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This document presents work package progress by CASU during Q2 2006.
For further details of group activities over the past month and quarter see
http://www.ast.cam.ac.uk/vdfs/diary.html. For the minutes of all group meetings see
http://www.ast.cam.ac.uk/vdfs/docs/minutes

WFCAM pipeline

Persistence: We released a report on persistence: see
http://www.ast.cam.ac.uk/~wfcam/docs/reports/persistence/. Even with a complicated
model, it is not clear that an accurate correction for persistence can be made since it
doesn't seem to be repeatable. The size of a persistent image can vary by 50 counts
even though the observing parameters (filter, chip, magnitude, sky level, delta-t,
exposure time, detector temperature) are the same. The error of a correction with the
current understanding would be of order the size of the correction. For JHK frames,
persistence does not seem to be a large and significant problem, even for non-
interleaved data. If data is interleaved and stacked then the effect is reduced further.
For Z and Y frames, where the level of persistence is high, the sky noise level is low
and no interleaving is carried out, the number of detected images caused by
persistence will be higher.

Although it is recommended that no correction for persistence be carried out, a
possibility is to flag catalogue entries that might be caused or affected by persistence
cf. 2MASS.

Reprocessing 05A: this was completed as planned by the end of May in plenty of time
to encounter the new challenges presented by the 06A data. The updated WFCAM
calibration is using a restricted 2MASS J-Ks colour range of 0 < J-Ks < 1 to help
exclude late-type giants, weird objects and heavily reddened stars was used. The new
version also includes information regarding the photometric quality of the night and
of the individual fits.

Reprocessing 05B: 6 nights have been reprocessed using the latest sky subtraction
algorithm. These mainly concerned UDS processing. Most of these were transferred
directly to the UDS group for inclusion in DR1. All of 05B will be recalibrated when
the Y- and Z-band upgrade is finished.

Raw WFCAM archives: all of the relevant raw WFCAM 05A and 05B (ie. UKIDSS +
calibration data) internet transfers to ESO are complete. The raw WFCAM data
archive for 06A is up to date and is lagging about 2-3 weeks behind the observations
being taken. Transfer to ESO of 06A data are complete up to 12th June.

Progress with 06A: processing is now back on track. There was an initial blockage
caused by the (new) presence of a seriously large number of randomly missing
component files and also the unexpected random appearance of files with null data

values in them. This required a complete re-write and robustification of the front-end of the pipeline. None of the data is yet flagged for transfer due to: (1) the DR1 sprint, (2) a desire at our end to get the UKlight connection up and running first to save money, (3) and also because of some further planned changes to the Y and Z calibration. These need a bit more work to incorporate the effects of Galactic extinction.

Photometric Calibration: For the JHK filters extensive tests on the current calibration and colour equations suggest they are well within spec and should probably be left well alone. Z- and Y-bands are still under investigation with external sequences (tricky in the case of Y).

Non-linearity update: Our analysis of the recently taken dome flats have revealed that WFCAM is (still) linear to better than 1% over almost the full range up to saturation. This agrees with analysis of previous dome flat sequences. Further on-sky tests using different exposure times for standard star fields also support the inference that WFCAM is essentially linear up to saturation. We note that this still does not account for the slight non-linearity apparent in the 2MASS comparison. An updated report including the latest results will be presented at the UKIDSS meeting.

UKIDSS EDR and DR1 papers: CASU contributed some more updates to the EDR and some text for the DR1 paper.

Problems: There still appear to be some problems related to deep stacking and cataloguing and there were also a few rather belated complaints about sky subtraction problems in some of the UDS data. Workarounds for all of these have been implemented. However, the upgraded pipeline catalogue generator still does not have the all-clear, as some of us are still not satisfied with its performance.

UKIRT board meeting

A UKIRT Board meeting was held at the University of Hertfordshire. MJI wrote a report that was included in the Board papers and gave a presentation of CASU progress on WFCAM data processing. Mike Reid and Steve Warren were also present at the meeting. The main debating points were: calibration and the release of WFCAM PI data.

VISTA

VIRCAM DRL: Progress on the VIRCAM Data Reduction Library is on schedule. Version 0.3 was successfully tested at ESO at the end of June as part of their end-to-end testing of the full VDFS. As part of our internal testing procedure, fake data are being generated to run through the pipeline to simulate different observing modes. Bugs are being fixed as they are found. There is also a full suite of test recipes that can be used to stress-test individual data reduction modules. The DRLD is being updated as changes are made to the software. The latest version was sent to ESO along with the v0.3 of the DRL.

VISTA public survey proposals: JRL attended the PSP meeting in Edinburgh.

ETC: PSB recently digitised the graphs for transmission and reflectance of various optical components in the light path. These are now available as tables in a suitable form for delivery to ESO. He also wrote a short document describing the data and the process.

AIT: PSB visited the RAL AIT test facility for a full day and morning during spot-projector tests. Working with the AIT team, we obtained a significant quantity of useful test data, including linearity (leading to bad-pixel mapping), spot data (FIQ, persistence and crosstalk), gain and readout noise data. This is being analysed alongside some earlier data provided by GD, which contained a large number of useful darks. All data had the full current set of FITS headers (simulated TCS).