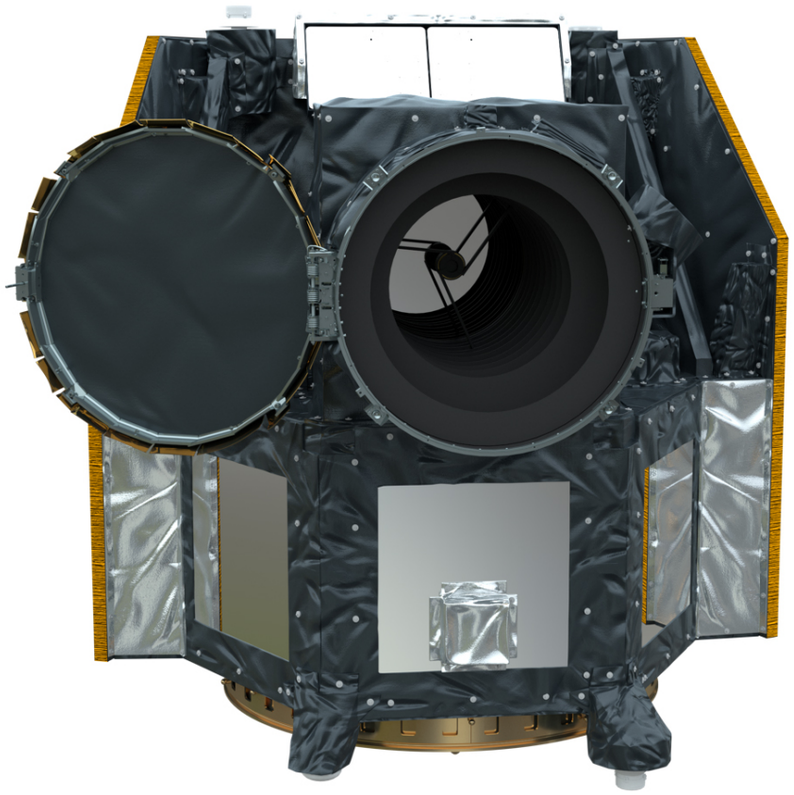
CHEOPS

CHARACTERISING EXOPLANET SATELLITE

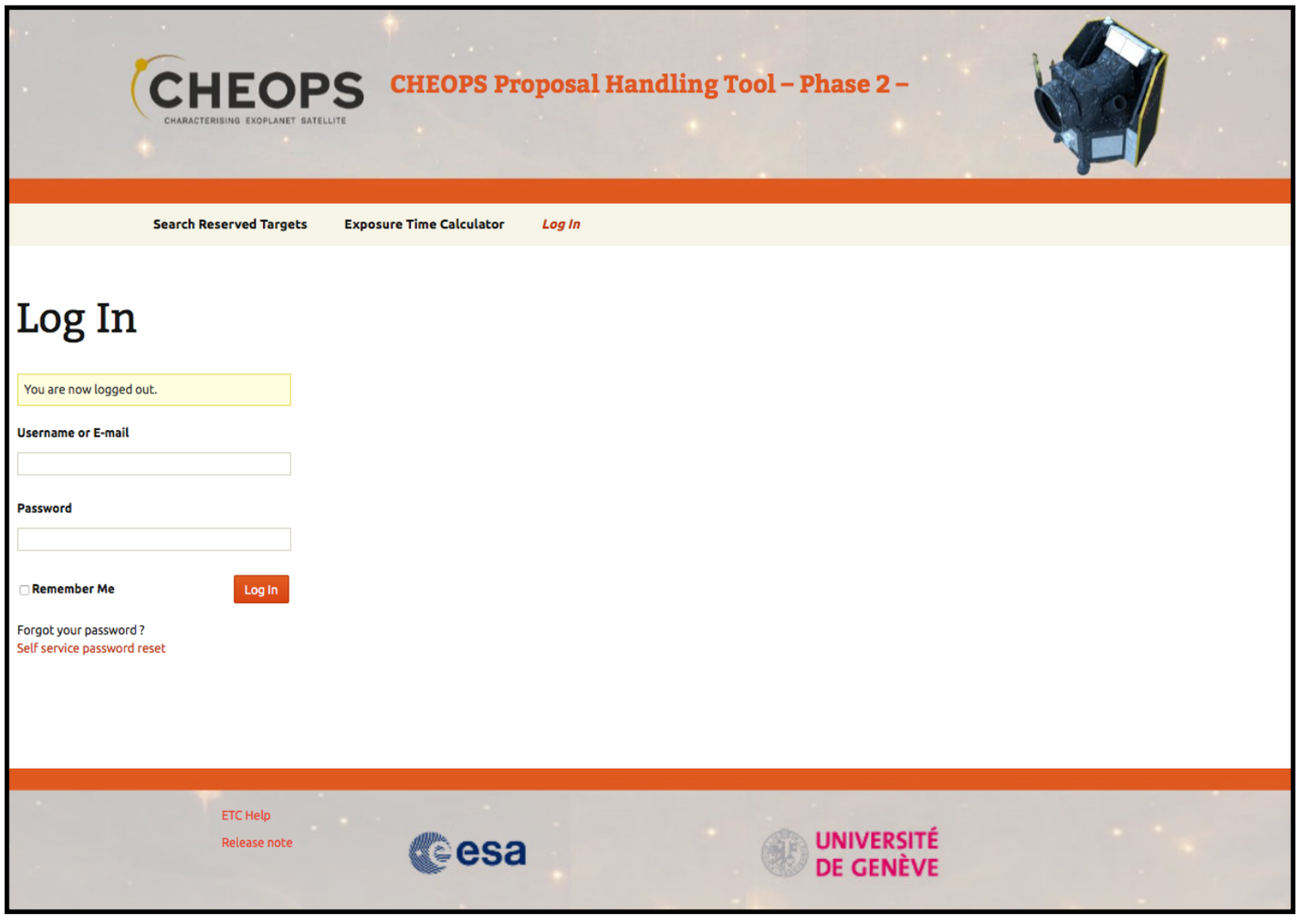


CHEOPS Proposal Handling Tool Phase 2 (PHT2) Guidelines (v_1.4)

*Prepared by Nicolas BILLOT on behalf of the CHEOPS **S**cience **O**perations **C**entre*

Proposal Handling Tool Phase II
PHT2 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 II
PHT2 Guidelines

Please login
with username and password
received from SOC

Proposal Handling Tool Phase II
PHT2 Guidelines

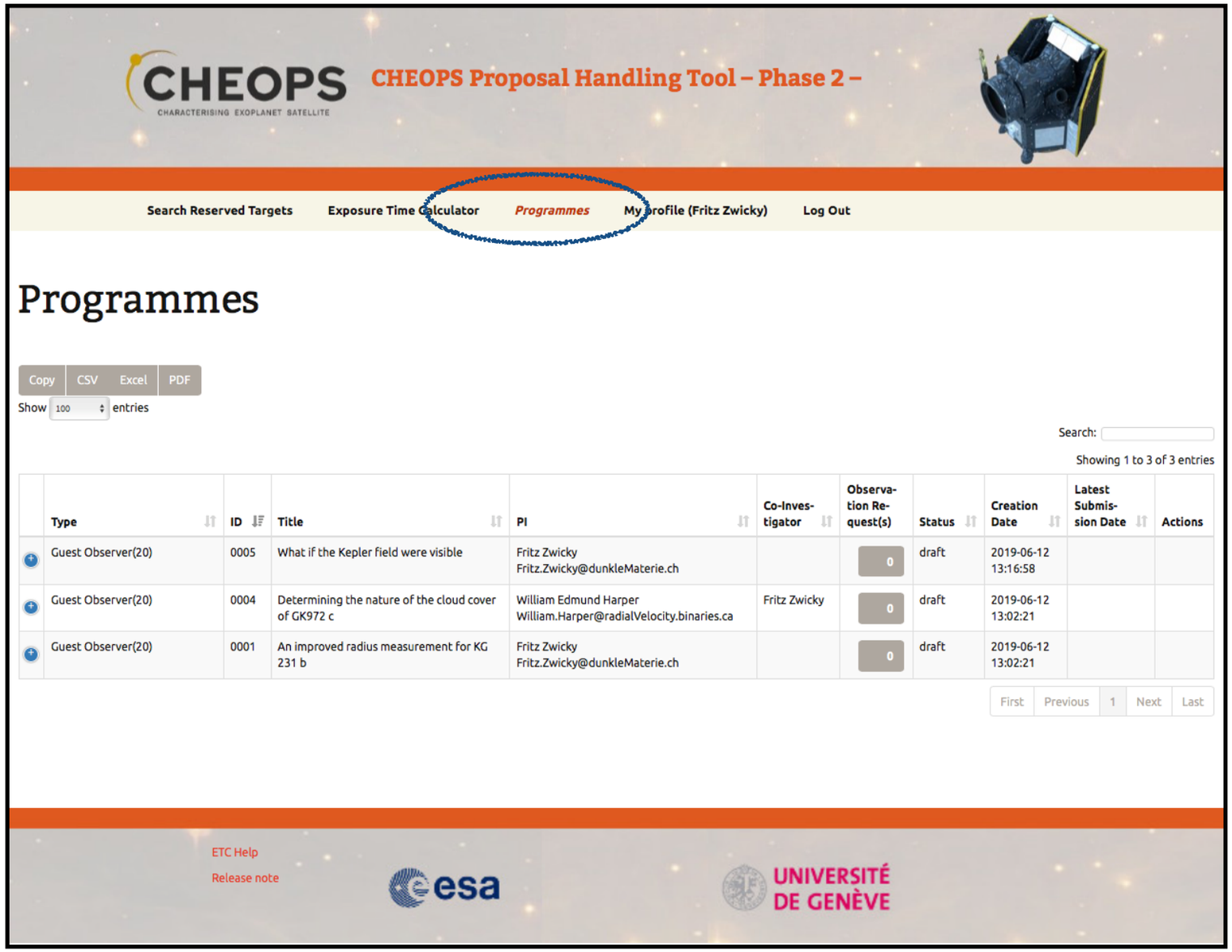
Your accepted "Programmes"

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

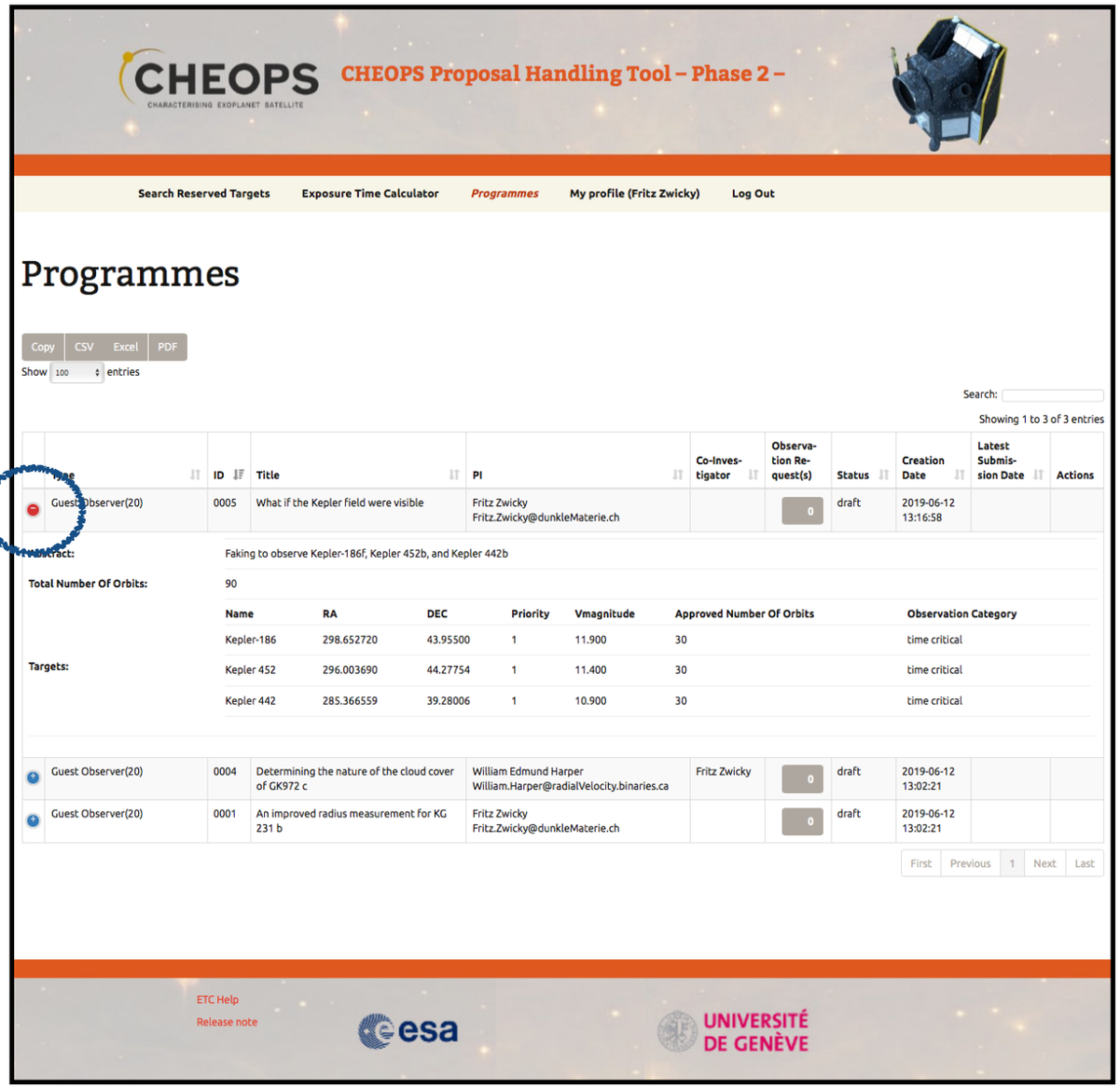


Proposal Handling Tool Phase II
PHT2 Guidelines

Your accepted "Programmes"

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

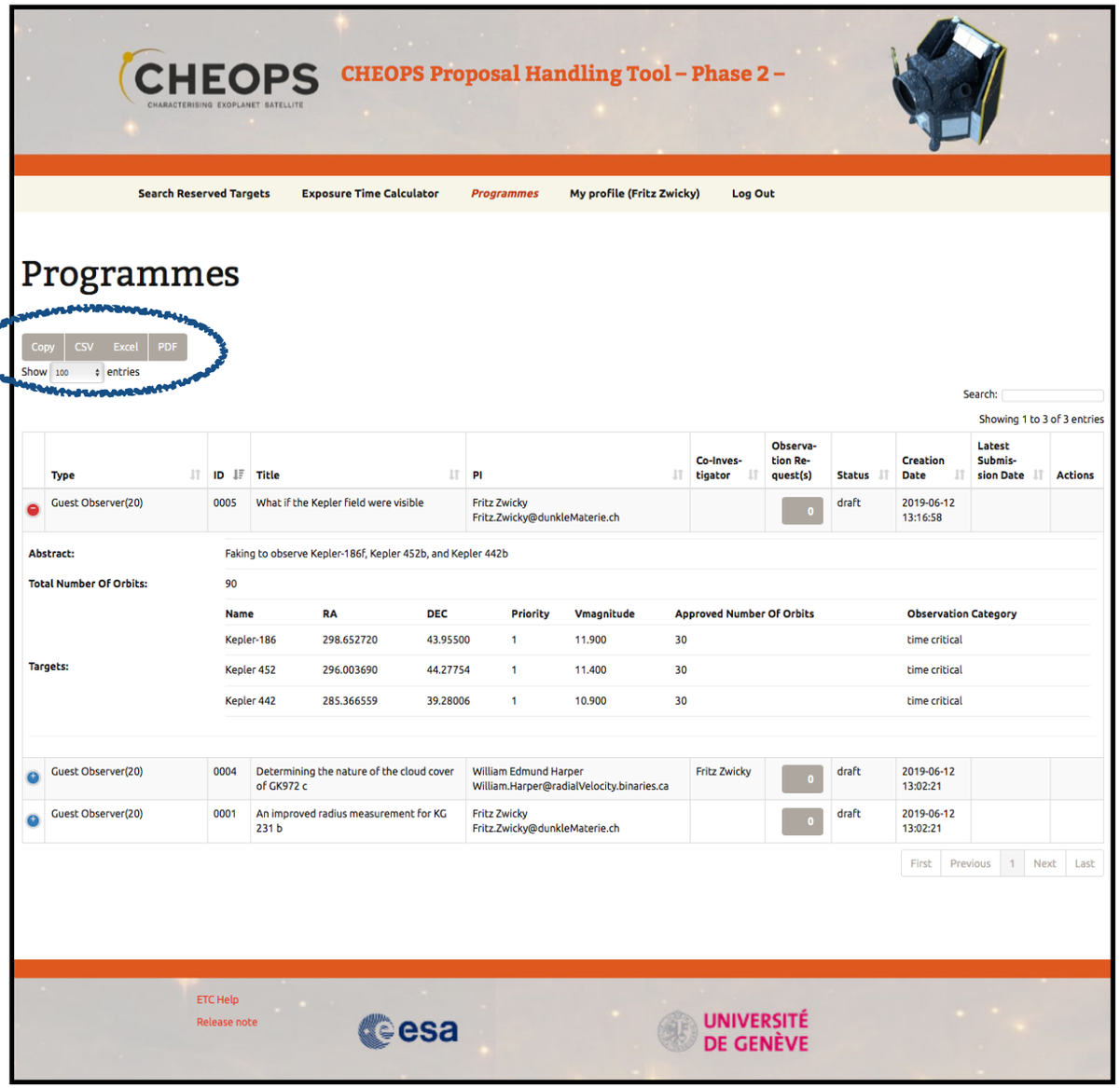
Programme-level information cannot be edited



Proposal Handling Tool Phase II
PHT2 Guidelines

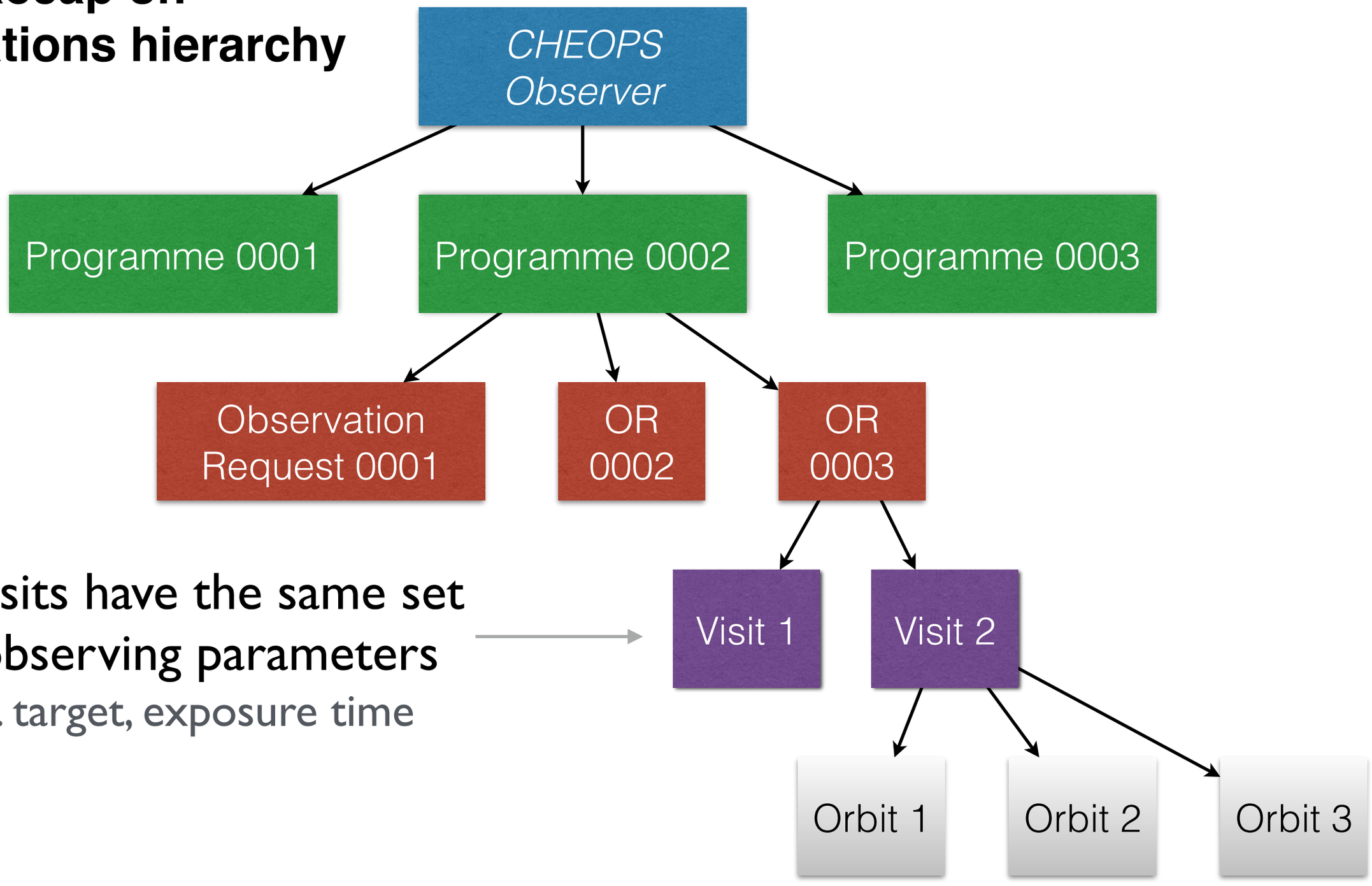
Your accepted "Programmes"

Programmes list can be exported in various formats for convenience.



Proposal Handling Tool Phase II
PHT2 Guidelines

Recap on Observations hierarchy



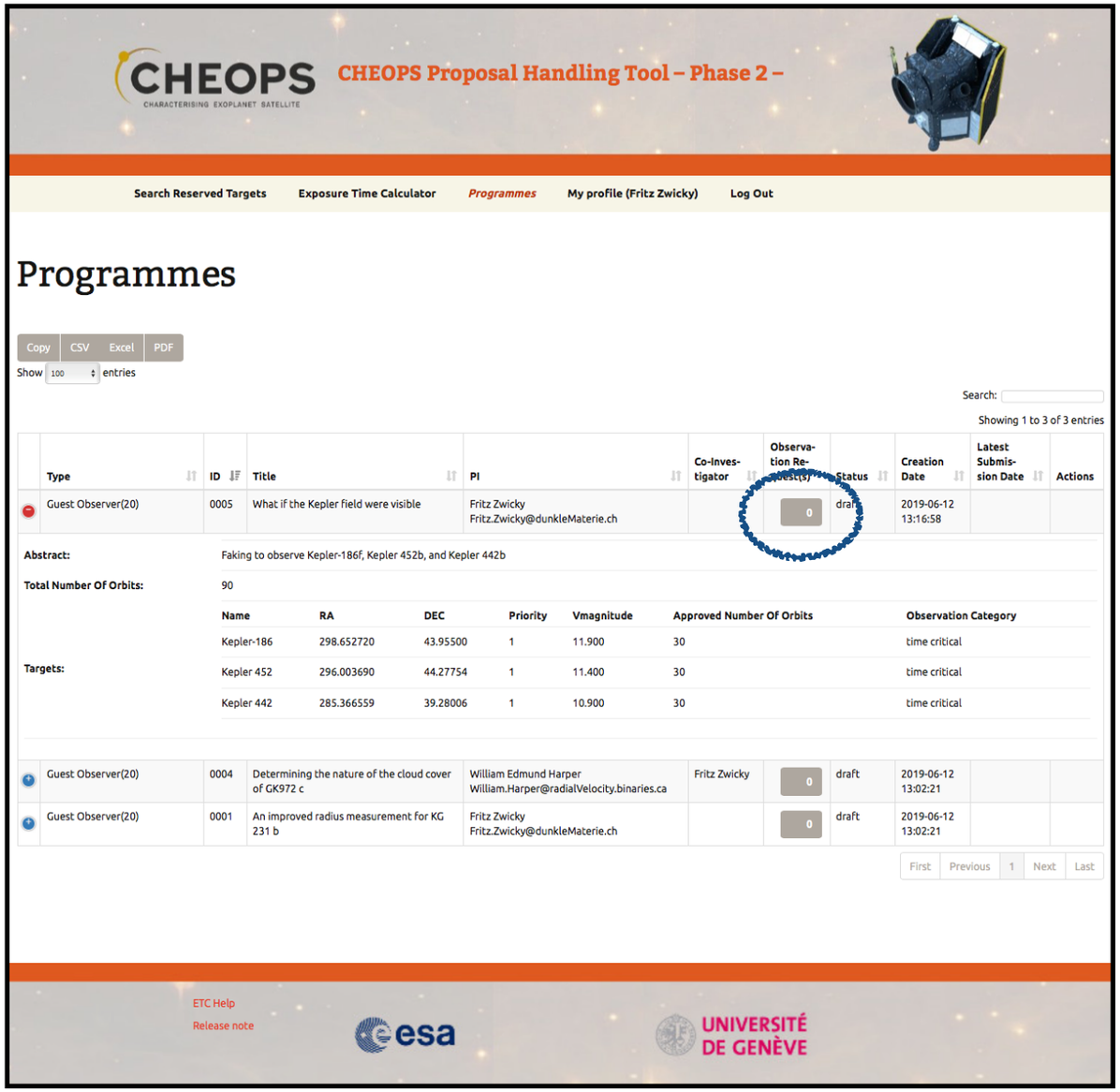
All visits have the same set of observing parameters

e.g. target, exposure time

Proposal Handling Tool Phase II
PHT2 Guidelines

Create an Observation Request

Click this icon to view / create observation requests

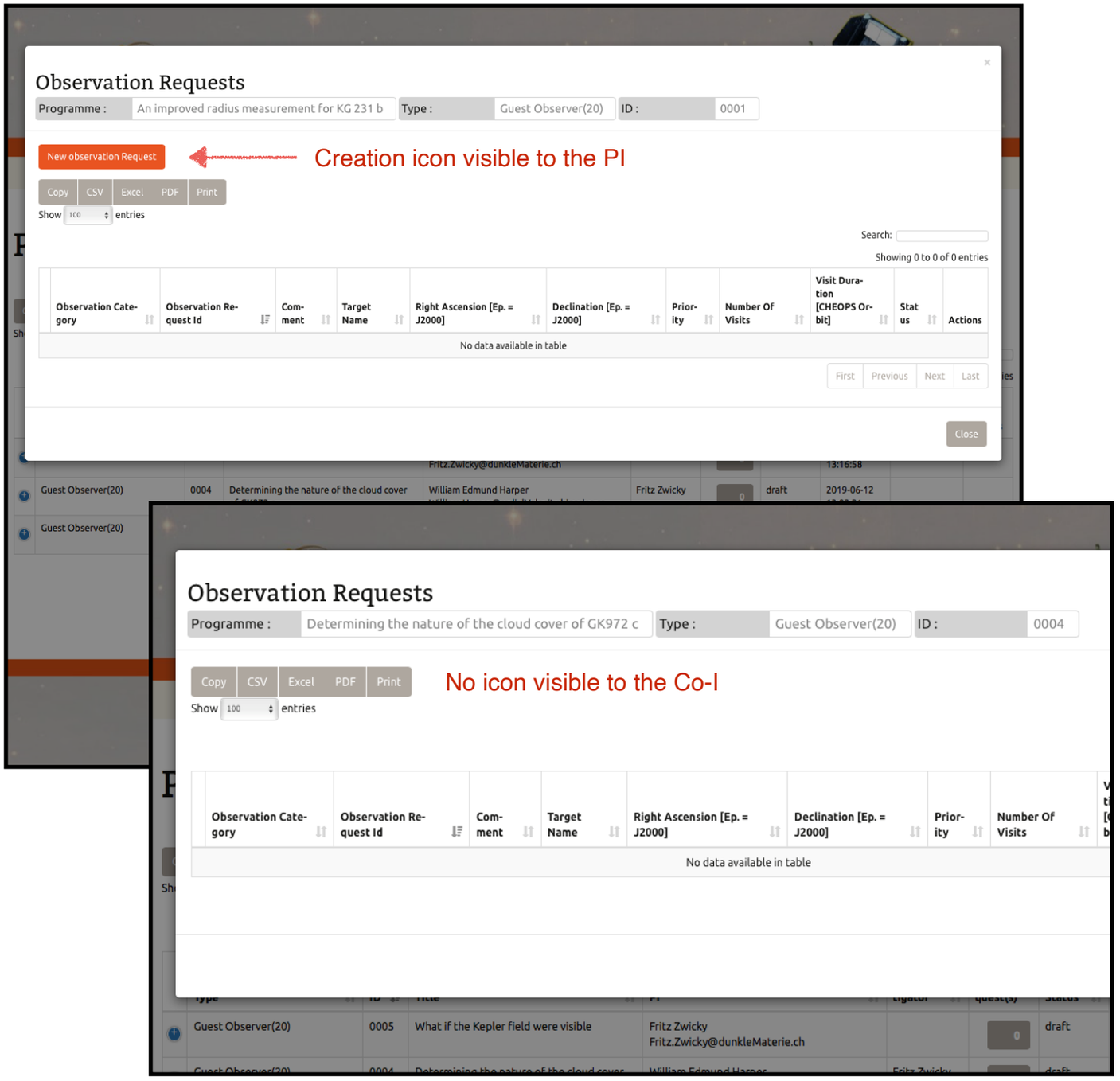


Proposal Handling Tool Phase II
PHT2 Guidelines

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.

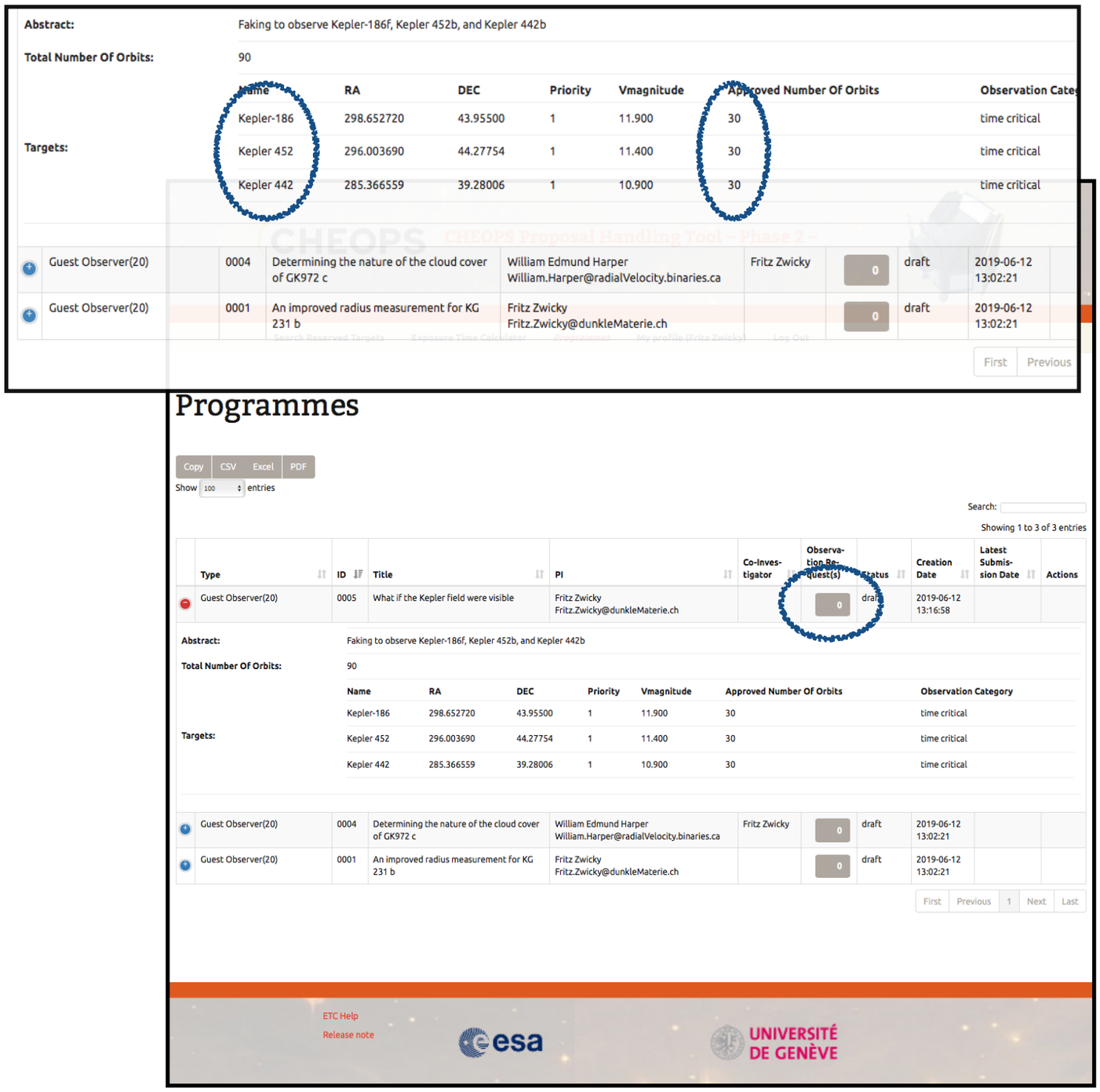


Proposal Handling Tool Phase II
PHT2 Guidelines

Create an Observation Request

Take the following example of 3 targets, each with 30 accepted orbits.

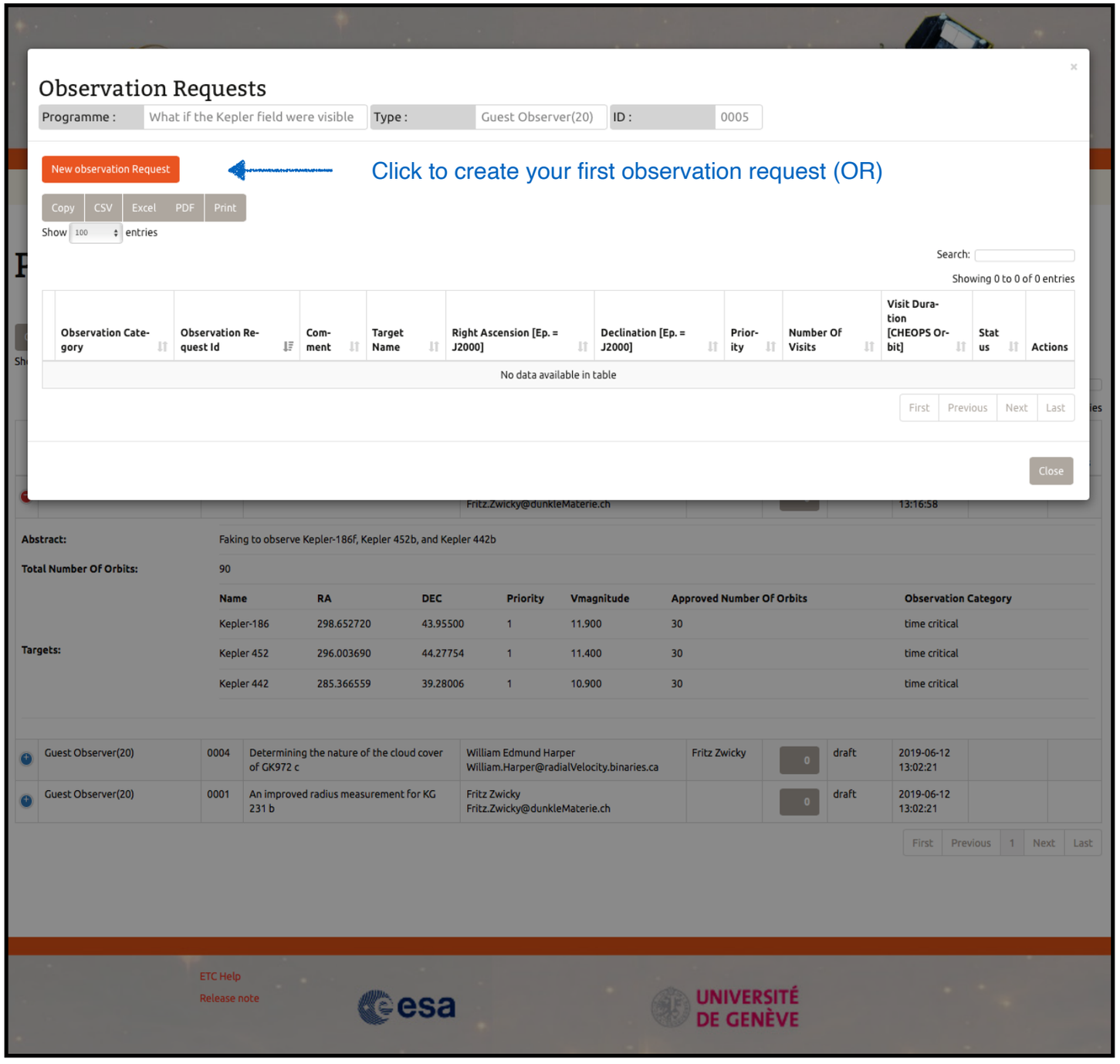
Click the observation request icon to create one.



Proposal Handling Tool Phase II
PHT2 Guidelines

Create an Observation Request

List of Observation Request is empty at this stage



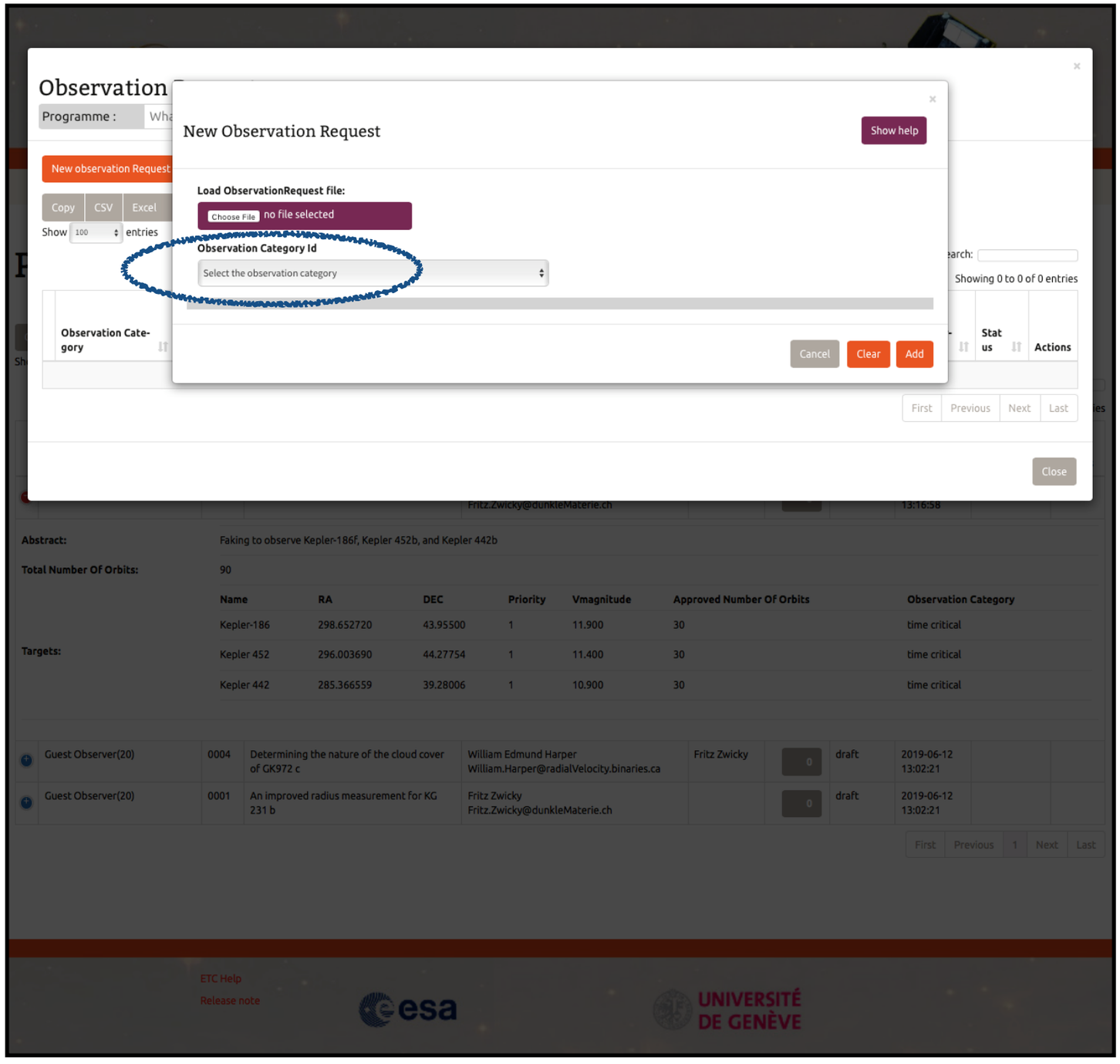
Proposal Handling Tool Phase II
PHT2 Guidelines

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

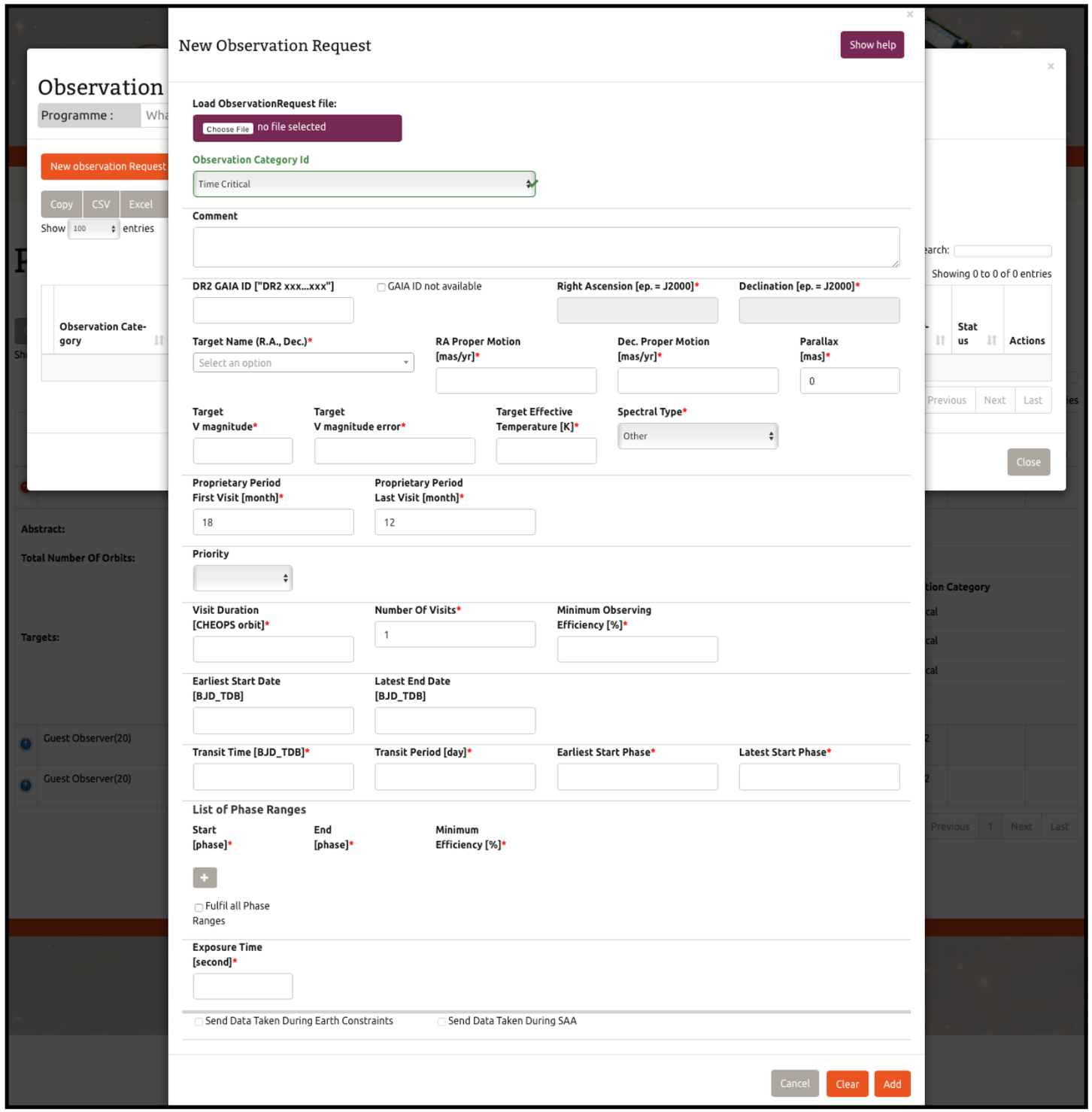


Proposal Handling Tool Phase II
PHT2 Guidelines

Fill in the Observation Request

Define the parameters of your observation

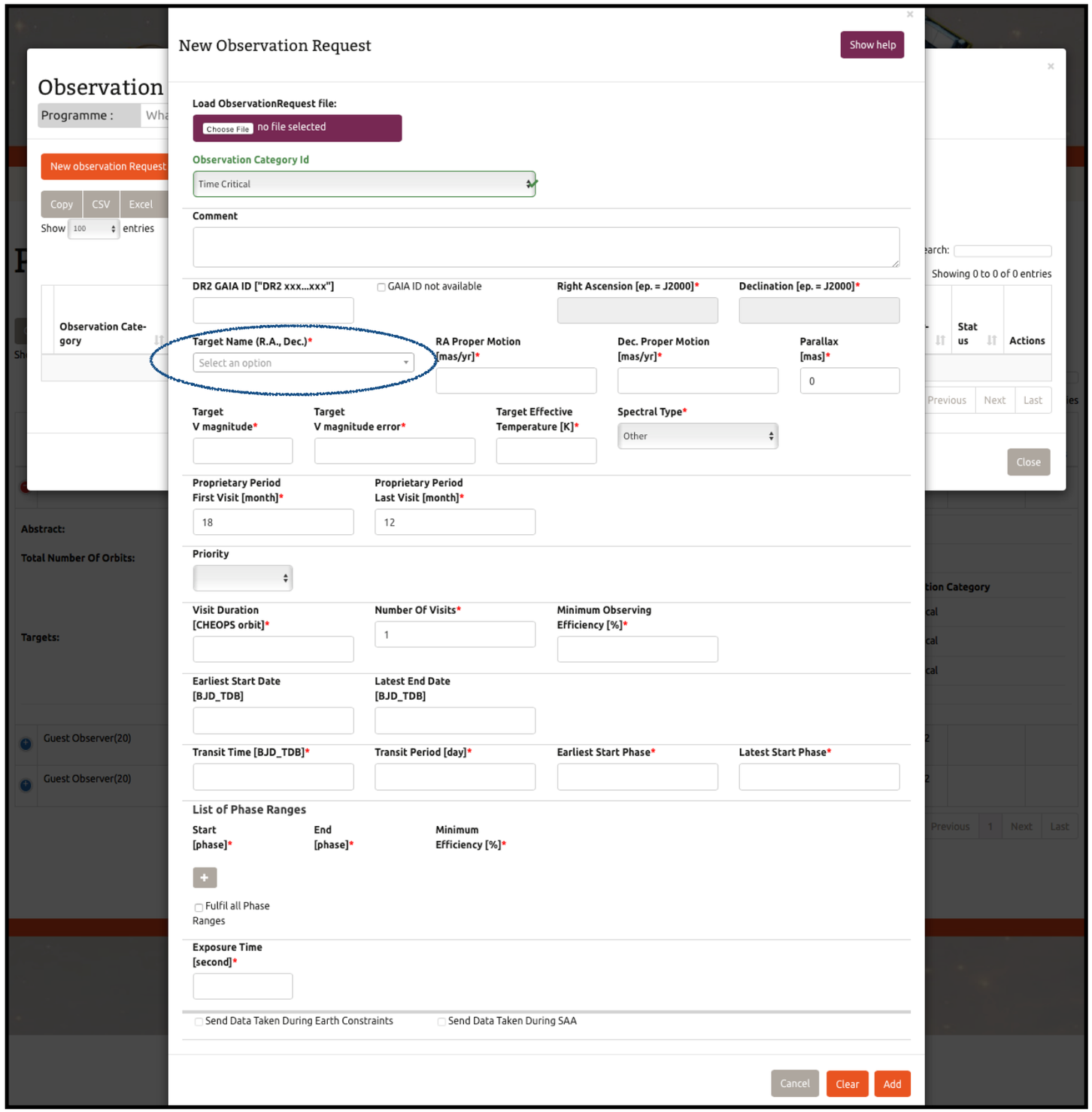
Some parameters are mandatory (indicated with a *)



Proposal Handling Tool Phase II
PHT2 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)

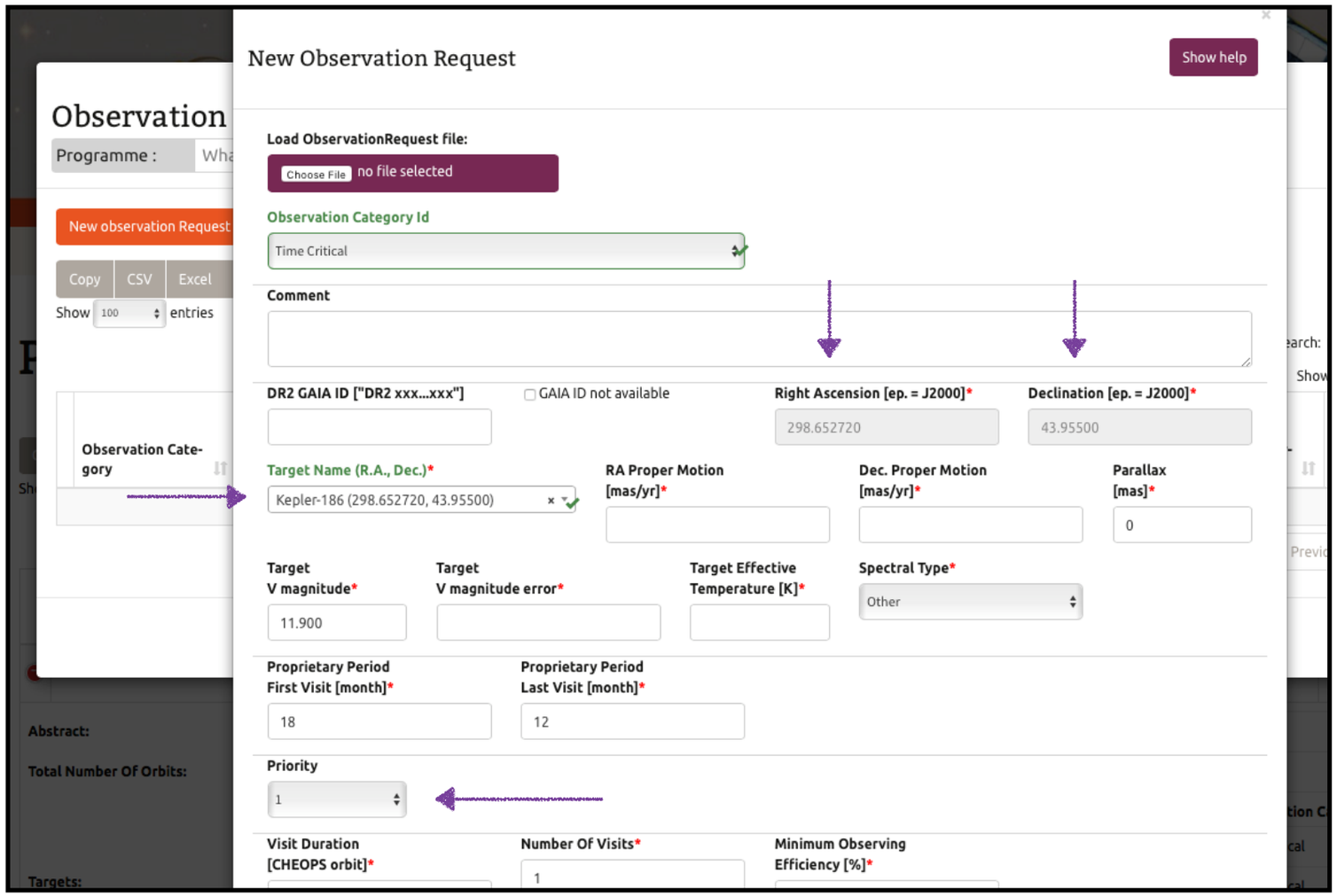


Proposal Handling Tool Phase II
PHT2 Guidelines

Fill in the Observation Request

Target coordinates are pre-filled with user-defined values from PHT-1

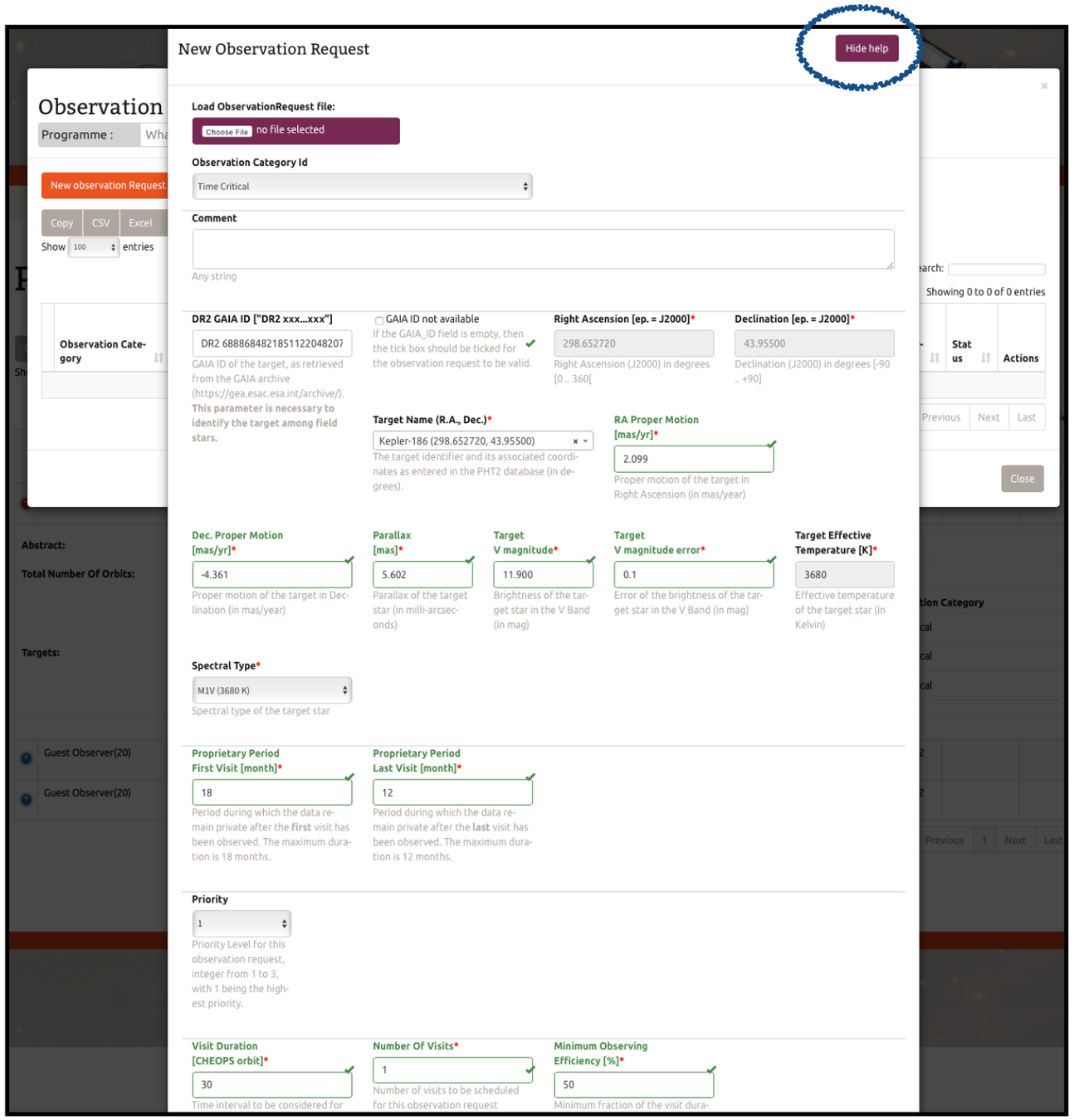
Priority field is pre-filled with the ESA-assigned priority for this target



Proposal Handling Tool Phase II
PHT2 Guidelines

Fill in the Observation Request

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

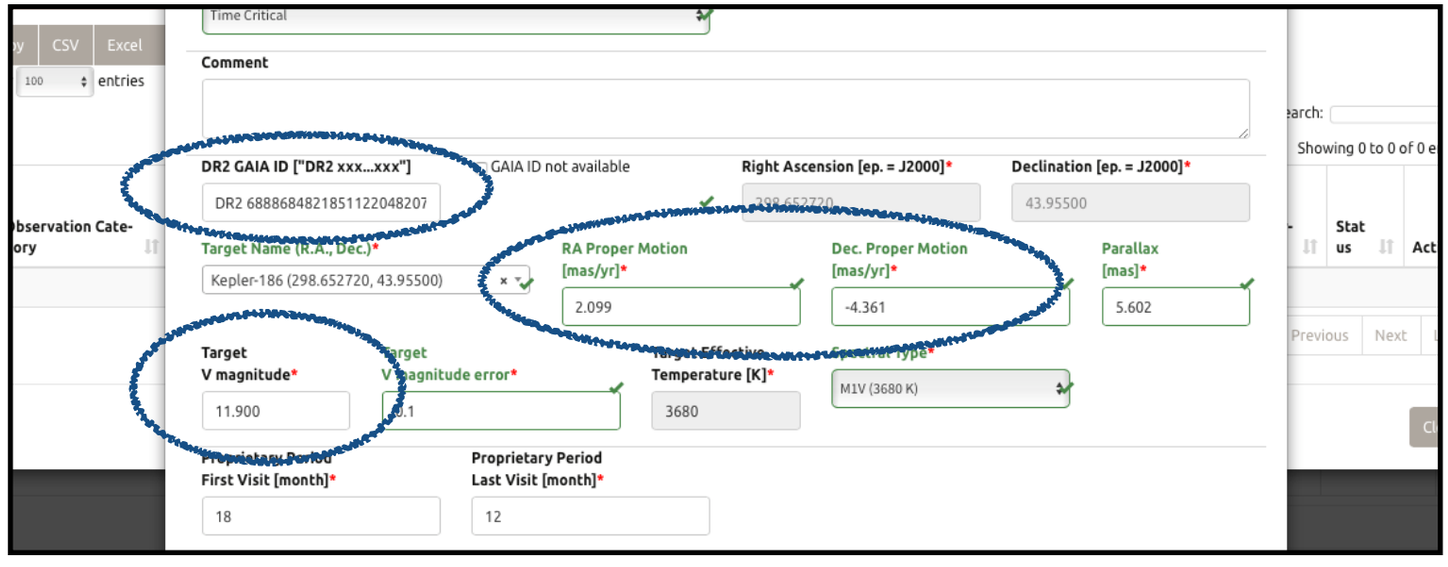


Proposal Handling Tool Phase II
PHT2 Guidelines

Fill in the Observation Request

- *Comment* field may be useful for your own record, or for describing the observing strategy to the SOC / Mission planner. *Public OR description* is a mandatory field.

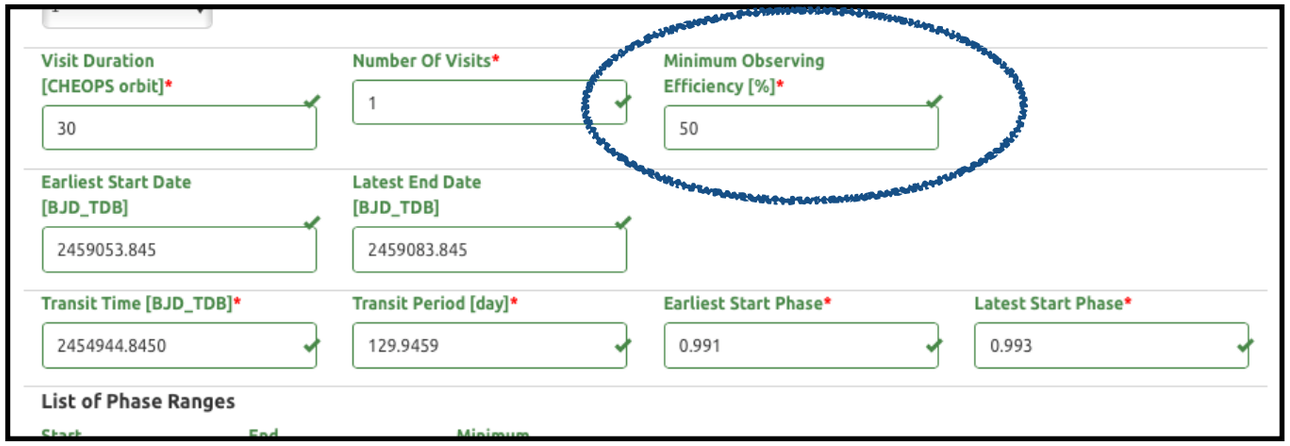
- Fill in the missing target information:
- **GAIA ID** is critical for on-board target identification. Field must start with "**DR2** xxxxxxxx". GAIA ID can be fetched from the GAIA Archive
- **Proper motion** may be critical for on-board target identification. Can be fetched from SIMBAD
- **Magnitude** may also be critical for on-board target identification. Can be fetched from SIMBAD



Proposal Handling Tool Phase II
PHT2 Guidelines

Fill in the Observation Request

- **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.                                    -->
```

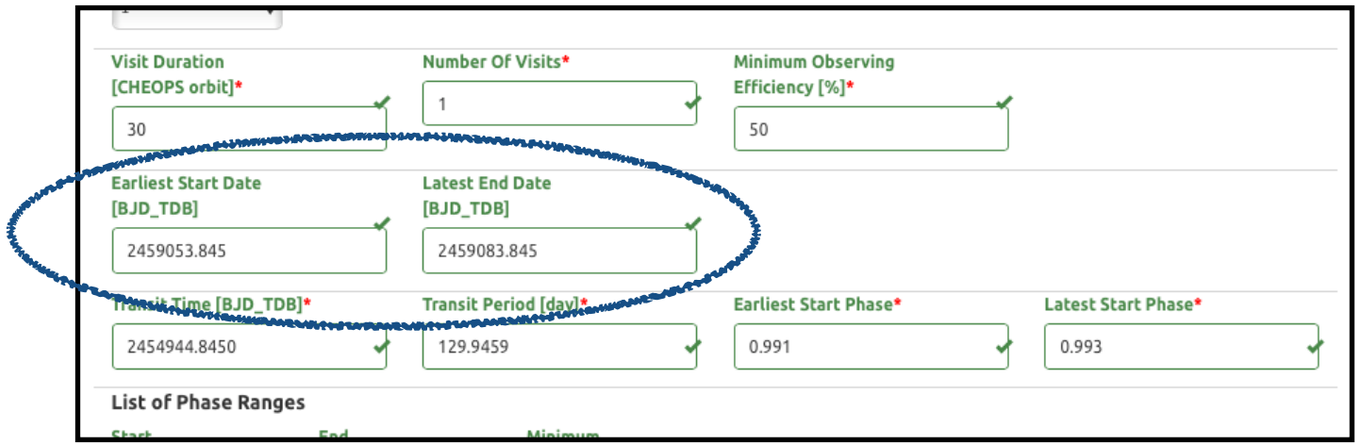
As the observing efficiency is mainly driven by the target location in the sky, it is highly *recommended* to set the requested observing efficiency to a rather low value, *typically 50%*, for all targets, except if the science case requires very high observing efficiency (assuming this efficiency is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

Proposal Handling Tool Phase II
PHT2 Guidelines

Fill in the Observation Request

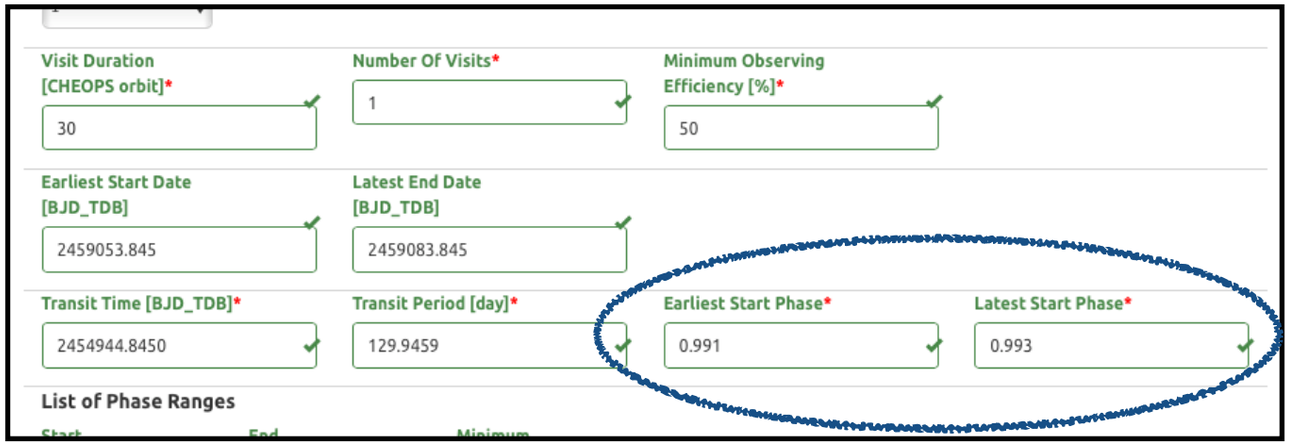
- Use **time bracketing** to constrain the scheduling dates of your observations.

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



Proposal Handling Tool Phase II
PHT2 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>)                           -->
```

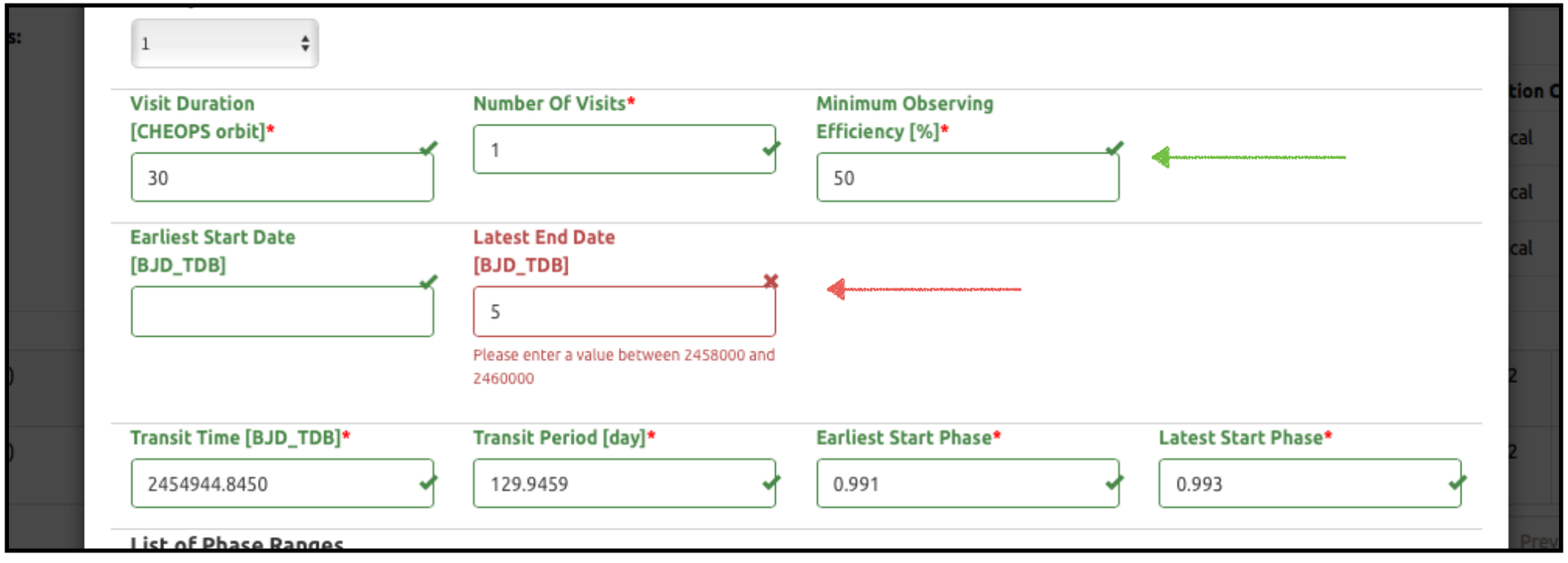
The start_phase slack allows for some scheduling flexibility. Be careful however that the slack is commensurate with the visit duration, i.e. that the visit covers the intended time period, typically the transit, for any start time during the start_phase slack.

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

Proposal Handling Tool Phase II
PHT2 Guidelines

Fill in the Observation Request

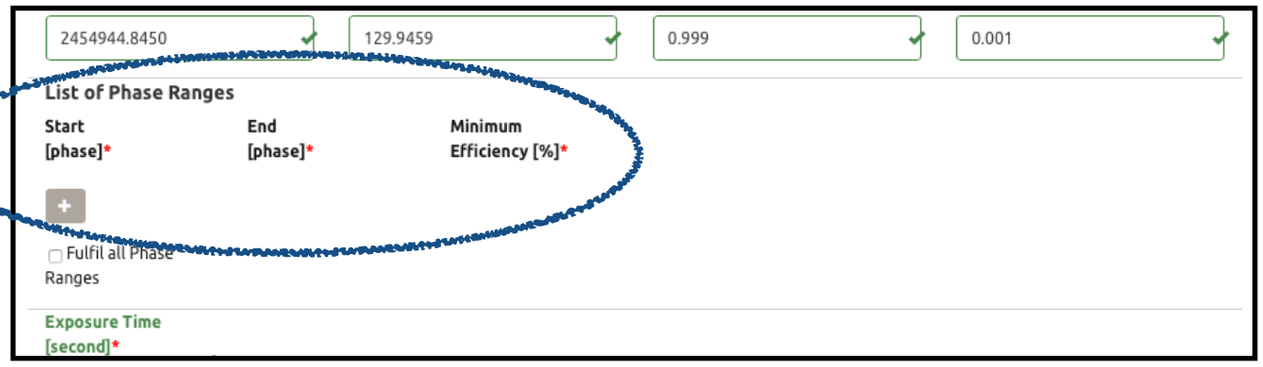
Valid and invalid entries are identified as such in the form.

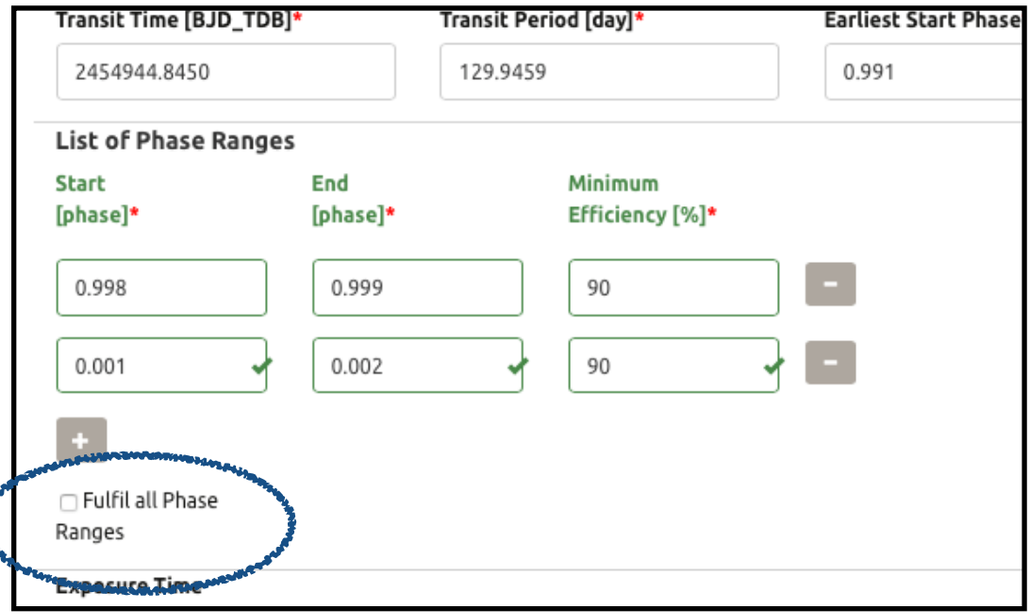


Proposal Handling Tool Phase II
PHT2 Guidelines

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):

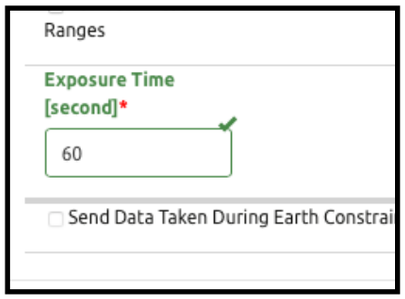
```
<!--  The set of parameters below is used to define specific (orbital) phase ranges                    -->
<!--        within which the observing efficiency may be increased to a specific value                -->
<!--        Convention is that the transit is at phase=0 (or equivalently 1)                          -->
<!--        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  -->
```

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.

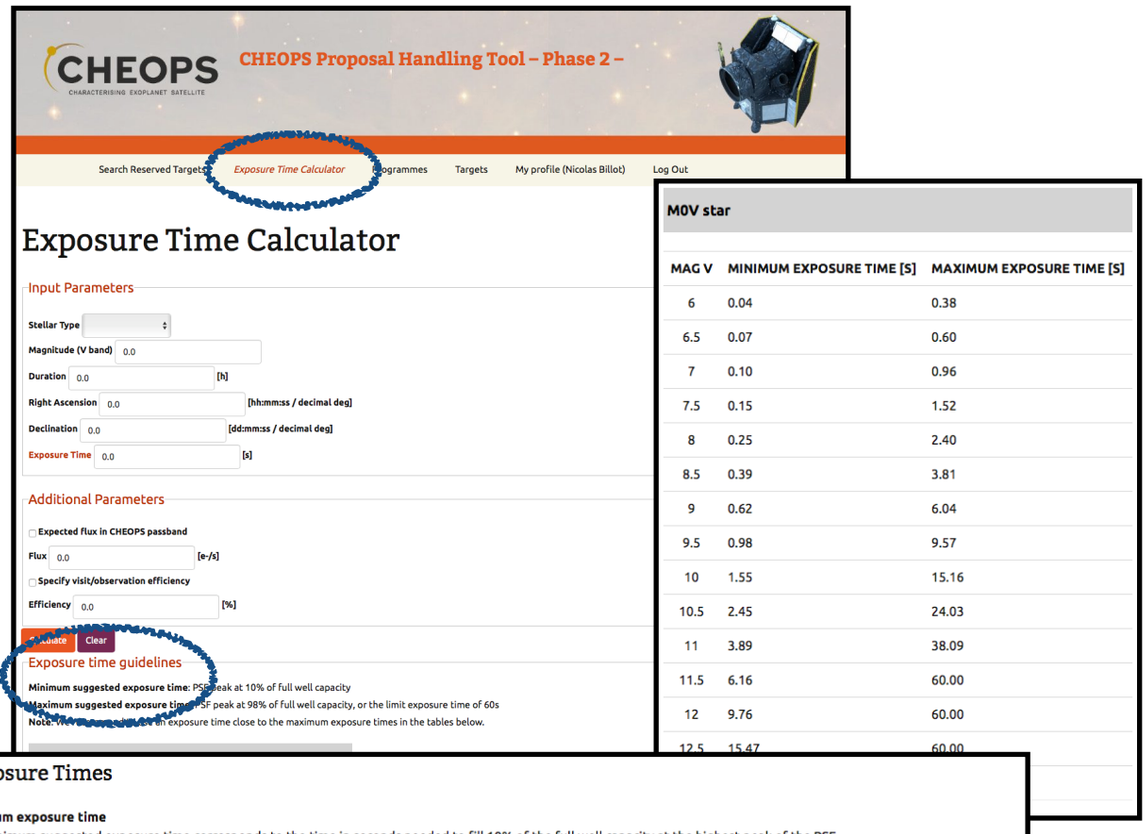
Proposal Handling Tool Phase II
PHT2 Guidelines

Fill in the Observation Request

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



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



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

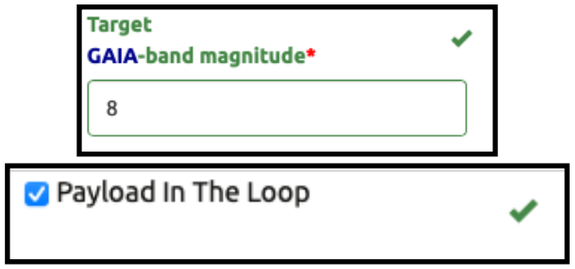
Proposal Handling Tool Phase II
PHT2 Guidelines

Fill in the Observation Request

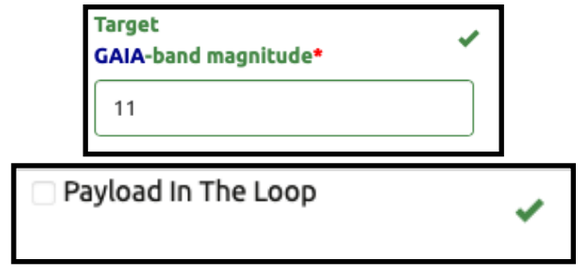
Payload-In-The-Loop (PITL) configuration:

- 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

PHT2 sets automatically the PITL configuration:

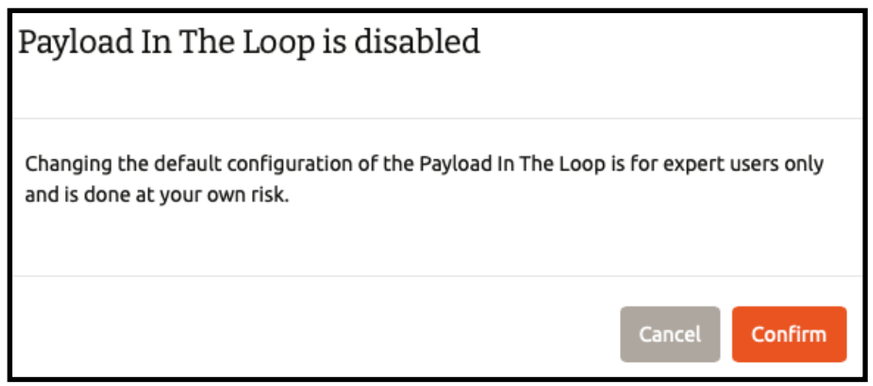


PITL is set to active
on targets brighter than Gmag=11



PITL is set to 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 II
PHT2 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.

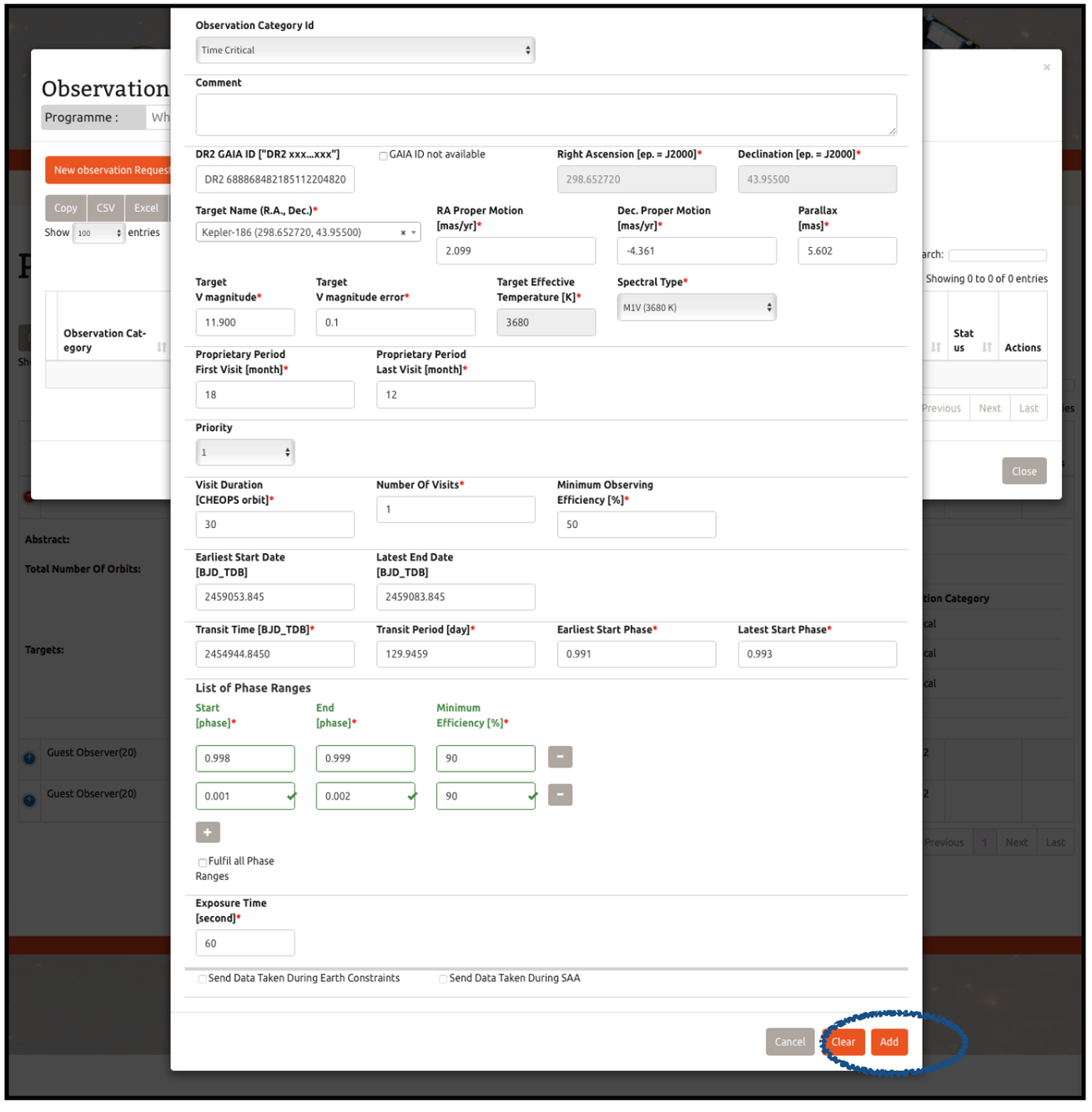
Their current default value for nominal science is False, i.e. data taken during SAA and Earth constraints will NOT be downlinked.

Proposal Handling Tool Phase II
PHT2 Guidelines

Finalise the Observation Request

Once your observation request is complete, please:

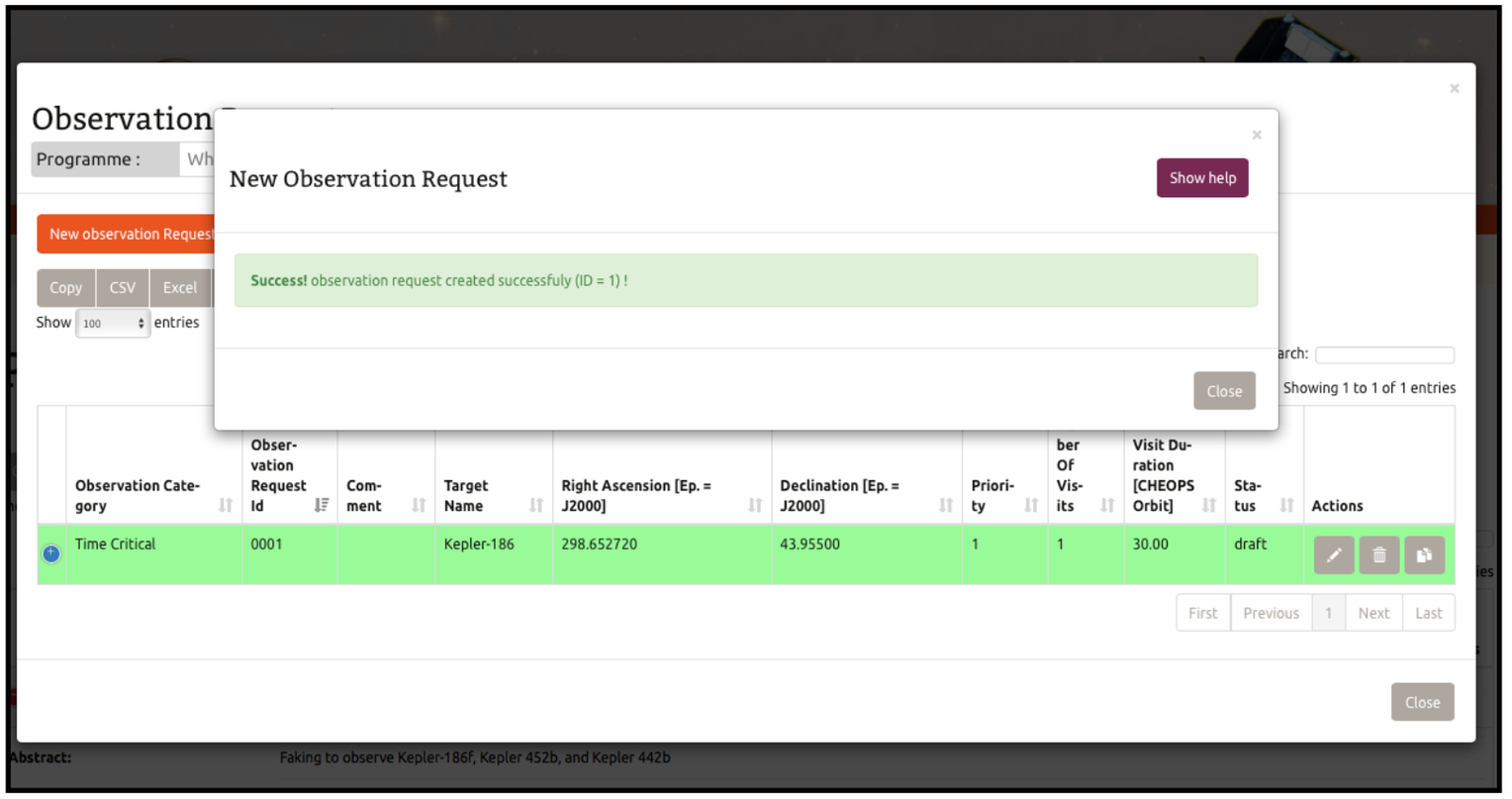
Click “Add”



Proposal Handling Tool Phase II
PHT2 Guidelines

Finalise the Observation Request

The new Observation Request now appears in the list

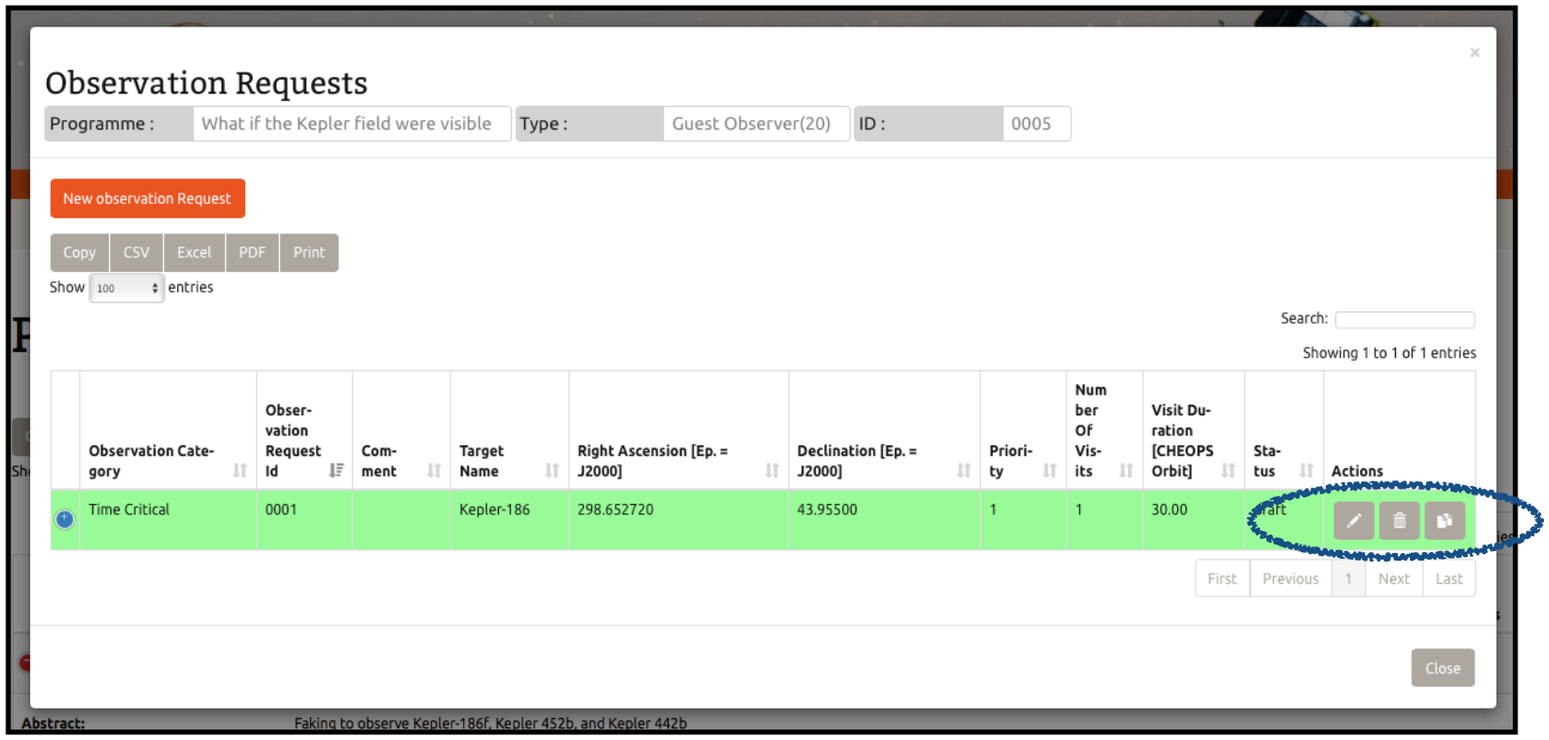


Proposal Handling Tool Phase II
PHT2 Guidelines

Complete your programme

Your newly created Observation Request now appears in the list

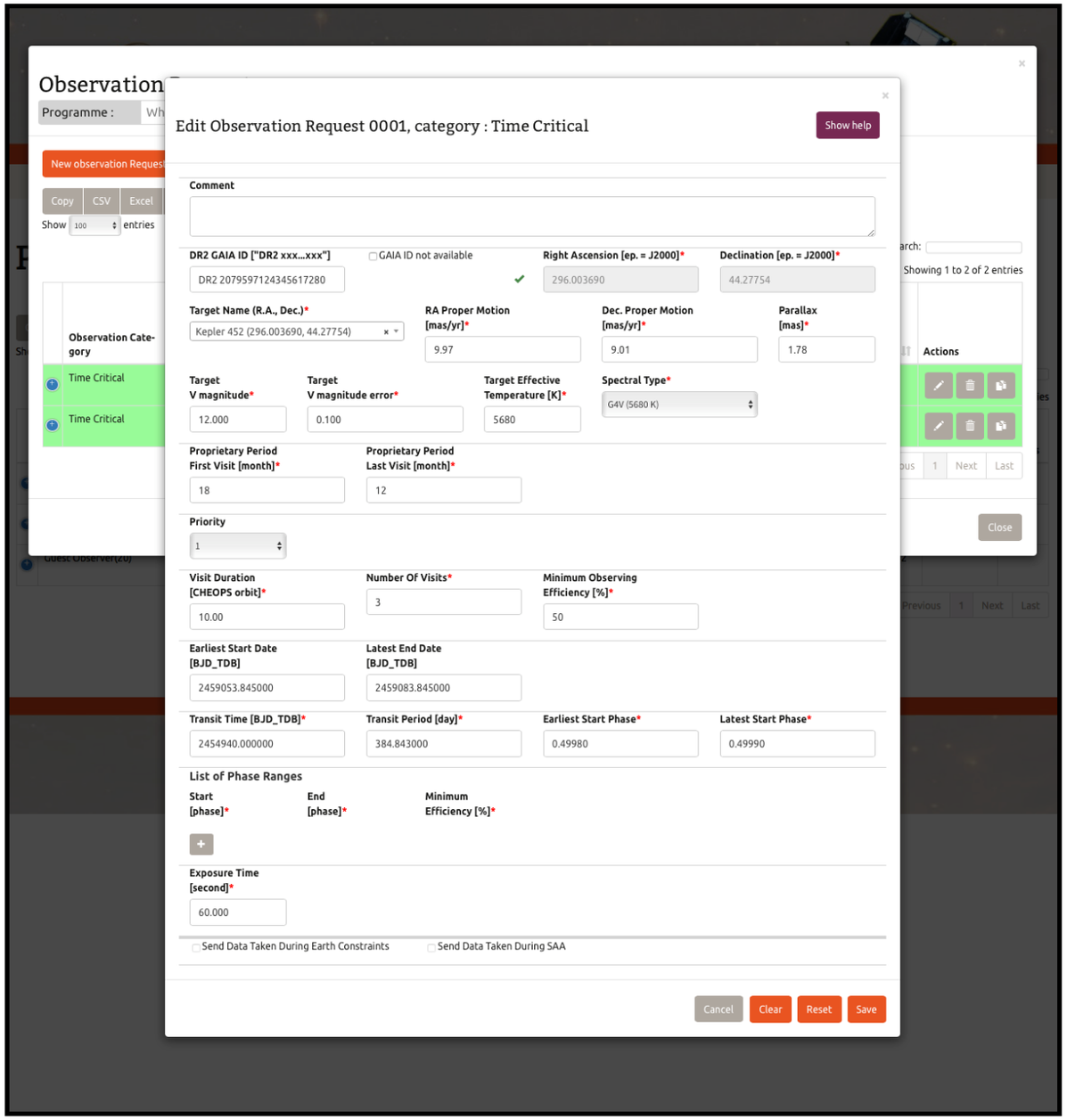
You can **Edit** , **Delete** , **or Clone** your observation requests



Proposal Handling Tool Phase II
PHT2 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.

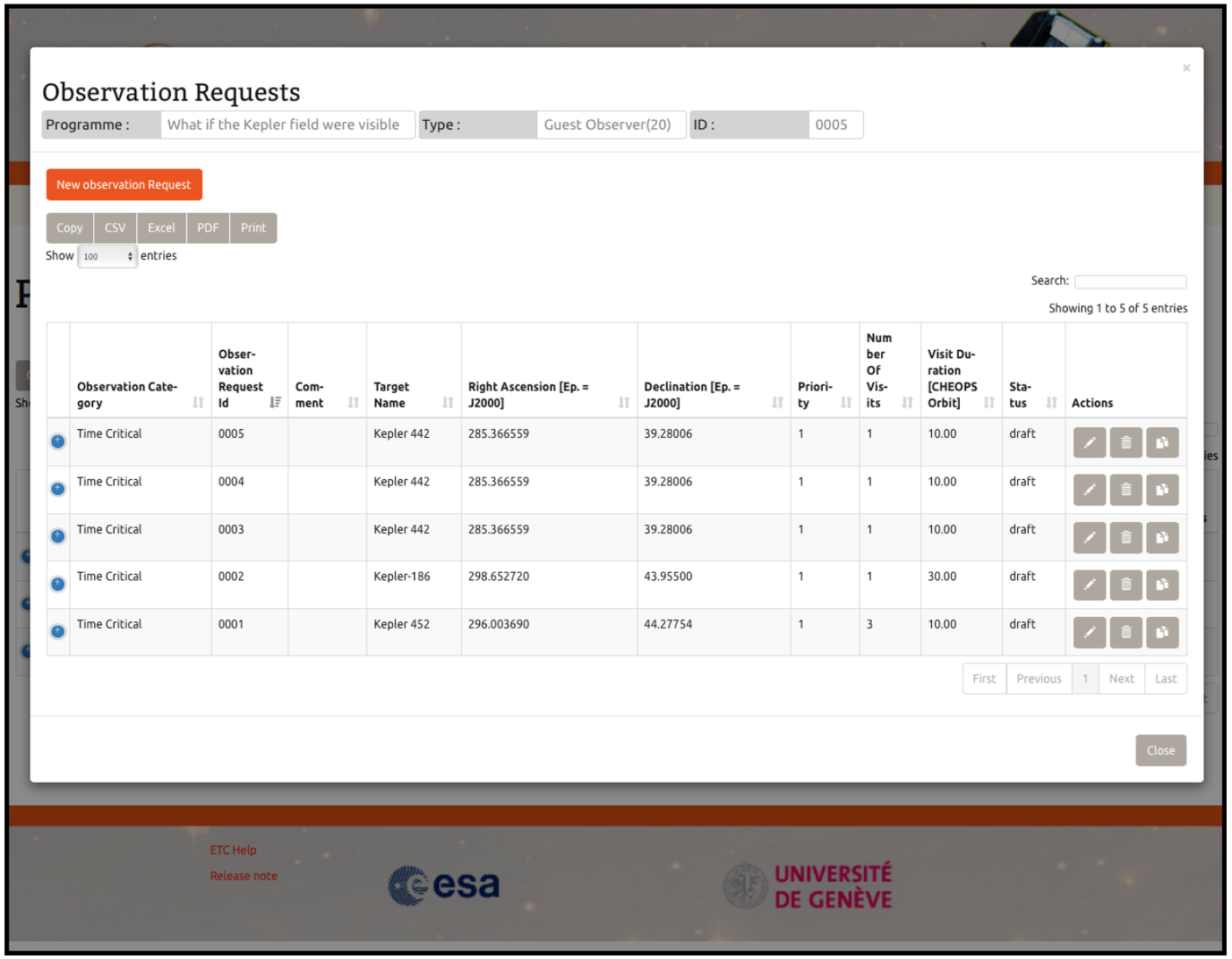


Proposal Handling Tool Phase II
PHT2 Guidelines

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



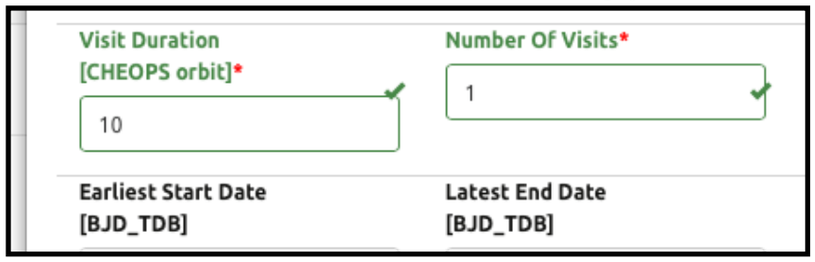
Proposal Handling Tool Phase II
PHT2 Guidelines

Complete your programme

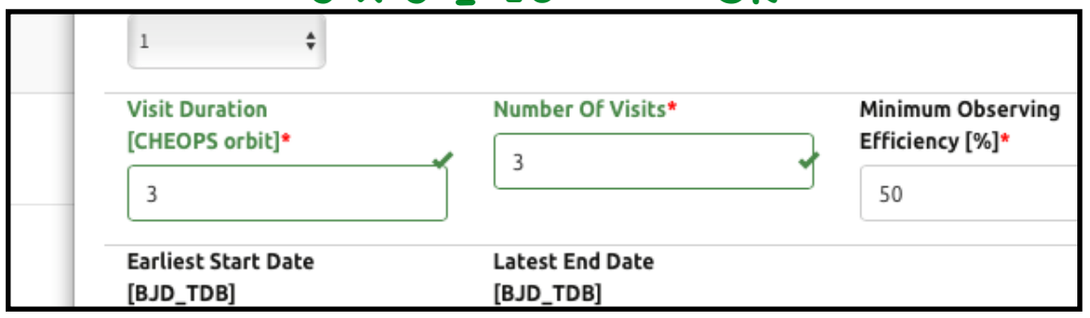
You cannot exceed the number of accepted orbits for a given target.

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

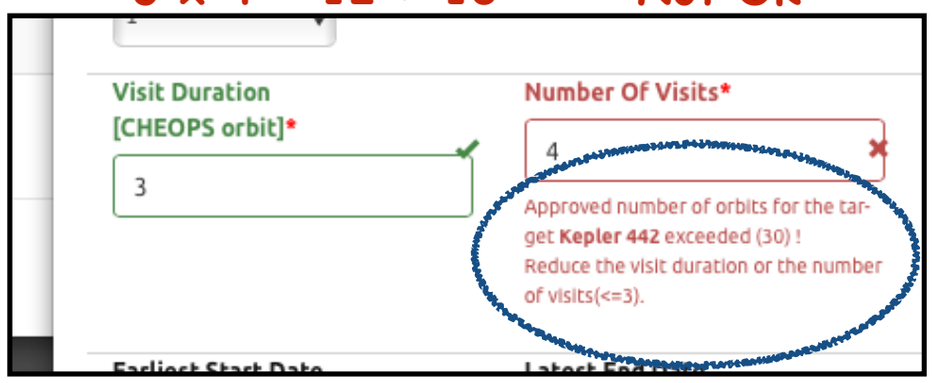
10 x 1 = 10 — OK



3 x 3 ≤ 10 — OK



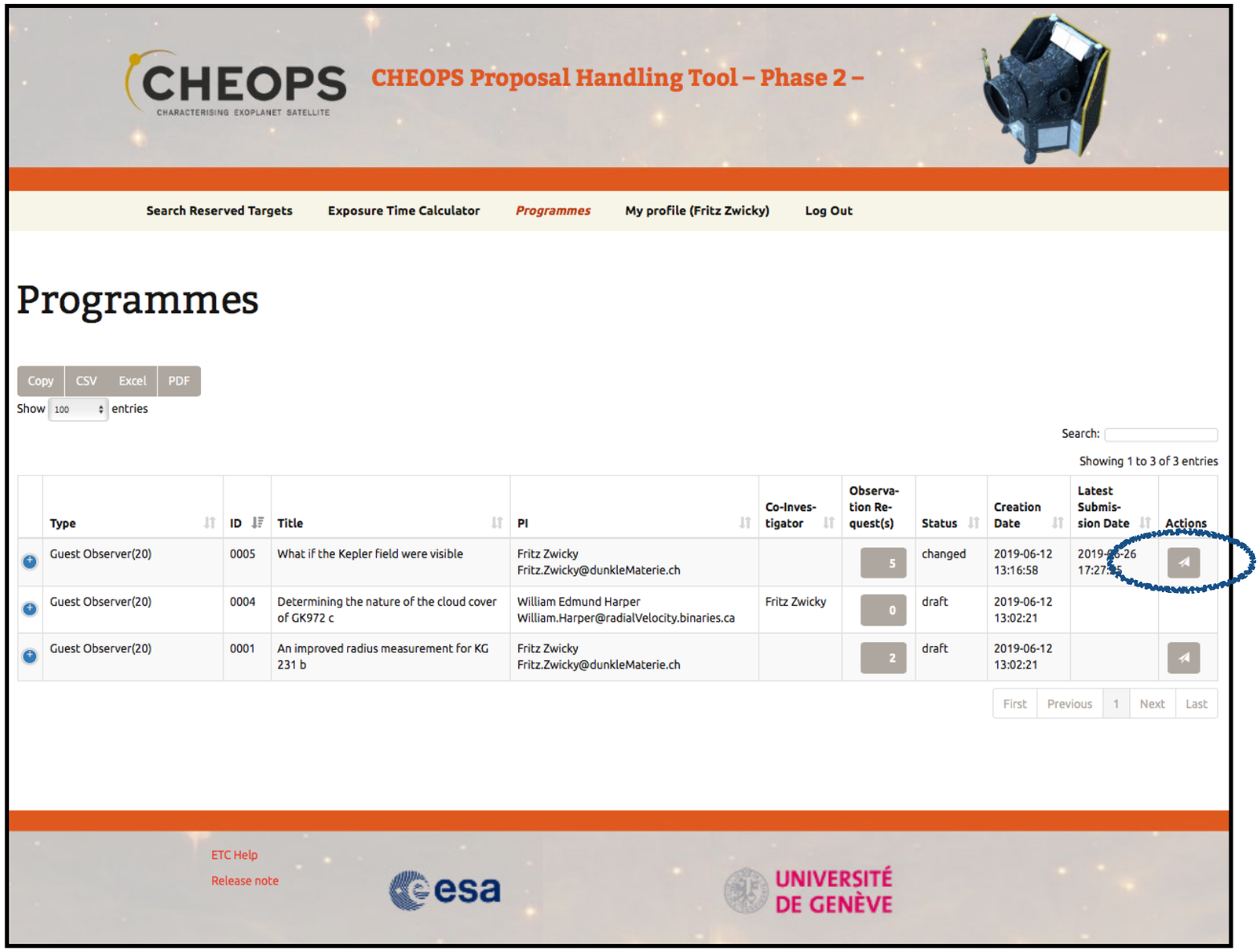
3 x 4 = 12 > 10 — Not OK



Proposal Handling Tool Phase II
PHT2 Guidelines

Submit your programme

Programmes that you own can be submitted with the icon.



Proposal Handling Tool Phase II
PHT2 Guidelines

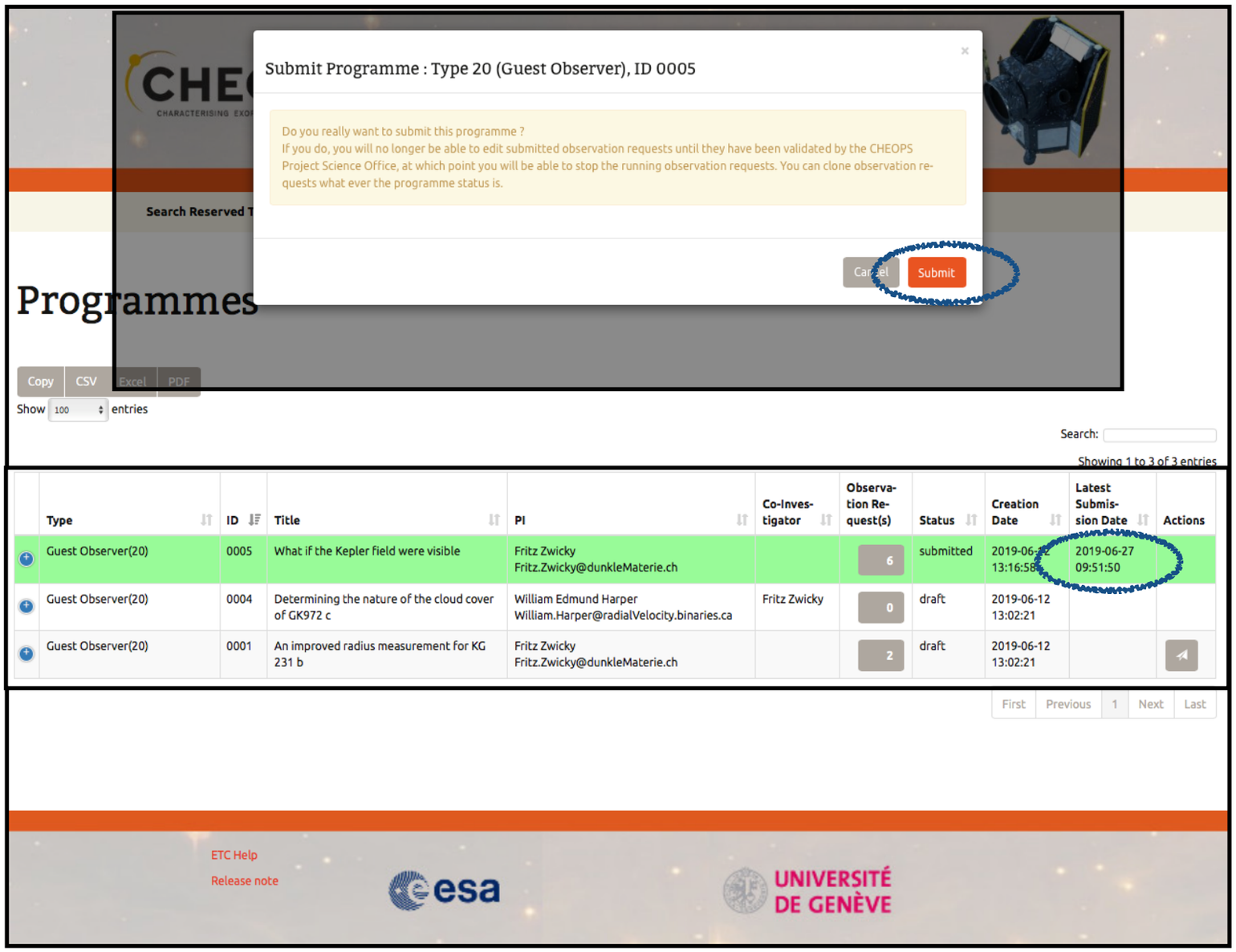
Submit your programme

Programmes that you own can be submitted with the  icon.

Only submit your programme if it is complete.

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

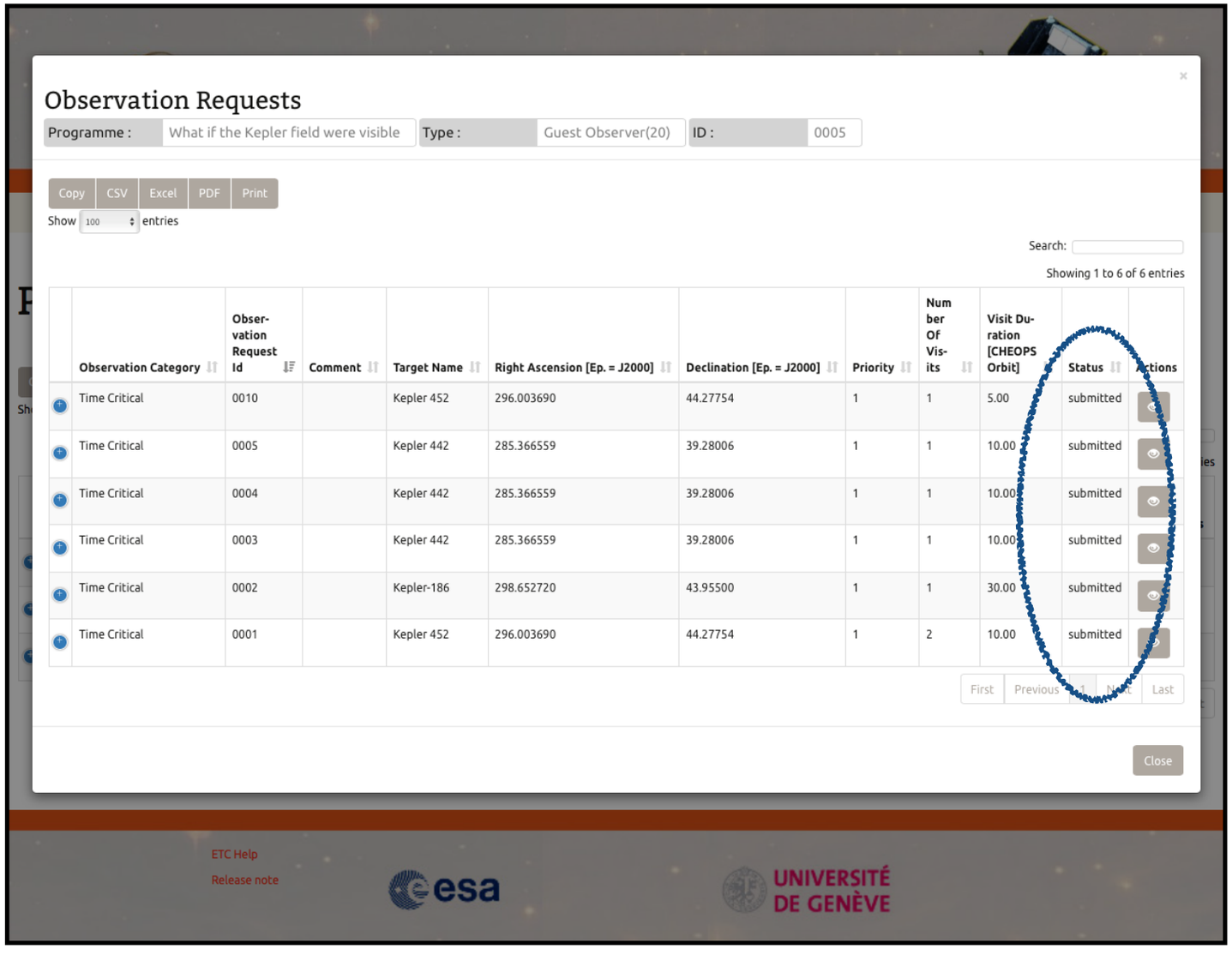
Date of submission is recorded.
Status changes to “Submitted”.



Proposal Handling Tool Phase II
PHT2 Guidelines

Submit your programme

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



Proposal Handling Tool Phase II
PHT2 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.