

# ***P2PP & OT*** ***Public Surveys Support***

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# Outline



- **Why dedicated Survey Support ?**
- **Scheduling Containers**
- **Ranking OBs**
- **P2PP / OT Survey Features**

# Why dedicated Survey Support?



- Survey observations are typically massive in terms of the number of observations and their total duration
- Shorter duration of OBs and the large number of OBs dramatically increases workload and decision taking pressure on the ESO night astronomers, and review efforts by USD.

- ▶ Provide better support to manage the implied complexity in the definition, execution and review phases
- ▶ Allow PIs to better express complex, long-term observation strategies and to modify them while already partially executed
- ▶ Run observations highly efficiently in service mode
- ▶ Support NA decision taking by introducing an effective *ranking engine* to suggest the next OBs to be executed
- ▶ Integrate reporting and reviewing capabilities



# Scheduling Containers



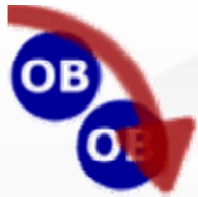
**Time Link**



**Group**



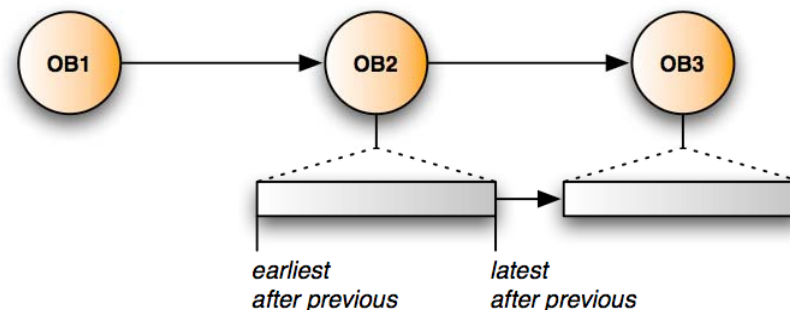
**Concatenation**



# Time Link

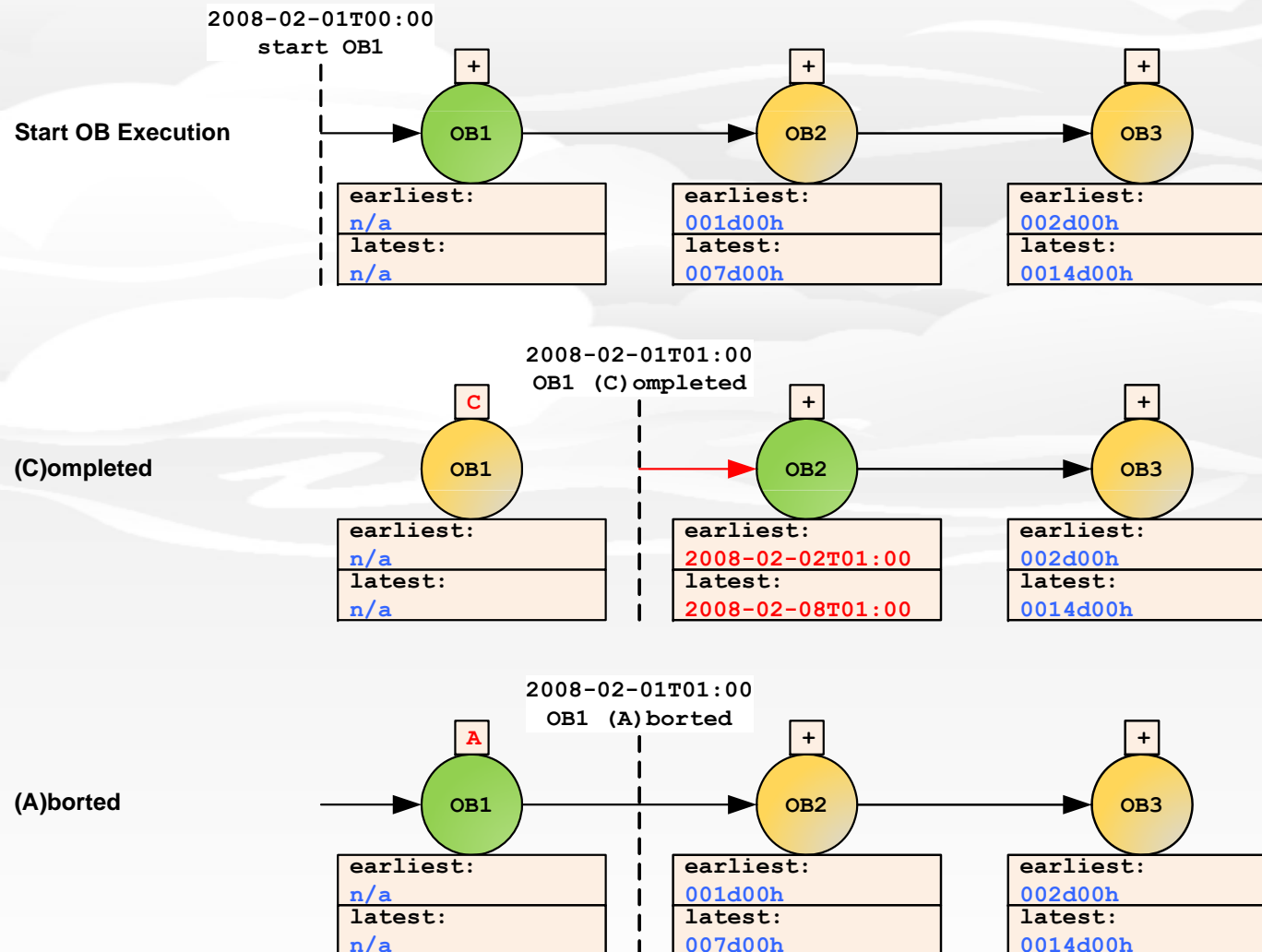


- Defines a *sequence* of OBs with minimum and maximum delay between them (*earliest / latest after previous*)
- First OB can be executed at any suitable time
- After execution of 1<sup>st</sup> OB, an absolute time constraint window is imposed on the 2<sup>nd</sup> OB, ...
- *Open time links* are allowed, i.e. no specification of *latest*
- If an OB in a time link fails, execution continues !





# Execution of Time Link OB

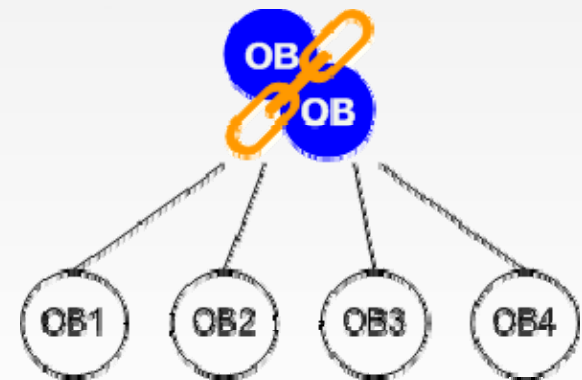




# Concatenation



- OBs executed with no breaks, “back to back”
- Execution order of OBs in concatenation is **not** specified
- If a concatenated OB fails, **the entire concatenation fails !**
- Example: science OB, calibration OB





# Group



- OBs *should* be executed close to each other
- Constraint is desirable, not mandatory
- Needed to implement non-trivial observing strategies
- A group has a **group score**
- An OB within a group has a **group contribution**
- Upon execution, OBs contribute to the group's score
- If an OB in a group fails, execution continues !



# Group Observation Strategies

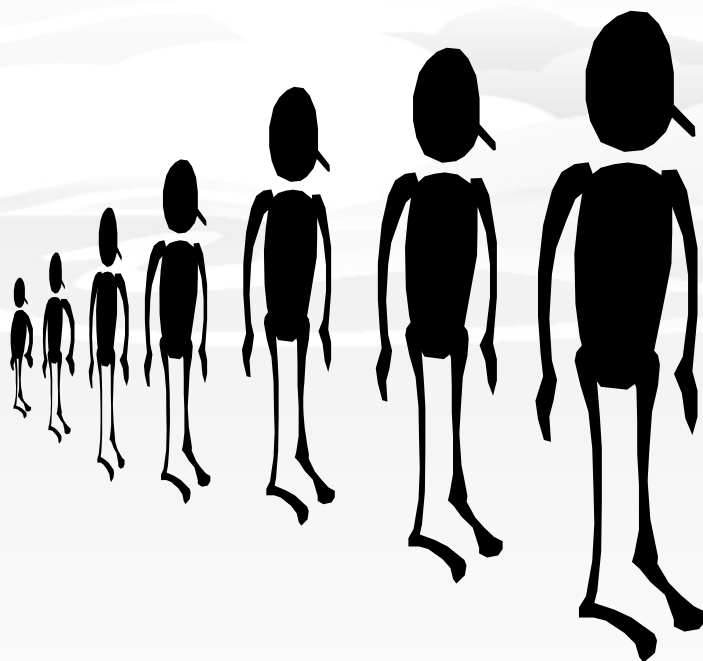


**Goal: Every tile of a survey area shall be observed by three OBs, one per wavelength**

- **Scenario 1:** If possible, a tile should be completed before a new tile is started
  - ▶ ***For every tile, create a group of three OBs with the same target, but different filter***
- **Scenario 2:** If possible, the complete Survey Area should be observed in one band, before switching to the next band
  - ▶ ***Create three groups corresponding to the three wavelengths, each containing one OB for every tile***



# Ranking Group OBs



# Group Execution Example



<i>OB Name</i>	<i>Group Name</i>	<i>Group Score</i>	<i>Group Contribution</i>
OB_A	Group 1	00%	50%
OB_B	Group 1	00%	20%
OB_C	Group 1	00%	30%
OB_D	Group 2	00%	50%
OB_E	Group 2	00%	20%
OB_F	Group 2	00%	30%

- **We start with two identical groups.**

# Group Execution Example



<i>OB Name</i>	<i>Group Name</i>	<i>Group Score</i>	<i>Group Contribution</i>
OB_B	Group 1	50%	20%
OB_C	Group 1	50%	30%
OB_D	Group 2	00%	50%
OB_E	Group 2	00%	20%
OB_F	Group 2	00%	30%

- **OB\_A is executed, raising Group 1's score to 50%**

# Group Execution Example



<i>OB Name</i>	<i>Group Name</i>	<i>Group Score</i>	<i>Group Contribution</i>
OB_B	Group 1	80%	80%
OB_D	Group 2	00%	50%
OB_E	Group 2	00%	20%
OB_F	Group 2	00%	30%

- **OB\_C is executed, raising Group 1's score to 80%**



# Group Execution Example

Non-observable

<i>OB Name</i>	<i>Group Name</i>	<i>Group Score</i>	<i>Group Contribution</i>
OB_B	Group 1	80%	20%
OB_D	Group 2	00%	50%
OB_E	Group 2	00%	20%
OB_F	Group 2	00%	30%

- For some reason, OB\_B becomes non-observable

# Group Execution Example



Non-observable

<i>OB Name</i>	<i>Group Name</i>	<i>Group Score</i>	<i>Group Contribution</i>
OB_B	Group 1	80%	20%
OB_E	Group 2	50%	20%
OB_F	Group 2	50%	30%

- **OB\_D is executed, raising Group 2's score to 50%**

# Group Execution Example



<i>OB Name</i>	<i>Group Name</i>	<i>Group Score</i>	<i>Group Contribution</i>
OB_B	Group 1	80%	20%
OB_E	Group 2	50%	20%
OB_F	Group 2	50%	30%

- **OB\_B becomes observable again.**



# Group Execution Example



<i>OB Name</i>	<i>Group Name</i>	<i>Group Score</i>	<i>Group Contribution</i>
OB_E	Group 2	50%	20%
OB_F	Group 2	50%	30%

- **OB\_B is executed, finishing the execution of Group 1.**

# Group Execution Example



<i>OB Name</i>	<i>Group Name</i>	<i>Group Score</i>	<i>Group Contribution</i>
OB_E	Group 2	80%	20%

- **OB\_F is executed, raising Group 2's score to 80%.**

# Group Execution Example



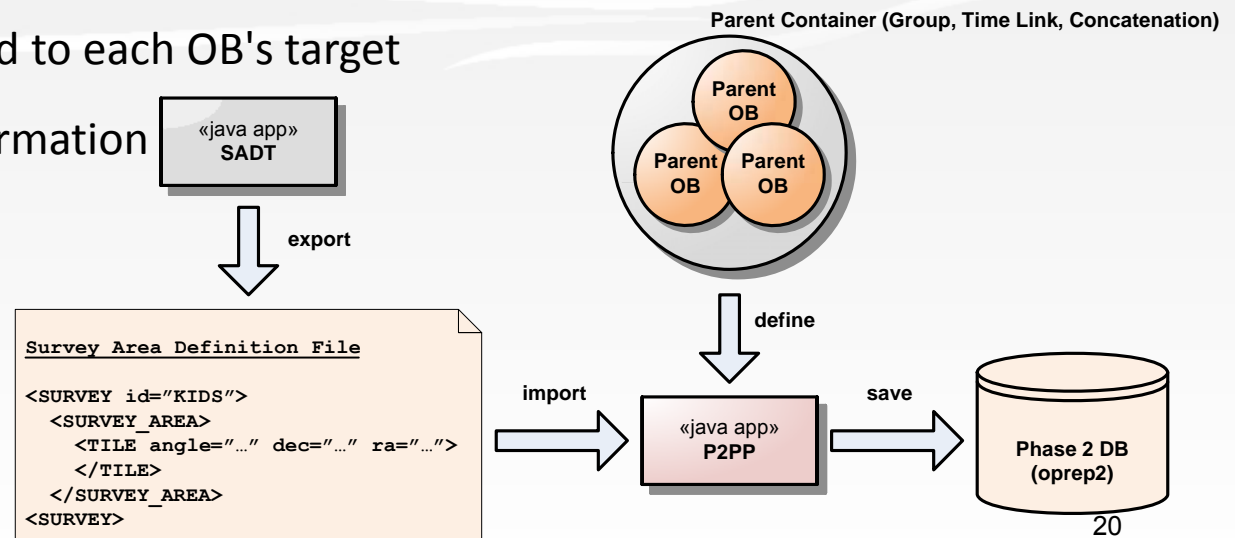
<i>OB Name</i>	<i>Group Name</i>	<i>Group Score</i>	<i>Group Contribution</i>

- **Finally, OB\_E is executed.**
  - ▶ *The example illustrates, that although we have two identical groups to begin with, once execution of group 1 is started, the algorithm tries to stick with that group. Only when – due to other constraints - that group has no more observable OBs to offer, execution is switched over to group 2, but returns to group 1 as soon as OBs are observable again.*

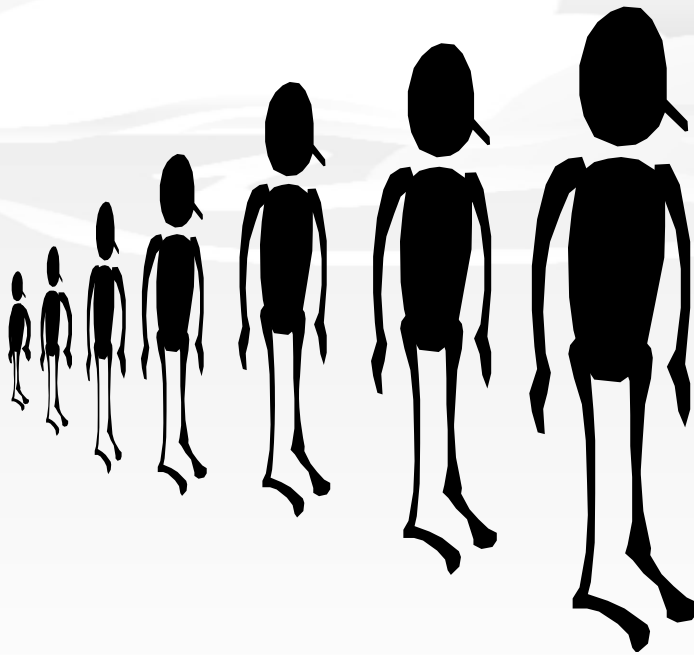


# Import Survey Area Definition into P2PP

- Create survey area definition file (XML) with SADT
- In P2PP, create container which acts as parent
- Create at least two parent OBs within that parent container, that specify different science goals for the same tile
- Add tile science template to each parent OB
- Select parent container and import survey definition: For every tile in the SAD, one container will be created containing duplicates of the two (or more) parent OBs, including their container-level properties
- Tile coordinates are assigned to each OB's target
- For each OB, guide star information is attached as a PAF file to a tile template parameter



# Ranking OBs with absolute time constraints



# P2PP – Definition of Time Constraints



Observation Block - No name

Obs. Description Target Constraint Set Time Intervals

Time Intervals

Time Intervals Sid. Time Intervals

Start Date	Time	End Date	Time	Days	Duration
2008-06-01	22:00	2008-06-08	22:00	7	
2008-06-17	22:00	2008-06-24	22:00	7	

+ Add  
↑ Up  
↓ Down  
- Delete



# Ranking Time Constraints

- Any OB can define one or more absolute time constraint windows
- For every OB, the ***total remaining constraint time*** is the sum of all remaining time constraint windows
- We normalize this figure by the ***total constraint time*** to get a relative measure for the time criticality of an OB
- Specific *earliest/latest after previous* constraints of time link OBs are treated in the same way
- The smaller this figure, the sooner an OB should be executed

$$\text{time criticality} = \frac{(\Delta t_{\text{TotalRemainingConstraint}} - \Delta t_{\text{OBDuration}})}{\Delta t_{\text{TotalConstraint}}}$$

# P2PP – Definition of Container



P2PP v3.1 alpha 3

File Edit Finding Charts Ephemeris File Readme File Reports Help

OB CB Folder G C T X Document Document

Obs/Calib Blocks Schedule

Name	Priority	Contrib. to Group	Earliest After Prev.	Latest After Prev.
[-] 060.A-9599(A)/SM/VIRCAM				
[-] G Group		4		
OB No name	✓		3	
OB No name	✓		2	
[-] T TimeLink		3		
OB No name	✗		000d00h	000d00h
OB No name	✗		005d00h	007d00h
OB No name	✗		005d00h	007d00h
[-] C Concatenation		2		
OB No name	✓			
OB No name	✓			
OB No name	✗	1		
[-] 60.A-9253(J)/SM/AMBER				
[-] 60.A-9253(I)/SM/VISIR				
[-] 60.A-9253(C)/SM/TIMMI2				
[-] 60.A-9253(F)/SM/FEROS				



# P2PP – Check-in of Container



P2PP v3.1 alpha 3

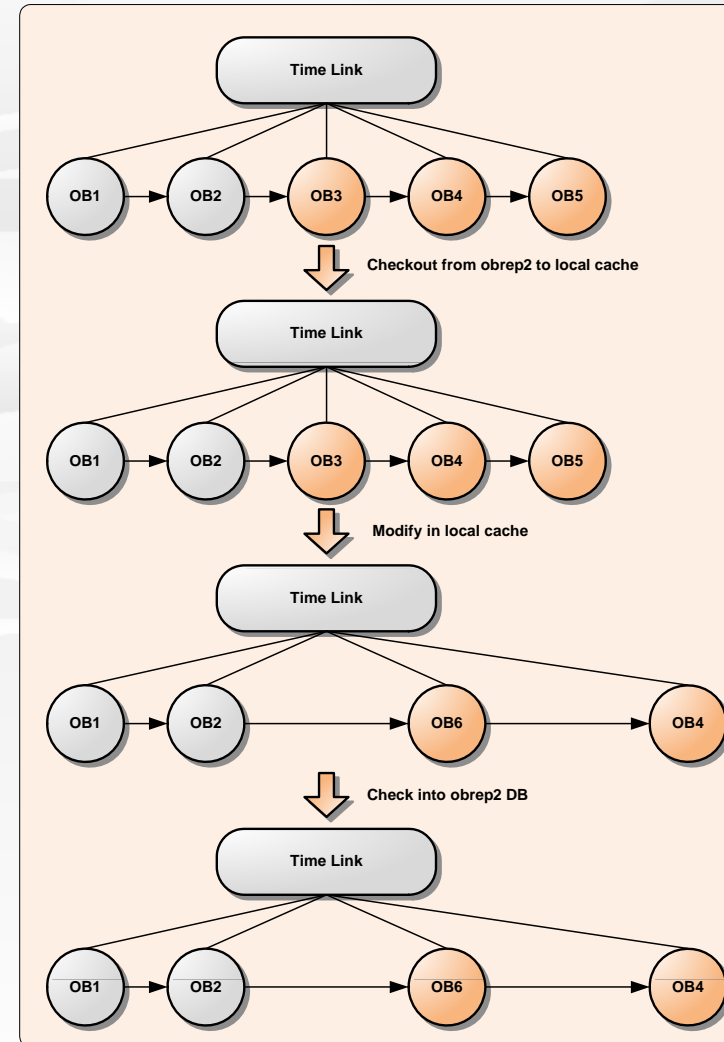
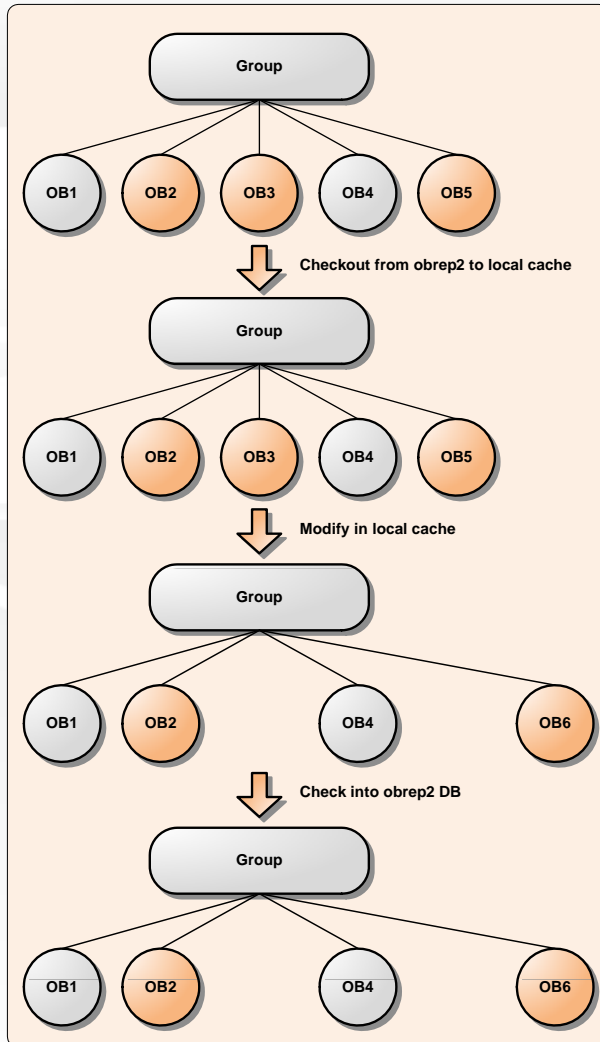
File Edit Finding Charts Ephemeris File Readme File Reports Help



OB CB [Folder] G C T X [Document] [Document]

Obs/Calib Blocks Schedule

Name	Local Id	ESO Id	Status	Target	OD	CS
060.A-9599(A)/SM/VIRCAM						
TimeLink						
OB No name	3		(P)artiallyDefined	No name	No name	No name
OB No name	4		(P)artiallyDefined	No name	No name	No name
OB No name	5		(P)artiallyDefined	No name	No name	No name
Group						
No name	1	323174	(D)efined	No name	No name	No name
No name	2	323177	(D)efined	No name	No name	No name
Concatenation						
OB No name	8		(P)artiallyDefined	No name	No name	No name
60.A-9253(J)/SM/AMBER						
60.A-9253(I)/SM/VISIR						
60.A-9253(C)/SM/TIMMI2						
60.A-9253(F)/SM/FEROS						
60.A-9253(H)/SM/SINFONI						

# P2PP – Modification of partially executed Container



September 2008  Executed, read-only OB  Pending OB

# OT – Main Screen



ORANG. DB server:acdbdev.hq.eso.org:6789

Edit OBS Readme Ephemeris Files Reports Finding Charts Options

**Obs to consider**

Telescope today queues UT1  
 Instrument today queues CRIRES  
 Queues  
 FEROS-RankA-P77-FSE  
 FEROS-RankB-QUEUE-P77-FSE  
 LGSF.NACO.AND.SINFONI  
 Lowells Junk Pile  
 Markus queue

UT Start Time: 2008-06-17T14:11:07 Now

Duration(hours): All Night

Step interval(minutes): 20

**Current weather conditions**

Seeing  Inactive  Active 1 Ma  
0,2 Mi

Sky transparency  Inactive  Active Photometric

Wind direction  Inactive  Active

**Visibility constraints**

Airmass 0 % tolerance

FLI  Inactive  Active 0 % tolerance

Moon Distance  Inactive  Active 0 % tolerance

Sun Max Elevation  Inactive  Active -18 degrees

Moon Elevation  Inactive  Active 0 degrees

Time Interval  Inactive  Active

Sidereal Time Interval  Inactive  Active

Zenith Avoidance  Inactive  Active

Exec Now only  Inactive  Active

**Ranking algorithm**

Algorithm RankAlgorithmFast Compute

Observable OB (64) Non observable OB (22) Night Report

**Selected Columns**

OB Name  OB Comment  Inst Comment  ProgID  PI  Target  RA  
 Dec  Instrument  UsrP  Seeing  SkyTran  Airmass  FLI  
 MoonDis  Strehl  ExecTime  OptElem  RankClass  QC Grade  Readme Version  
 Readme Status  Sidereal Time St...  Sidereal Time End  Baseline  Ephemeris File  Queue ID  
 Rank

Query Break Clear Execution Sequence Copy Export... OB History create UT1 cont. del UT1 cont. report UT1 cont.

Rank Score	OB ID	Status	Container	Type	Rank
1	270831	+		O	score 000.80
1	270832	I		O	score 000.80
1	270834	+	C	O	score 000.80
1	268534	+	P	O	score 000.80
2	268462	M	G	O	score 001.00
2	268463	M	T	O	score 001.00
2	268468	M		O	score 001.00

Rows: 64

Container Info: c:7 run:79087400 Rank Description Ob Tree View

Ob Id	Status	Execution
270804	+	00:16:30.000
270824	+	01:04:00.000
270826	+	01:04:00.000
270834	+	01:01:30.000
297744	+	00:30:00.000

# OT – OB Reporting



**OB report**

<b>OB property</b>		<b>Constraints</b>	
Ob id:	267603	Seeing:	0.8
Ob name:	B3-b7 - K1	Airmass:	1.5
Run id:	79033800	Sky transparency:	Variable, thin cirrus
Ob status:	C	FLI:	1.0
Grade:	?	Moon distance:	30

Public comment:

- A
- B
- C
- D
- X
- ?

Internal comment:

OK Cancel

# Conclusion



- **Scheduling Containers are a powerful means to express more complex, long-term observation strategies**
- **Use conservatively and only where really needed, since they reduce the likelihood of your observations being carried out**