## How to best use SALT: maximizing your chances

Petri Vaisanen & the SALT Astronomy Operations

#### Outline:

Block principles Visibilities and tracks Target distributions Simulations with unexpected results What can you do Optional targets Conditions and probabilities Science now







- A minimum schedulable unit
- one acquisition, one pointing, one target
- can have multiple configurations (but simplicity is a virtue)
- (can tie blocks together, talk to your liaison SA)





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Fixed-altitude SALT visibilities often non-intuitive for new users

















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Do not make your track too tight within a visibility window!







### Do not make your track too tight within a visibility window! Do not make your Block too tight within a track!

	SALT Visibility	Calcula	tor (3.	.8)	_	_					_		_
Target:				Track	Length	n Nig	htly Visibili	ity Ar	inual Visi	ibility			
Date: Jun 🗘 1 🗘 2015 🔹 2457175 Enter JD	110	18:00 19	9:00 2	0;00 2	21:00	22:00 2	SAST 3:00 00:00	「 (hrs) 01:00	02:00 03	:00 04:00	05:00	06:00	07:00
The night begins on 1 June.	1.10					3338	sec						
Coordinates: 15 0 0.0 +2 0 0.0	1.15 -												
Sun set: 15:39 UT Sun rise: 05:30 UT Evening twilight: 17:06 UT Morning twilight: 04:03 UT	1.20 -												
Minimum target distance from Moon: 22°	1.25 -					/							
99%	Airmas 1.30 -												
	1.35 -				1								
Source Availability:	1.40												
Start: 19:03 UT Stop: 22:51 UT Δt: 13706s	1.45												set
Track Time Remaining:	1.50	Twilight				click	on plot to vi	ew the tra	ack length	١		ъ	with
Start: 19 : 49 : 52 UT Duration: 3,338s	1.50	16:00	1	8:00	:	20:00	22:00 UT	(hrs)	00:00	02:00		04:00	
The actually available track time may be about 2 minutes shorter than the value shown here.				-	– Airma	ass 🔺 A	ccessible to S	SALT A B	right Time	2			





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900	SALT Visibility Calculator (3.8)
Target:	Track Length Nightly Visibility Annual Visibility
Date: Jun : 1 : 2015 2457175 Enter JD The night begins on 1 June. Coordinates: 15 0 0.0 + 2 0 0.0 ? Sun set: 15:39 UT Sun rise: 05:30 UT Evening twilight: 17:06 UT Morning twilight: 04:03 UT Moon set: 04:57 UT Moon rise: 15:03 UT Minimum target distance from Moon: 22° 99%	SAST (hrs) 18:00 19:00 20:00 21:00 22:00 23:00 00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 3338 sec 3338 sec 3338 sec 3338 sec 3000 2250 2000 2150 2000 2500 2000 2500 2000 2500 2000 2
Source Availability: Start: 19:03 UT Stop: 22:51 UT Δt: 13706s Track Time Remaining: Start: 19 : 49 : 52 UT Duration: 3,338s The actually available track time may be about 2 minutes shorter than the value shown here.	Image: Second state sta





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Consider seasonal visibility

– and fold in <u>seeing</u> and <u>Moon phase</u> requirements especially with early/late season targets. If you have more than one restrictive constraint, things get very tough.

- What is the probability of a given block getting done ???





### **Annual Visibilities**







### **Annual Visibilities**

Too many early semester targets







## **Annual Visibilities**







**SALT Observation Simulations** 

We can simulate a Semester to a good accuracy now (MC simulations using real database by Paul Kotze)



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#### Semester Simulation Completeness



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- All blocks will not get done even if conditions were perfect
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Program completeness – real

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## What can you do to enhance your chances ?

.. making the most of what you get from your TAC (or influencing the TAC by smart choices)

Use Optional Targets (Pools)

• If you e.g. need 10 targets of a certain type observed for a sample, submit 40 of them in the queue in phase-1 already.

• The wider the RA-range the better. Chances really go up.





Pool		
Pool name	P2 Pool	
Pool rule	Observe any blocks from the pool	
Please select Blocks in oth	t the blocks which are part of this pool. her pools cannot be selected.	
🗹 IRAS 13	8052-5711_pg900	
🗹 IRAS 13	8052-5711_pg1800	
🗹 ESO 22	1-IG010_pg1800	
🗹 ESO 31	9-G022_pg900	
🗹 ESO 31	9-G022_pg1800	
🗹 ESO 26	7-G030_pg900	
🗹 ESO 26	7-G030_pg1800	
🗹 NGC 18	19_pg1800	
🗹 CGCG 0	949_pg900	•
🗹 CGCG 0	049_pg1800	
🗹 IRAS 01	1364-1042_gp900	
ESO221	-IG008A_pg3000	
🗹 IRAS 10	)173+0828_pg900	
🗹 IRAS 10	)173+0828_gp1800	
SGC 12	04_pg1800	
🗹 NGC 12	204_pg900	~
🗹 ESO 55	0-IG025A_pg1800	* *

## What can you do to enhance your chances ?

Moon related issues to realize:

• Bright time is under subscribed – think of science which can use it.

• Be careful with Equatorial targets and Bright time – Moon is likely to be too close (<30 deg) to your field for most of that time

• Gray time means Moon illumination 15-85% <u>at the time</u> your block is in the visibility window. Can be very restrictive.

Check the WM for your block visibilities





## What can you do to enhance your chances ?

### Other things:

- P4 time is unrestricted, uncharged, unlimited.
- Poor seeing time is also less over-subscribed, at seeing 2.0" or 2.5" and over.
- Be pro-active, check your data, give feedback, remind us of e.g. time critical windows coming up.





## Science is coming out – see Anja Schroeder's Poster



S-ALL-T



### Science good news

#### Instruments/modes available:

SALTICAM – normal and fast modes RSS / long-slit and NB imaging RSS / MOS RSS / Fabry-Perot LR & MR back, HR maybe for 2016) RSS / Polarimetry for 2016 HRS / all modes

#### Recent improvements:

RSS throughput better by 30-50% RSS stray-light decrease by 50% – improves faint target SNR New RSS guide-probe funded – no more rotational drift in 2016 (MOS) Active alignment progressing (2016?) – PSF issues much better





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#### Pipeline:

Primary reduced data available to all

Effort to get analysis-ready data-product pipelines is not funded by SALT (yet, at least). RSA users can contact SAAO-based staff for ad hoc help.





## Summary

Be careful with your Block visibilities and tracks, nightly and seasonal

• We will give more info about this in the next Call for Proposals and in future WM pages

Use Optional Targets and Pools

Try to think of areas not used by others (e.g. Bright, P4s)

Be active in checking your data, communicate.

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