

ODI Data Pipelines.

Some words of wisdom.



ODI Science Requirement Document

- **Instrument pipeline:** Overscan, flat field, world coordinate system.
- Finished by ~12pm after last observing night (visitor mode!).
- Master calibration files created at afternoon:
 - Dome flats, bias.
 - Super sky flat from WIYN repository.
- Shortcoming:
 - No master calibration files from actual science data!
 - Some reprocessing required after observing runs.
 - Pipeline operations might be overwhelming for observer.

ODI Pipe Dreams

- **Tier 0**

Quick look analysis for observers and time-domain programs: very basic analysis done on site on local machines.

- **Tier 1**

End-of-run, removal of instrument signatures and crude spectrometric and photometric calibrations on individual images. Updated master calibration products.

- **Tier 2**

Image stacking, high-accuracy astrometric and photometric solutions, psf re-sampling, cosmic ray removal, fringing correction.

- **Tier 3**

Fine-tuning on stacking (e.g specific selections of images) and production of catalogs.

ODI Pipe Dreams

- **Tier 0**

Quick look analysis for observers and time-domain programs: very basic analysis done on site on local machines.

ODI Instrument Project

- **Tier 1**

End-of-run, removal of instrument signatures and crude spectrometric and photometric calibrations on individual images. Updated master calibration products.

Expanded Operations

- **Tier 2**

Image stacking, high-accuracy astrometric and photometric solutions, psf re-sampling, cosmic ray removal, fringing correction.

- **Tier 3**

Fine-tuning on stacking (e.g specific selections of images) and production of catalogs.

Beyond the instrument project.

Tier 0 Implementation

- **Part of the ODI instrument plan.**
- Within the ODI software framework.
 - Crude master calibration file creation.
 - Flexibility of architecture allows definition of workflows.
 - Ability to reprocess data.
- **Fast!**

Tier 1 Implementation

- Undefined area. Dependent on ODI operational model.
 - Expand ODI data acquisition architecture.
- Modify PanSTARRS Image Processing Pipeline for ODI:
 - Designed to be distributable to PanSTARRS PS1 partners.
 - Closest to ODI needs.
 - Carries CFHT Megacam knowledge/legacy.
 - Interface on fits-file level.
 - ODI & PanSTARRS have same data format.
 - Further synergy benefits. Share existing code. Concentrate on recipes.
 - Operated by WIYN/ODI personnel.
- Preferred Solution.

Tier 2+3 Implementation

- Conceptual/idea level at this time only!
- **Science case dependent.**
- Operate & develop Tier 2+3 pipeline at Indiana University
 - Run on existing super computers and data storage systems.
 - Reduction based on PanSTARRS IPP pipeline.
 - Synergy between PanSTARRS, ODI Tier 1, and ODI Tier 2+3.

In this review:

- Concentrate on Tier 0 only.