

Characterisation Measurements for 11.0 (Summer 2015)

Starting from Summer 2015, administrative ("cycle") releases are accompanied by a measurements report characterising the current performance. Metrics included in these reports are expected to increase in number and sophistication at subsequent releases. This brief report describe measurements of interest that were carried out.

Summary of Photometric Repeatability Measurements

Submitted by [Jim Bosch](#)

This dataset is a selection of i-band HyperSuprime-Cam engineering data taken in the SDSS Stripe 82 region. This dataset consists of 30s exposures, so it is somewhat similar to projected LSST data in depth. Our current calibration approach has many limitations relative to what we ultimately plan to implement for LSST:

- There's currently no relative calibration being run at all.
- We have only limited correction for chromatic effects.
- There's currently no allowance for zeropoint variations smaller than the scale of a CCD
- We also use a much simpler sample selection than that proposed by the SRD

Annotated code to compute the metrics can be found at <https://github.com/lst/afw/blob/tickets/DM-3896/examples/repeatability.ipynb>.

| Metric Characterised | Metric Ref | Target | Measured Value | Measurement Method |
|--|-------------------------|---------|----------------|---|
| Photometric repeatability (procCalRep) | DLP-307 | 13 mmag | 10.6 mmag | DM-3338 (using i band data) |
| Photometric repeatability (PA1gri) | DLP-315 | 13 mmag | 10.6 mmag | DM-3338 |
| Photometric repeatability (PA1uzy) | DLP-316 | 13 mmag | 10.6 mmag | DM-3338 (using i band data) |

Summary of Algorithmic Performance Measurements

Submitted by [John Swinbank](#)

The i-band HSC engineering data (described above) was used where possible and the same caveats apply. Consult the tickets in the Measurement Method column for more details.

| Metric Characterised | Metric Ref | Target | Measured Value | Measurement Method |
|---|-------------------------|----------|----------------|-------------------------|
| Residual PSF Ellipticity Correlations (TE1) | DLP-290 | 5e-3 | 6e-5 | DM-3040 |
| Residual PSF Ellipticity Correlations (TE2) | DLP-290 | 5e-3 | 2e-5 | DM-3047 |
| Relative Astrometry (AM1) | DLP-310 | < 60 mas | 12.49 mas | DM-3057 |
| Relative Astrometry (AM2) | DLP-311 | < 60 mas | 12.19 mas | DM-3064 |

Summary of Computational Performance Measurements

Submitted by [John Swinbank](#) and [Simon Krughoff](#)

At this point of Construction, the computational performance measurements are a combination of precursor data processing and extrapolation from R&D assumptions.

DECam/HITS data was used for the OTT1 estimate and for the diffim and single-frame measurement of the Alert Production Computational Budget in combination with data from the [3rd Data Challenge](#).

For the Data Release Production of the computational budget, we used DECam/HITS data for estimating diffim performance, HSC-I for assembling and measuring coadds and for forced measurement, estimates from FDR for multifit, and data from the 3rd Data Challenge for SDQA. Calculations for the DRP computational budget used [this iPython notebook](#)

| Metric Characterised | Metric Ref | Target | Measured Value | Measurement Method |
|--------------------------|-------------------------|------------|----------------|-------------------------|
| OTT1 | DLP-328 | 240 sec | 200-250 sec | DM-3724 |
| AP Computational Budget | DLP-329 | 231 TFLOPS | 34-39 TFLOPS | DM-3267 |
| DRP Computational Budget | DLP-314 | 645 TFLOPS | 318 TFLOPS | DM-3083 |

