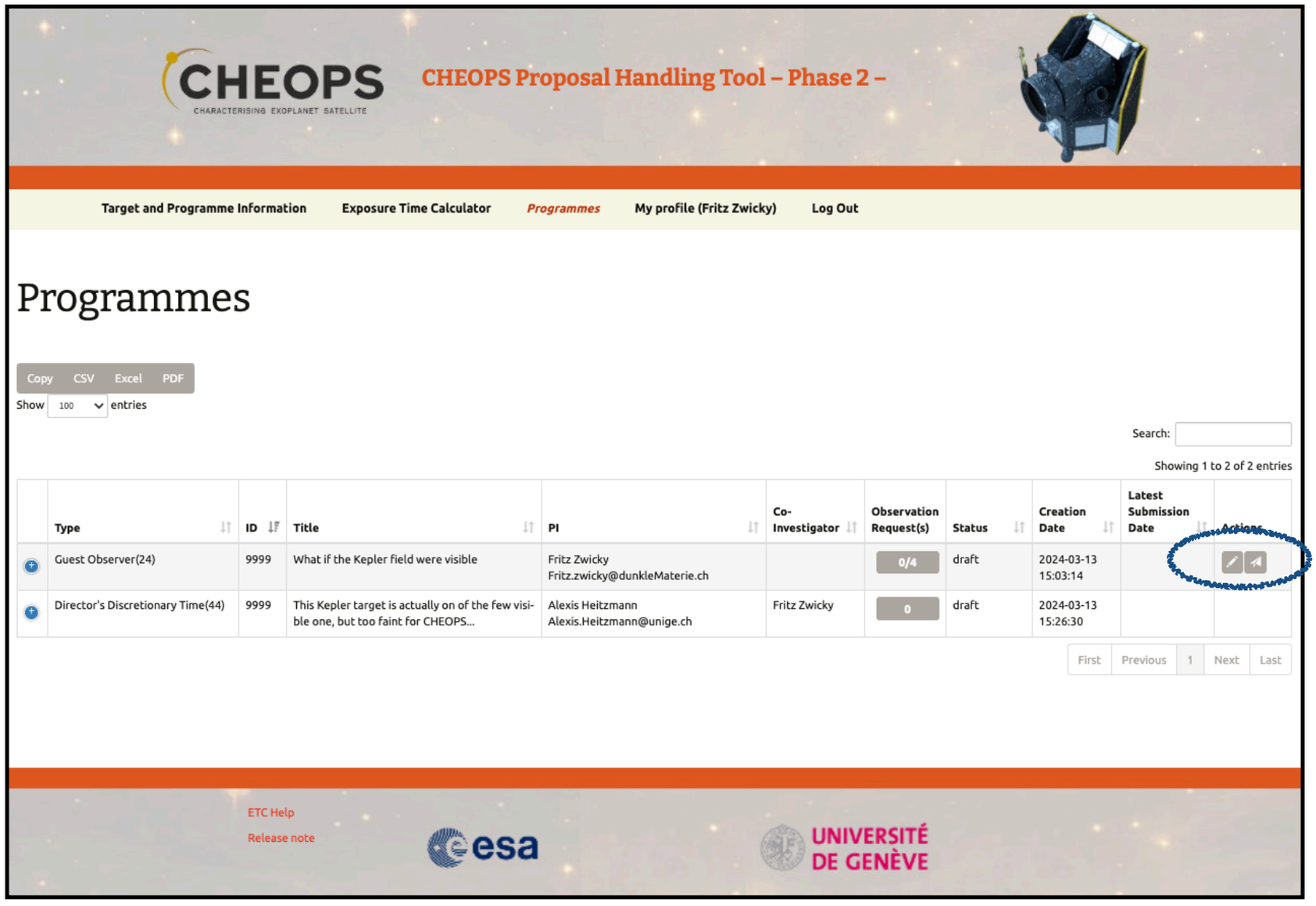
3 x 4 = 12 > 10 — Not OK



Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Submit your programme

Programmes that you own can be submitted with the icon.



Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Submit your programme

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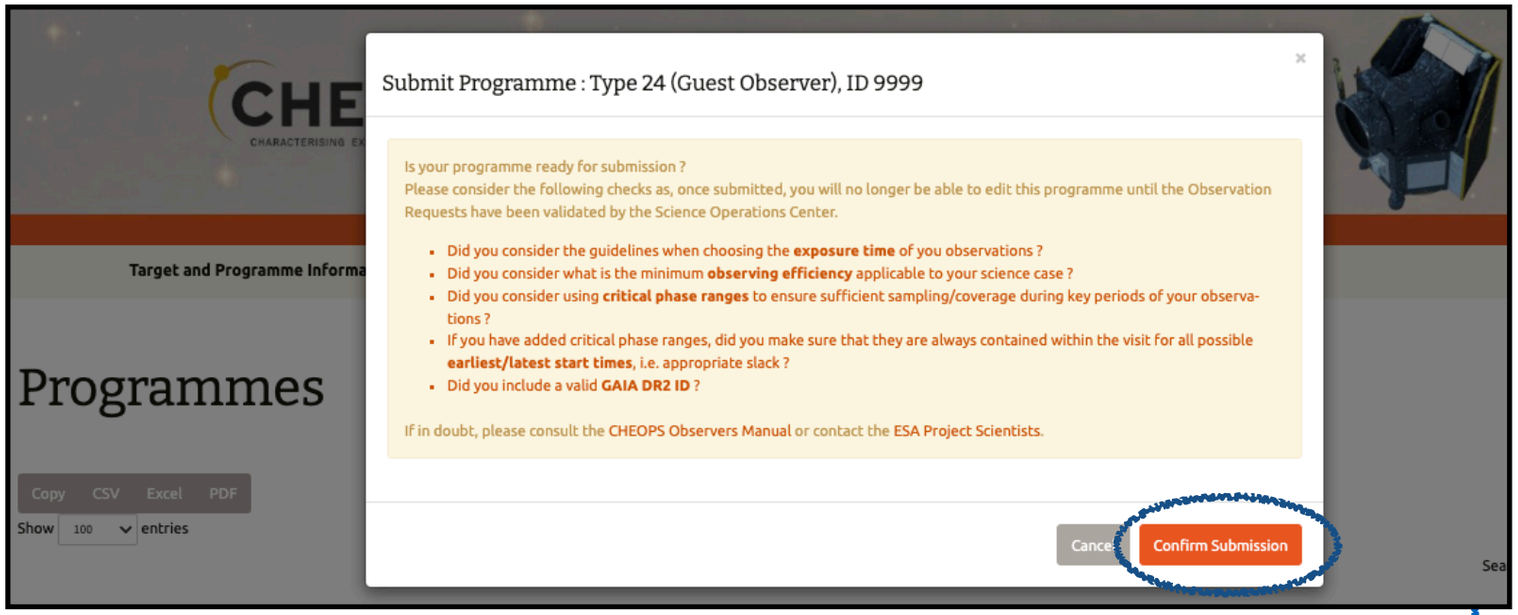


Only submit your programme if it is complete

You cannot modify your programme or observation requests after it is submitted!

Date of submission is recorded. Status changes to “Submitted”.

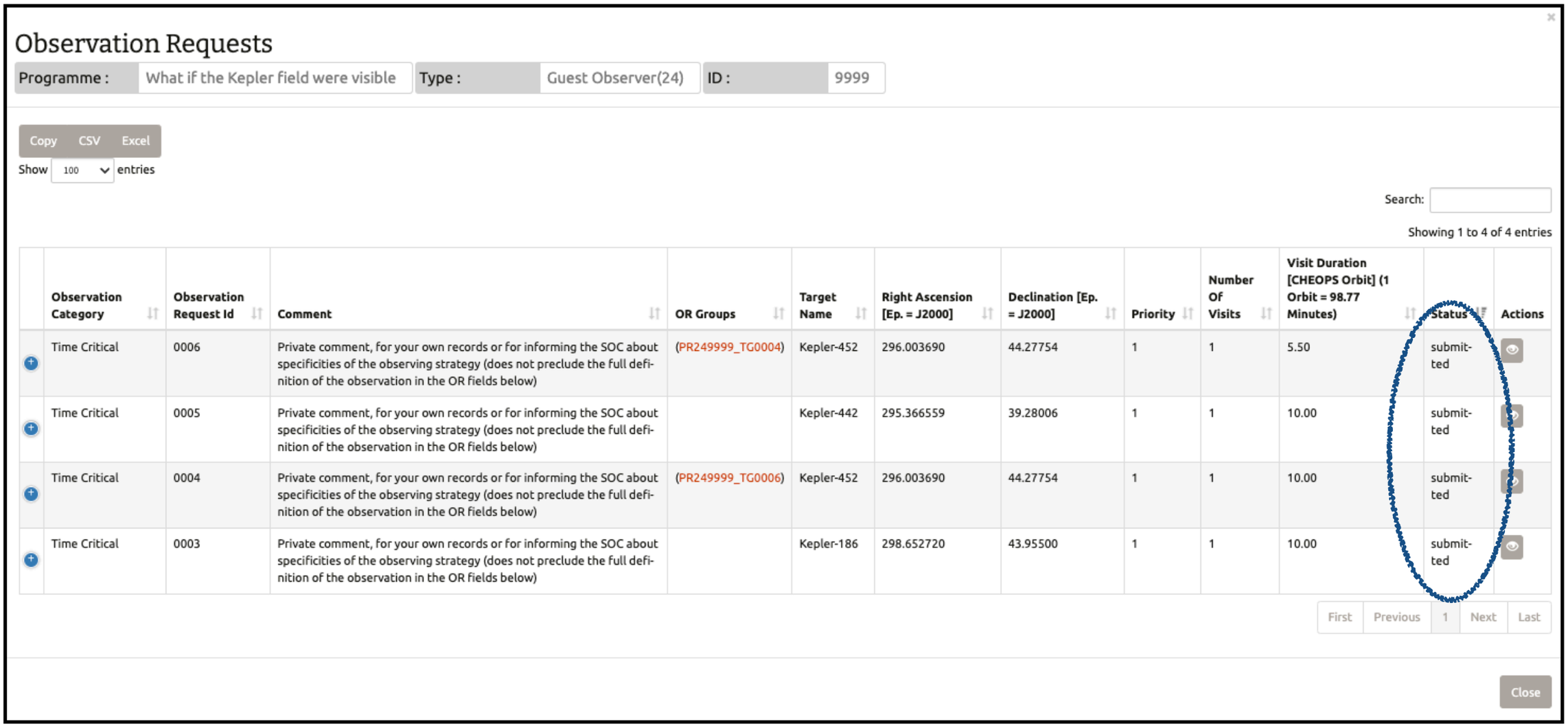
	Type	ID	Title	PI	Co-Investigator	Observation Request(s)	Status	Creation Date	Latest Submission Date	Actions
⊕	Guest Observer(24)	9999	What if the Kepler field were visible	Fritz Zwicky Fritz.zwicky@dunkleMaterie.ch		0/4	submitted	2024-03-13 15:03:14	2024-03-13 17:35:03	✎
⊕	Director's Discretionary Time(44)	9999	This Kepler target is actually on of the few visible one, but too faint for CHEOPS...	Alexis Heitzmann Alexis.Heitzmann@unige.ch	Fritz Zwicky	0	draft	2024-03-13 15:26:30		

Note: The icon allows you to modify only the Title, Abstrait and Description of Observations

Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

Submit your programme

Observation requests are in status “submitted”. They cannot be edited anymore.



Proposal Handling Tool - Phase 2 - PHT-2 Guidelines

You will be notified by email if/when your targets are scheduled for observations, typically a few days before the actual observations are executed.

You will receive another email when your data are available on the CHEOPS archive for you to download.