

SURVEY STRATEGY OPTIMIZATION, SCHEDULING & CADENCE ISSUES

DES strategy, tactics, and ObsTac,
and lessons therefrom

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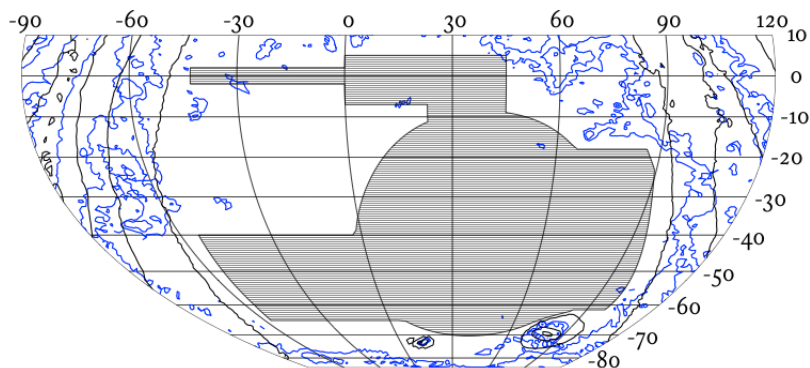
DES Surveys

Wide

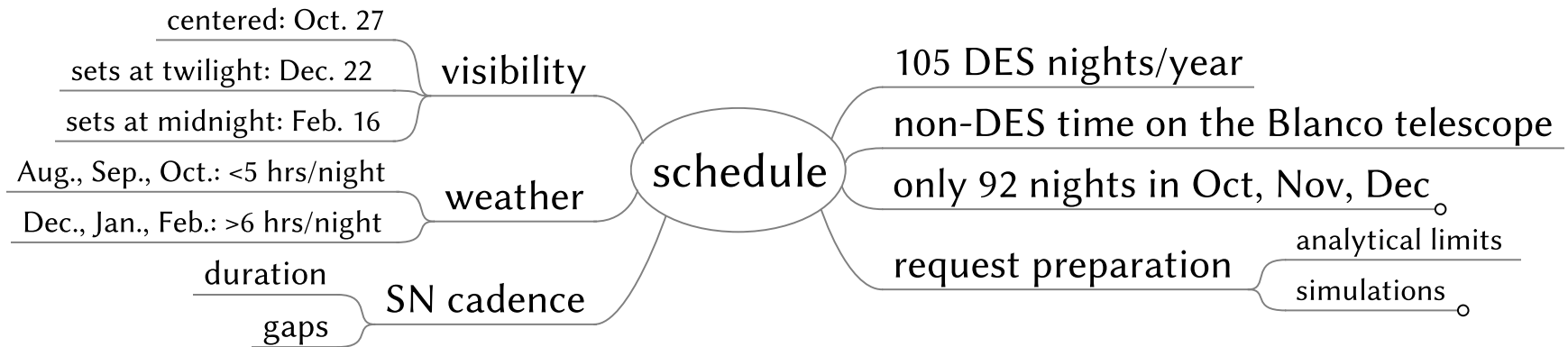
- 10 tilings
 - Each covers the footprint once.
 - Each has ~ 1600 pointings.
- 5 filters/pointing: g, r, i, z, Y
- $\text{FWHM} < 1.1''$ in r, i, z

Time domain (“supernova”)

- maximum cadence
- 3 deep & 7 shallow fields
- 4 filters: g, r, i, z
- exposures in sequences

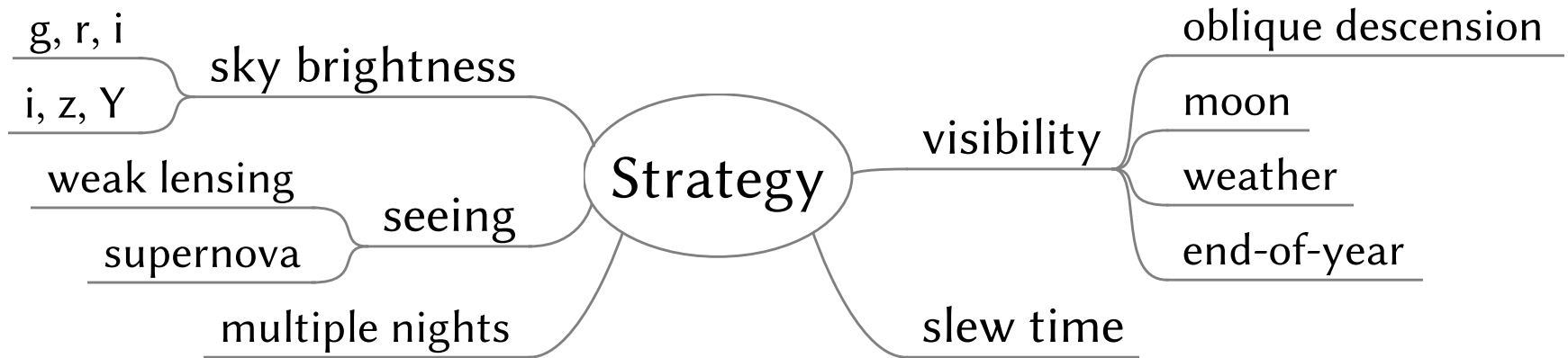


SCHEDULING CONSIDERATIONS



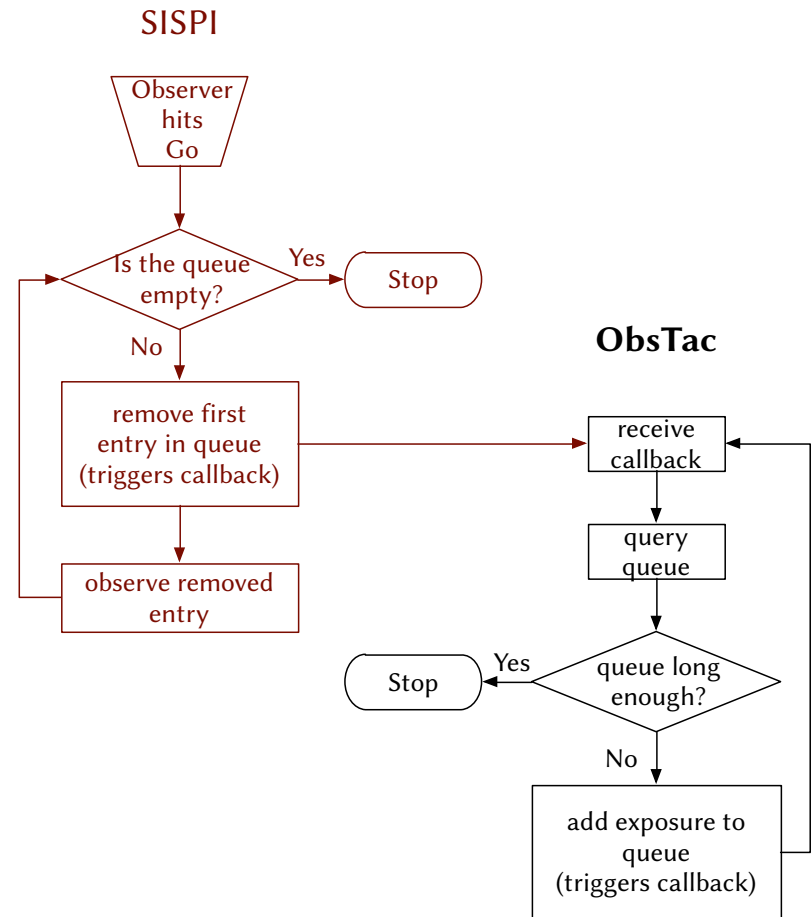
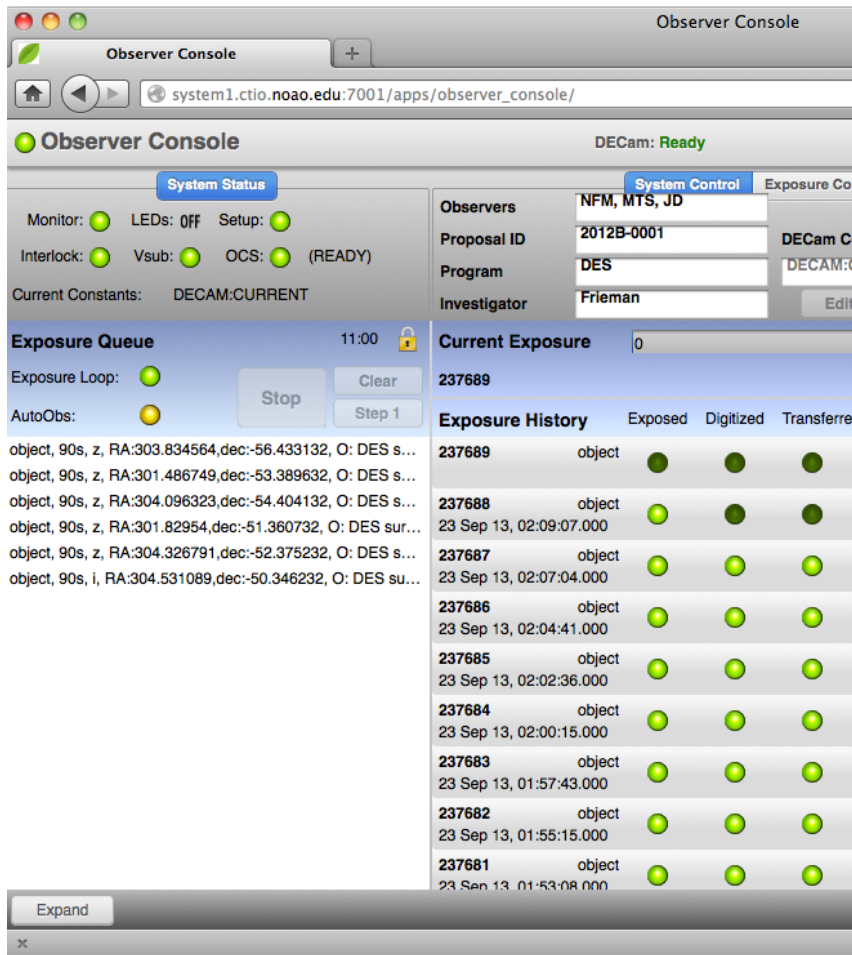
For the wide survey: select the latest starting schedule with useful visibility.
For SN: minimize long periods on non-DES use, prefer long calendar duration.

GLOBAL STRATEGY



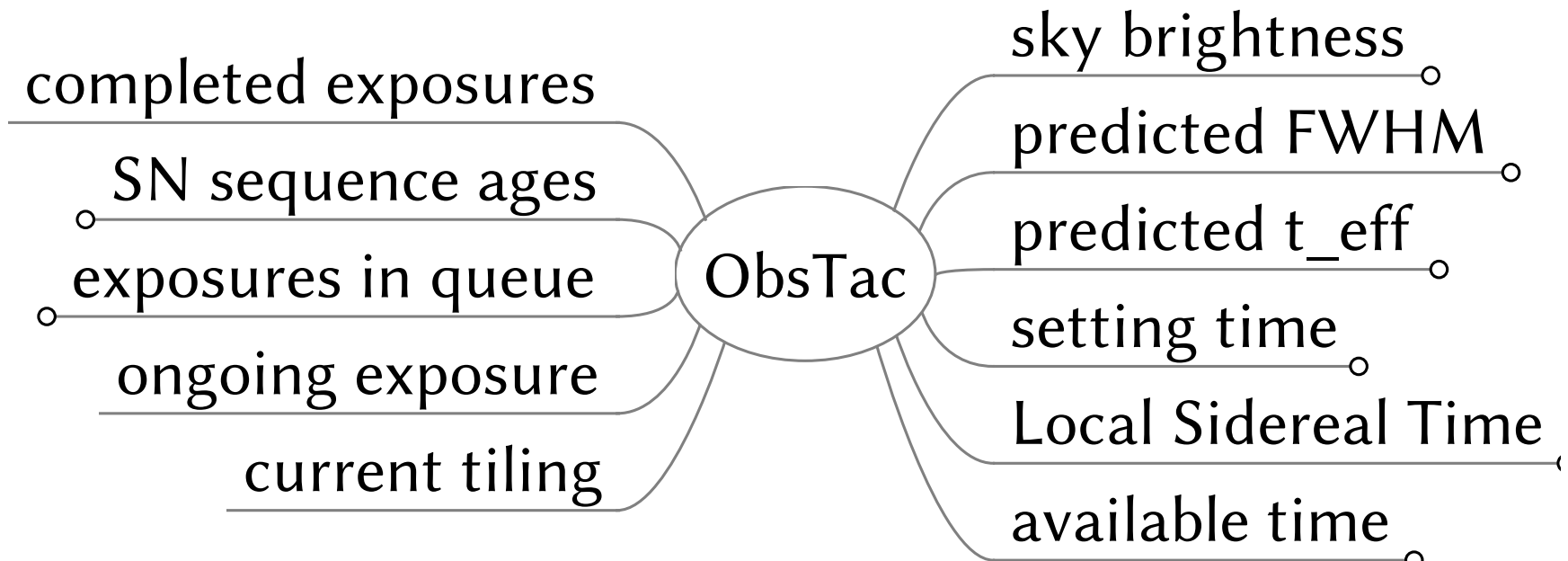
Minimize the number of fields that set before they can be observed: order by oblique descension.

OBSTAC IN OPERATION



Integrating the automation into the human interface works well.

DYNAMIC CONSIDERATIONS



VALIDATE INPUT

A man with one watch *thinks* he knows what time it is...

DIMM + instrument expectations

Data Management FWHM

ImageHealth FWHM

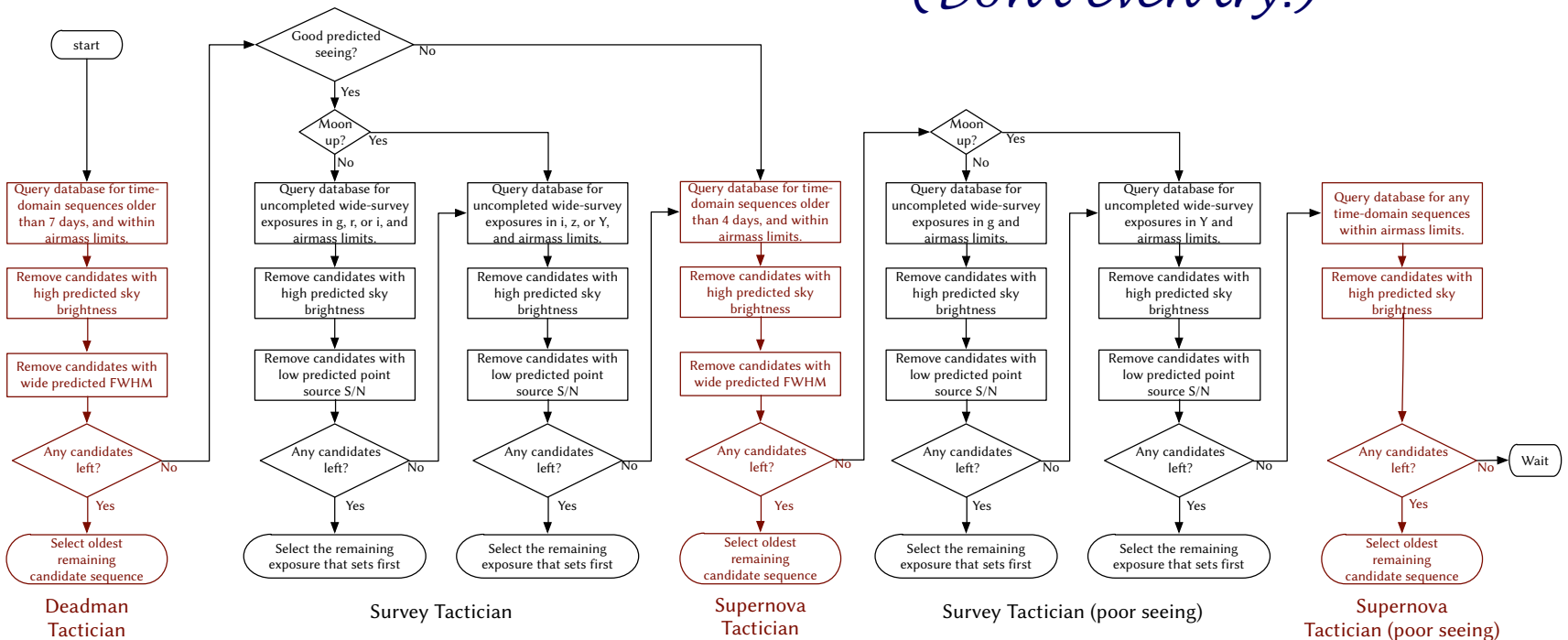
QuickReduce FWHM

kentools FWHM

ALGORITHM

(Simplified)

(Don't even try.)



ALGORITHM INTUITION

Strategists and developers need to be able to respond quickly to questions and requests.

What will it do tonight?

Why did it do *that*?

Why didn't it do *this*?

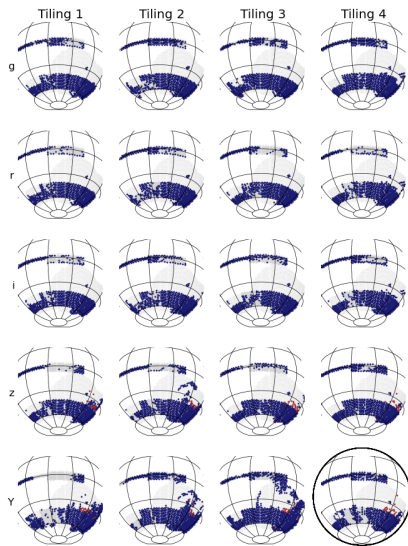
Make it do *this*!

Many will think they see bugs that require urgent attention.
Sometimes they will be right.

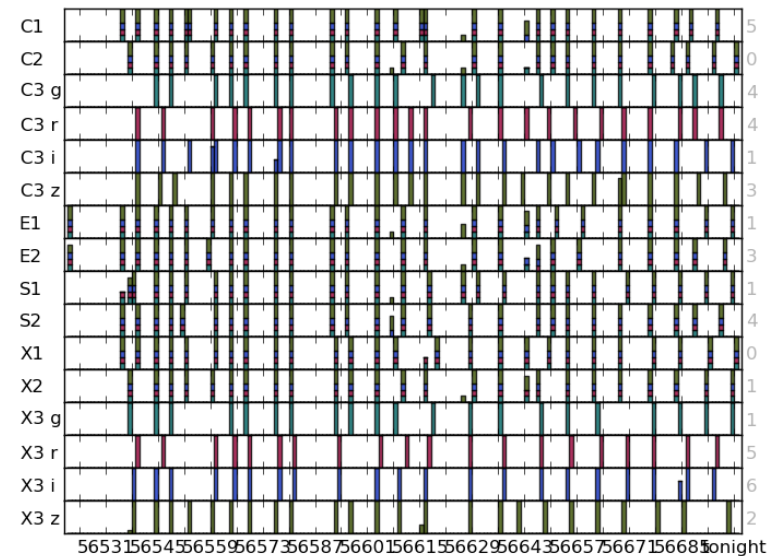
Progress monitoring

nightsum: a nightly report that includes both an account of the night, and plots useful for monitoring survey progress.

Wide survey



Supernova survey

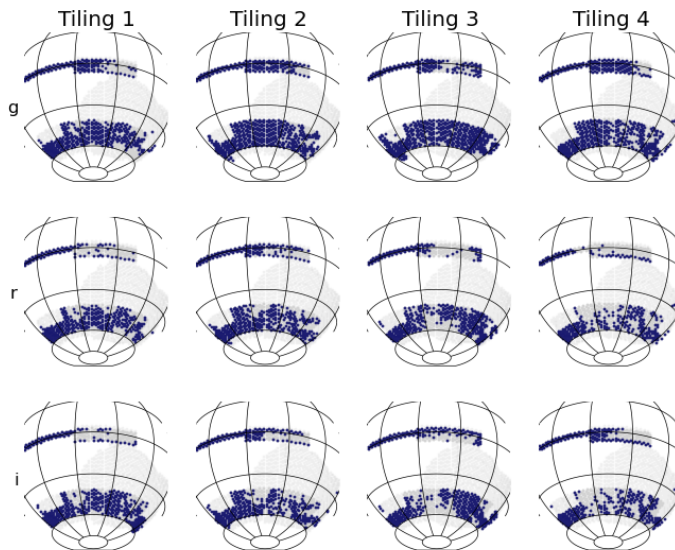


Quality feedback

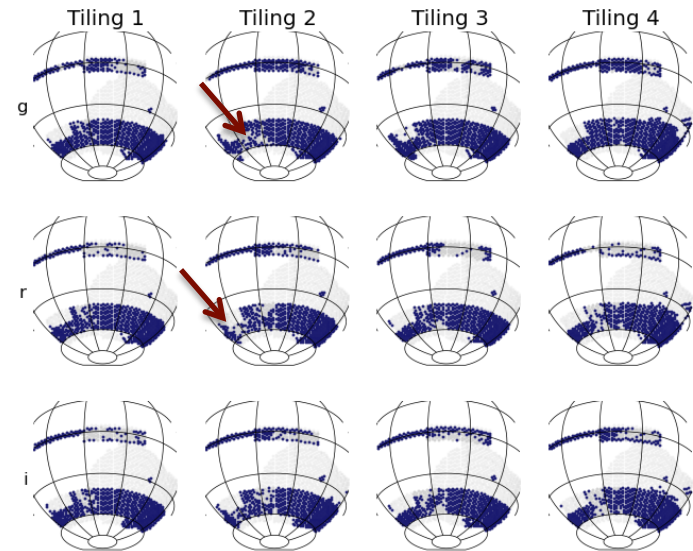
Be ready to declare exposure quality in a timely fashion from the beginning.

Cadence and coverage depend on it.

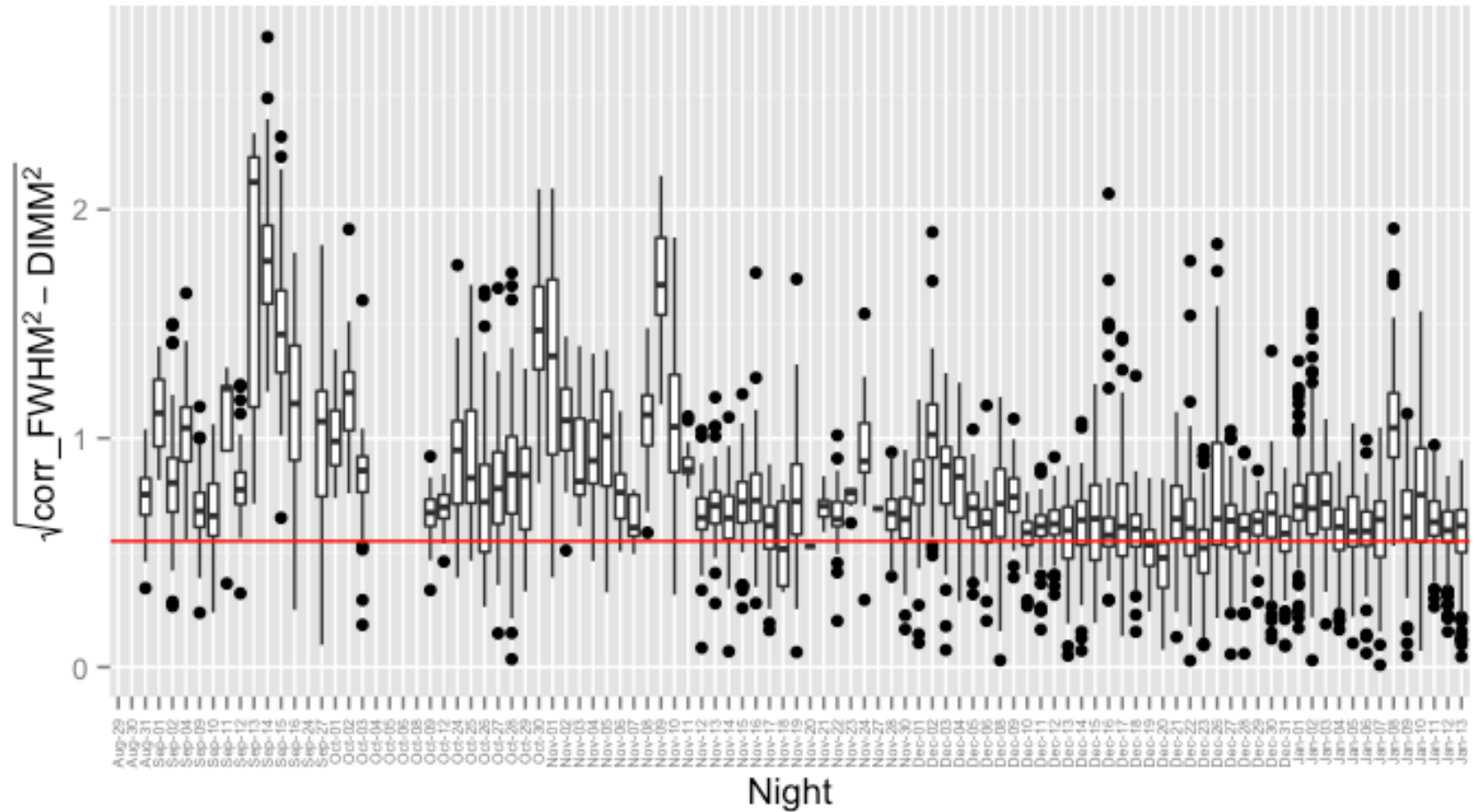
“Done” on December 18



Done on February 9

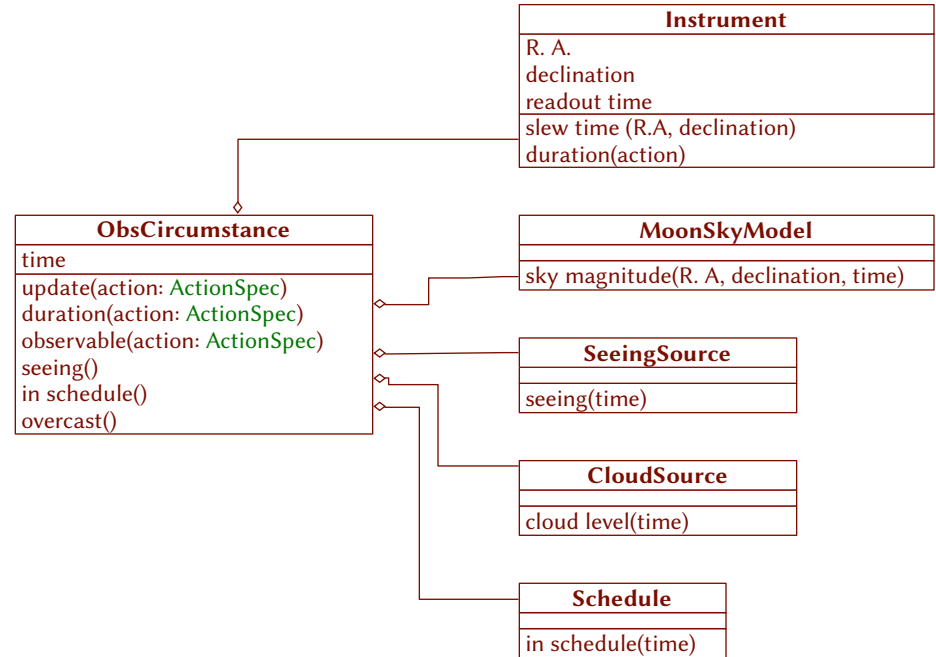
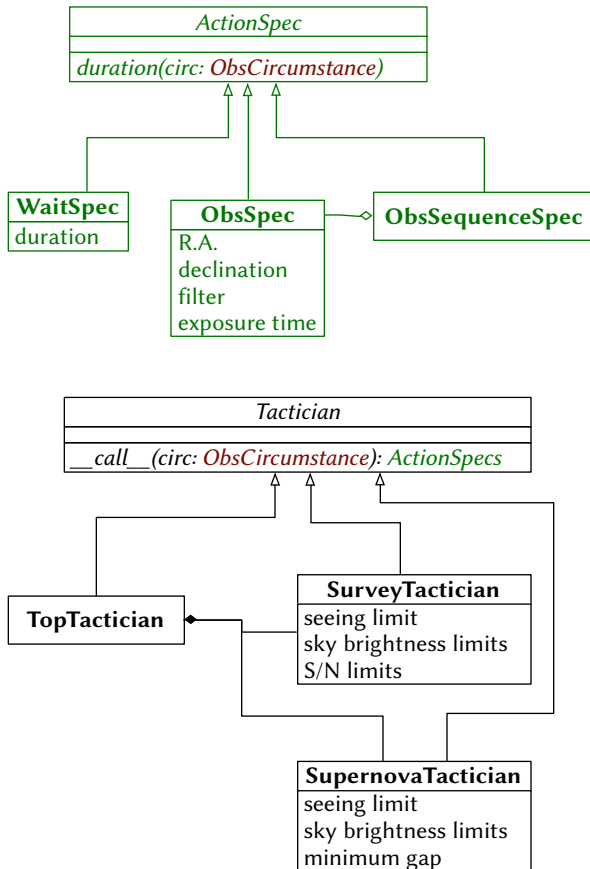


SIMULATION VS. REALITY



STRUCTURE

(SIMPLIFIED)



(Don't even try here, either.)

ObsTac uses the same tactical and book-keeping code in simulation and production.

DES and LSST

Similarities

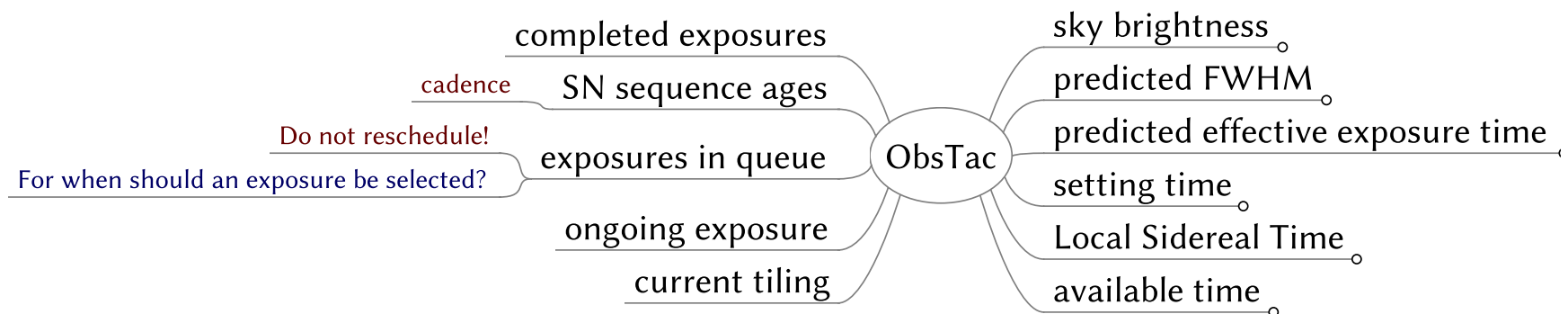
- Automation of observing
- Multiple competing science programs
- Reaction to conditions
- Simulations
- Book-keeping!
- Reporting

Differences

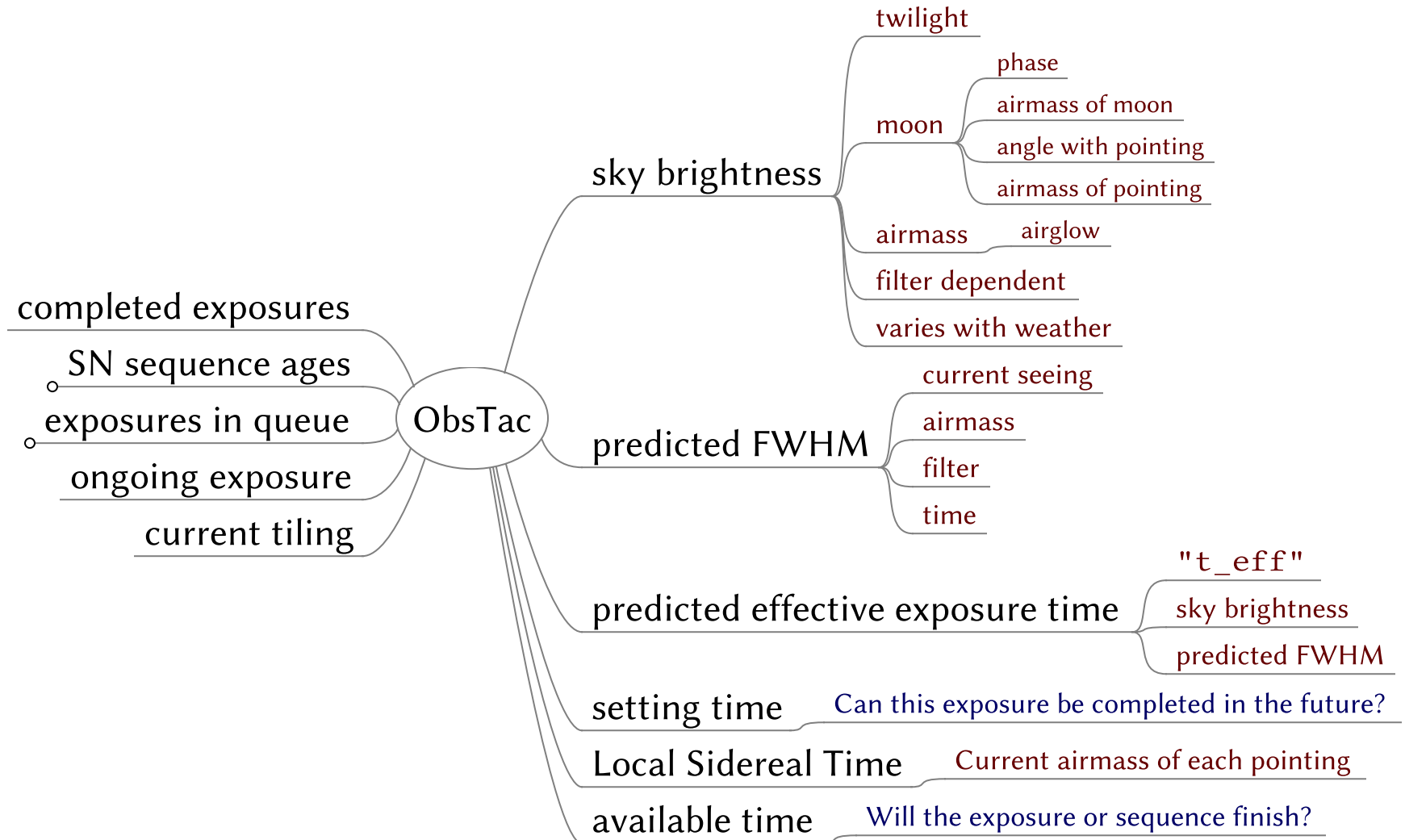
- Schedule
 - DES: 105 nights
 - LSST: year-round
- Footprint
 - DES: South Galactic Cap
 - LSST: fully spans R. A.
- Cadence
 - DES: about one cadence
 - LSST: many complex cadences

SUPPLEMENTAL SLIDES

DYNAMIC CONSIDERATIONS



DYNAMIC CONSIDERATIONS



SIMULATION DATA FLOW

