

# CHEOPS Feasibility Checker Guidelines

# Feasibility Checker Guidelines

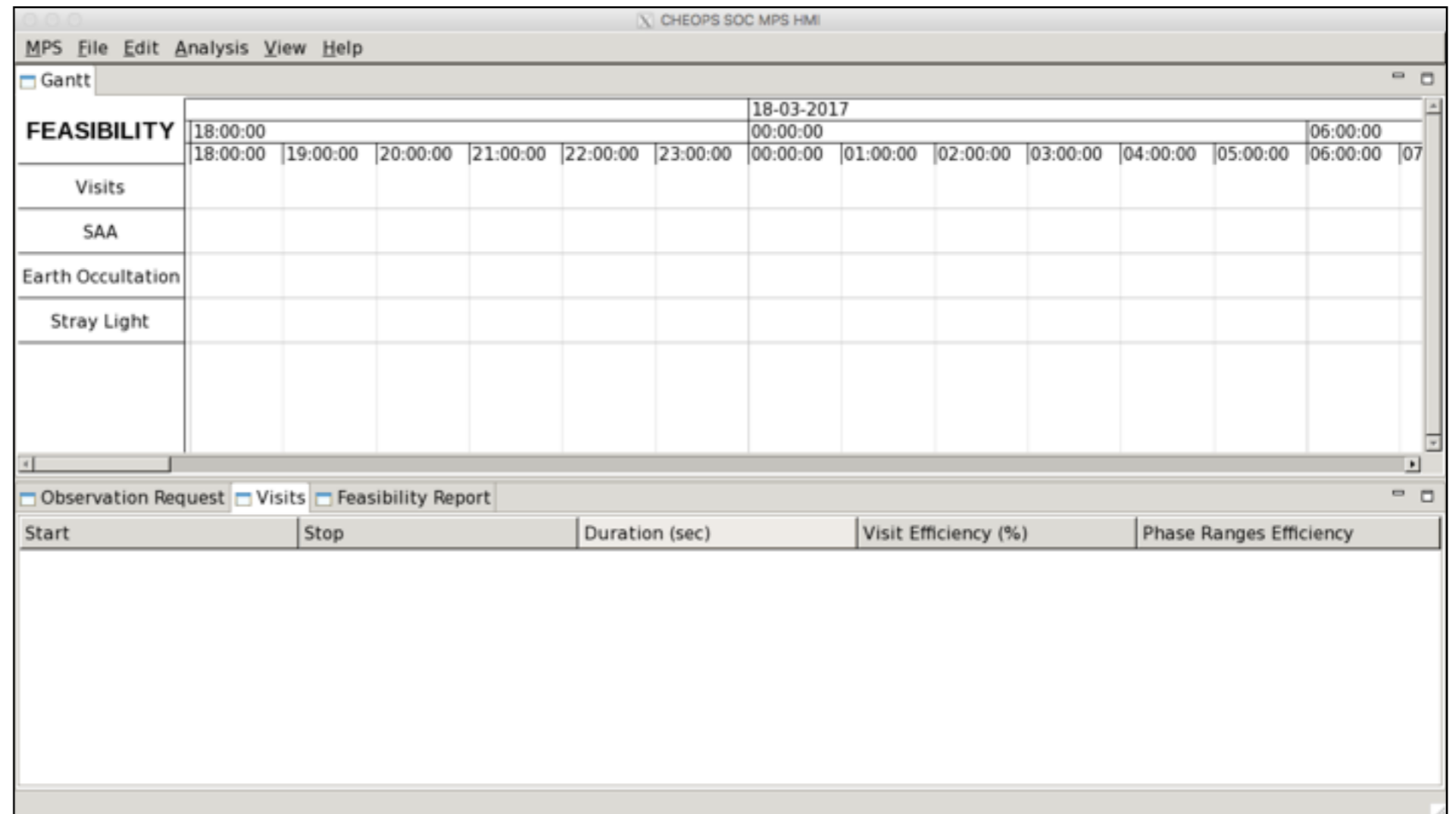
Open a terminal and run the following commands (USERNAME as provided by the SOC - UNIGE):

```
ssh -X USERNAME@isdc-nx00.isdc.unige.ch
ssh -X USERNAME@tichpsmps00
/cheops_sw/mps_test/bin/mps_client &
```

(-Y option for Mac users)

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

The following window opens

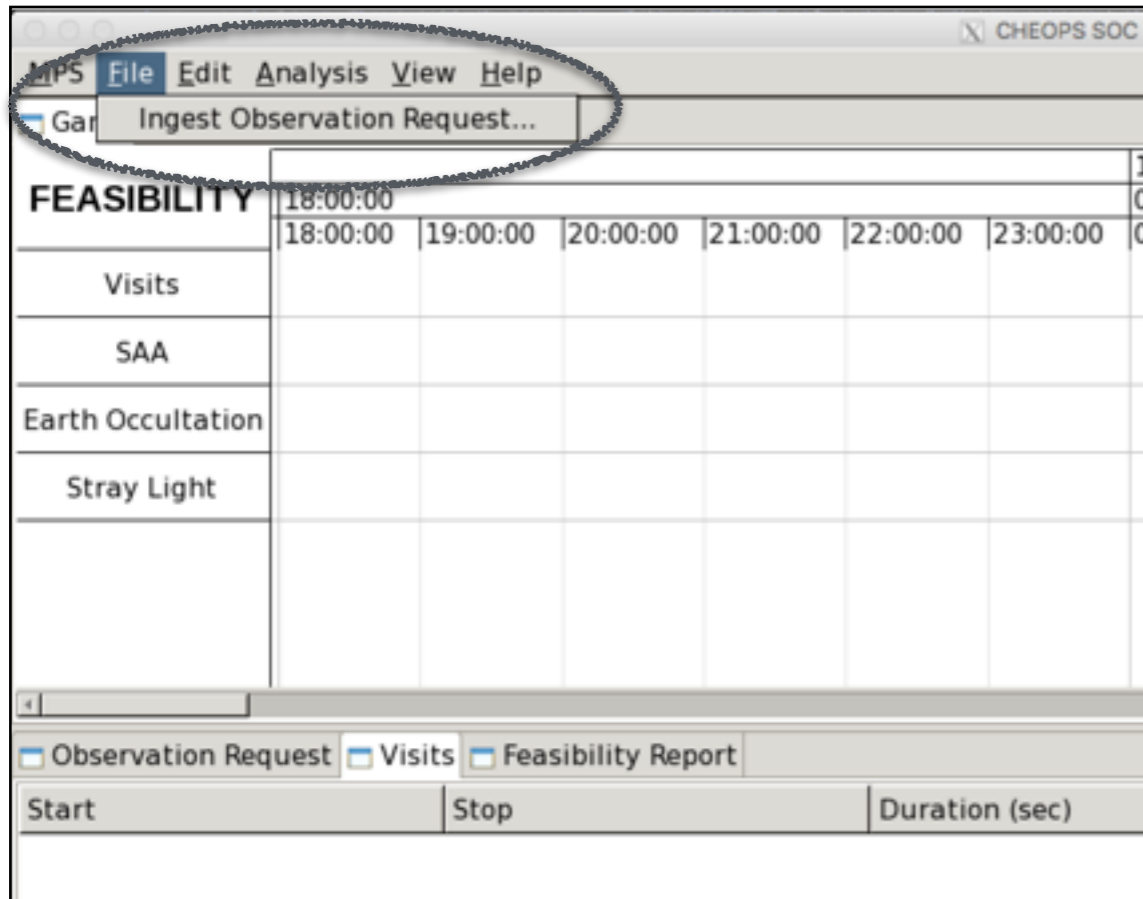


The screenshot shows the 'CHEOPS SOC MPS HMI' window. The top menu bar includes 'MPS', 'File', 'Edit', 'Analysis', 'View', and 'Help'. The main window is divided into two panes. The top pane, titled 'Gantt', displays a Gantt chart for the date '18-03-2017'. The chart has a time axis from 18:00:00 to 06:00:00. The left side of the chart lists categories: 'FEASIBILITY', 'Visits', 'SAA', 'Earth Occultation', and 'Stray Light'. The bottom pane, titled 'Observation Request', contains a table with the following columns: 'Start', 'Stop', 'Duration (sec)', 'Visit Efficiency (%)', and 'Phase Ranges Efficiency'. The table is currently empty.



# Feasibility Checker Guidelines

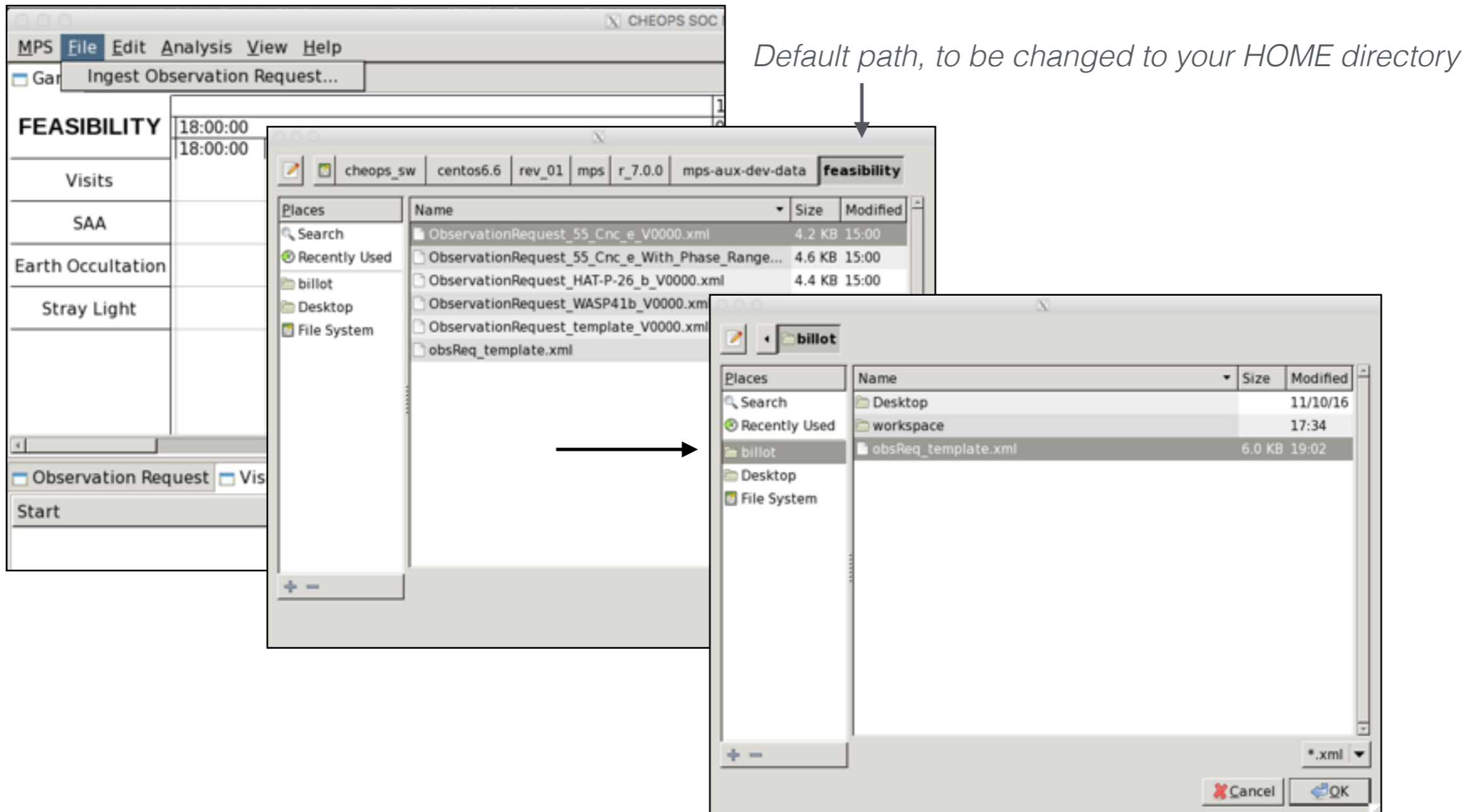
Read in the observationRequest file in the Feasibility Checker:



# Feasibility Checker Guidelines

## Read in the observationRequest file in the Feasibility Checker:

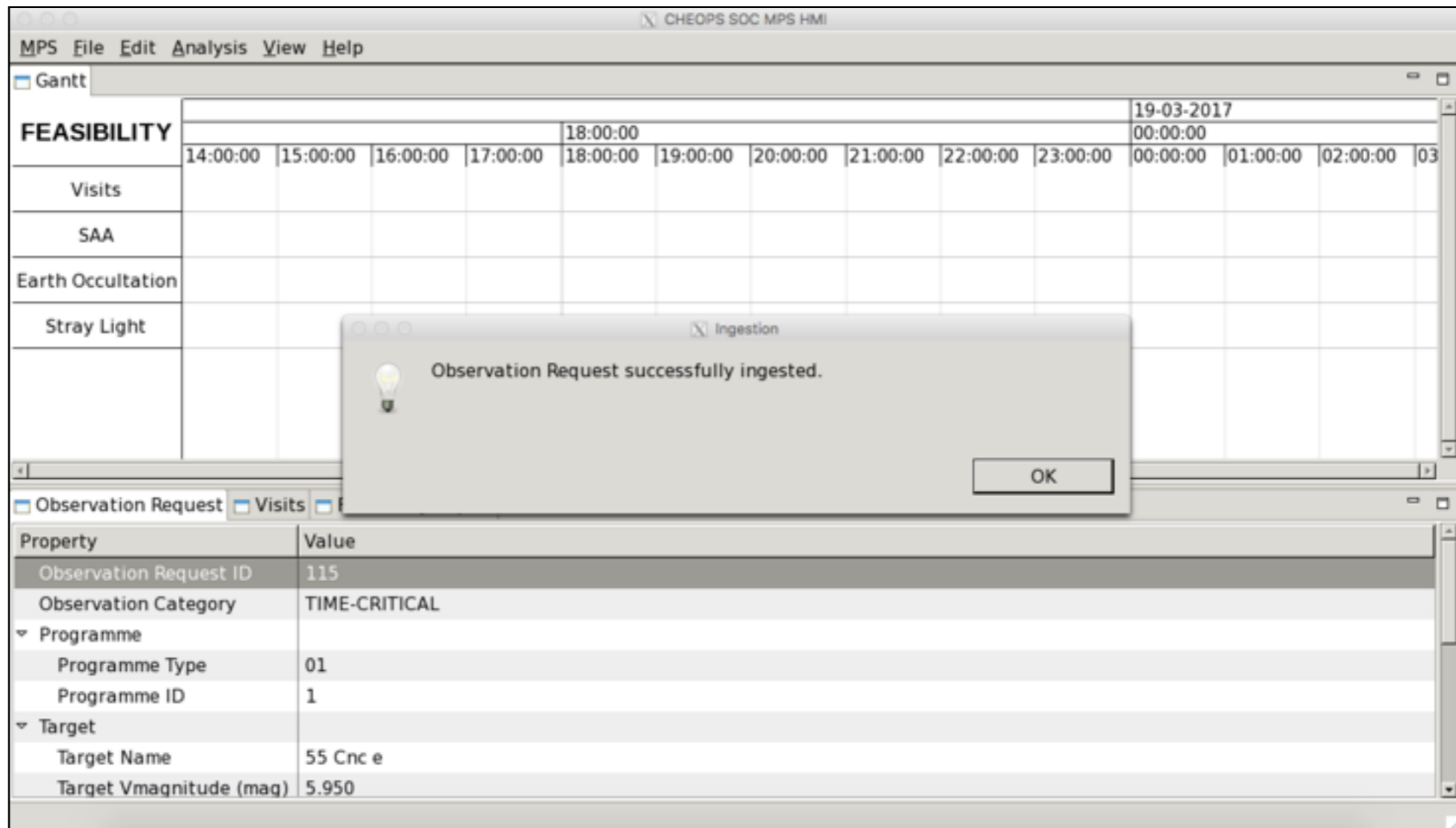
Navigate the menu to read in the files from your HOME directory



# Feasibility Checker Guidelines

**Read in the observationRequest file in the Feasibility Checker:**

Successful ingestion of the observation request file



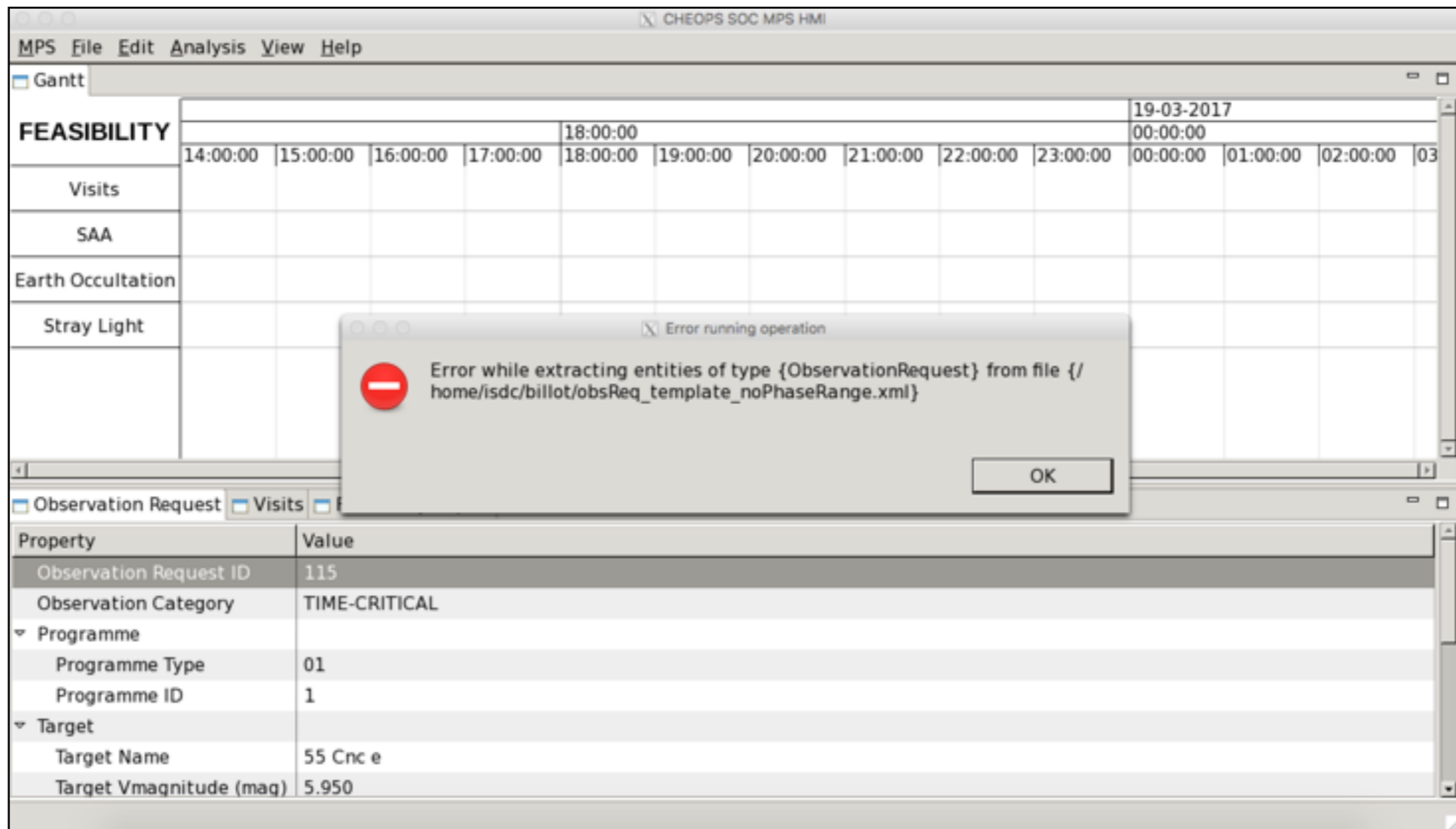
The screenshot shows the CHEOPS SOC MPS HMI interface. The main window displays a Gantt chart for the date 19-03-2017, with a time range from 14:00:00 to 03:00:00. The Gantt chart is currently empty. Below the Gantt chart, there is a table with the following data:

Property	Value
Observation Request ID	115
Observation Category	TIME-CRITICAL
Programme	
Programme Type	01
Programme ID	1
Target	
Target Name	55 Cnc e
Target Vmagnitude (mag)	5.950

A dialog box titled 'Ingestion' is displayed in the foreground, containing the message 'Observation Request successfully ingested.' and an 'OK' button.

## 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.

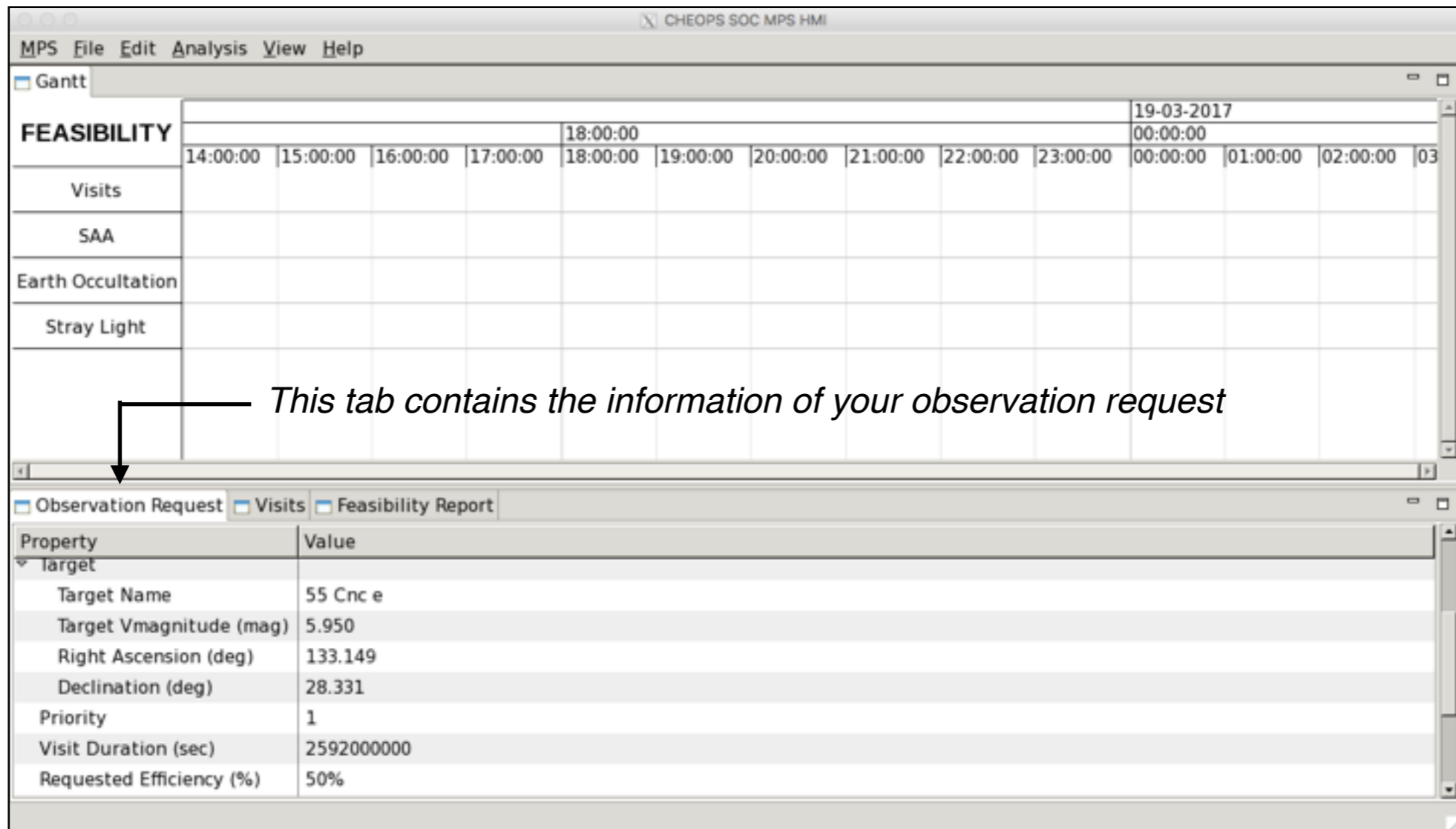


The screenshot shows the CHEOPS SOC MPS HMI interface. The main window displays a Gantt chart for a feasibility check on 19-03-2017. The chart is divided into hourly slots from 14:00:00 to 03:00:00. The 'FEASIBILITY' row shows a bar from 18:00:00 to 00:00:00. Below the Gantt chart, there are sections for 'Visits', 'SAA', 'Earth Occultation', and 'Stray Light'. An error dialog box is overlaid on the chart, titled 'Error running operation'. The message in the dialog reads: 'Error while extracting entities of type {ObservationRequest} from file {/home/isdc/billot/obsReq\_template\_noPhaseRange.xml}'. An 'OK' button is visible at the bottom right of the dialog.

Property	Value
Observation Request ID	115
Observation Category	TIME-CRITICAL
Programme	
Programme Type	01
Programme ID	1
Target	
Target Name	55 Cnc e
Target Vmagnitude (mag)	5.950

# Feasibility Checker Guidelines

Read in the observationRequest file in the Feasibility Checker:



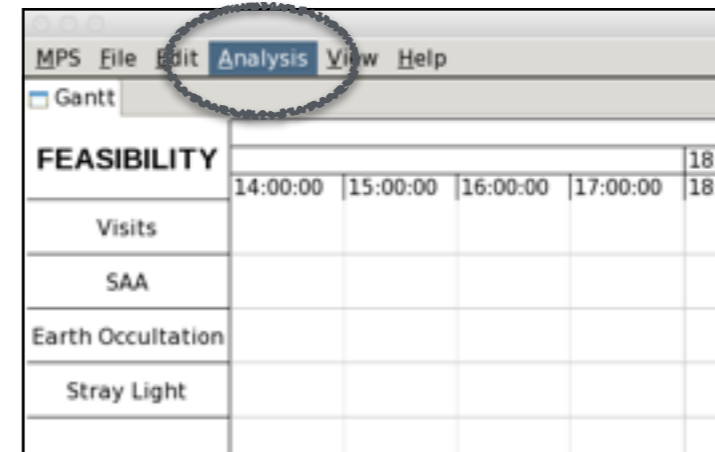
*This tab contains the information of your observation request*

Property	Value
Target	
Target Name	55 Cnc e
Target Vmagnitude (mag)	5.950
Right Ascension (deg)	133.149
Declination (deg)	28.331
Priority	1
Visit Duration (sec)	2592000000
Requested Efficiency (%)	50%



## Run the Feasibility Checker

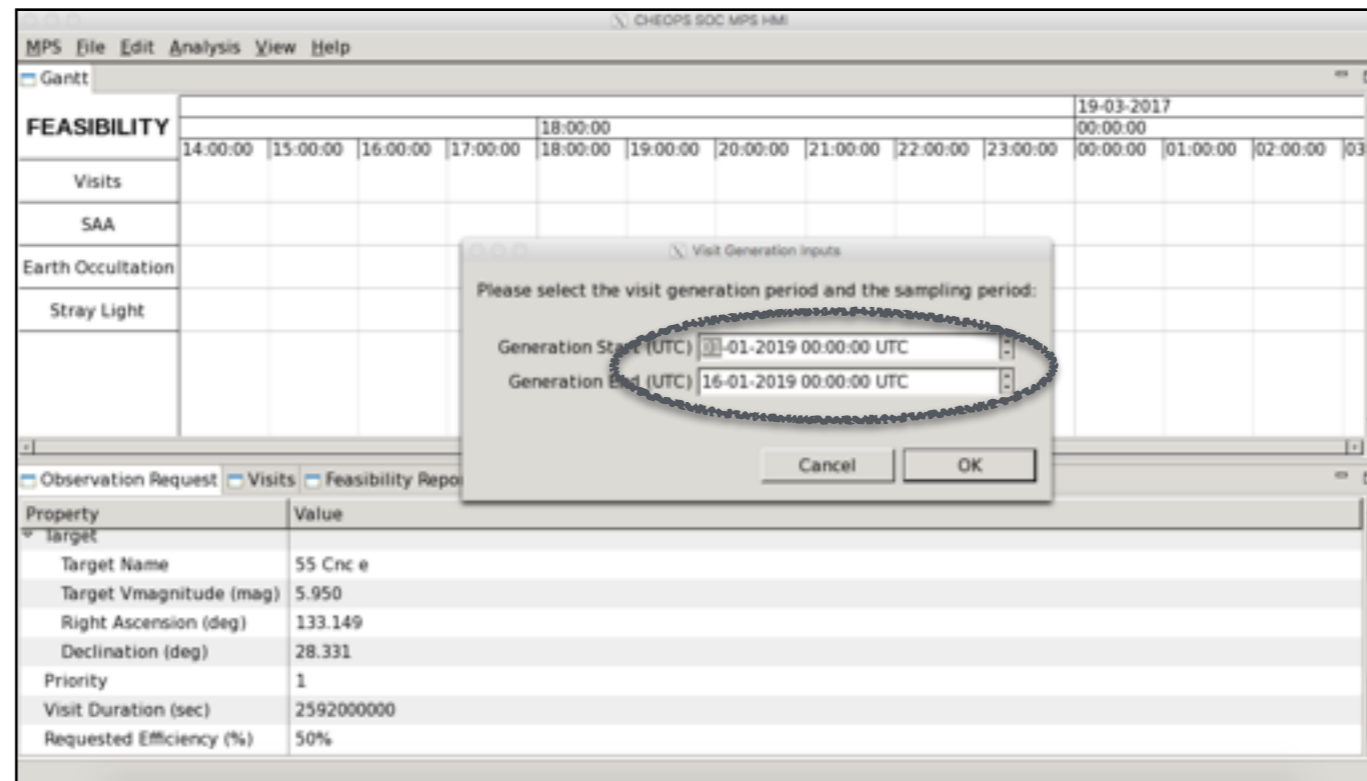
Go to “*Analysis*”, and “*Feasibility Check...*”



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

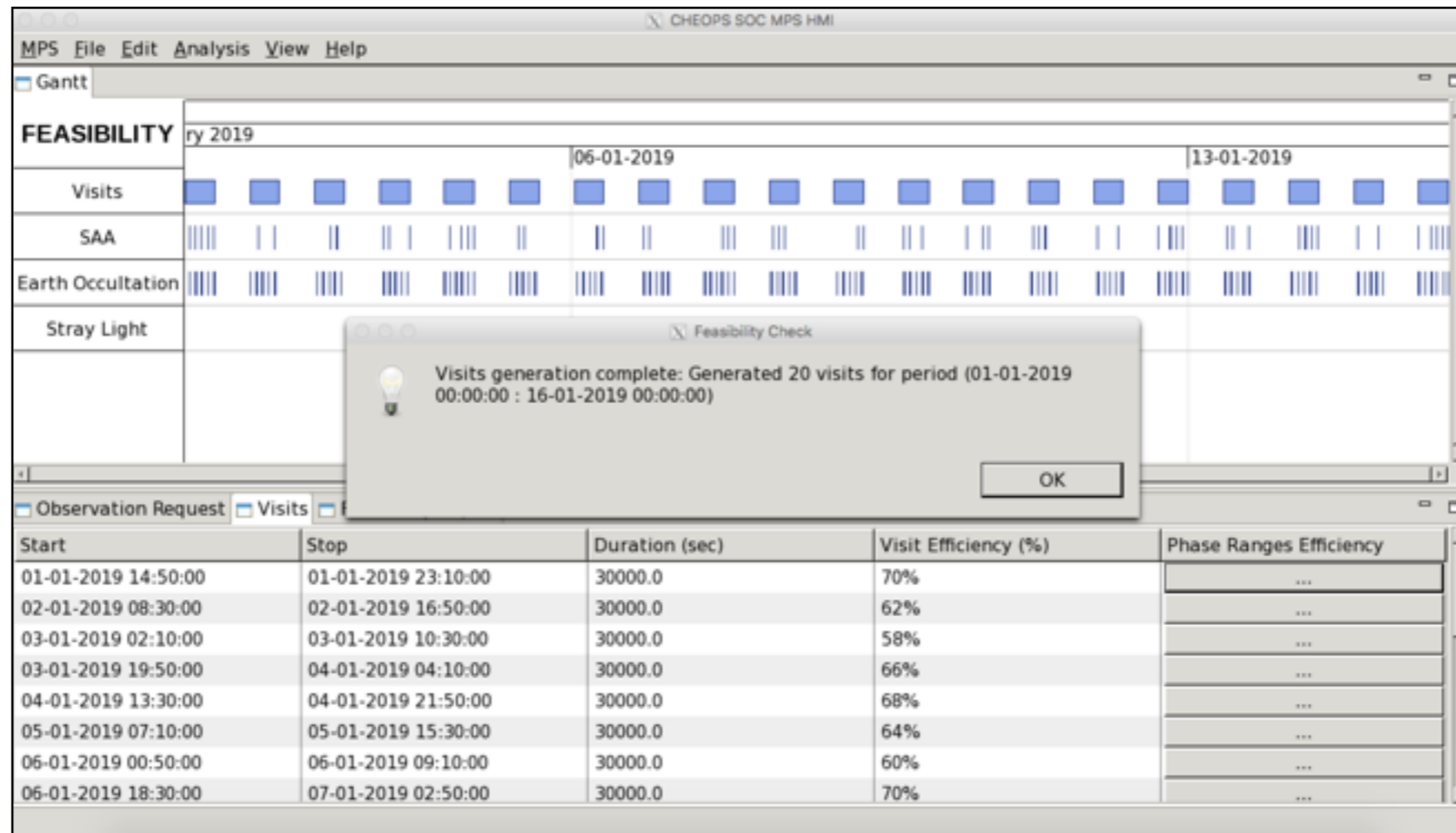
**Caveat: only the period 01/01/2019 – 01/01/2020 can be explored in this version the tool (will be extended in future version)**

Hit “*OK*”



## Run the Feasibility Checker

Successful generation of the possible visits



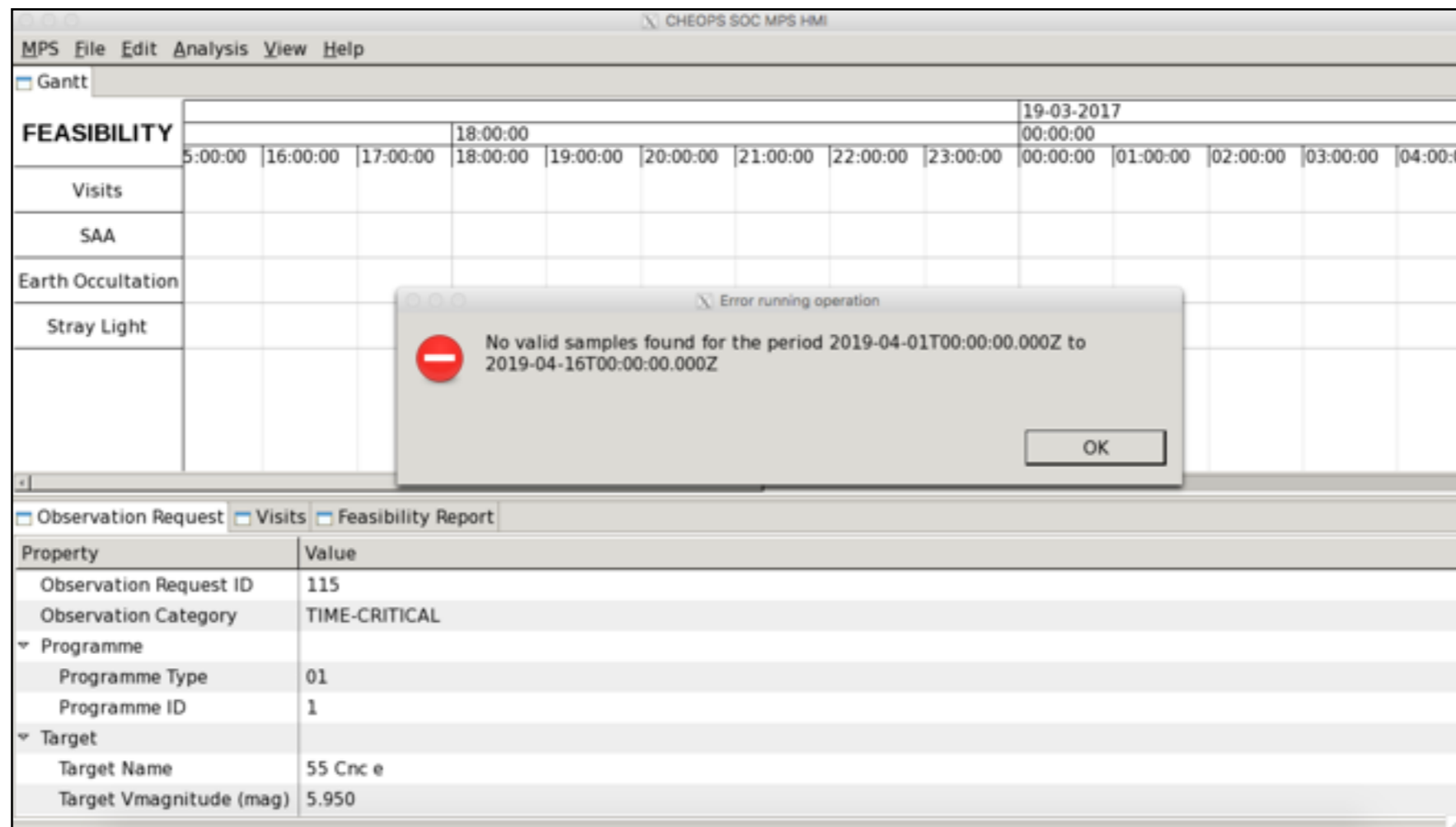
The screenshot displays the CHEOPS SOC MPS HMI interface. The main window shows a Gantt chart for January 2019, with rows for Feasibility, Visits, SAA, Earth Occultation, and Stray Light. A dialog box titled 'Feasibility Check' is overlaid on the chart, stating: 'Visits generation complete: Generated 20 visits for period (01-01-2019 00:00:00 : 16-01-2019 00:00:00)'. Below the dialog, a table lists the generated visits with their start and stop times, durations, and efficiencies.

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%	...

## 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.



The screenshot shows the CHEOPS SOC MPS HMI interface. The main window displays a Gantt chart for a feasibility check on 19-03-2017. The chart shows time slots from 05:00:00 to 04:00:00. The 'FEASIBILITY' row is highlighted, and the 'Visits' row is empty, indicating no valid samples were found. An error dialog box is overlaid on the chart, stating: "Error running operation. No valid samples found for the period 2019-04-01T00:00:00.000Z to 2019-04-16T00:00:00.000Z". Below the chart, there is a table with the following data:

Property	Value
Observation Request ID	115
Observation Category	TIME-CRITICAL
Programme	
Programme Type	01
Programme ID	1
Target	
Target Name	55 Cnc e
Target Vmagnitude (mag)	5.950

## Is my target visible at all with CHEOPS?

If yes, when?

### Most permissive / favourable case

Allows for high levels of stray light  
(adequate for bright stars)

Over 50% of uninterrupted observation per orbit

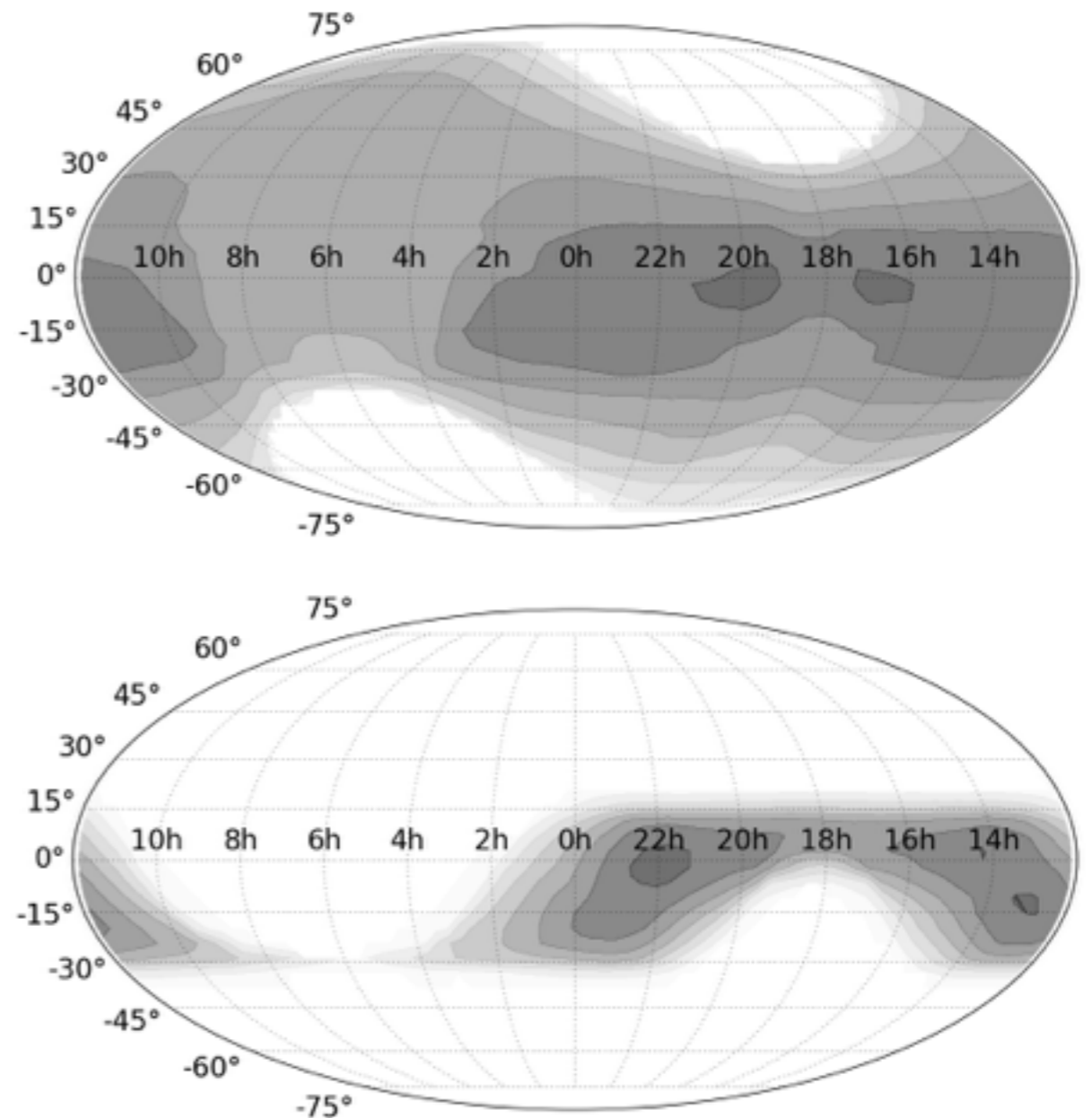
### Most restrictive / unfavourable case

Allows for lower levels of stray light  
(required for faint stars)

Over 80% of uninterrupted observation per orbit

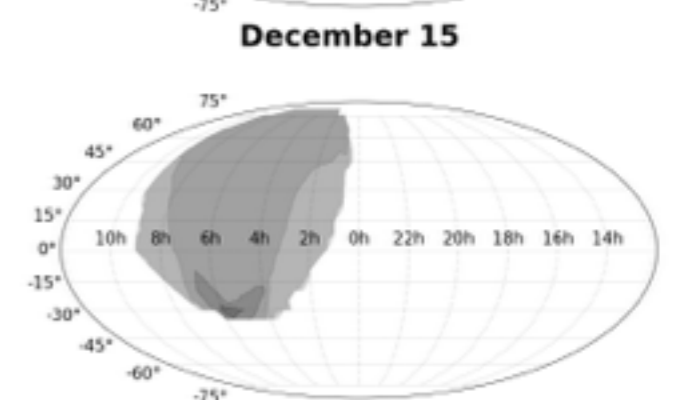
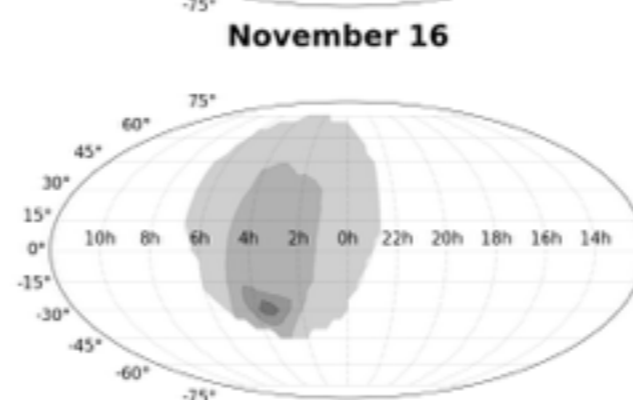
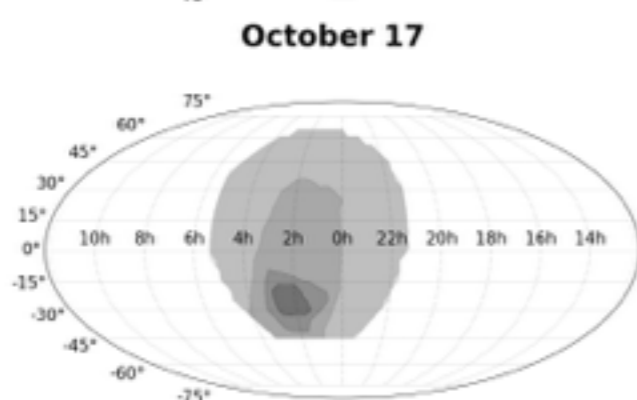
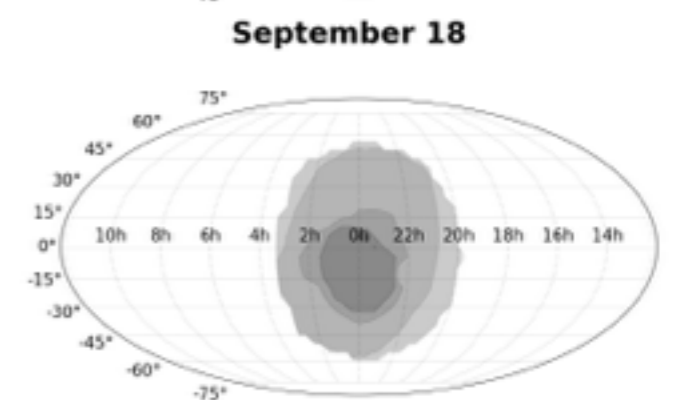
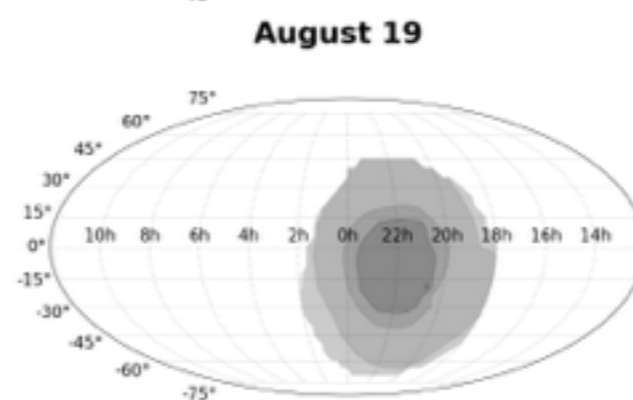
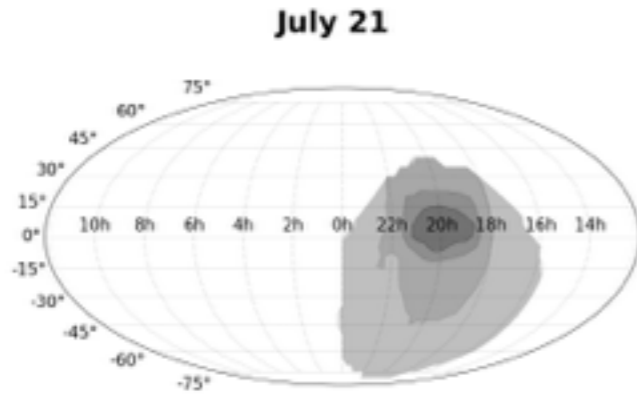
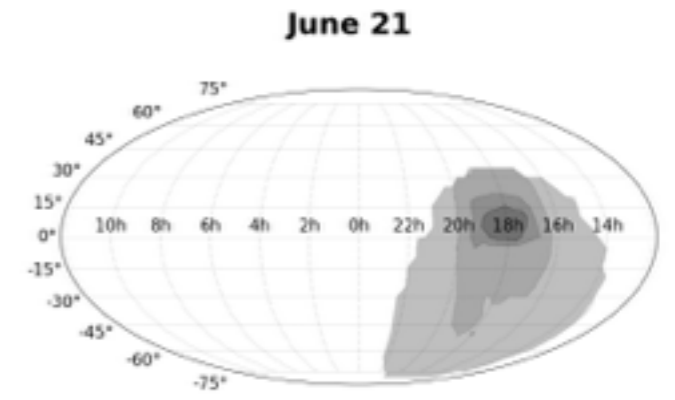
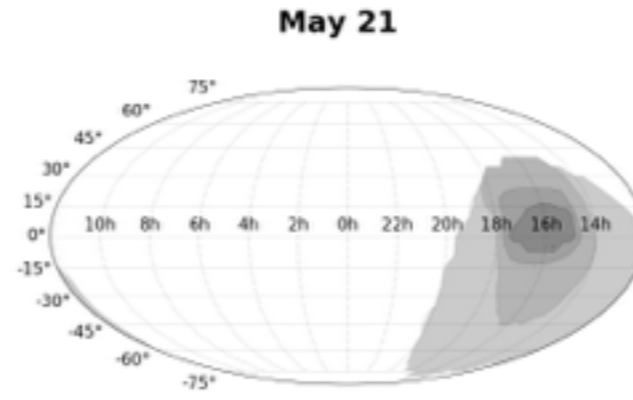
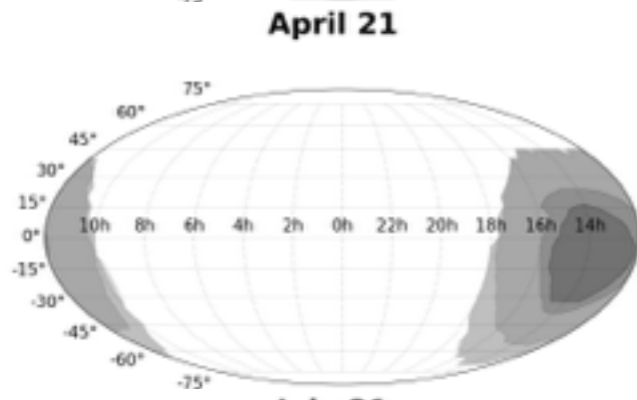
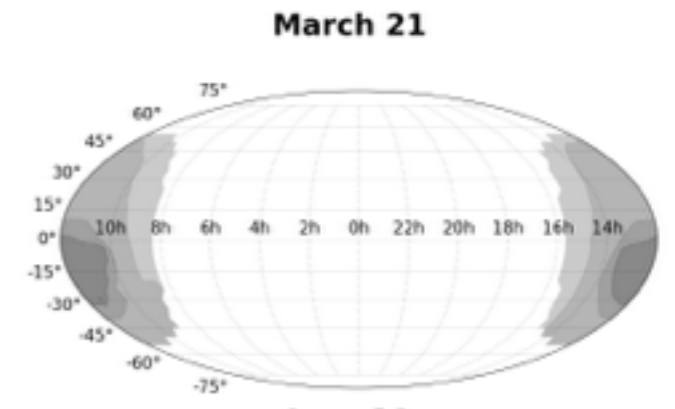
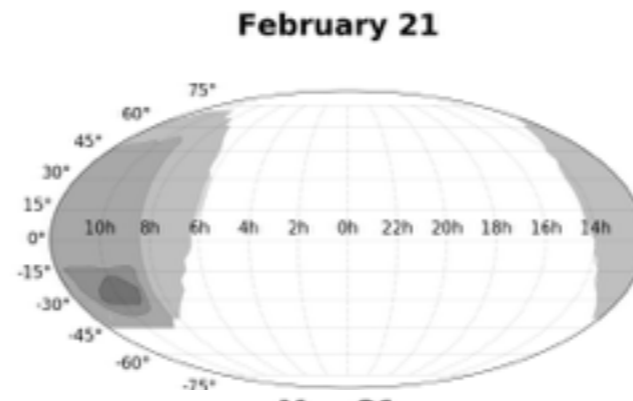
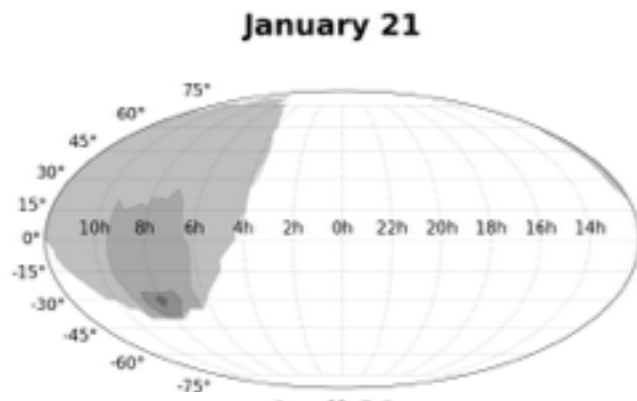
### Sky visibility maps

(darker shapes indicate fewer interruptions)



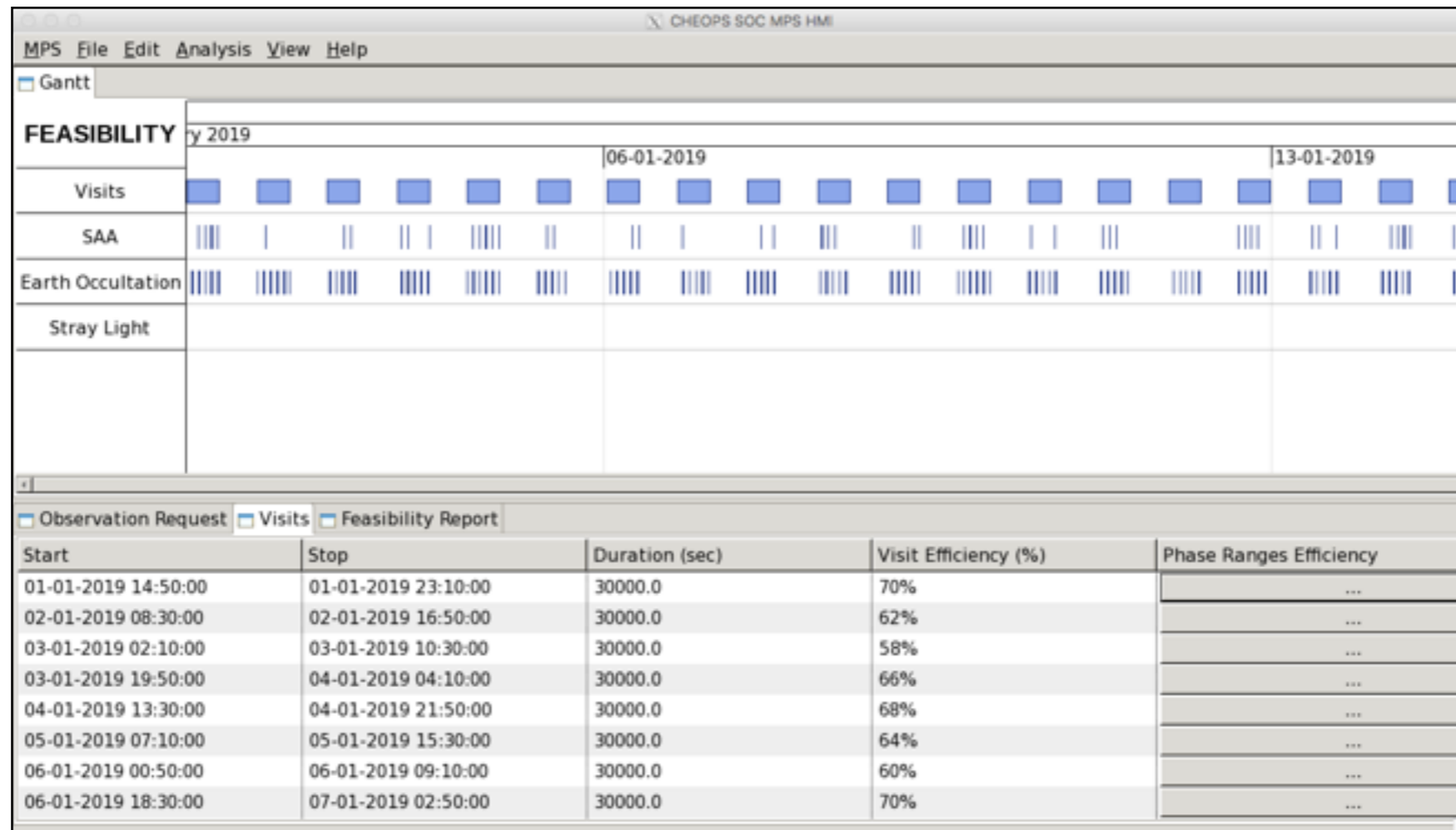
# Feasibility Checker Guidelines

Monthly sky visibility maps  
When can a source be observed with CHEOPS?



## Explore the result

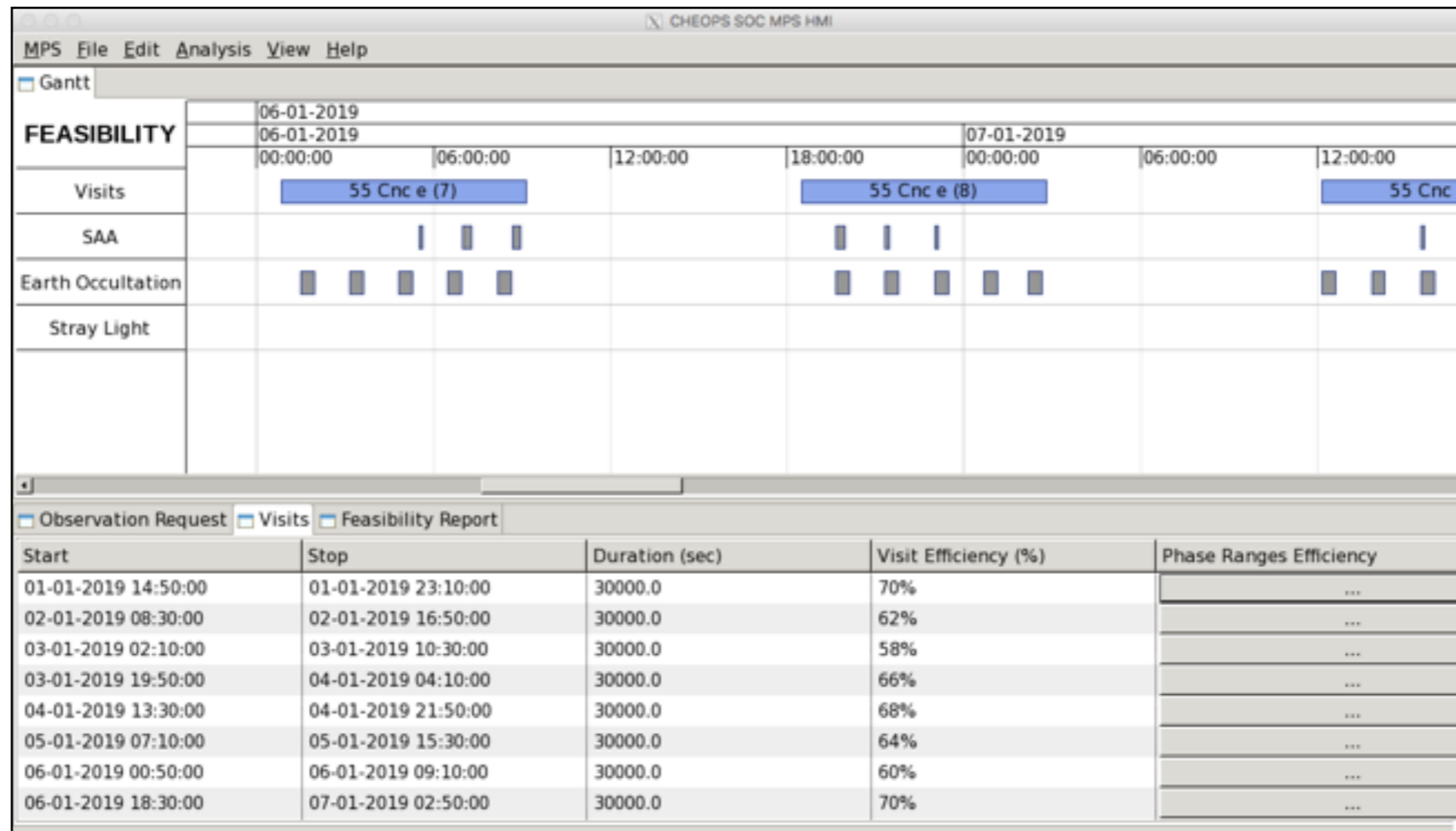
The Gantt chart shows the possible visits over the requested period, along with associated interruptions due to Earth occultations and South Atlantic Anomaly crossings



**Caveat: Threshold on acceptable straylight levels is not yet representative**

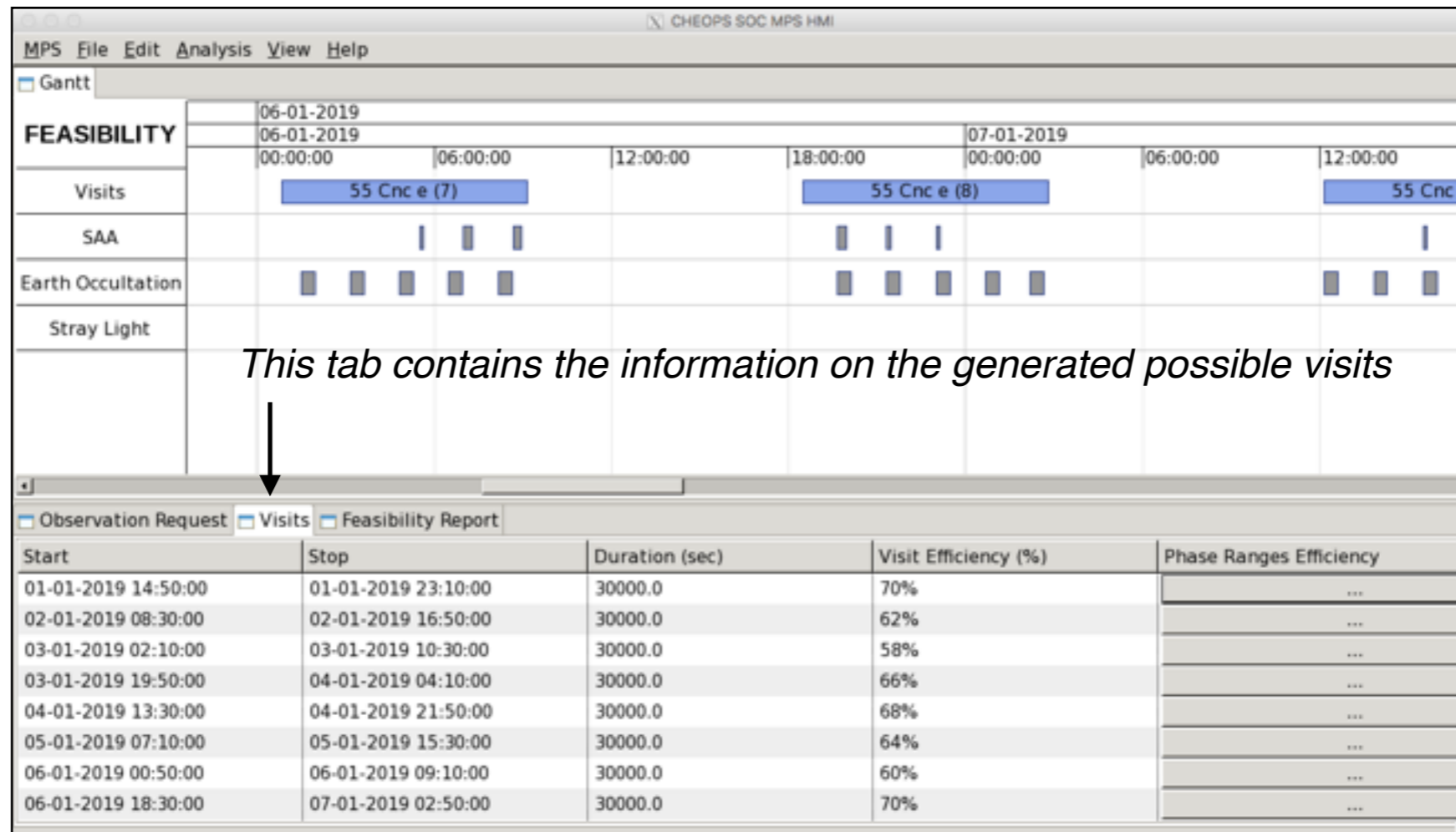
## Explore the result

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



## Explore the result

You can consult the details of generated visits:  
Start / Stop time and (effective) duration



*This tab contains the information on the generated possible visits*

Visits details

Only relevant if you have provided phase ranges

Start

Stop

Duration

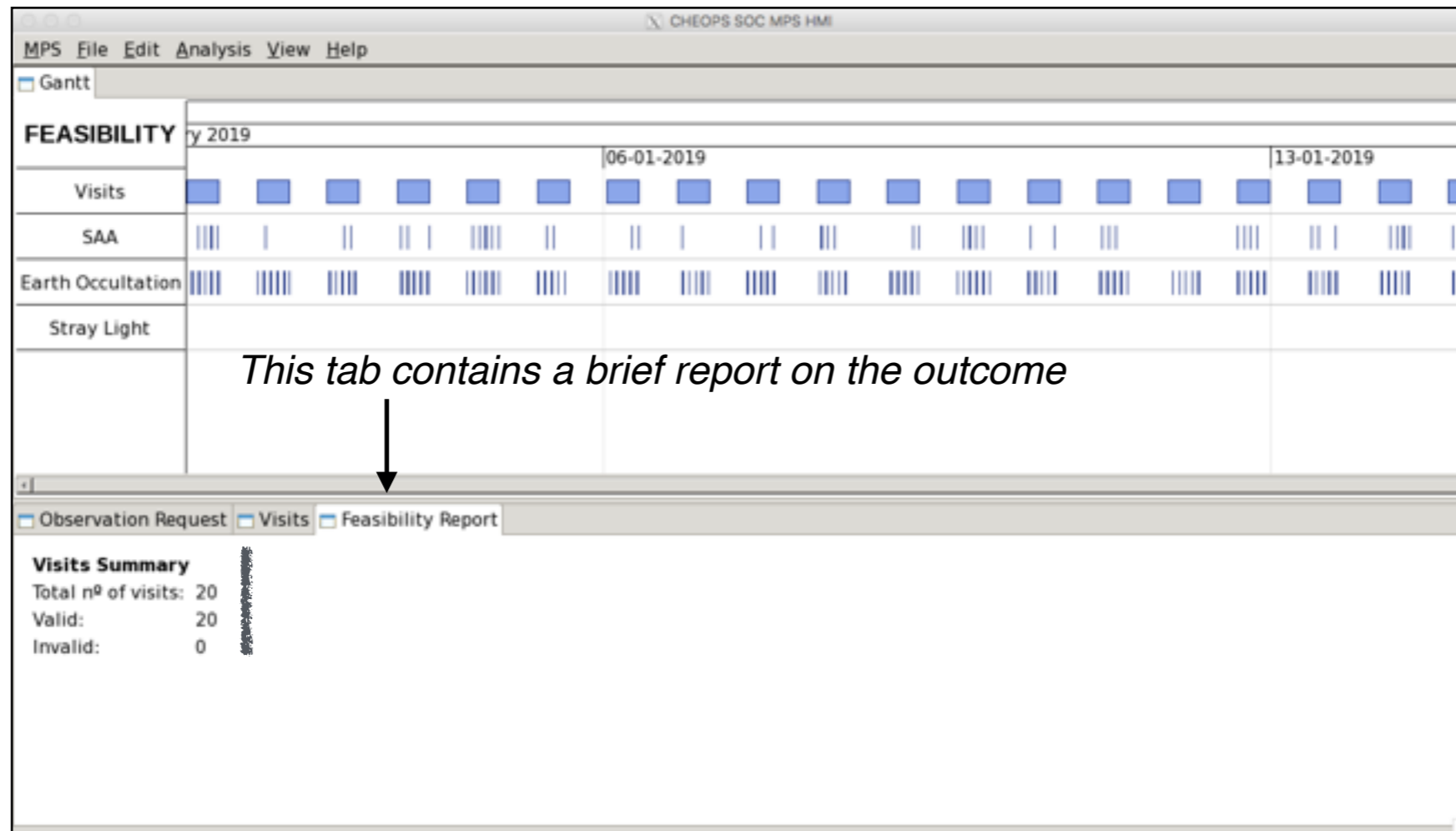
Efficiency

Efficiency Phase Ranges



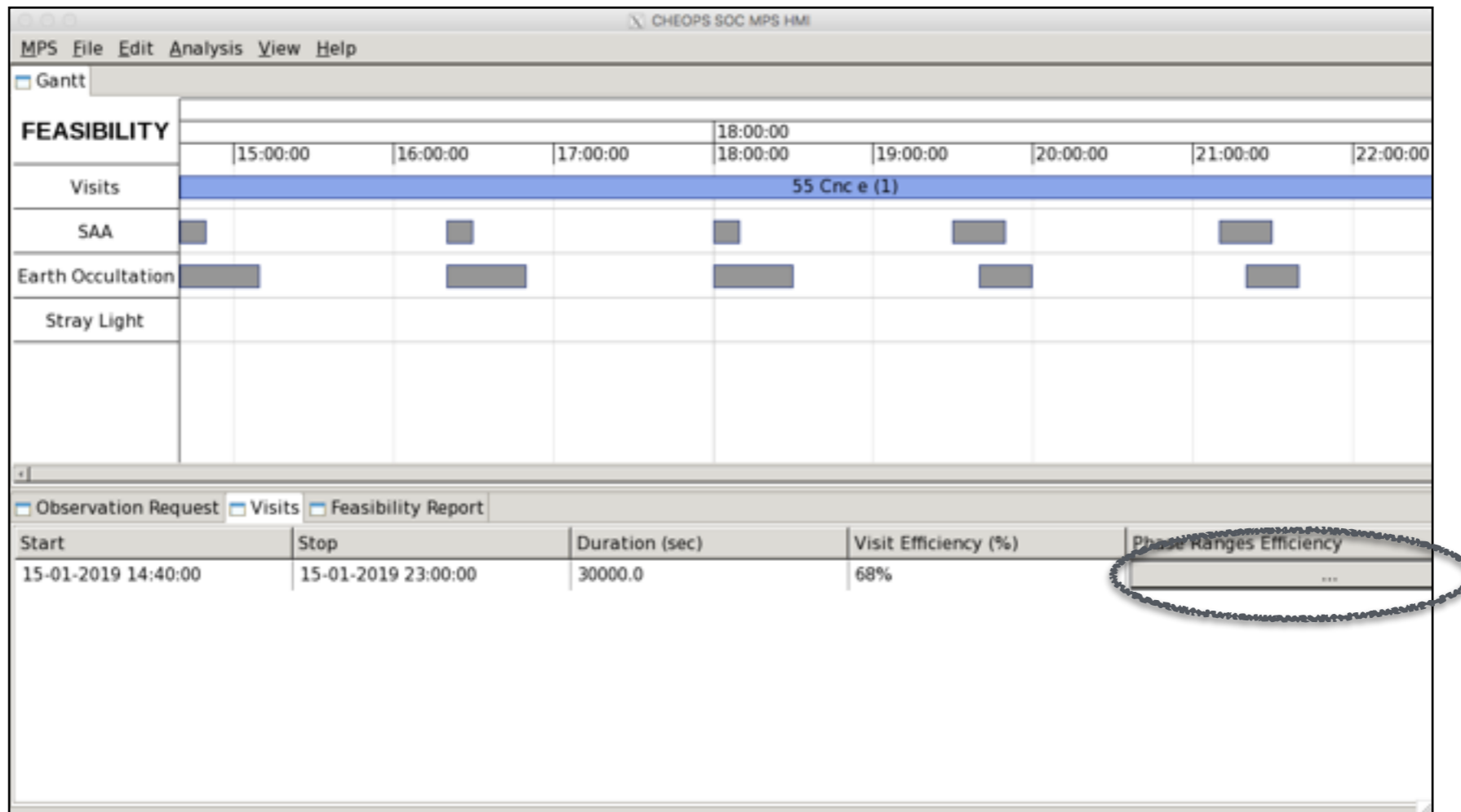
## Explore the result

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



## 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



## 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

