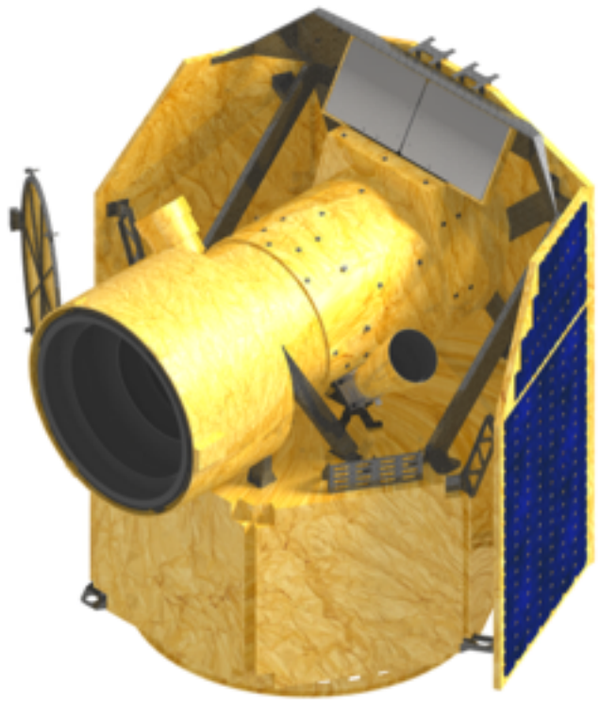
CHEOPS

CHARACTERISING EXOPLANET SATELLITE



CHEOPS Feasibility Checker Guidelines

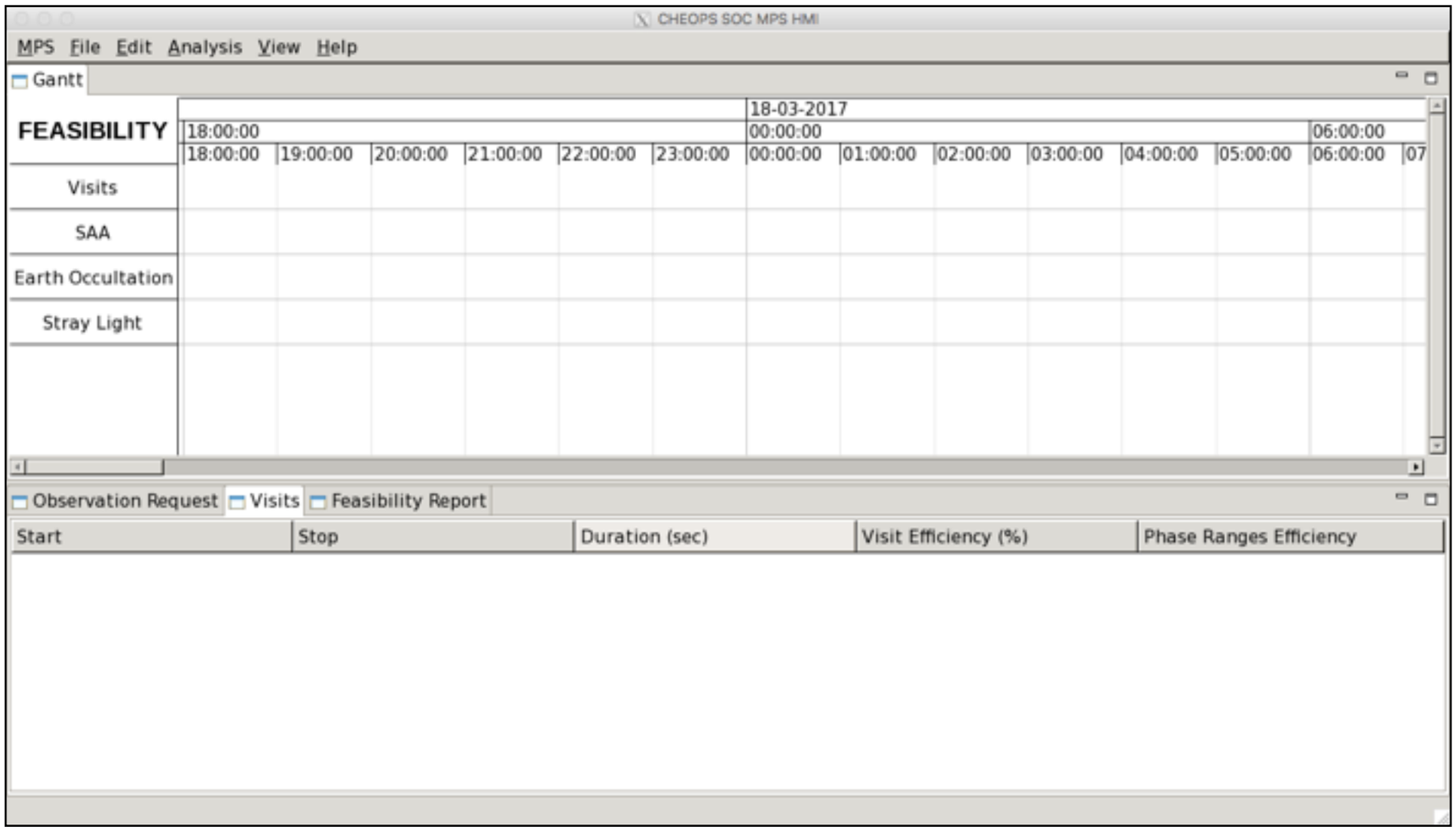
Feasibility Checker Guidelines

Open a terminal and run the following commands (USERNAME as provided by the SOC - UNIGE):

ssh –X USERNAME@isdc-nx00.isdc.unige.ch (*-Y* option for Mac users)
ssh –X USERNAME@tichpsmps00
/cheops_sw/mps_test/bin/mps_client &

Warning: copy from pdf to paste onto the terminal does not always work as expected!

The following window opens



Feasibility Checker Guidelines

Copying and editing the observationRequest file:

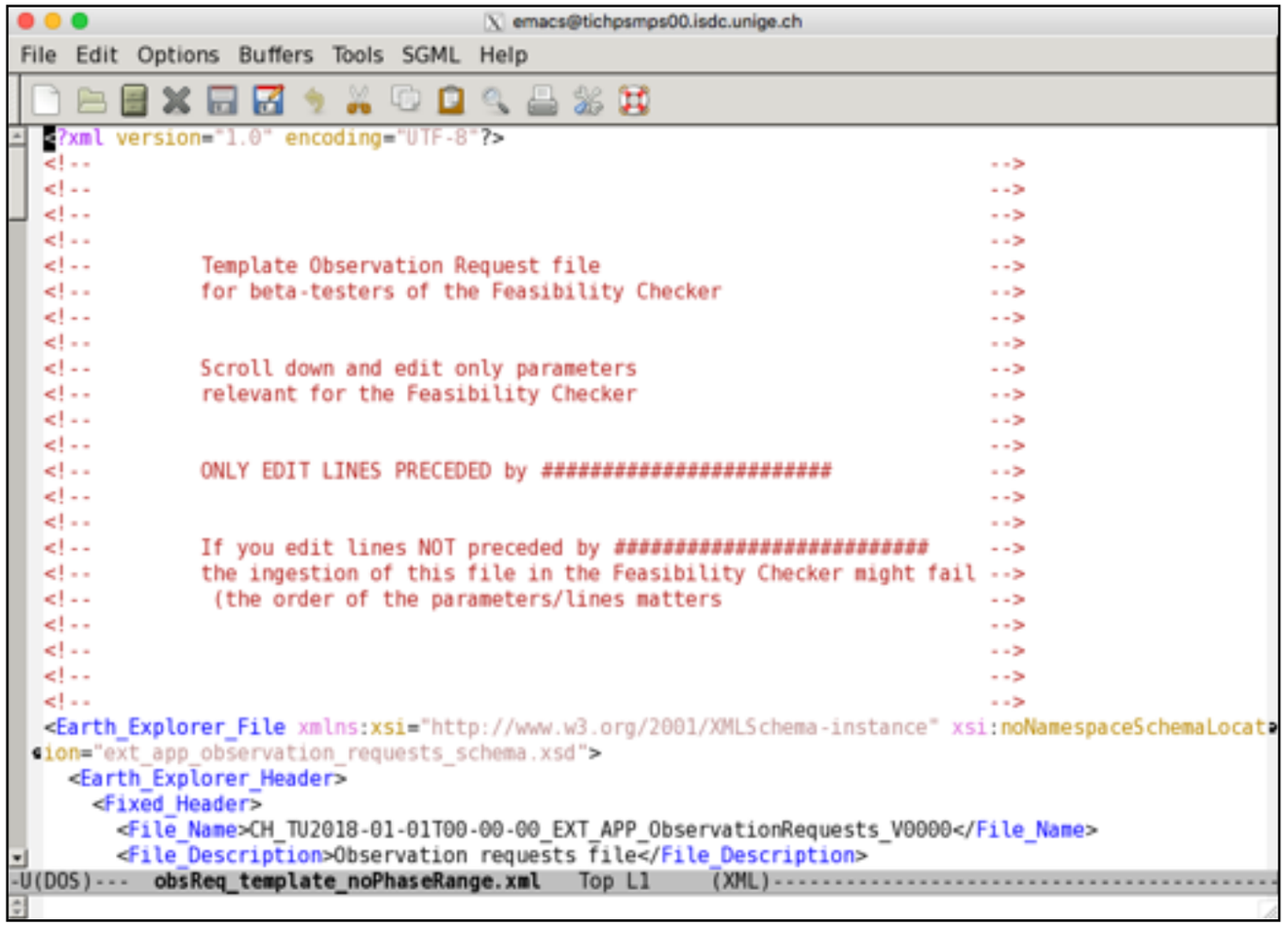
You have to copy these template observationRequest files to your HOME directory to be able to edit then

```
cp   /cheops_sw/centos6.6/rev_01/mps/r_7.0.1/mps-aux-dev-data/feasibility/obsReq_template*.xml   ~/.
cd   ~
ls   obsReq_template*.xml
nedit   obsReq_template_noPhaseRange.xml   &     (or vi obsReq_template_noPhaseRange.xml)
```

Edit this xml file to specify the technical details of your planned observation. Relevant parameters:

- *Target name*
- *R.A. — Dec*
- *Earliest Start / Latest End (optional)*
- *Transit central time*
- *Transit period*
- *Visit duration*
- *Observing efficiency*
- *Critical phase ranges (optional)*

Save the file after editing

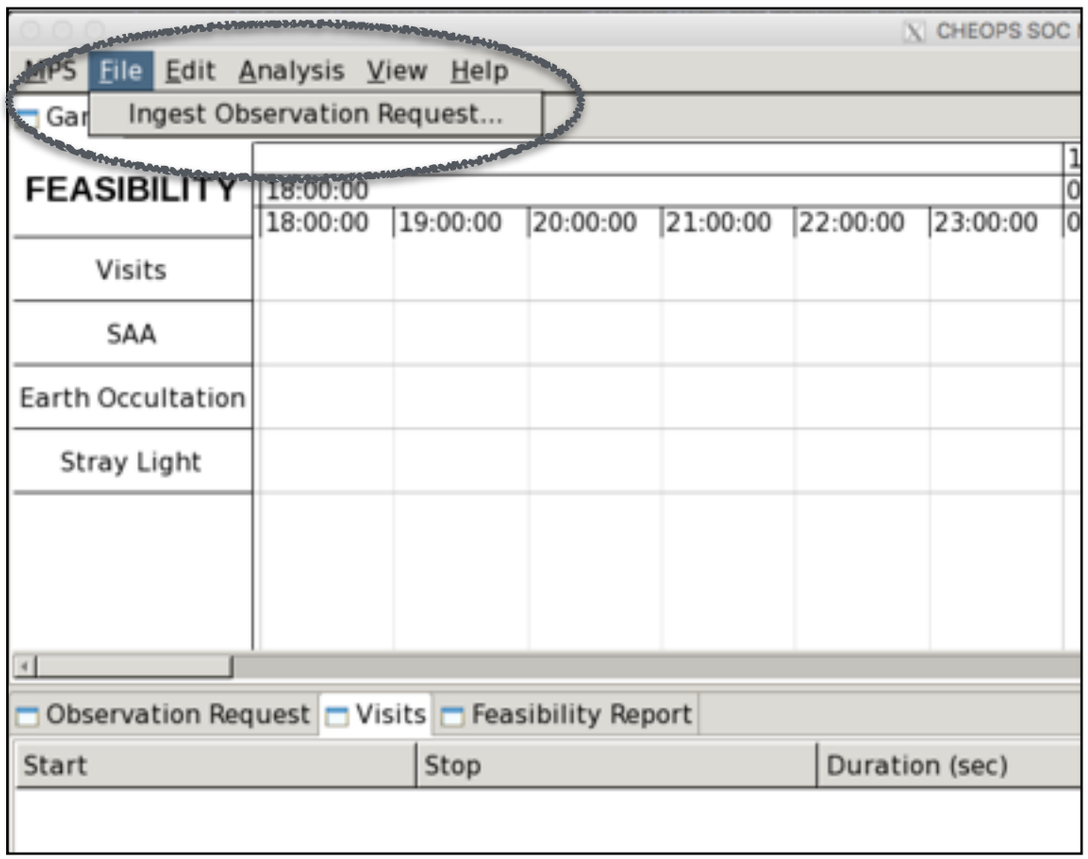


WARNINGS:

- This file must contain only one request (fail otherwise)
- Only the above parameters should be modified. They are identified as such in the file (see header).
- Re-organizing the file structure or changing not-recommended parameters will likely make the file ingestion fail!

Feasibility Checker Guidelines

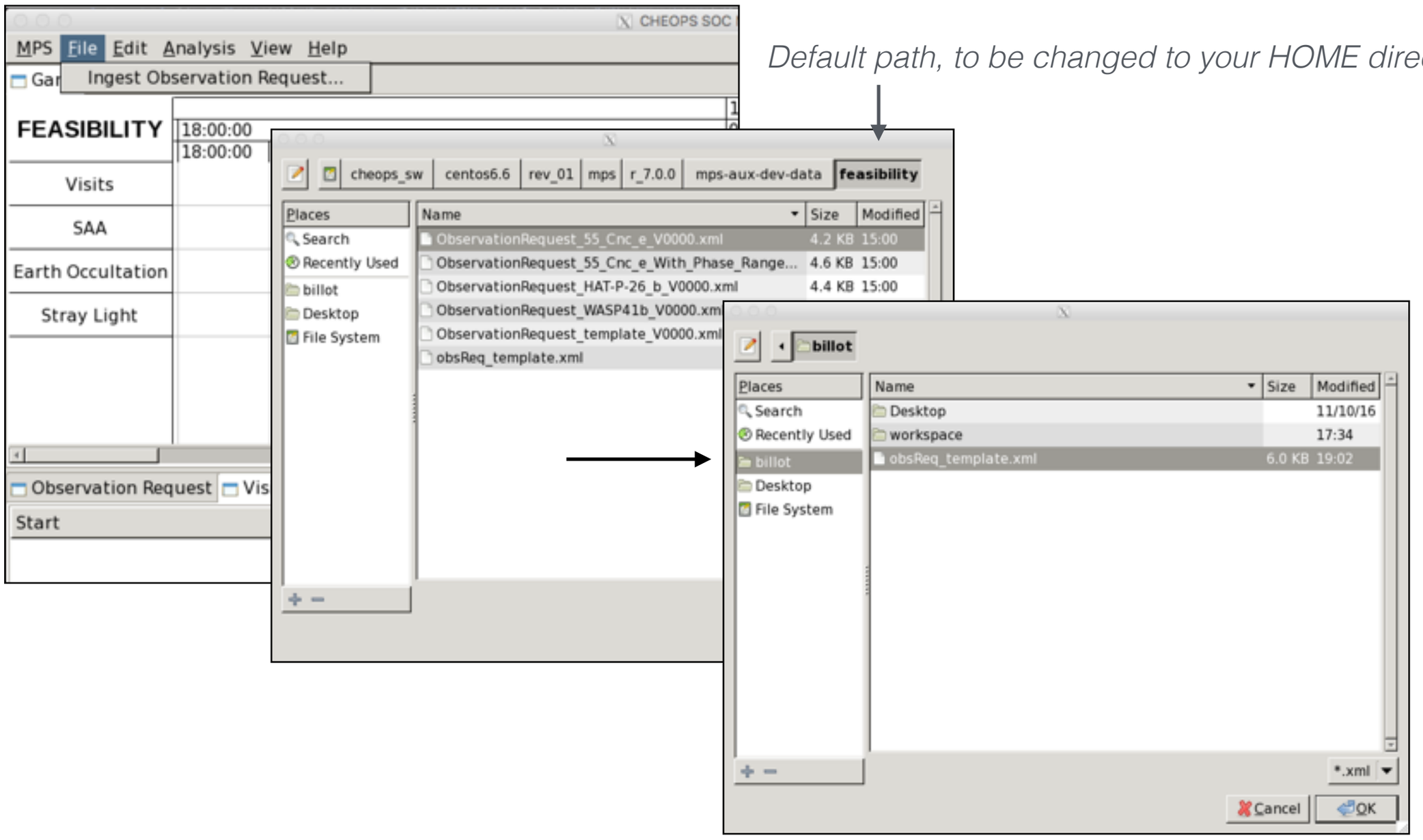
Read in the observationRequest file in the Feasibility Checker:



Feasibility Checker Guidelines

Read in the observationRequest file in the Feasibility Checker:

Navigate the menu to read in the files from your HOME directory

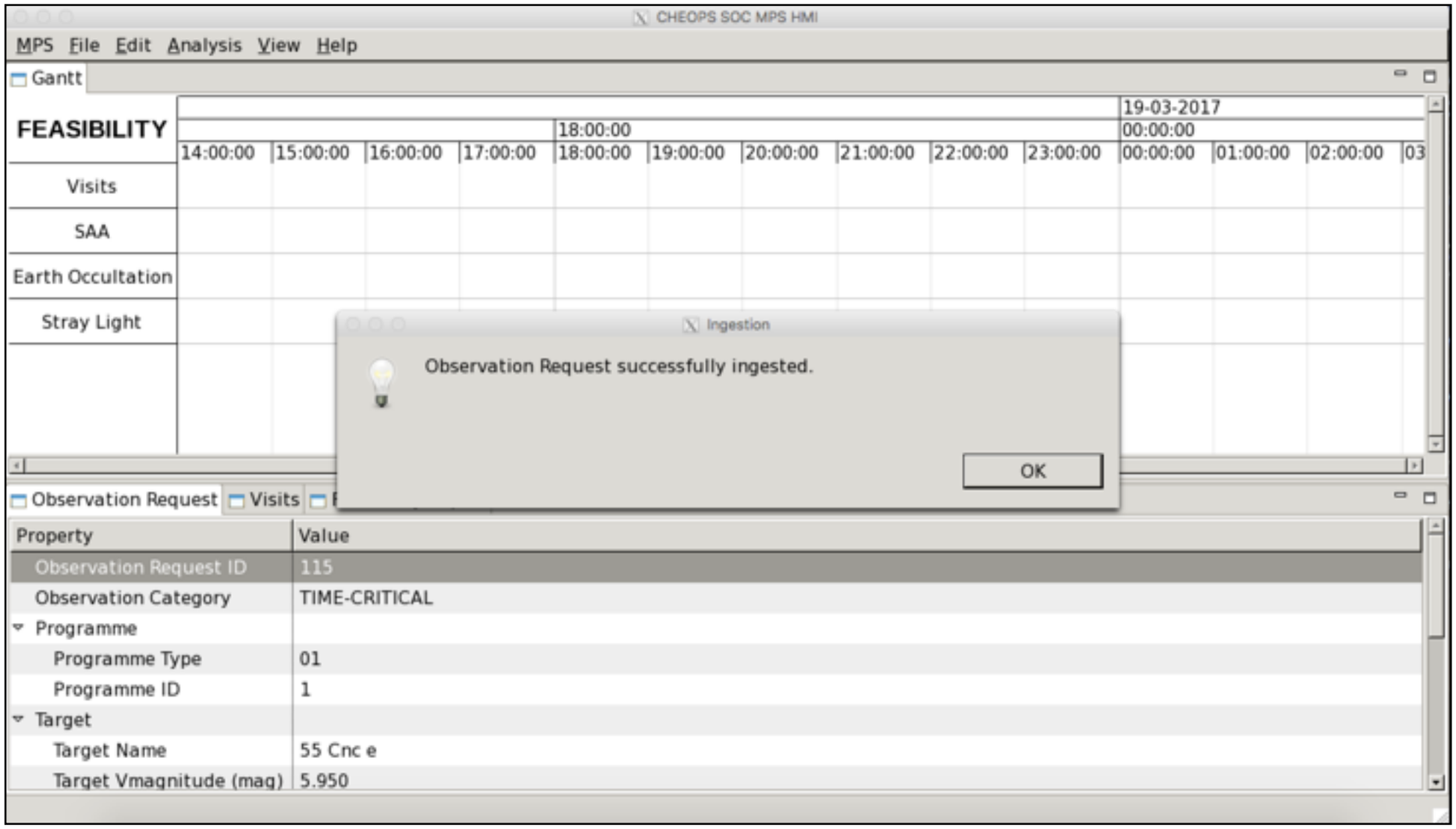


Default path, to be changed to your HOME directory

Feasibility Checker Guidelines

Read in the observationRequest file in the Feasibility Checker:

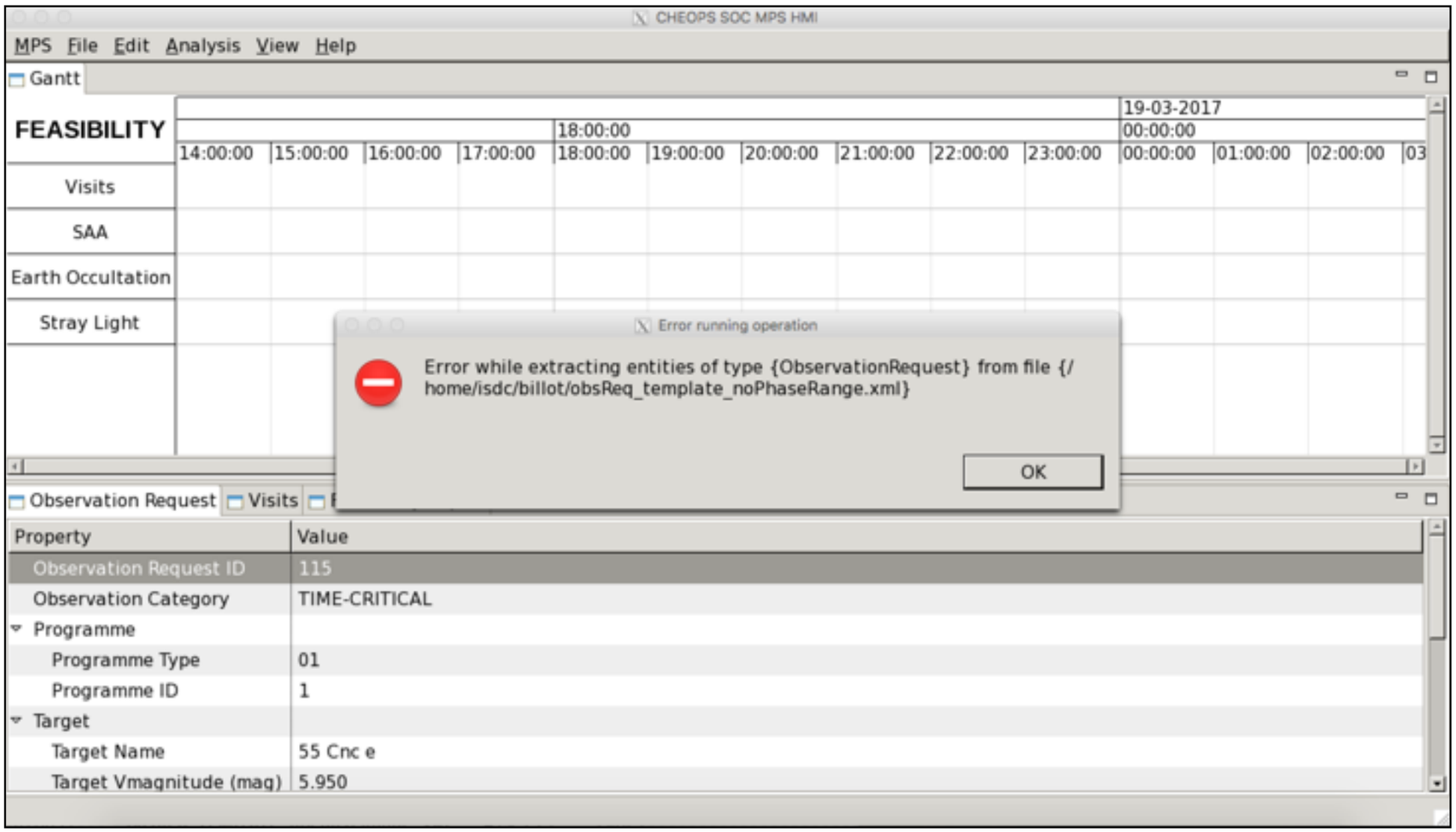
Successful ingestion of the observation request file



Feasibility Checker Guidelines

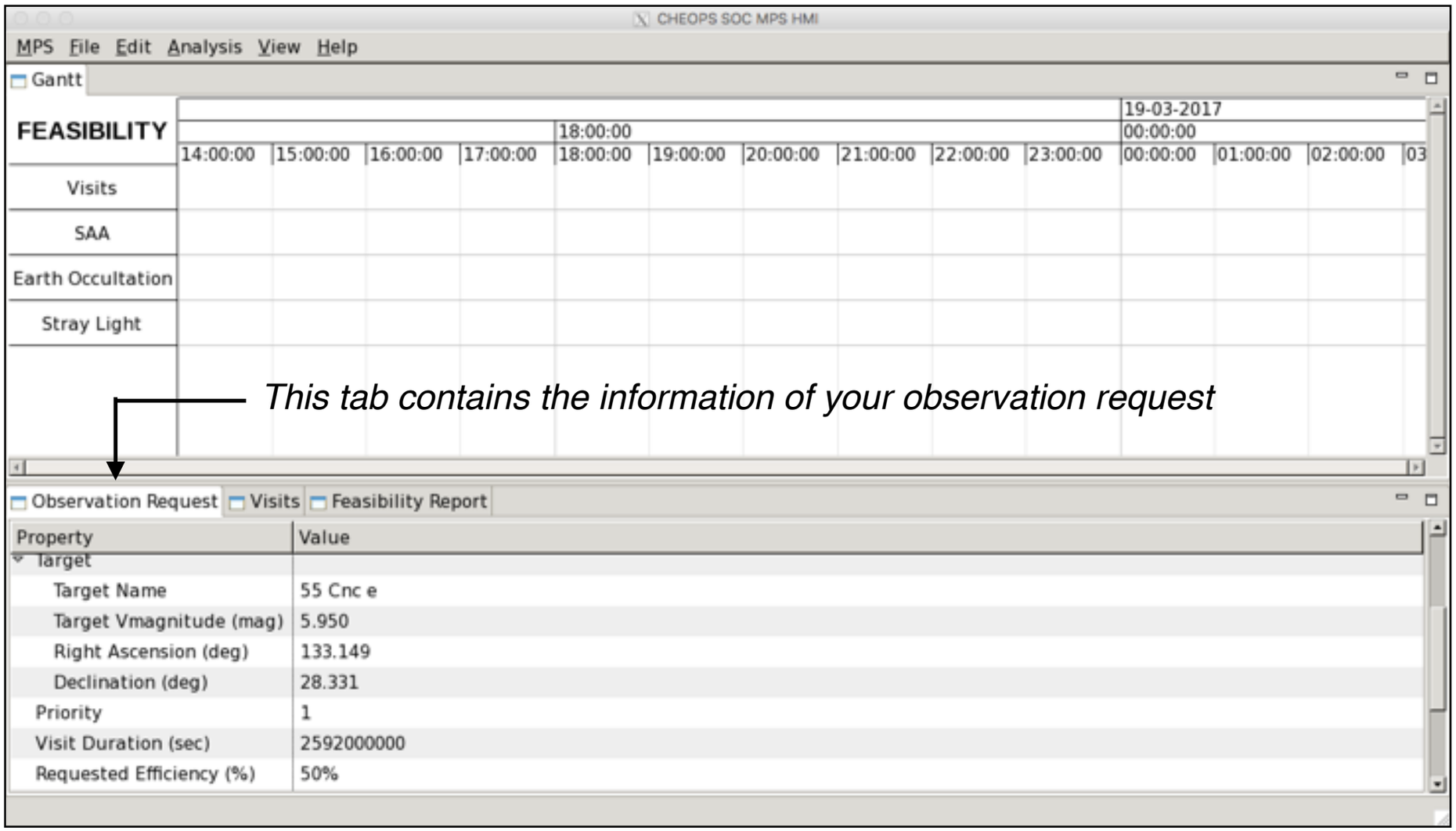
Read in the observationRequest file in the Feasibility Checker:

If you obtain this error message, it means that you have erroneously modified the observation request file. Restart from the original observation request file following instructions found in the file to solve this issue.



Feasibility Checker Guidelines

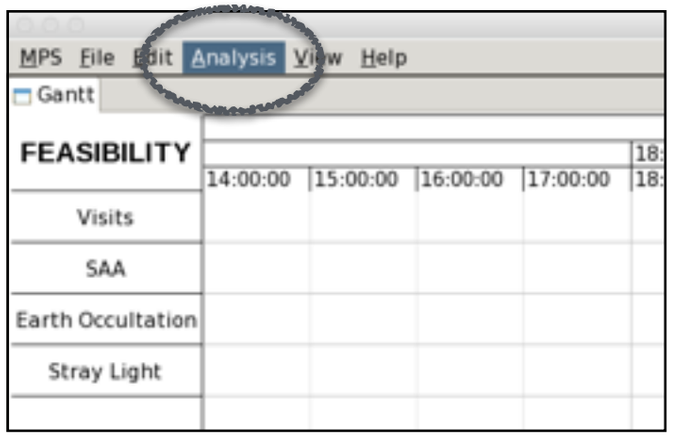
Read in the observationRequest file in the Feasibility Checker:



Feasibility Checker Guidelines

Run the Feasibility Checker

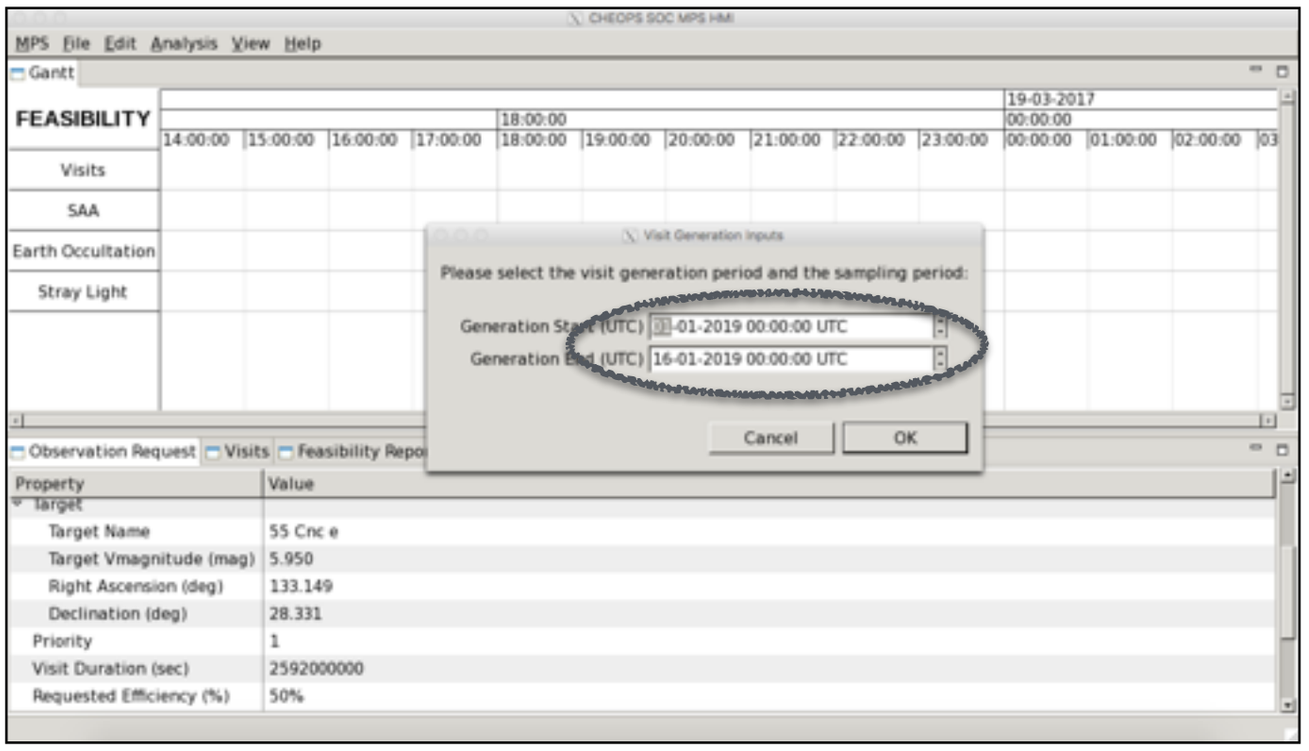
Go to "*Analysis*", and "*Feasibility Check*…"



Set the time interval to be explored for generating the possible visits

Caveat: only the period 01/01/2019 — 01/01/2020 can be explored in this version the tool (will be extended in future version)

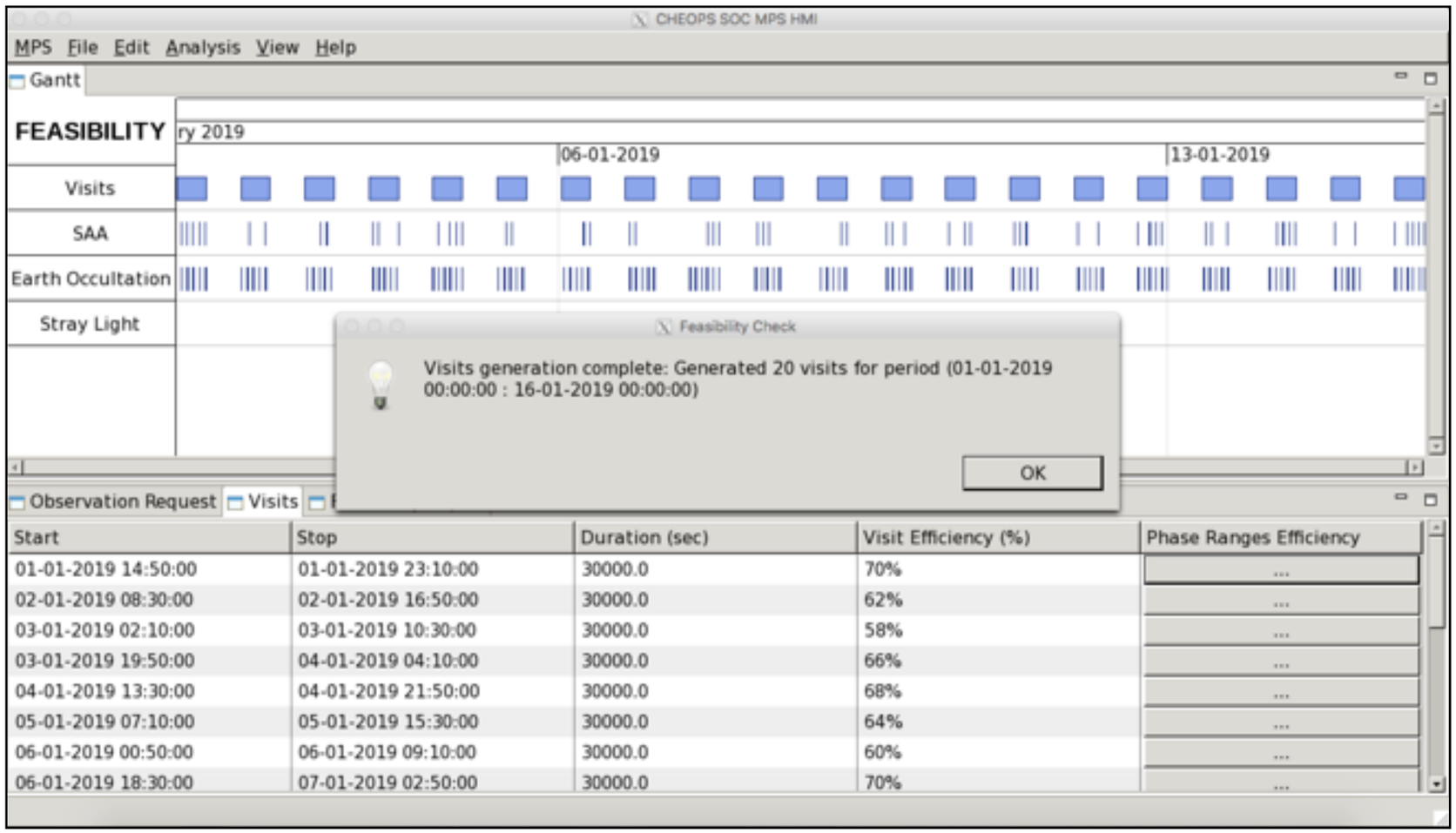
Hit "*OK*"



Feasibility Checker Guidelines

Run the Feasibility Checker

Successful generation of the possible visits

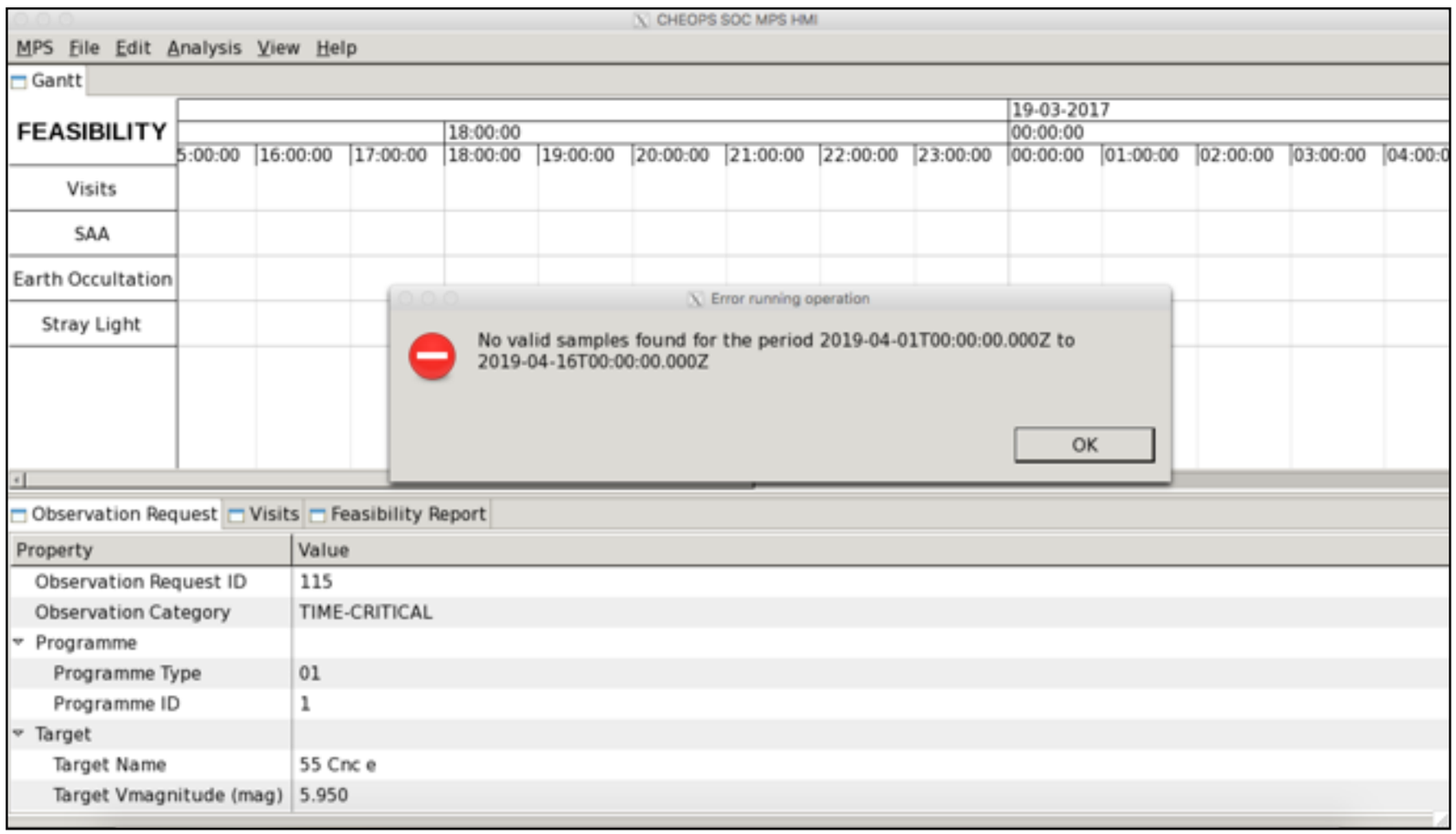


Feasibility Checker Guidelines

Run the Feasibility Checker

Sometimes, no possible visits are found in the requested period. You will then see this error message.

Your source might not be visible (see next couple of slides), or you should relax the "*Earliest Start*" / "*Latest End*" parameters in the observation request file.



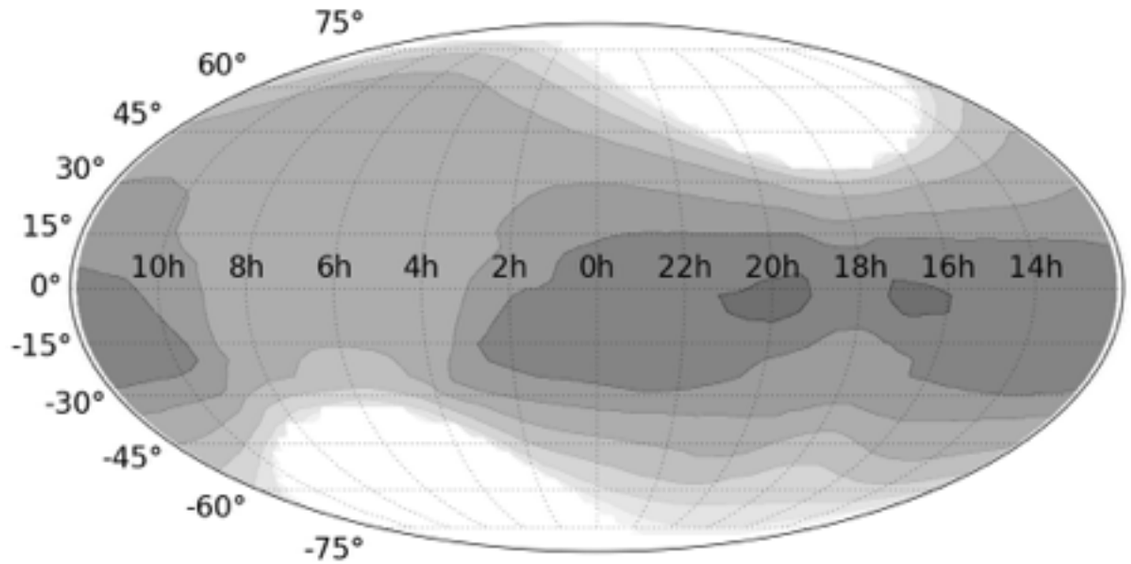
Feasibility Checker Guidelines

Is my target visible at all with CHEOPS?

If yes, when?

Sky visibility maps

(darker shapes indicate fewer interruptions)

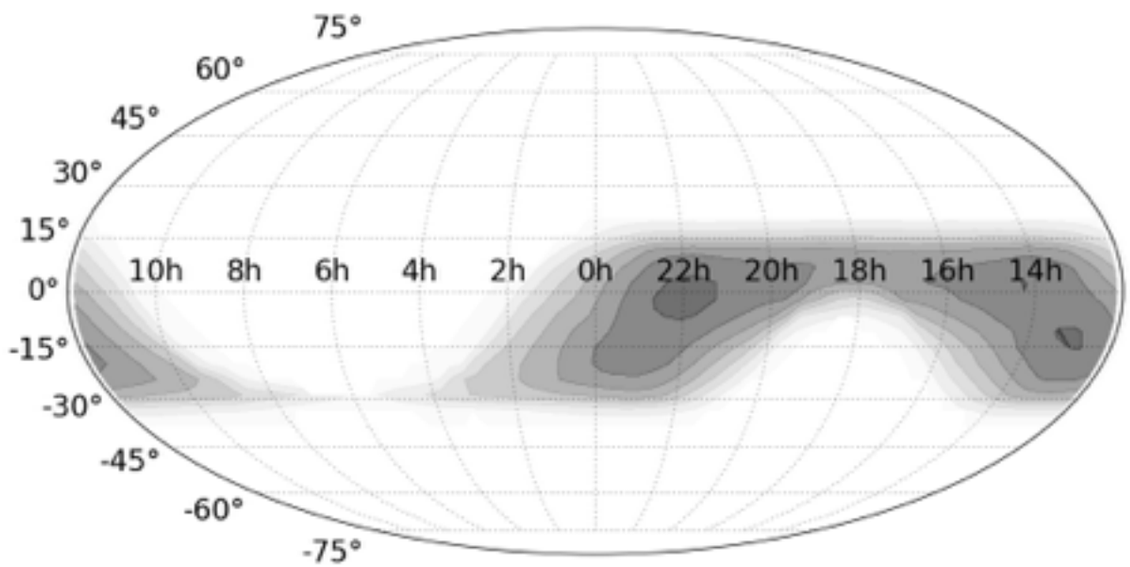


Most permissive / favourable case

Allows for high levels of stray light

(adequate for bright stars)

Over 50% of uninterrupted observation per orbit



Most restrictive / unfavourable case

Allows for lower levels of stray light

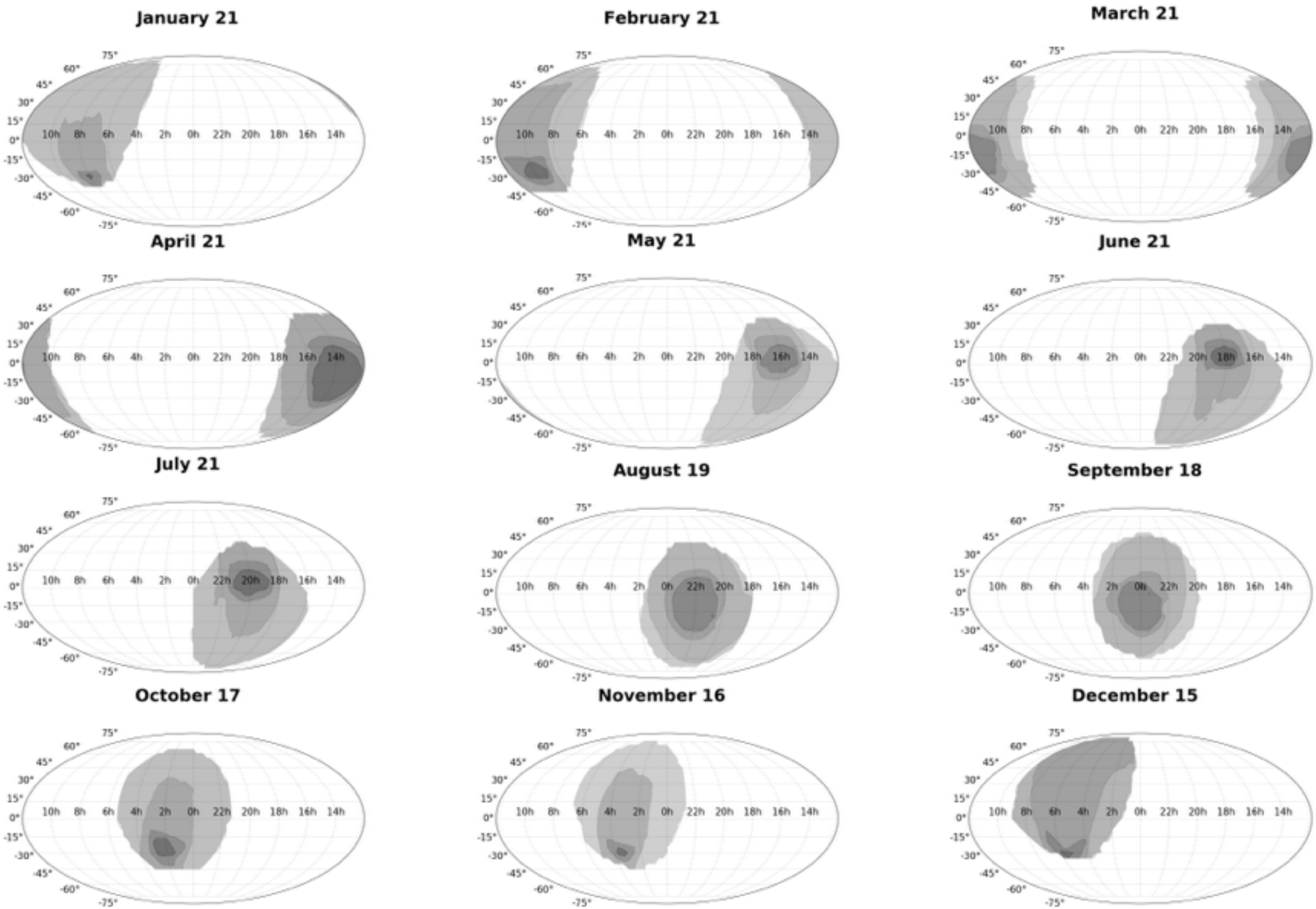
(required for faint stars)

Over 80% of uninterrupted observation per orbit

Feasibility Checker Guidelines

Monthly sky visibility maps

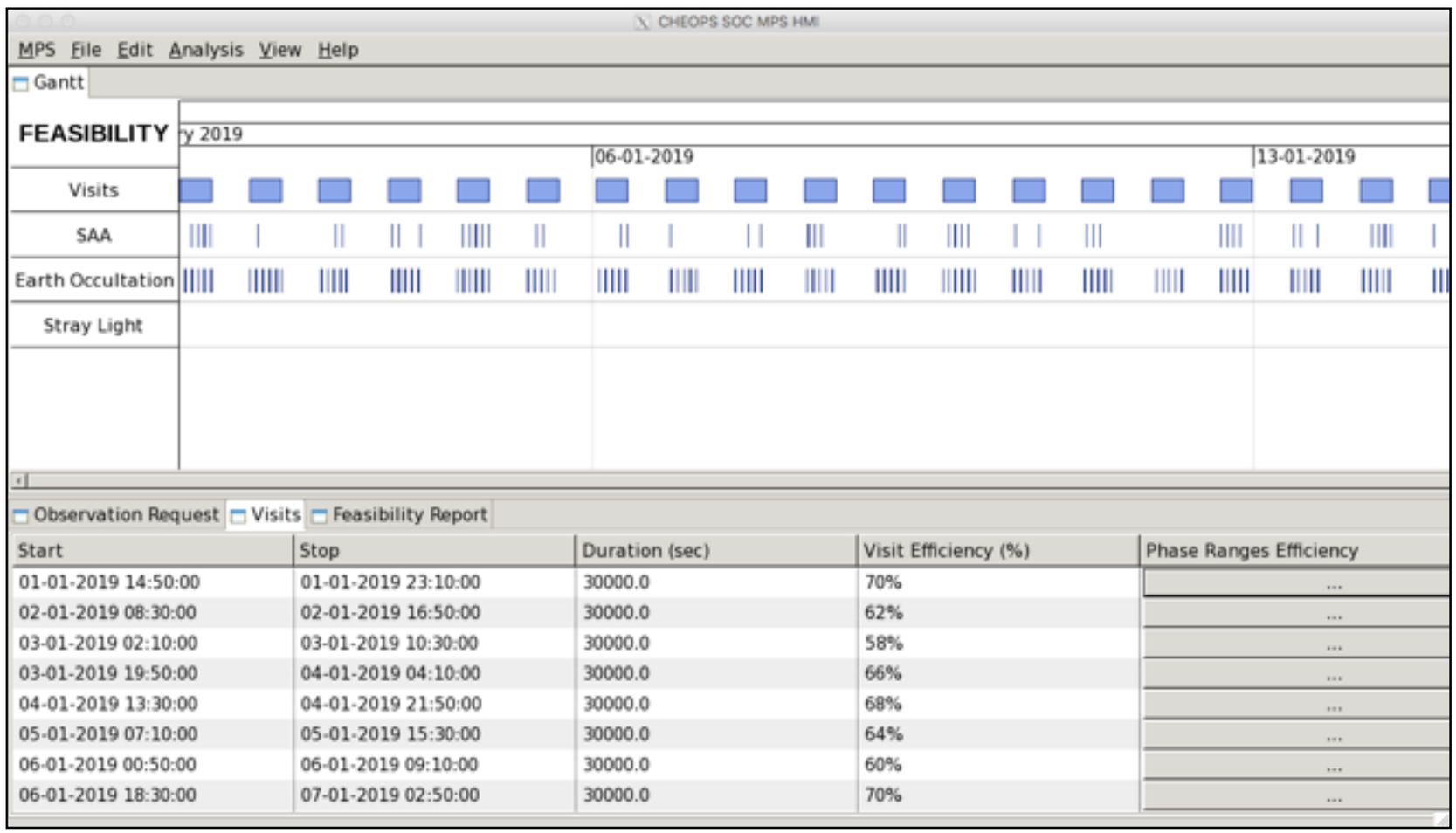
When can a source be observed with CHEOPS?



Feasibility Checker Guidelines

Explore the result

The Gantt chart shows the possible visits over the requested period, along with associated interruptions due to Earth occultations and South Atlantic Anomaly crossings



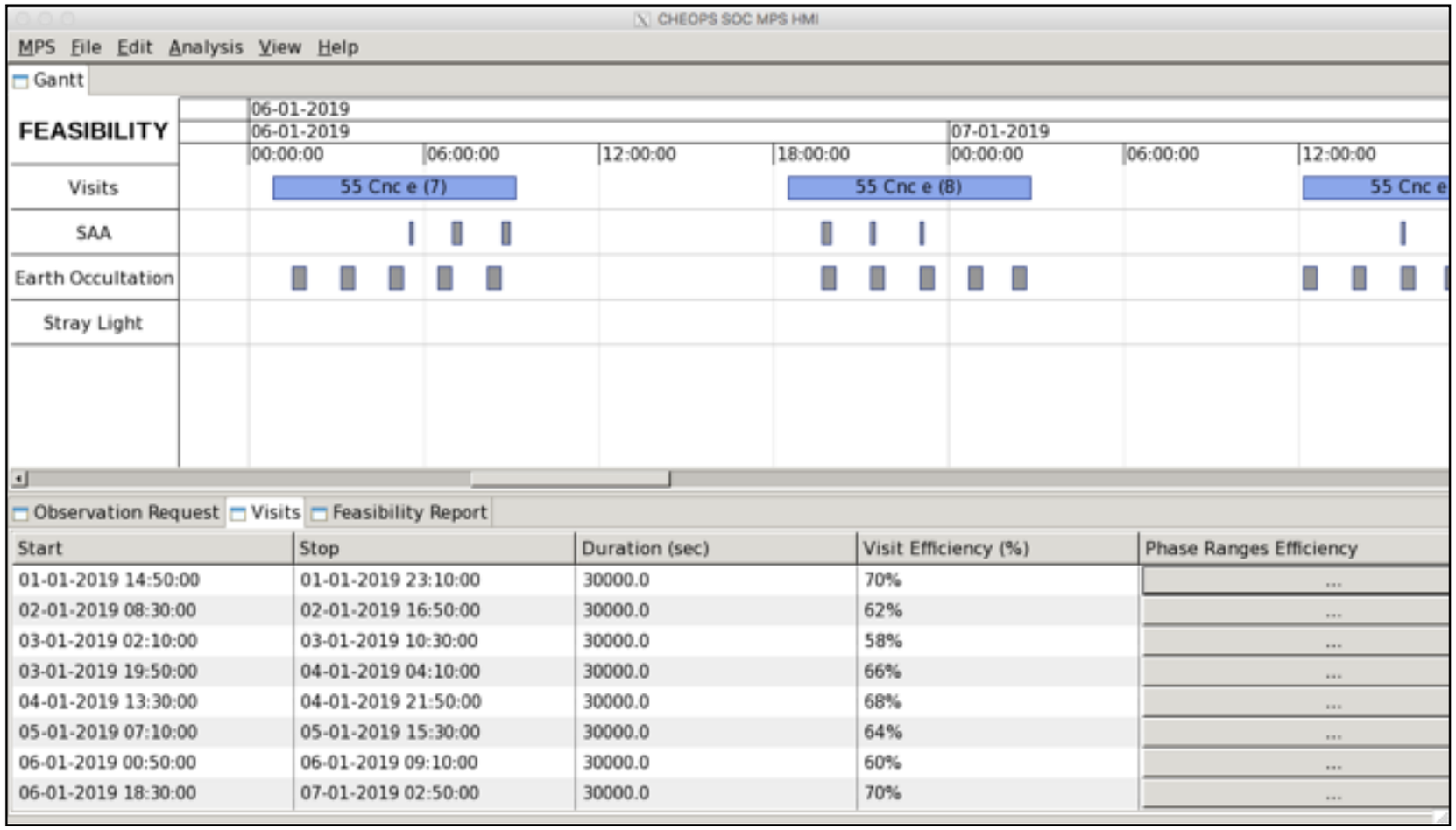
Start	Stop	Duration (sec)	Visit Efficiency (%)	Phase Ranges Efficiency
01-01-2019 14:50:00	01-01-2019 23:10:00	30000.0	70%	...
02-01-2019 08:30:00	02-01-2019 16:50:00	30000.0	62%	...
03-01-2019 02:10:00	03-01-2019 10:30:00	30000.0	58%	...
03-01-2019 19:50:00	04-01-2019 04:10:00	30000.0	66%	...
04-01-2019 13:30:00	04-01-2019 21:50:00	30000.0	68%	...
05-01-2019 07:10:00	05-01-2019 15:30:00	30000.0	64%	...
06-01-2019 00:50:00	06-01-2019 09:10:00	30000.0	60%	...
06-01-2019 18:30:00	07-01-2019 02:50:00	30000.0	70%	...

Caveat: Threshold on acceptable straylight levels is not yet representative

Feasibility Checker Guidelines

Explore the result

You can zoom in/out using “*Control*” + “*Mouse wheel*” (two-finger scroll on touchpads)

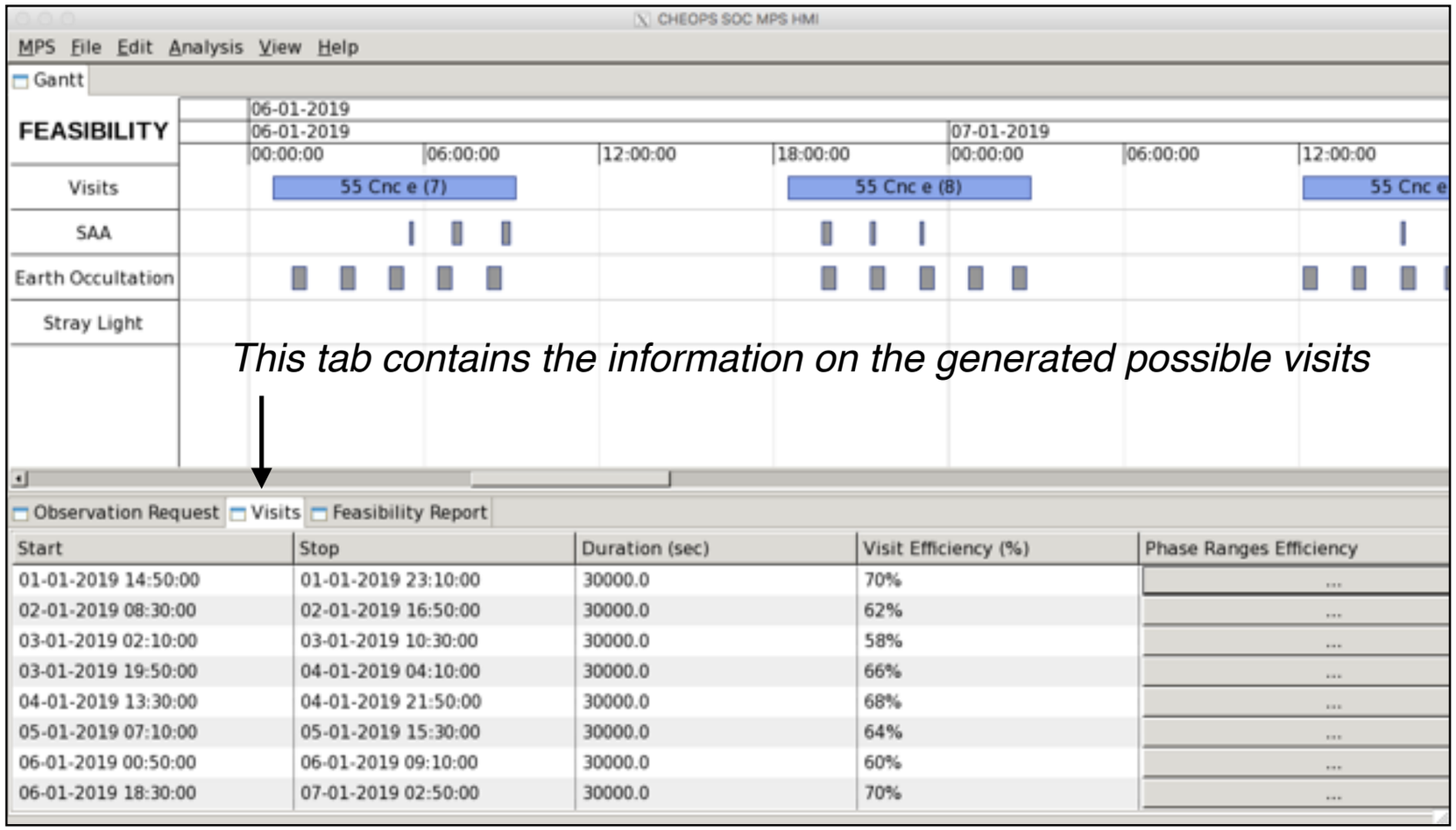


Feasibility Checker Guidelines

Explore the result

You can consult the details of generated visits:

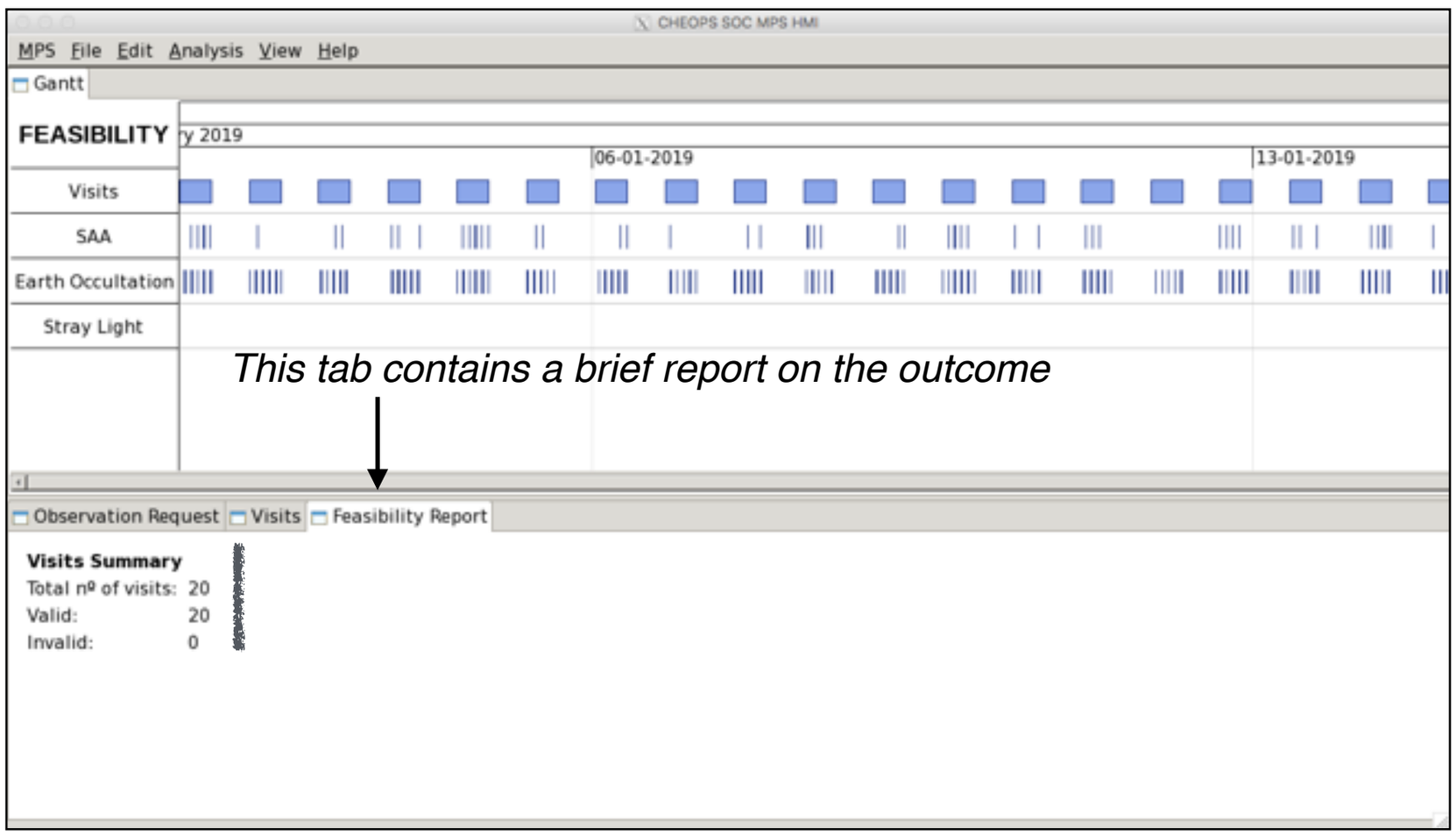
Start / Stop time and (effective) duration



Feasibility Checker Guidelines

Explore the result

In that case, out of the 20 possible visits, 20 have observing efficiencies higher than requested, thus making them all ***valid***

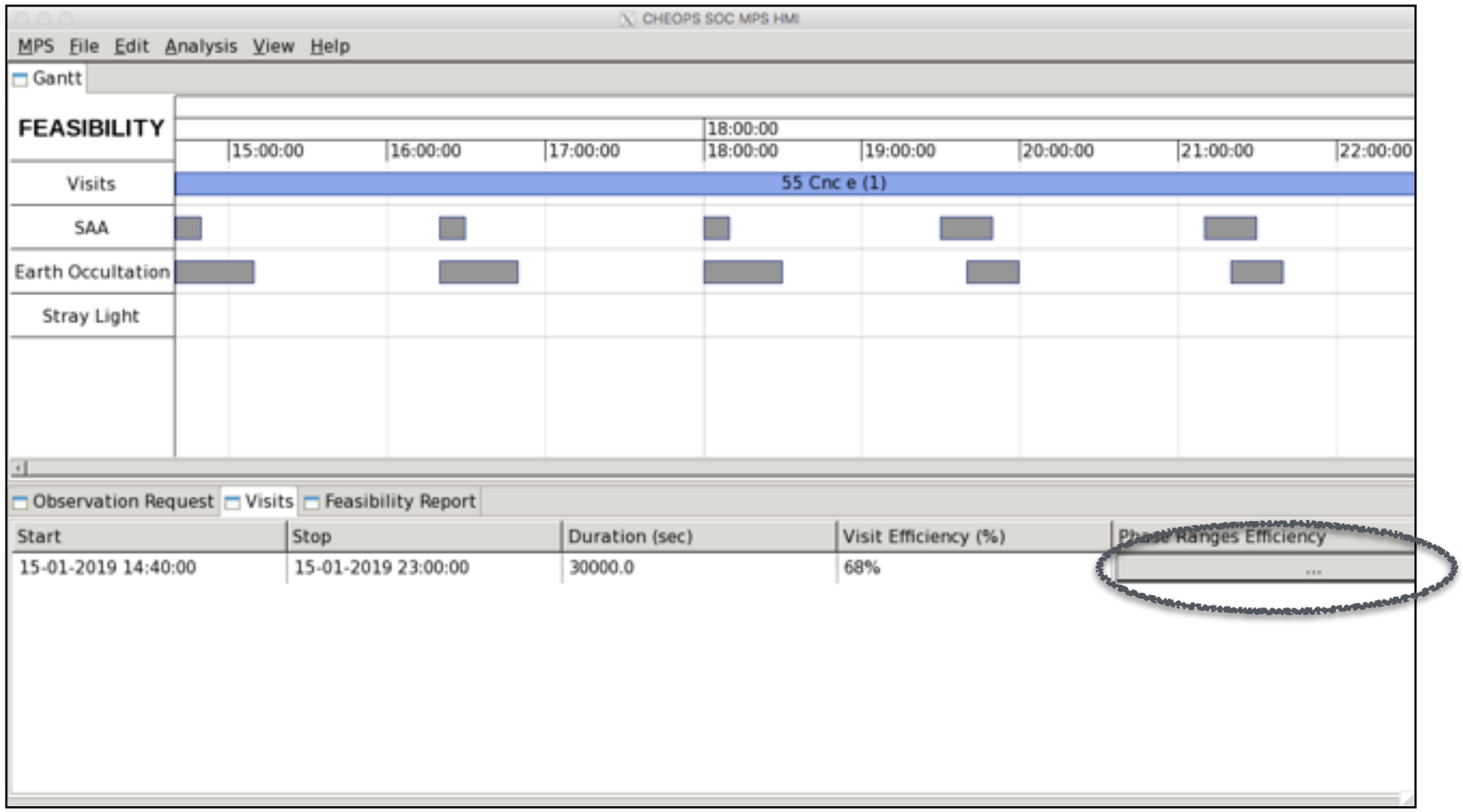


Feasibility Checker Guidelines

Explore the result (critical Phase Ranges)

If you have ingested an observation request with critical phase ranges (e.g. obsReq_template_twoPhaseRange.xml)

You can explore the observing efficiencies within the pre-defined phase ranges



Feasibility Checker Guidelines

Explore the result

In that particular case, the requested efficiency in the phase range is 90%, while the observed efficiency is 0% (i.e. the phase range is entirely filled with interruptions)
This visit is therefore not valid as the requested efficiency within the phase range cannot be met