is important to have a selection on **filterID**. The time term is a modified Julian date, which is found in the `Multiframe` table. Ordering by **mjdObs** puts the results in time order. The last 2 output terms are useful for determining how good the light curve is. The **ppErrBits** flag tells the user if the object has been flagged for potential poor photometry. The best match table flag is also useful: if **flag=1** then the object has been matched to two sources, suggesting eother motion or deblending; if **flag=2** then the lack of detection is probably due to the object being within a dither offset of the edge of the frame, and not a source that has taken a drastic dip in brightness.

If the band passes are correlated, so that a `SynopticSource` table is produced, then the following produces a similar light curve:

```
SELECT ml.meanMjdObs,e.kaperMag3,e.kaperMag3Err,
e.kppErrBits,x.flag
FROM xxxSourceXSynopticSourceBestMatch AS x,
xxxSynopticSource AS e,xxxSynopticMergeLog AS ml
WHERE x.sourceID=NNN AND x.synFrameSetID=
e.synFrameSetID AND x.synSeqNum=e.synSeqNum
AND e.synFrameSetID=ml.synFrameSetID ORDER BY
ml.meanMjdObs
```

For correlated bandpasses, light curves can be produced for several filters together:

```
SELECT ml.meanMjdObs,e.japerMag3,e.japerMag3Err,
e.jppErrBits,e.kaperMag3,e.kaperMag3Err,
e.kppErrBits,x.flag
FROM xxxSourceXSynopticSourceBestMatch AS x,
xxxSynopticSource AS e,xxxSynopticMergeLog AS ml
WHERE x.sourceID=NNNNNNNNNN AND x.synFrameSetID=
e.synFrameSetID AND x.synSeqNum=e.synSeqNum
AND e.synFrameSetID=ml.synFrameSetID
ORDER BY ml.meanMjdObs
```

APPENDIX B: OVERLAPS

B1 Describing overlaps

The overlaps between different pointings can be complicated, due to UKIRT using 4 non buttable detectors. With the typical overlapping there are 16 possibilities (not counting ones across a diagonal from each other). We found all these 16 possibilities (one along each side of each of the 4 detectors), see Fig B1, with an additional 2 arrangements where the pointings were not arranged as expected, see Fig B2.

To describe each of these overlaps, we need a consistent set of labels. We use the following descriptor: X1_X2_N, where X1 is the **extNum** of the first multiframe, X2 is the **extNum** of the second multiframe and N is a number describing which side of each detector is used. The **extNums** are not unique by themselves as can be seen in Fig B1. A further complication is that the x and y axes rotate by 90 degrees from detector to detector (see (Dye et al. 2006), Fig 1). A typical overlap lies along the full length of the x- or y- axis and the width of the overlap is typically 3% of the

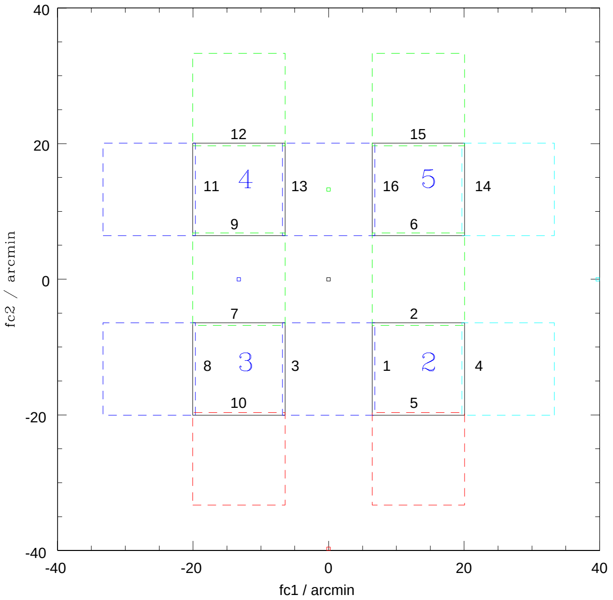

Figure B1. Typical arrangements of pointings in the DXS (and most WFCAM datasets). The black solid lines show the pointing in question. The blue, green, red and cyan dashed lines show the neighbours with large overlaps. The extension numbers are given in large blue numerals. Each overlap is numbered by a smaller black number. These numbers are the indices in Table B1.

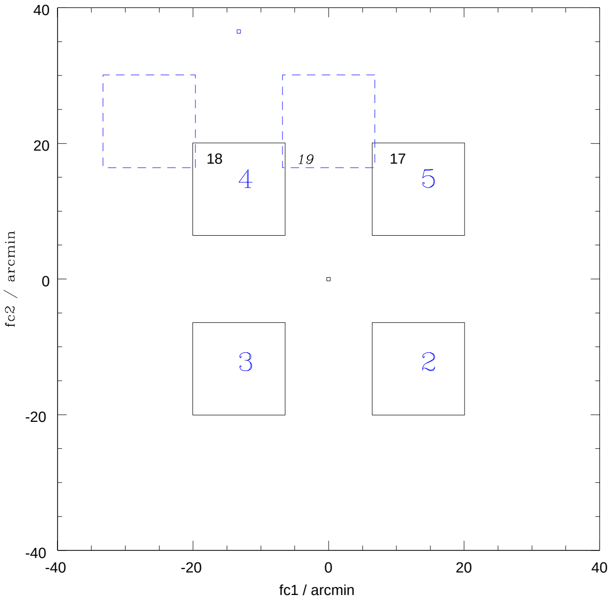

Figure B2. Non-typical arrangements of overlaps in the DXS. These occurred when guide stars were changed. See Fig B1 for details. *19* is an overlap where there were no J or K sources (with at least 20 good observations).

width of the detector, so the distribution of the sources between any two framesets can specify which overlap it is in. We find frameset pairs by looking for sources which are in two different deep stacks, i.e. **priOrSec**> 0 and then using the `dxsSourceNeighbours` table and `Source` table to find the framesets. We checked though all overlaps (except at corners where the number of sources is minimal). In each overlap, we calculate the mean and standard deviation of the x-coordinate and the mean and standard deviation of the y-coordinate for both multiframes. If the overlap is long along the y-axis and narrow along the x-axis and close to $x = 0$ then $< x >\sim 0.5w$, $\sigma(x) \sim 0.25w$, $< y >\sim 0.5l$, $< y >\sim 0.25l$ (w is the width of the overlap, typically 0.03 of the detector size l). We assign one of three values to each of the four coordinates (x1, y1, x2, y2). If the mean is close to the detector mid-point, then the value is 0, if it is close to 0, then the value is 1, and if it is close to the maximum, then the value is 2. We also make sure the standard deviation is high in the first case and low in the later cases. The descriptor N is therefore:

$$N = \sum_i a_i 3^{4-i} \tag{B1}$$

where a_i is the value of the i^th coordinate. So the overlap of extension 2, along the y-axis, at $x \sim 0$ with extension 5, along the x-axis at $y \sim 4000$ has $a_0 = 1$ ($< x1 >$: minimum), $a_1 = 0$ ($< y1 >$: midpoint), $a_2 = 0$ ($< x2 >$: midpoint), $a_3 = 2$ ($< y2 >$: maximum). The overlap is therefore 2_5_29. Table B1 describes all the overlaps in Figs B1 & B2. These overlaps all have mirror images (e.g. 2_2_11=2_2_19 and 2_5_55=5_2_15. We have always ordered them with the lowest extension number first.

Table B1. Overlaps in the DXS

Index	ID	No. J	No. K	Δ mag J	Δ mag K
1	2_2_11	13	13	-0.001 ± 0.003	0.000 ± 0.005
2	2_2_33	25	32	$\mathbf{0.011 \pm 0.002}$	0.009 ± 0.003
3	2_3_15	11	16	-0.005 ± 0.006	0.006 ± 0.003
4	2_3_21	24	62	0.001 ± 0.007	-0.003 ± 0.002
5	2_5_29	26	29	0.001 ± 0.003	-0.007 ± 0.002
6	2_5_55	58	45	0.004 ± 0.001	$\mathbf{0.010 \pm 0.002}$
7	3_3_11	26	33	-0.009 ± 0.002	$\mathbf{-0.017 \pm 0.002}$
8	3_3_33	21	28	$\mathbf{0.017 \pm 0.003}$	$\mathbf{0.025 \pm 0.003}$
9	3_4_15	44	62	0.007 ± 0.002	0.001 ± 0.001
10	3_4_21	11	23	$\mathbf{0.017 \pm 0.003}$	$\mathbf{-0.011 \pm 0.003}$
11	4_4_11	17	32	$\mathbf{-0.023 \pm 0.004}$	$\mathbf{-0.034 \pm 0.003}$
12	4_4_33	29	39	0.007 ± 0.002	$\mathbf{0.013 \pm 0.002}$
13	4_5_15	10	16	-0.006 ± 0.005	-0.003 ± 0.002
14	4_5_21	11	63	0.001 ± 0.004	0.003 ± 0.003
15	5_5_11	35	32	-0.005 ± 0.002	$\mathbf{-0.013 \pm 0.003}$
16	5_5_33	30	21	-0.001 ± 0.002	0.007 ± 0.004
17	2_5_24	4	2	$\mathbf{-0.037 \pm 0.007}$	0.003 ± 0.009
18	3_4_56	4	5	$\mathbf{-0.029 \pm 0.005}$	$\mathbf{-0.045 \pm 0.006}$
19	2_4_10	0	0	$---$	$---$

Table B2. Table of the overlaps in the DXS. This gives the number of J and K sources in the overlap regions, with at least 20 good observations per source. $\Delta\, J$ and $\Delta\, K$ represent the typical difference in magnitude across the offset. The bold numbers are offsets with $\Delta\, m > 0.01$ mag

B2 Offsets

To calculate the offsets between overlaps, we assume that each type of overlap will be affected in the same way, wherever in the survey it is, i.e. the 2_2_11 overlap between two observations in the ELIAS N1 region of the UKIDSS-DXS will have the same offset as the 2_2_11 overlap between two other observations in the ELIAS N1 region and the Lockman Hole region. Finally we select objects that have a magnitude $m_{limit}-7. < m < m_{limit-3.}$ where m_{limit} is the J or K-band limit in the `VarFrameSetInfo` table, see § 4.2. The brighter limit should reduce effects of saturation and the fainter limit should remove very noisy objects.

We calculate $\Delta\, mag$ very simply by finding the $3\sigma-$ clipped mean magnitude of each source from observations on one side of the overlap and subtracting the equivalent value on the other side. Some of these sources will vary in time and have different numbers of observations on each side, corresponding to when the observations were taken. However, these variations will be different for each source and just add some addition random error if there are enough sources in each overlap.

The offsets for each overlap are shown in Table B1.

B2.1 Variations with position and magnitude.

In each overlap region we have looked for variation with position or magnitude. We look at the coordinate along the primary direction of the first extension (i.e. along the side of the detector) We have plotted a subset of the overlaps showing some with large offsets, some with small offsets in Figs B3 - Fig B6. The full set of plots can be found at ???. While we find some linear trends with position, there seems to be no noticeable variation with magnitude over the 4 magnitudes in question.

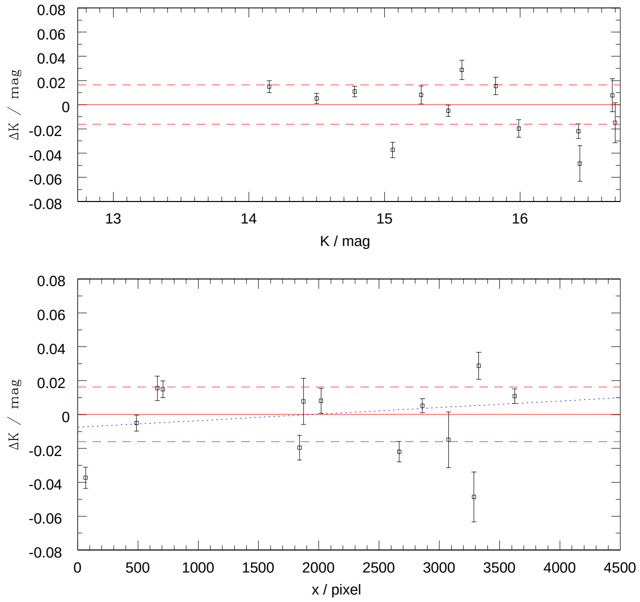

Figure B3. Relative photometry of the sources on either side of the K-band 2_2_11 overlap. The lower plot shows the variation with the position, and the upper plot shows variation with magnitude. The red solid line gives the mean offset and the red dashed lines give the $3 - sigma$ deviation from this offset. The blue dotted line gives the best fit linear variation with position. This overlap shows no significant offset and no significant trend with magnitude or position.

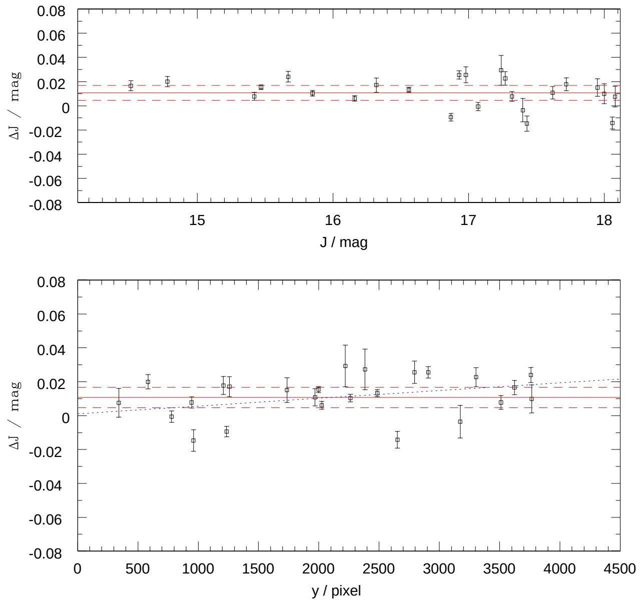

Figure B4. Relative photometry of the sources on either side of the J-band 2_2_33 overlap. See Fig B3 for details. This overlap shows a significant offset 0.011 ± 0.002 mag. There is no significant trend with magnitude or position.

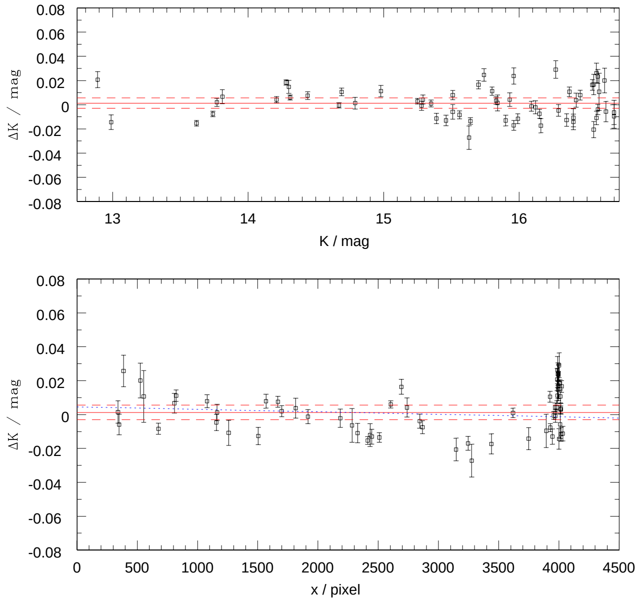

Figure B5. Relative photometry of the sources on either side of the K-band 3_4_15 overlap. See Fig B3 for details. This overlap between two different detectors shows no significant offset or trends.

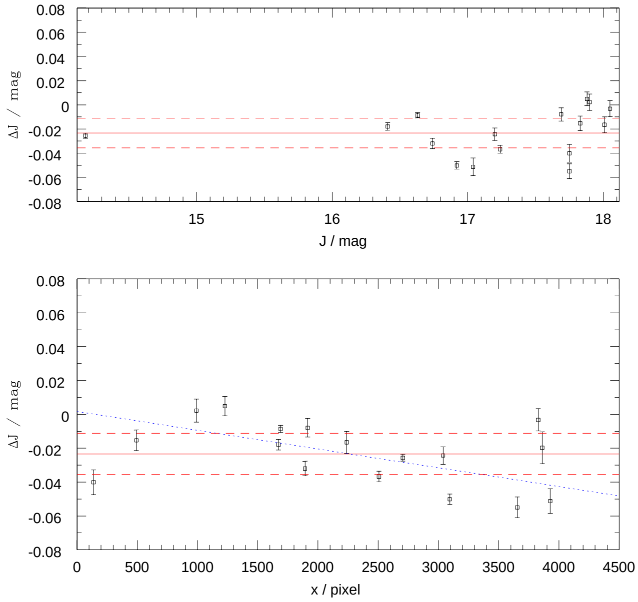

Figure B6. Relative photometry of the sources on either side of the J-band 4_4_11 overlap. See Fig B3 for details. There is a significant offset -0.023 ± 0.004 and a strong trend with position. Again there is no trend with magnitude.