1st November Simulations Meeting

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Attending: debbie, simon, warren, dave, ajc, jim, cathy, abi, kem, lynne, tony

Actions

- Cathy to send the new opsim schema to the mailer
- Francisco, will talk with ajc about moving to git (after V3.0 in place)
- ajc will look at the open source versions of slalib and we will have a simulations discussion about transitioning
- Srini will represent OpSim at the camera geometry rework

Actions from last week:

- ajc will talk to Iain about moving confluence off the 8443 port
  - Iain will address this after FDR
- Steve r will discuss with the camera team the alignment of simulations with their work (2 week timescale)
  - ajc will follow up with the status of this
- Simon will update catalog development plan - DONE
- John will update phosim plan (DM roadmap is at ls.st/ldm-240)

DESC meeting (Dec 4-6 Pittsburgh)

- Debbie, Warren, Simon planning to attend
- Discussion will include science requirements for the cosmology catalogs and running phosim

DM camera geometry work (Simon)

- DM needs a framework for describing sensors, their properties and positions, including how to iterate over the sensors
  - 6 months for delivery of this
  - Plan is python except for a detector class (with coord transforms) and then detector class in C++
  - OPSIM: needed outside of opsim for post-processing of outputs of opsim, may be needed inside of opsim for dithering (a long term goal)
    - probably only need positions at the amplifier level
    - Srini and Steve R will work with Simon to make sure Opsim is represented
  - PHOSIM:
    - John will represent phosim on the camera geom redevelopment

Following is a part of an email sent to members of the OpSim and Camera teams. I am very interested to have conversations with anyone having a stake in the design of the camera geometry classes. Further, please feel free to add requirements to the design page.

> *I (Simon Krughoff) am leading the DM effort to redesign the camera geometry framework. From the DM perspective the camera framework is responsible for several things.*
> *1. Providing iterators over all devices in the camera. This allows logical flows like:*
> *for every device in my camera:*
> *do some work*
> *2. Providing coordinate transforms to/from a set of defined coordinates systems (e.g. pixel, camera, sky).*
> *3. Providing a container to hold important electronic information for calibration as well as how to assemble amp segments into a full chip size grid.*
> *The work is currently in the design phase and I would very much like to get input from the camera team and the OpSim team on requirements that are not provided by DM.*
> *The current design document is at:*
> *https://dev.lsstcorp.org/trac/wiki/Winter2014/Design/CameraGeom*
> *The summary is that we intend to take a hierarchical approach where cameras contain rafts and rafts contain detectors. The implementation will primarily be in python with the detector class implemented in C++ so that the coordinate transforms contained by the detectors can be written in C++ and accessed by algorithms in C++. The Detector class will be available in python via SWIG wrappers. We intend both the hierarchy and coordinate systems to be configurable.*

Crosstalk

- Tony mentioned that modelling cross talk may be significant for opsim
  - magnitude of crosstalk correlates with readout time so simulations of the impact of increasing readout could be beneficial
  - better understanding of the crosstalk on time scale of 2 months

Slalib transition:

- opsim and catsim depend on slalib
- we should move to an open source variant (Dave M reminded people that an open source version was mention last year)
- action to look into how we can swap out the current version

Work plan for the next 3 months.

OPSIM:

a) Validate and deliver Opsim 3.0 - Dec 1, 2013

- cadence validation runs (~12), will release a new reference run, expect 4-5% fewer observations (due to increase in downtime) otherwise similar

- CCB to define a reference run

- Simon: expect to ingest it. Cathy: a new schema so need to be aware of that

b) Docs for OpSim review - Dec 23, 2013

- Simulations group to review the documents (plus input from systems engineering)

c) OpSim dry run - Jan XX, 2014 (will know better by Wednesday)

d) OpSim review: week of Feb 3, 2014

e) Deliver OpSim 3.0 cadence runs: TBD

f) Finalize Comparison FrameWork Design ?

CATSIM:

- Complete framework updates to allow external catalogs from RDMSs as well as flat files – Nov. 10, 2013
  - Code review – scheduled for the week of Oct. 28
- Validate galaxy distributions relative to the simulations requirements – Dec. 1, 2013
  - Generate all validation figures and metrics presented in the validation document using new framework – Nov. 10, 2013
  - Compare metrics to requirements – Nov. 15, 2013
  - Make any necessary corrections and circulate realized distributions – Nov. 30, 2013
- Complete framework refactor for generation of fully realistic inputs to PhoSim (precise astrometric transforms, galactic extinction, variability) – Dec. 31, 2013
  - Re-implement astrometric transforms as python Mixins – Dec. 10, 2013
  - Re-implement photometric transforms as python Mixins – Dec. 20, 2013
  - Re-implement code to sample SFD dust maps as a python Mixin – Dec. 31, 2013
- Implement unit tests for all aspects of the catalogs framework – Jan. 15, 2014
  - Implement basic unit test framework – Completed
  - Identify necessary unit tests – Jan. 1, 2014
  - Implement unit tests – Jan. 15, 2014
- Complete documentation and expanded example code set – Jan. 31, 2014

Future work needed (from the review)

- Variability model, sky model needs to be in place before June, morphologies
- slalib needs to be removed

PHOSIM:

- 7/13: PhoSim v3.3 Release
- 8/13-11/13: PhoSim v3.4 Development (PhoSim Reference Document plan)
- 11/13-12/13: BNL, FDR, & DESC meetings & preparations
- 12/13-1/13: PhoSim v3.4 I&T
- 2/13: PhoSim v3.4 Release