

# Summary Table Column Descriptions

THESE ARE THE OUTPUT COLUMNS FOR OPSIM v4 SIMULATIONS.

They are not the same as the outputs for Feature Based Scheduler simulations!!

A product of the Operations Simulator (OpSim) is an SQLite database file, named using its unique identifier (hostname\_sessionID), which contains all the information pertaining to that simulated survey. This database file includes an extra table created to facilitate analysis with MAF which is named "Summary". "Summary" contains the most commonly used fields from the output tables, and additional useful quantities such as the limiting magnitude and a set of dithered coordinates.

This is a description of the columns in the "Summary" table.

**\*\*Please Note\*\***, a single OpSim visit can sometimes be used by multiple proposals. Thus, there are entries in the Summary table that are identical except for the value of propID. When searching the database, one will usually want to use a "group by" clause. For example:

## Using "group by"

```
sqlite> select count(fieldRA) from (select fieldRA from summary where night = 1 and filter = 'r' group by
expMJD);
count(fieldRA)
64
sqlite> select count(fieldRA) from (select fieldRA from summary where night = 1 and filter = 'r');
count(fieldRA)
67
```

Without "group by", we get three repeated entries. If you use the MAF framework, the "group by" is done automatically.

Also note, we are using the LSST nomenclature, and each record in the database describes a "visit", where a visit is a pair of exposures.

Column Name	Type	Units	Description
obsHistID	integer	-	Unique visit identifier (same as ObsHistory.obsHistID).
sessionID	integer	-	Session identifier which is unique for simulated surveys created on a particular machine or hostname. Simulated surveys are uniquely named using the form hostname_sessionID.
propID	integer	-	Unique (for every run) identifier for every proposal (observing mode) specified in a simulated survey. Note that a single visit can satisfy multiple proposals, and so duplicate rows (except for the propID) can exist in the Summary table (same as Proposal.propID).
fieldID	integer	-	Unique field (or target on the sky) identifier (same as Field.fieldID). OpSim uses a set of 5292 fields (targets) obtained from a fixed tessellation of the sky.
fieldRA	real	radians	Right Ascension (J2000) of the field center for this visit (same as Field.fieldRA).
fieldDec	real	radians	Declination (J2000) of the field center for this visit (same as Field.fieldDec).
filter	text	-	Filter used during the visit; one of u, g, r, i, z, or y.
expDate	integer	seconds	Time of the visit relative to 0 sec at the start of a simulated survey.
expMJD	real	days	Modified Julian Date at the start of a visit.
night	integer	none	The integer number of nights since the start (expDate = 0 sec) of the survey. The first night is night = 0.
visitTime	real	seconds	Currently, a visit comprises two 15- second exposures and each exposure needs 1 sec for the shutter action and 2 sec for the CCD readout. The second readout is assumed to occur while moving to the next field (see slewTime), so the length of each visit for the WFD observing mode is 34 sec.
visitExpTime	real	seconds	Total integration time on the sky during a visit, which for current observing modes is 30 sec (see visitTime).
finRank	real	-	Target rank among all proposals including all priorities and penalties (generally used for diagnostic purposes).
finSeeing	real	arcseconds	<b>**Depreciated column**</b> The FWHM of the seeing including wavelength dependent atmospheric and optical contributions (derived from rawSeeing).
FWHMgeom	real	arcseconds	"Geometrical" full-width at half maximum. The actual width at half the maximum brightness. Use FWHMgeom to represent the FWHM of a double-gaussian representing the physical width of a PSF.
FWHMeff	real	arcseconds	"Effective" full-width at half maximum, typically ~15% larger than FWHMgeom. Use FWHMeff to calculate SNR for point sources, using FWHMeff as the FWHM of a single gaussian describing the PSF.
transparency	real	-	The value (in 8ths) from the Cloud table closest in time to this visit.
airmass	real	-	Airmass at the field center of the visit.

vSkyBright	real	mag /arcsec <sup>2</sup>	The sky brightness in the Johnson V band calculated from a Krisciunas and Schaeffer model with a few modifications. This model uses the Moon phase, angular distance between the field and the Moon and the field's airmass to calculate added brightness to the zero-Moon, zenith sky brightness (e.g. Krisciunas 1997, PASP, 209, 1181; Krisciunas and Schaefer 1991, PASP, 103, 1033; Benn and Ellison 1998, La Palma Technical Note 115).
filtSkyBrightness	real	mag /arcsec <sup>2</sup>	Measurements of the color of the sky as a function of lunar phase are used to correct vSkyBright to the sky brightness in the filter used during this visit.
rotSkyPos	real	radians	The orientation of the sky in the focal plane measured as the angle between North on the sky and the "up" direction in the focal plane. XXX-We need to document the sense of this—is it to the east or west.
rotTelPos	real	radians	The physical angle of the rotator with respect to the mount.  rotSkyPos = rotTelPos - ParallacticAngle
lst	real	hours	Local SiderealTime at the start of the visit (0 - 24 hours).
altitude	real	radians	Altitude of the field center at the start of the visit.
azimuth	real	radians	Azimuth of the field center at the start of the visit.
dist2Moon	real	radians	Distance from the field center to the moon's center on the sky.
solarElong	real	degrees	Solar elongation or the angular distance between the field center and the sun (0 - 180 deg).
moonRA	real	radians	Right Ascension of the Moon.
moonDec	real	radians	Declination of the Moon.
moonAlt	real	radians	Altitude of the Moon taking into account the elevation of the site.
moonAZ	real	radians	Azimuth of the Moon
moonPhase	real	%	Percent illumination of the Moon (0=new, 100=full)
sunAlt	real	radians	Altitude of the Sun taking into account the elevation of the site, but with no correction for atmospheric refraction.
sunAz	real	radians	Azimuth of the Sun with no correction for atmospheric refraction.
phaseAngle	real	*	Intermediate values in the calculation of vSkyBright using the Krisciunas and Schaeffer models.
rScatter	real	*	" "
mieScatter	real	*	" "
moonBright	real	*	" "
darkBright	real	*	" "
rawSeeing	real	arcseconds	The seeing as taken from the Seeing table which is an ideal seeing at zenith and at 500 nm.
wind	real	-	A placeholder for real telemetry.
humidity	real	-	A placeholder for real telemetry.
slewDist	real	radians	Distance on the sky between the target field center and the field center of the previous visit.
slewTime	real	seconds	The time between the end of the second exposure in the previous visit and the beginning of the first exposure in the current visit.
fiveSigmaDepth	real	magnitudes	The magnitude of a point source that would be a 5 sigma detection (see Z. Ivezić et al, <a href="http://arxiv.org/pdf/0805.2366.pdf">http://arxiv.org/pdf/0805.2366.pdf</a> ).
ditheredRA	real	radians	The offset from the Right Ascension of the field center representing a "hex-dithered" pattern.
ditheredDec	real	radians	The offset from the Declination of the field center representing a "hex-dithered" pattern.