Data Release Production End to End Flow

Supporting documentation:

- LDM-151 has details on DRP algorithms.
- Data Release Production Overview
- Level 2 Calibrated Exposure Processing
- SUIT design

02C.07.01.03 Pipeline Control and Infrastructure

- Determine data to process
    - per sky tract?
- Submit jobs to orchestration system
    - All visits can be generated in parallel
    - Then visits can be warped to tract WCS in parallel (some visits in multiple tracts)

02C.04.03 PSF Estimation Pipeline

PSF varies spatially and with source brightness.

- Decompose PSF into atmospheric and telescope/camera components.
- Estimate telescope/camera component using wavefront sensor and metrology.
- Estimate atmospheric component by using bright, isolated stars.

02C.04.04 Image Coaddition Pipeline

- Basic snap/visit processing (**02C.03.01**):
    - Instrument signature removal
    - Cosmic ray rejection
    - Basic PSF determination
    - Source extraction and basic WCS calibration
- Apply results of relative astrometric solution from Single Frame Pipeline
- Warp images to common coordinate system
- Co-add images, optionally with "background matching"

02C.04.05 Object Detection and Deblending

- Detect sources on co-adds
- De-blend

02C.04.06 Object Characterization Pipeline

- Associate CoaddSources with Level 1 catalog and single frame catalog
- Source characterization:
    - Single-epoch characterization
    - Multifit
    - Point source model fit
    - Bulge-disk model fit
    - Trailed model fit
    - Dipole model fit
    - Centroids
    - Adaptive moments
    - Petrosian and Kron fluxes
    - Aperture surface brightness
    - Resolved/unresolved object separation
    - Variability Characterization
- Forced photometry

02C.06.01.01 Catalogs, Alerts and Metadata
Databases used:

- Read:
    - Level 1 Catalog
    - External Catalogs

- Read/Write:
  - Catalogs from single frame processing
- Write (during DRP / Read by SUI):
  - Object catalog
  - Forced Sources catalog

02C.05.02 Data Analysis and Visualization Tools

- Display and plot catalog from single visit
- Display cutout of deep coadd and associated catalog overlay.
- Display time-series for a selected source
- View alert history for selected source including annotations.
- Send complex query to object catalog and display results
- Obtain provenance information for an Object (visits included, data release number, software versions used, associated alerts)
- Create DOI for query

Relevant Key Performance Metrics

⚠ DLP-290 - Jira project doesn't exist or you don't have permission to view it.

⚠ DLP-308 - Jira project doesn't exist or you don't have permission to view it.

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