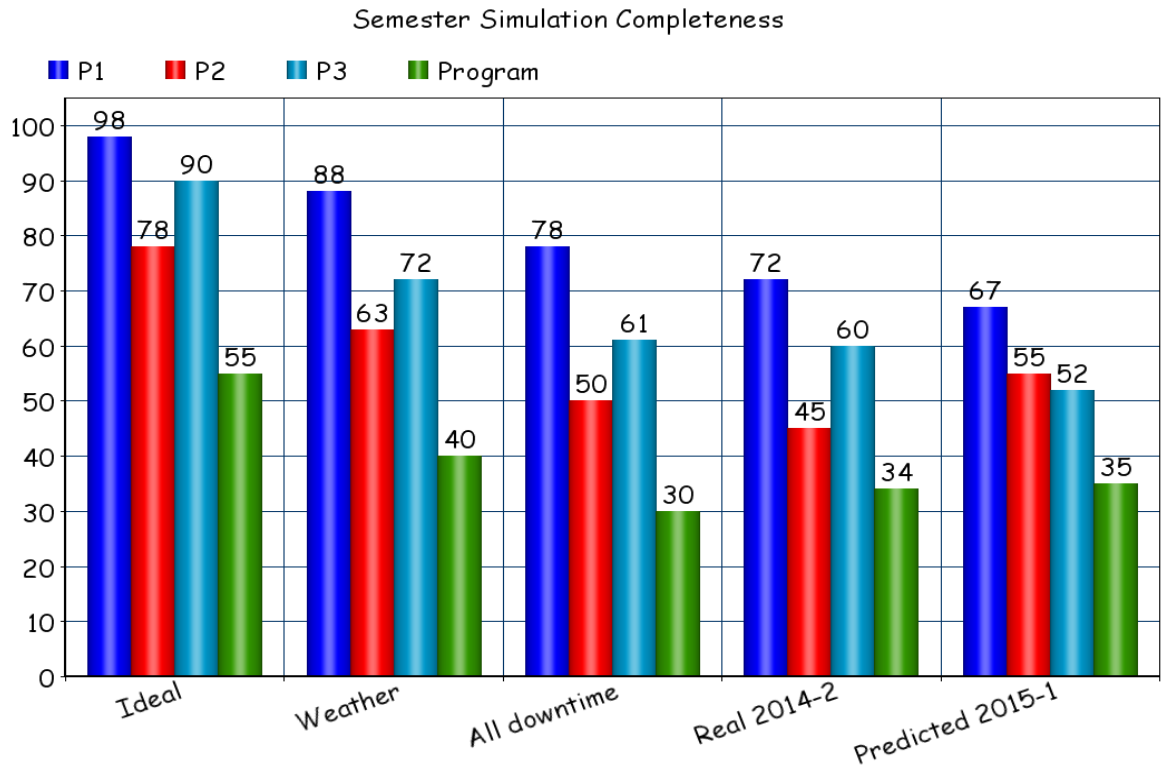
SALT Scheduling Simulation Summary (updated)

May 27, 2015

Even at this early stage of their development, the simulations are a close representation of reality. This gives us confidence that we can use this tool to make real decisions on how to schedule the telescope. In the analyses below, different cases were tried: "Ideal" where available science time equals night time and there is no bad weather, or technical/engineering down time. Another case, "Weather" included the effects of weather, "All downtime" included faults and engineering time.



Simulations yielded block completeness per Priority as well as Program completeness (what fraction of programs have 90% of allocated time done, green bar) for the 2014-2 semester using the Ideal case, the Weather case, the 'All downtime' along with the results for 2014-2 Semester as it happened and a prediction for 2015-1.

There are some (possibly surprising) results that come out of the study.

- **Blocks and programs cannot be finished even if the Science time was 100%.**
- **Block incompleteness is driven by clashing target visibilities.**
- **Program incompleteness is driven by multiple-priority programs.**
- **As it is, we are observing blocks and programs close to maximum rate possible. For better efficiency more targets are needed in the queue and/or time allocation philosophy needs revisiting.**

For more details refer to the Scheduling Simulations document by Kotze et al. submitted to the Board. As described therein, for example, *Block Scoring* algorithms as already implemented at the telescope can increase completeness – but typically only by a few percentage points. Program and priority completeness is unlikely to increase materially even if true optimal scheduling of the full semester were performed.

Scheduling Strategic Policy

SALT Operations requires a clear instruction from the Board about what is to be optimized in the way time on the telescope is scheduled:

1. **Should program completeness be optimized?**
2. **Should high priority block completeness be optimized?**
3. **Should telescope idle time be minimized?**

Detailed options to discuss

If program completeness is to be optimized:

- We recommend using single priority per program. Increased P1-P2 share helps this.
- More targets and a more even distribution of them will help further.
- Could define completeness for snap-shot survey type programs differently.

If high priority block completeness is to be optimized a more even distribution of targets is required:

- SALT Ops can provide information to TACs regarding probability of getting targets/blocks observed. This requires better track length & visit information in phase-1. This will help program completeness as well.

If idle time is to be minimized, we need in addition to even distribution more targets in the queue.

- Encourage more optional target Pools.
- Oversubscribe P3 while concentrating on high completeness for P1 and P2.
- Convert P3 (and P4) to mainly survey type optional target programs. Think HST snap-shot programs, where e.g. 40% completeness would be defined as “complete”.

Other recommendations and requests

The SALT Ops report includes a number of other requests from the Board to maximize the SALT observing process. These include e.g. winter weather specs, priority percentages, new Dark and Any time definitions in phase-1 and phase-2.

The Figures below show the RA and DEC distributions of P1+P2 targets (blue) and completed targets (cyan) in 2014-2, as well as the submitted and predicted completion for 2015-1 on sky.

