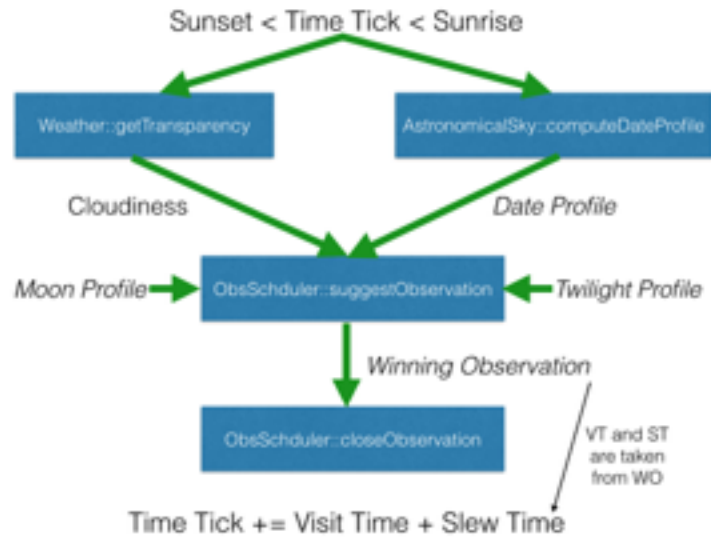
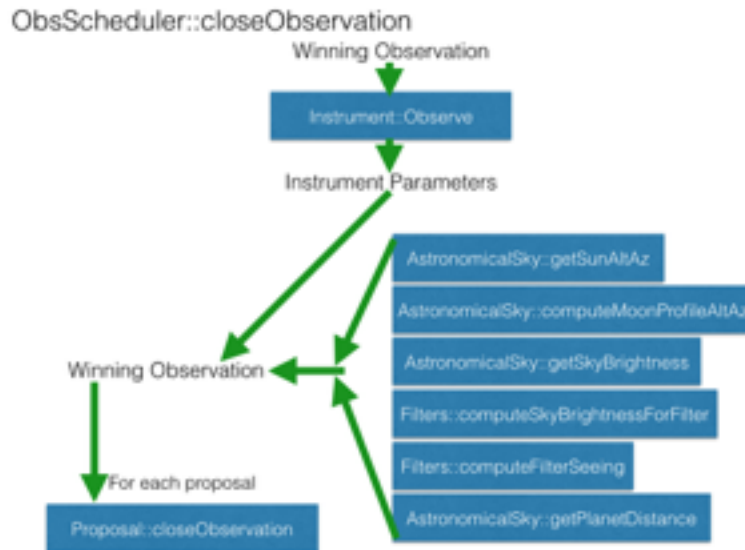


Observation Cycle



Top-level flow of observation cycle. Data movement shown by green arrows. Cycle through diagram once for each time tick.





Functions

As the inputs and outputs for the functions are defined, any one that requires the number of seconds from simulation start will be noted by s4.

Weather::getTransparency

INPUTS

date (s4)

OUTPUTS

cloudiness (from DB)

AstronomicalSky::computeDateProfile

INPUTS

date (s4)

OUTPUTS

date (s4)

Modified Julian date (at s4)

Local Sideral Time (at s4, rad)

ObsScheduler::suggestObservation

INPUTS

Date Profile
Moon Profile
Twilight Profile
cloudiness

OUTPUTS

winning Observation

ObsScheduler::closeObservation

INPUTS

winning Observation

OUTPUTS

None

Weather::getSeeing

INPUTS

date (s4)

OUTPUTS

Raw Seeing

SchedulingData::findNightAndTime

INPUTS

time (s4)

OUTPUTS

Scheduling Data Night
Scheduling Data Time (s4)

Proposal::suggestObs

INPUTS

Date Profile
Number of Suggested Observations Per Proposal
Exclusive Observation
Minimum Distance to Moon
Raw Seeing
Seeing (adjusted)
Transparency
Scheduling Data Night

Scheduling Data Time

OUTPUTS

List of target Observations

Instrument::Observe

INPUTS

Right Ascension (rad)

Declination (rad)

Date Profile

Exposure Time

Filter

Delay

OUTPUTS

Delay

Rotator Sky Position

Rotator Telescope Position

Altitude

Azimuth

Slew Data

Slew Initial State

Slew Final State

Slew Max Speeds

List of Slew Activities

AstronomicalSky::getSunAltAz

INPUTS

Date Profile

OUTPUTS

Sun Altitude (rad)

Sun Azimuth (rad)

AstronomicalSky::computeMoonProfileAltAz

INPUTS

date (s4)

OUTPUTS

Moon Right Ascension (rad)

Moon Declination (rad)

Moon Phase (percent)

Moon Altitude (rad)

Moon Azimuth (rad)

AstronomicalSky::getSkyBrightness

INPUTS

fieldID
Right Ascension
Declination
Altitude (rad)
Date Profile
Moon Profile
Twilight Profile
extinction
skyBrightness

OUTPUTS

Total Brightness
Distance to Moon
Moon Altitude (rad)
Brightness Profile

Filters::computeSkyBrightnessForFilter

INPUTS

filter
skyBrightness
date (s4)
Twilight Profile
Moon AltAz Profile

OUTPUTS

Filter Sky Brightness (single number)

Filters::computeSeeingFilter

INPUTS

seeing
airmass

OUTPUTS

Seeing Filter Dictionary

AstronomicalSky::getPlanetDistance

INPUTS

planet
target (*Observation*)
date (s4)

OUTPUTS

Angular Distance to Planet (rad)

Proposal::closeObservation

INPUTS

winning *Observation*
Observation History ID
Twilight Profile

OUTPUTS

None

Data Objects

These are collections of values that are designated in the above diagrams as *italics text*. A *Winning Observation* is just an *Observation*.

Observation

- obsType
- proposal
- propID
- subsequence
- fieldID
- filter
- seqn
- pairNum
- date
- mjd
- lst
- night
- exposureTime
- visitTime
- slewTime
- slewDistance
- fieldFilterInterval
- fieldInterval
- fieldVisits

- propRank
- finRank
- maxSeeing
- rawSeeing
- seeing
- transparency
- cloudSeeing
- airmass
- skyBrightness
- filterSkyBright
- ra
- dec
- altitude
- azimuth
- parallactic
- distance2moon
- rotatorSkyPos
- rotatorTelPos
- sunAlt
- sunAz
- phaseAngle
- extinction
- rScatter
- mieScatter
- moonAlt
- moonAz
- moonIllum
- moonBright
- darkBright
- solarElong
- exclusiveBlockRequired
- moonRA
- moonDec
- moonPhase
- log
- logfile
- verbose

Date Profile

- Date (number of seconds since start)
- Modified Julian Date
- Local Sideral Time (rad)

Moon Profile

- Right Ascension (rad)

- Declination (rad)
 - Phase (percent)
-

Twilight Profile

- Sunrise Twilight
 - Sunset Twilight
-

Observatory Profile

(once)

- Latitude (rad)
 - Longitude (rad)
 - Elevation (m)
 - Epoch (MJD)
 - Pressure
 - Temperature
 - Relative Humidity
-

Brightness Profile

- Alpha (phase angle of Moon illuminated fraction)
 - Extinction coefficient
 - Rayleigh scattering
 - Mie scattering
 - Illuminance of Moon
 - Moon brightness (nanoLamberts)
 - Sky brightness (nanoLamberts)
-

Moon AltAz Profile

- Right Ascension (rad)
 - Declination (rad)
 - Phase (percent)
 - Altitude (rad)
 - Azimuth (rad)
-

Seeing Filter Dictionary

Key: Filter Name

Value: Adjusted Seeing