

LSST DM Stack State

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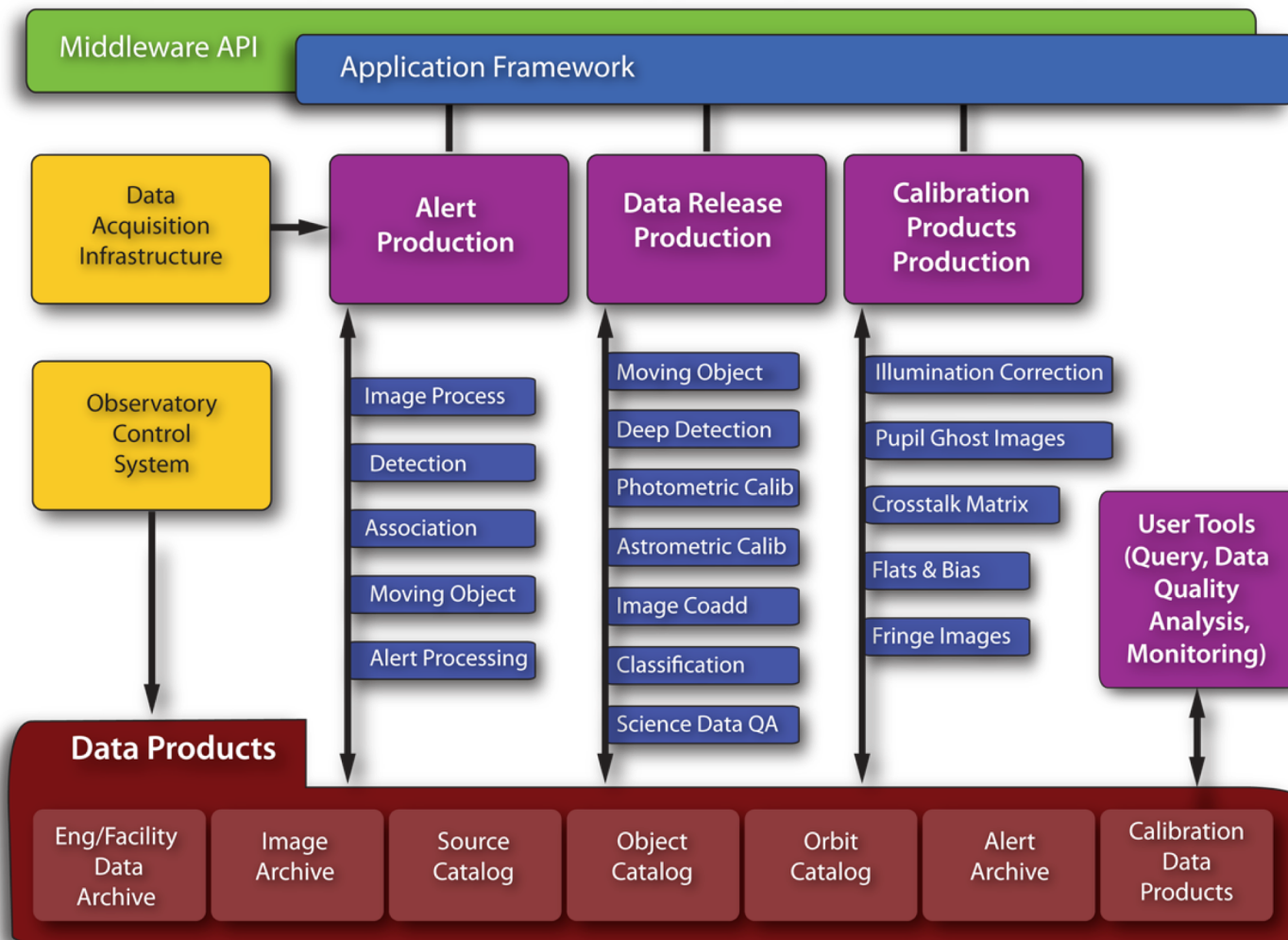
5th February 2020



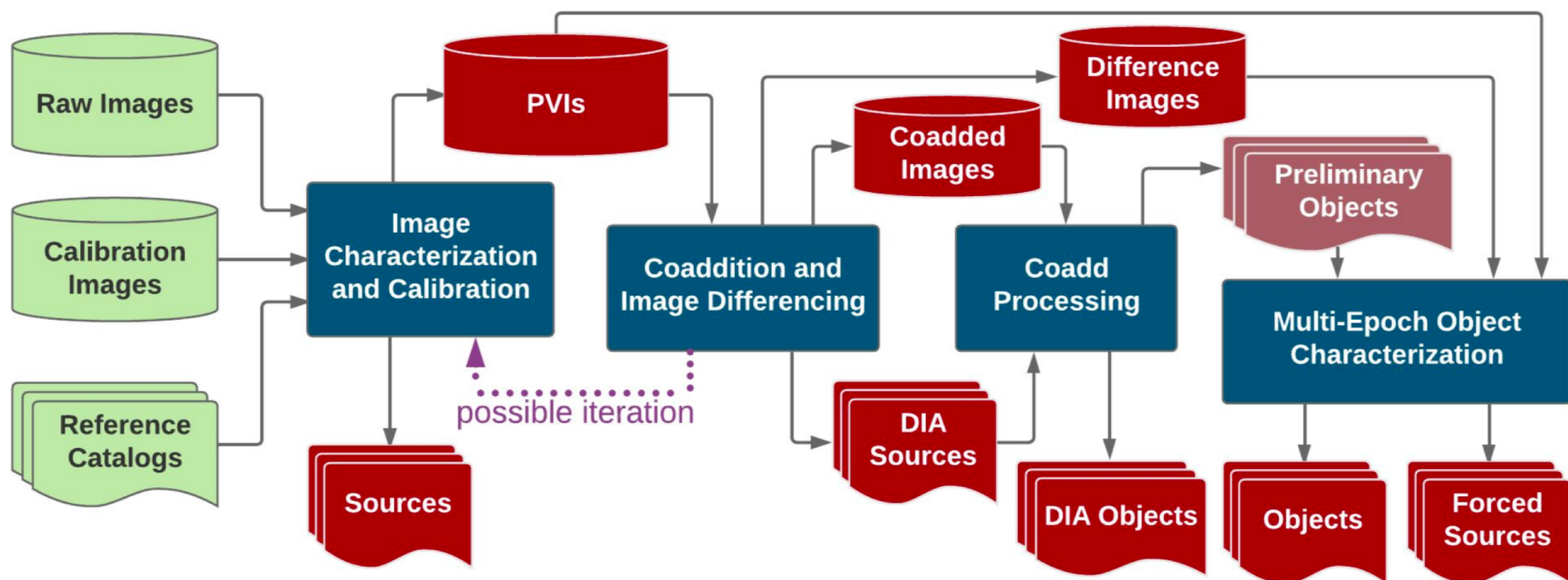
LSST SCIENCE PIPELINE

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Application Layer - framework-based pipelines process raw data to products



DATA RELEASE OVERVIEW



DM code and organisation

- C++, embedded with python
- DM group with a plan to have release ready for day 1 (in 2022)
- Open software, but not open development team (changing)
- LSST software will provide algorithm, pipeline framework, access to data, visualisation ...
- Code use as the standard code for HSC image reduction/analysis
- Code is ready to incorporate many cameras
- Weekly new version, usually
- Sparse documentation, specially for developers (not from the DM team), hard to explore the code (kind of reverse engineering)

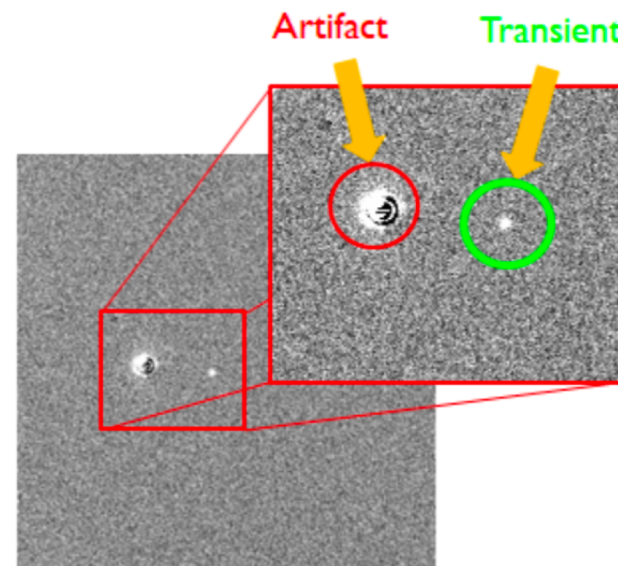
Stack steps to produce Lightcurves

- **Calexp** : Basic reduced calibrated images (ignore here full calib)
- **Coadd** : Coaddition : production of deep template image
- **Imdiff** : Image difference : difference between new Calexp and Coadd :
- **DIAsources** : measured on Imdiff (position a la sextractor)
- **ForcedphotDIAsource** : Forced photometry at position of DIAobject on difference image
- **Lightcurves from Diasources** : at detection level
- **Lightcurve from ForcedphotDiasources**
- **Lightcurve from scene modelling**

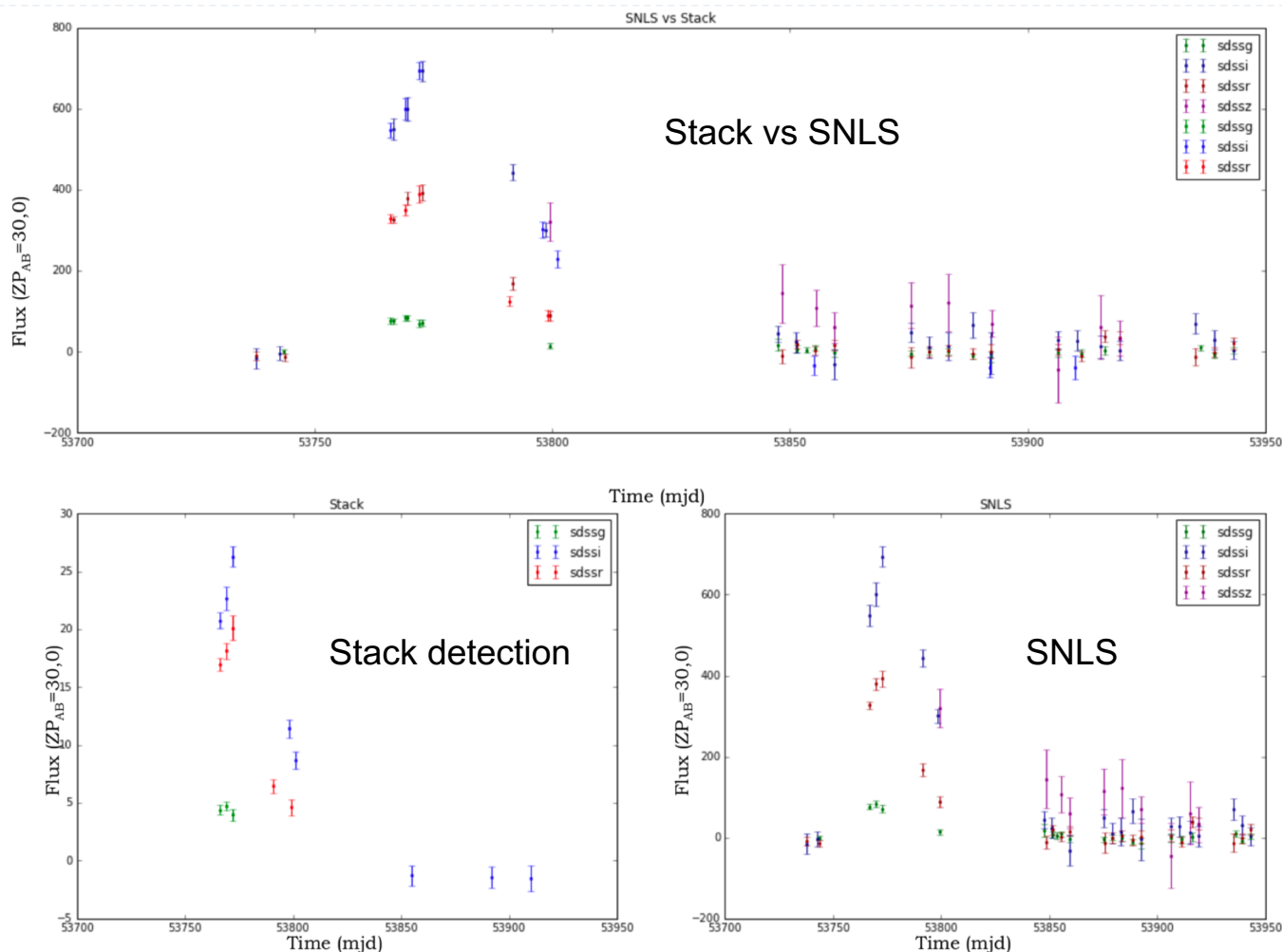
Stack steps to produce Lightcurves

- Color coding « readiness of stack » to « not yet ready » to may be not foreseen
- **Calexp** : Basic reduced calibrated images
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Image difference on CFHT image

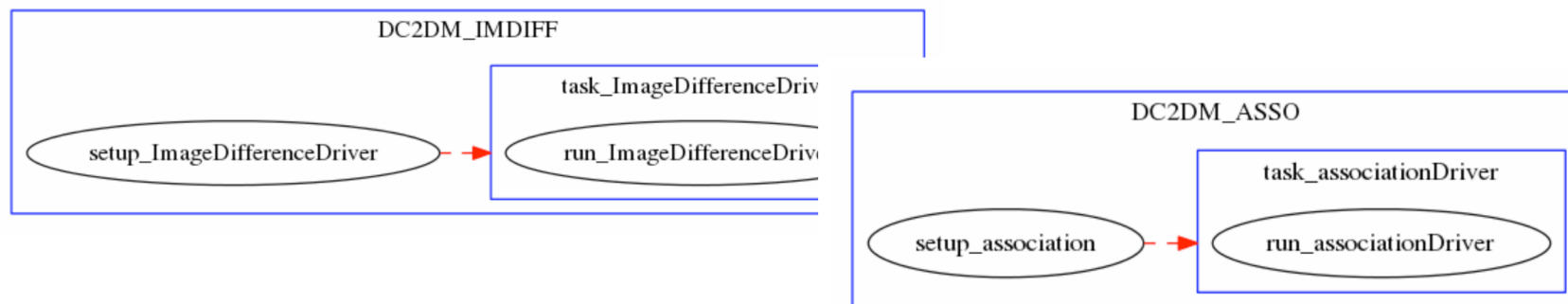
 $S(x,y)$  $R(x,y)$  $D(x,y)$

A example of comparison Stack detection vs SNLS scene modelling

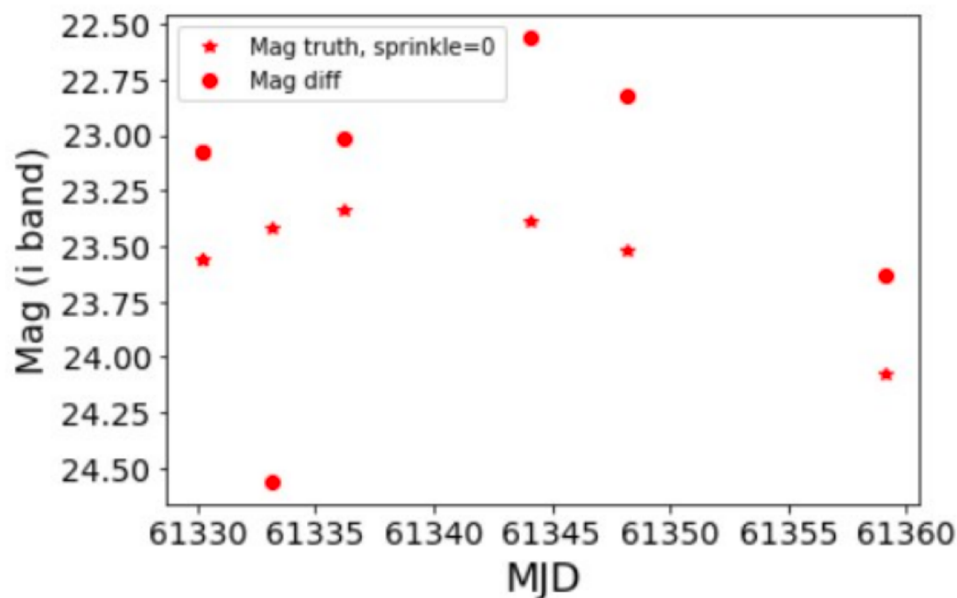


Difference Image Analysis pipeline

- Development using DESC DC2
- The DIA DM is not as mature as « static DRP » DM : we need to implement « missing » part : dia_pipe package repo
- The « SRS » pipeline has been set up to run the « DIA » processing, to produce the full DC2 production



A example of comparison Stack detection vs Truth on DC2



Tracking problem underway, pointing toward truth generation

Some pending Stack issues

- Careful checks of photometry
- forcephotdia vs scene modelling
- Quality/efficiency of detection
- Production speed
- Bogus detection
- ...