

# UKIDSS Implementation Meeting

## 09/06/04 Cambridge

### ***Present:***

Paul Hirst (PH)  
Jim Lewis (JRL)  
Steve Warren (SJW)  
Simon Hodgkin (STH)  
Simon Dye (SD)  
Mike Irwin (MJI)

### ***WFCAM update*** (PH)

- Corrector plate delivered by AMOS with 90nm rms tolerance, substantially larger than the 40nm spec.
- Problem with optics: PSF larger than expected, may be due to corrector plate. AMOS unable to improve spec.
- Arrays: Now cooling arrays using *all* thermal pins on back (previously used a number somewhere between all of them and min recommended). Also, as a possible safeguard against delamination, arrays are now not fitted fully into zif sockets. Small gap left between underside of array and socket, but leaving good length of pin for socket to grip.
- One array has a channel with suppressed output.
- Acceptance tests start 14/6/04 at ATC and last one week. If all OK, WFCAM arrives Hawaii late July.

### ***Commissioning/Characterisation/Verification Period***

- PH has not yet written document defining terminology and schedule of WFCAM's commissioning/characterisation/verification stages.
- (Re) Action:** PH to provide doc (on JAC web pages) defining terminology and schedule of WFCAM's commissioning/characterisation/verification stages.
- SJW clarified philosophy of science verification (SV). General agreement was made that areas of overlap with on sky characterisation (OSC) should not be covered by a separate science verification program. Agreement made to wait and see what survey heads decide they would like to use their 10hours SV time for. If nothing new is proposed that isn't already in OSC, then should absorb SV phase into OSC.
- It was decided that if the 10 SV hours is part of OSC then it is public domain data ie. experimenting with different strategies etc. whereas if it is the 1st part of the UKIDSS surveys, it is UKIDSS data.
- PH expressed dislike of term '*Science Verification*' since has specific meaning in Gemini terminology. Pending output from survey heads re. above point, if this stage is sufficiently distinct from OSC then rename SV stage.

### ***MSBs***

- Alastair Edge's (AE) DXS MSB principles propose randomised order of microstepping + offsetting within an MSB to minimise image persistence. MJI feels this is not needed, preferring MSBs which follow a fixed offset/microstep pattern with randomised starting points (ie. randomise starting positions of guide star on grid of points formed by autoguider CCD pixel corners)
- Action:** SD to relay this to AE + contact him for quantification of MSB 'macro stepping'.

Instruct AE to use WFCAM user's guide terminology. More concrete proposal now required from AE.

- If AE's 'macro step' is larger than about 15", then not efficient to do this within an MSB since offsets larger than ~15" are not 'fast' (ie. need full telescope slew for large offsets, rather than just chopping of secondary mirror).

**Action:** SJW to check with Martin Folger about brightness selection criteria of guide stars in SDT.

**Action:** SD to contact Omar Almaini: are UDS MSBs likely to be same as DXS?

- GPS MSB principles from Phil Lucas include possibility of observing offset skies regularly within an MSB to measure a rapidly varying fringe structure. If this variation is slow, then Phil's proposal is to use the ~hourly calibration observations for measuring fringe structure. MJI not in favour of this, preferring offset skies for this purpose. Initial GPS should therefore include one set of offset skies per hourly MSB. Standard star obs will probably be enough to monitor fringing levels but this should not be relied on until on-sky characterisation complete. For standard observations, MJI prefers one pointing sequence per standard star (eg. a 2x2 interleave or 2 dithers and a 2x2 interleave). Thinks we should start with the latter (which is the "normal" observing mode) and use the same default 5s exposure time for each part of the sequence to minimise systematics (~40s total exposure for each filter). Revisit this issue and frequency of standard observations after some months of operation.
- Discussion between SJW and MJI+JRL about fringe pattern. SJW has previously found that amplitude of fringes is directly proportional to sky brightness. MJI+JRL have not found this. JRL+MJI suggested that fringe pattern obtained from GPS offset skies could probably be fit with a linear combination of eigen-modes of varying spatial frequency. The idea would then be to measure the amplitude of these modes from median filtered GPS data for fringe removal.
- SJW worried about no. tiles per MSB per filter. SJW not happy with reducing this number in LAS MSBs from 4 to 1 because hard to filter out objects for sky flat. MSB principle is that it should be reducible on its own.
- SJW inquired about MSB duration limits. If an MSB uses all of its OR folders and ends up being 80mins long, is this acceptable? PH: stated that in principle this is okay but consideration must be given to required frequency of calibration observations. SJW asked about variable int. time to allow for variable seeing and sky brightness: PH agreed with this in principle but see next point.
- Discussion regarding splitting LAS into two separate areas, one allocated for poor weather conditions (bad seeing, high sky brightness, cirrus) and one for good conditions. Idea is that area for poor conditions has MSBs with fewer tiles, but longer integration per tile to reach required survey depth. In this way the poor weather MSBs have same duration as those in good weather area to keep calibration observations frequent. Proposal was to define area at top of LAS (high dec) for poor conditions and good area at bottom of LAS. Each of these areas would be represented as two separate projects, LAS1 & LAS2 in the OMP. Size of these areas depends on distribution of sky brightness values, PSF sizes and cloud conditions as well as the criteria used to define bad weather. If weather doesn't adhere to expected distribution, then in order to ensure LAS1 fills at same rate as LAS2, need to either a) redefine LAS1 & LAS2 areas or b) change weather criteria. Option b) is easier since weather criteria can be set at the project level which applies to all MSBs removing need to modify site quality components in every MSB. Option a) requires redefining MSBs which could be done but probably only on longer timescale (ie. of about a year).

- Concerns were raised about brightness of sky in J at start of night. All 5 surveys use J. If MSBs are multi-filter, then the first ~2 hours every night will never satisfy sky brightness criteria set in MSB site quality component, hence no MSBs will ever be executed. To solve this problem, SJW proposed splitting MSBs into two filter combinations; those with Y&J and those with H&K, the former only being scheduled when the sky is sufficiently dark in Y&J. Would have to ensure that these two MSB types for a given tile location are observed with a night or two of each other. Also, there was some worry that the J sky brightness measures may include a significant (blue) twilight component. STH to investigate.

**Action:** STH to contact Andy Adamson (AA) for sky brightness data (ie. Variation in each JHK + z? With UT) + understand behaviour of sky brightness at twilight. Look at correlation between variation in diff passbands.

- SJW & PH agreed that LAS MSBs should have the 'thin cirrus' photometric quality component selected. Photometry will be estimated by summit pipeline (measures extinction of every observation to roughly 5% level using 2MASS photometry so frequency is of order minutes). Autoguider trace also gives rough (relative) level of extinction due to clouds. Extinction levels to be put into zones (ie. Quantify 'photometric', 'thin cirrus' etc with level of extinction) during on-sky characterisation. The TO during survey observation will then look at extinction from pipeline and put into scheduler for selection of MSBs. SJW in favour of defining 'thin cirrus' as <30% extinction.

### **OMP**

- OMP can already accommodate forum for fault finding/knowledge base.
- MJL suggested creation of web pages (@JAC) with info on stages and status of commissioning for UKIDSS users.

### **SV Data access**

- Discussion on how survey heads get access to processed 10hours worth of SV data. Issues raised: - FTP from WFA (capacity limitations? - set up password protected area at WFAU?), posting tape (available hardware for reading by survey heads?). Raw unprocessed data will be available from CASU if required - password needed for download. Processed data will prob be around 150Gb of data per 10hours.

**Action:** SD to check with survey heads that downloading 150Gb will not present a problem.

- Getting SV data from observation date to WFA will take about a month. Current status of WFA is to have running archive (updated daily) and release archive (updated with data releases).

**Action:** MJL to compare UFTI & WFCAM sensitivities to check consistency.

### **AOB**

**Action:** SD to contact survey heads for science verification MSBs.