TIPS AND TRICKS WHEN USING SALT

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WHAT IS SALT ESPECIALLY GOOD AT?

Telescope: Huge collecting power.

Site: Skies are very dark (22 mag/arcsec²). Seeing only modest (median 1.4")

- Diffuse low-surface-brightness spectroscopy very competitive.
- Objects above background also observed very efficiently.
- Can change instruments and observing modes in seconds.
- Rapid reaction to ToOs.
- Some rare modes for large telescopes (MOS, Polarimetry, mixed modes, high-time res)

• SALT as a *spectroscopic survey telescope*. Most efficient programs are surveys with large <u>pools of targets</u> over the sky.



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DPTI - v7.3.2 <u>File Edit Operate Tools Window Help</u> PROJECT VIEWS TIME-RESTRICTED BLOCKS CALIBRATIONS ENGINEERING Debug TABULAR SCHEDULE Lunar phase tonight Select database: Moon Set Moon Rise Use lunar phase tonight? SALTICAM 35 RSS Minimum viz time left (min) Mag range 15 85 00:19 10:57 ∇ SELECT TIME: SDB 100 0 () 15.00 14/11/2018 14/11/2018 Min SAST when run + Time (7) 19:30:11 HRS BVIT 0.00 () 0.00 Select semester 21:41:10 SELECT SDB COLUMNS 13/11/2018 Min bright Current ∇ Select lunar phase range Date () 13/11/2018 () 8.00 7.00 (+) 50.00 Min angular distance to Moon Select Moon Phase (-) 30.00 100 Any NOW UPDATE "Available Targets' Select RSS Mode Display inactive targets? Track time - ObsTime? Moon Distance filtering? Azimuth range ANY ∇ ÷) 0 Seeing Range () 0.00 Current SALTICAM filters only? Current RSS only? Select Detector Mode Select Transparency Avoid CCAS? Find central tracks? (+) 360 - nī 90 180 270 360 0 1 2 3 4 5 6 7 8 9 10 7 10.00 ANY Any ∇ ∇ Updating... Refresh RSS installed filters, etalons and masks Refresh SALTICAM current filters UPDATE "Available Targets" NOW ABORT 0 Available Targets East Track East Track West Track West Track ObsWindowStart ObsWindowEnd (SAST) MinLunarAngularDistand MaxLur Block Id Completion DaysAvail Score Block Name Proposal_Code Target Proposa Priority PiRankir ToO? NVisits NDone LastObserve WaitDays ObsTime MaxSeein Transparen PI MaxMag 76645 5.35 2018-2-LSP-001 1351 3 Thin cloud Buckley 16 19:34:25 00:11:28 16.375 Large Sc 0 30 100 74938 9.75 13.897 2018-2-5CI-033 2650 2.5 Thin cloud Jeffery 14.5 21:30:52 22:40:01 03:35:32 04:44:41 100 122 Science 2 1 0 1 0 0 30 Ĭ 76620 5.35 13.539 2018-2-LSP-001 10 0 2375 3 Thin cloud Buckley 15 19:32:56 00:11:34 30 100 38 Large Sc 2 1 1 3 2018-2-SCI-007 74740 0.00 107 0.593 Science 3 2 0 1 0 0 3575 4 Thin cloud Gilligan 11.97 21:28:03 23:51:05 01:57:38 04:20:39 30 100 2018-2-SCI-025 1061 Thin cloud Gilligan 21:29:23 22:40:05 01:53:20 03:04:02 30 100 74761 0.00 82 0.401 Science 3 1 0 1 0 0 4 10.27 74783 0 0 1090 4 Thin cloud Gilligan 10.08 30 100

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VISIBILITY WINDOWS VS TRACK TIMES

Targets	
Target: Get from Catalog Date: Dec • 5 • 2017 • 2458093 Enter JD The night begins on 5 December. Coordinates: 5h 38m 42.4s -1° 30' 03.36" Sun set: 17:32 UT Sun rise: 03:22 UT Evening twilight: 19:12 UT Morning twilight: 01:42 UT Moon set: 06:12 UT Moon rise: 19:33 UT Minimum target distance from Moon: 29° 92%	Track Length Nightly Visibility Annual Visibility 20:00 21:00 22:00 23:00 00:00 01:00 02:00 03:00 04:00 05:00 4000 3529 sec
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VISIBILITY WINDOWS VS TRACK TIMES

Target:	000	SALT Visibility Calculator (3.8)
Date: $Apr \neq 17 \neq 2013 \neq 2456400$ Enter JD The night begins on 17 April. Coordinates: $13 0 0.0 - 2 0 49.9999999982$ $\textcircled{0}$ Sun set: $16:12 \text{ UT}$ Sun rise: $05:00 \text{ UT}$ Weinig twilight: $17:34 \text{ UT}$ Morning twilight: $03:38 \text{ UT}$ Moon set: $21:35 \text{ UT}$ Moon rise: $11:27 \text{ UT}$ Minimum target distance from Moon: 81° Source Availability: East (rising) Start: 19:38 UT Stop: $21:36 \text{ UT} \Delta t$: 7049s West (setting) Start: $22:10 \text{ UT} \text{ Stop: } 21:36 \text{ UT} \Delta t$: 6966s Track Time Remaining: Start: $22:10 \text{ UT} \text{ Stop: } 21:36 \text{ UT} \Delta t$: 6966s The actually available track time may be about 2 minutes brown there, where, when here, where the mark the may be about 2 minutes The actually available track time may be about 2 minutes Th	Target:	Track Length Nightly Visibility Annual Visibility
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	Start: 22 : 00 : 23 UT Duration: 0s The actually available track time may be about 2 minutes shorter than the value shown here.	18:00 20:00 22:00 00:00 02:00 04:00 UT (hrs) — Track Length — Track Length outside Twilight - Bright Time

SOME MORE TRICKS...

- Use the question marks Luke!
- Calibrations at the end of the science
- Bright time (e.g. >70% Lunar illumination)
- Lower your seeing requirements (>2")
- Use Pools of optional targets.
 - Speak to us about automatic block creation
- Think about your priorities
 - P1 most competitive
- Use P4 wisely
 - 15–30 min long which are easy to plug into queue gaps
 - bright targets, easy to ID and acquire (eg 10–17 mag)
 - Any weather/Moon



.. A COUPLE MORE...

	NIR (Uns	submitted-004) - PIPT (5.8)	
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Proposals	Block		
> Semester 2023/1			
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V Semester 2022/1	http://astronomers.sal	lt.ac.za/call-for-proposals-document/	
V P NIR (Unsubmitted-004)	If you have any specifi	ic calibration needs not covered in the SALT calibration plan,	please indicate
> () Investigators	them in the Comments	s field below.	
> 📅 Targets			
V 🐻 Blocks	Name	NIR test	
> B NIR test	Unique Identifier	d80d1313-30af-4def-aeec-eee9594af72f ?	
Pools			
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> P NIR First Light (2022-1-COM-001)	Comments		
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	Time between Visits	0.0 days	
	Do the visits consecu	tively	

Do use the comments field – really useful for us

Block

Effective exposure time:	2000 s
Overhead time:	743 s
Total charged time:	2743 s
Proposal	
Effective exposure time:	2000 s
Overhead time:	743 s
Total charged time:	2743 s

.. AND A FEW MORE...

- If ToO Watch out for the Moon angular distance
- The wait period between visits of a block is a *minimum* time.
- Use Monitoring pools to monitor a target in different priorities with a single cadence but use Wait Days too
- You will NOT get absolute fluxes from SALT plan accordingly.
- RSS has a guider and keeps focus, and we can use SALTICAM filters consider using it for imaging.
- BINNING:
 - RSS pixels are 0.125"x0.125" spatially and our mean seeing is ~1.5. 4x4 binning gives 0.5"/bin.
 - Use x2 binning in wavelength with gratings PG0300, PG0700 and PG0900.
- Match your slit width to your science (and preferred seeing)
 - If too wide, you add too much sky and you lose resolution
 - If too narrow, you lose too much light and (depending on grating and binning) you may not really gain resolution.

.. EVEN MORE...

- Get the PIPT to generate the Finding Charts for you!
 - Verifies slit orientation
 - Verifies target coordinates
 - Check target brightness:
 - whether we'll need further FCs (if target is invisible)
 - Choose appropriate alignment star
- Speak to us through salthelp@salt.ac.za
 - We aim to answer immediately, but at least within 24hrs
 - Please include your proposal code in the subject (if you have one)



TROUBLE-SHOOTING TIME



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Validation

Click me!

STILL HAVING TROUBLE?

Use the menu item Proposal > Clean

Employ the time-honoured Windows method: Save – Quit – Restart

Send an email to salthelp@salt.ac.za:

- Export the proposal as a zip file and attach it to the mail
- Include the proposal code (if applicable) in the subject

READ TARGETS FROM A CSV FILE



https://astronomers.salt.ac.za/importing-targets-into-the-pipt/

CREATE YOUR BLOCKS WITH PYTHON (OR C, OR FORTRAN, OR...)

- Create a block as similar as possible to your planned blocks as possible
- Export this block as a template
- Write a script which uses this template to generate XML files, with one block per file
- Replace placeholders like --- INSERT NAME--- with correct values
- Choose auto-generated as the finder chart path
- Save all the files in the same directory...
- ... and import this directory into the PIPT
- In future, it might be possible to bypass the PIPT and submit your blocks directly with a script

Search for "Adding many blocks" on http://pysalt.salt.ac.za/pipt-manual/html/pipt-manual.html.

QUESTIONS?