VIKING (VISTA Kilo-degree Infrared Galaxy Survey): Imaging and Catalogue Data Release 4

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Alastair Edge and Will Sutherland, for the VIKING team

Abstract: The VIKING survey with VISTA (ESO programme ID 179.A-2004) is a wide area (covering a final area of 1350 sq.degrees), intermediate-depth (5-sigma detection limit J$\sim$21 on Vega system) near-infrared imaging survey, in the five broadband filters Z, Y, J, H, K_s.

The sky coverage is at high galactic latitudes, and includes two main stripes $\sim 70 \times 10^\circ$ each: one in the South Galactic cap near Dec$\sim -30^\circ$, and one near Dec$\sim 0^\circ$ in the North galactic cap; in addition, there are two smaller outrigger patches called GAMA09 and CFHLS-W1.

Science goals include z >6.5 quasars, extreme brown dwarfs, and multiwavelength coverage and identifications for a range of other imaging surveys, notably VST-KiDS and Herschel-ATLAS.

This fourth and final public data release of VIKING data covers all of the highest quality data taken in the survey to its completion. This release, when combined with the first three releases, VIKING DR1, DR2 and DR3, includes all fields that met our quality control thresholds in seeing ($< 1.3''$) and atmospheric transmission (thin cirrus or clearer). The majority of the data was generated using version 1.3 of the CASU processing pipeline that gives better tile grouting and zero point corrections than used in the DR1 in 2013. A small number of the fields required processing with the most recent version of the pipeline (V1.5) to improve the photometric calibration, galactic reddening corrections and improve the photometric reliability of the derived catalogs but the resulting images and catalogs are comparable between these two versions.

This release contains 935 tiles with coverage in all five VIKING filters, 891 of which have a deep co-add in J, and an additional 44 with at least two filters where the second OB was not executed or one filter in an OB was poor quality. These 935 fields cover a total of 1350 square degrees and the resulting catalogues include a total of 94,819,861 sources (including low-reliability single-band detections). The imaging and catalogues (both single-band and band-merged) total 0.67 TB in this release. The coverage in each of the five sub-areas is not completely contiguous but any inter-tile gaps are relatively small.

The VIKING survey finished observing new fields in P97 reaching a final survey area of the 1350 sq.deg.. This was slightly smaller than the design goal of 1500 sq.deg. as the original time allocation assumed lower observational time overheads that were actually encountered. Repeat observations in Periods 98, 99 and 100 of the poorest quality fields were performed to ensure that the data are as uniform as possible within this footprint. This final release includes data from the full survey area with additional area covered compared to FR3 plus a round of repeated observations of fields where one or more of the images in one or more of the filters did not meet our minimum data quality in terms of depth and/or seeing.

Overview/layout of observations

The basic unit of observations is the VISTA tile, made from combining six offset “pawprints” to fill in gaps between the individual detectors. All VIKING tiles are observed in the default (zero) rotator-sky angle; thus each tile covers a rectangle approximately 1.5 degrees in RA by 1.0 deg in Dec to full exposure.

Data Release 4 consists of a total of 935 tiles (1350 sq.deg): this is subdivided into 449 tiles in the Northern Galactic Equatorial Strip (NGP) that covers the GAMA09/12/14 regions, 480 tiles in the Southern Galactic Pole Strip (SGP), and 6 tiles in the CFHLS-W1 region. These comprise all of the data observed over the full VIKING survey, and have overlap with VST-KiDS, the GAMA redshift survey in GAMA09/12/14, the Herschel-ATLAS submm survey (in both GAMA09/12/14 and SGP), and medium-deep CFHT Legacy Survey visible data in W1. The current coverage is summarised in Figure 1 that plots the distribution of fields in DR4 with at least 3 filters.

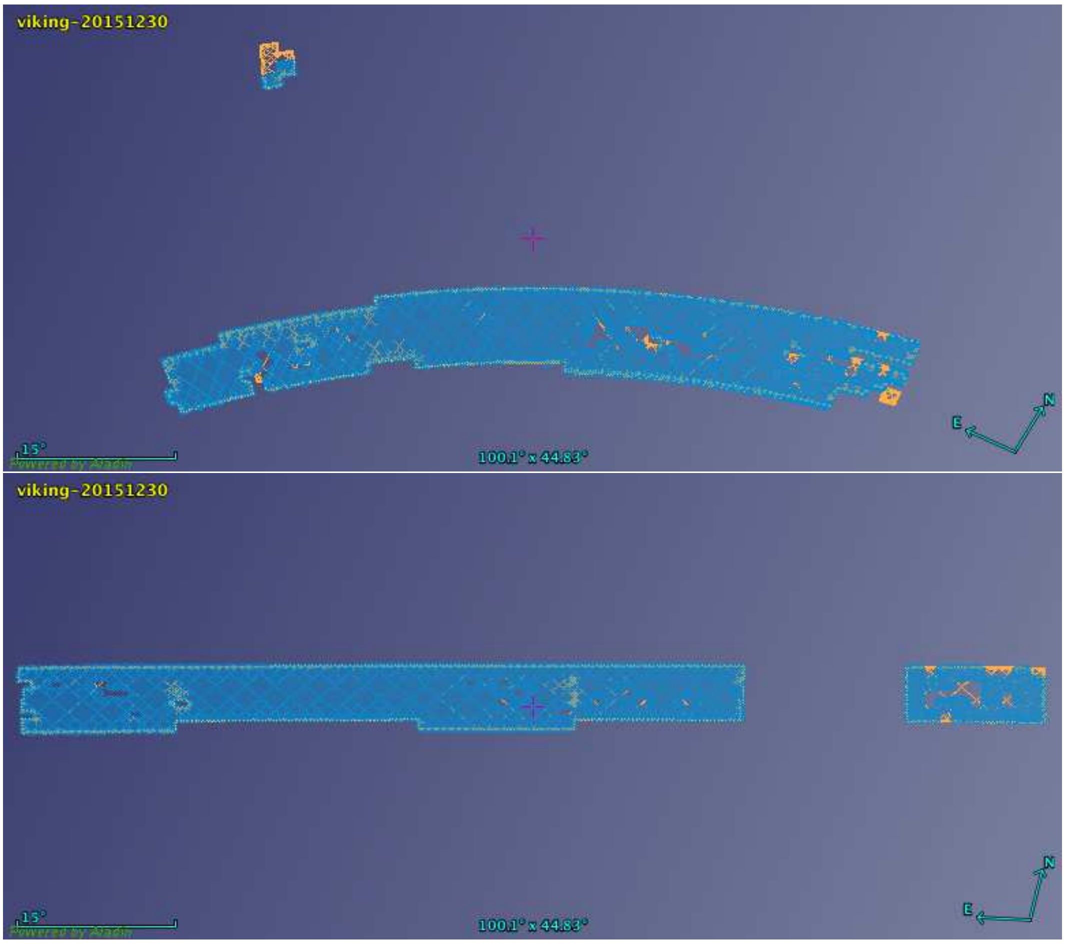

Figure 1: Sky coverage of the fields in the combination of all four VIKING releases. Top: fields in the South Galactic strip and small GAMA02 region; and Bottom: fields in the North Galactic strip. The fields with at least three filters are coloured orange and those with all filters coloured blue.

Release content

Exposure times per passband are as given in Table 2; note that exposure times per source are the median values (and correspond to pixels with value 100 in the associated confidence-maps); pixels in detector overlap regions receive more exposure, while pixels near the top and bottom in detector x-coordinate (North/South) receive half the median exposure.

Note that each tile was observed in two separate observing blocks (OBs) of approximately 70 minutes duration each: one for J, Y, Z filters, and the other for J, K_s, H; these are taken in either order, with the J exposure time divided between the two OBs. The time-span between the two blocks may be months and, in some cases, years; thus, the split J-band is intended to flag objects which may have moved or varied between the two blocks. Observations for band pairs Y/Z and K_s/H are in one OB, separated by a time-lag typically 25 minutes. The photometry from the two shallower J images is provided in this release so accurate variability studies or moving object selection can be performed through comparison of the two single epochs in J. In 891 of the 935 cases where two J-band images exist and both have the required image quality, we combined the images to create a deeper image refered to as J_deepimage. The J-band magnitudes determined in each of the two single visits are given in the catalogues as J_1 and J_2 in addition to the magnitude from the coadded data given as J. More details of the naming conventions used are given on Page 6.

Region	RA range	Dec range	Tiles
CFHTLS-W1	02h 16m to 02h 28m	-6.7 to -2.7 deg	6
SGP	22h 05m to 03h 45m	-36.0 to -27.0 deg	480
NGP	08h 34m to 15h 50m	-4.0 to +4.0 deg	449

Table 1: Approximate boundaries of sky coverage for the current release.

Filter	Integration/ tile	Integration/ source	Njitter	NDIT x DIT (sec)	Mag.lim (median)
Z	1440 sec	480 sec	4	1×60s	21.4
Y	1200 sec	400 sec	4	2×25s	20.6
J	2×600 sec	2×200 sec	2×2	2×25s	20.1
H	900 sec	300 sec	3	5×10s	19.0
K_s	1440 sec	480 sec	4	6×10s	18.6

Table 2: Integration times per tile, per source (median), number of jitter positions (per pawprint) and individual exposure lengths. Also shows median 10-sigma (Vega) magnitude limit for each passband.

The depth reached is not identical over all fields but none are more than 0.3mag shallower than the medians given in Table 2 as this was our quality threshold for depth. Likewise no field has a seeing worse than 1.2$''$ as this was the threshold set for image quality.

We have deprecated all fields with an ESO grade of C, R or X that are assigned to be incomplete or poor quality OBs by the telescope operator after execution.

All poor quality fields have been or will be reobserved until our thresholds have been met within the time allocation awarded to the survey by ESO.

Release Notes

Previous Releases: This release builds on from the VIKING band-merged catalog data release in DR3 (736 tiles) and includes 199 additional fields. A large fraction of the imaging data – 4184 science images in total – are released here for the first time. The three different versions of the CASU pipeline (V1.3, V1.3.1 and V1.5) were used depending on exactly when the fields were reduced in Cambridge. Note that 168 of the pre-P96 observations were reanalysed with the most recent version of the pipeline to be compatible with repeat observations made post-P96.

The data reduction follows the standard CASU infrared imaging pipeline from each individual tile image.

In brief, the reduction steps are as follows:

Reset correction: This occurs in the data acquisition system, i.e. a VISTA data frame is a difference of two non-destructive detector readouts separated by DIT seconds. Then, NDIT of these frames are co-added within the data acquisition system, before saving to hard disk.

Dark subtraction: using exposures with the dark filter inserted, matching the DIT values of the given science exposure.

Linearity correction: the VIRCAM detectors show non-linearity, typically a few percent at 10,000 ADUs. A correction polynomial (one per detector) is derived from a fit to observations of the dome screen with varying exposure times, and applied to the counts.

De-striping: this step removes a low-level horizontal striping intrinsic to the VIRCAM detector readout electronics, which is correlated across blocks of 4 detectors.

Flat-field correction: the frame is divided by a flat-field frame, derived from a set of twilight sky flats in the matching filter band.

Bad pixel rejection: Pixels showing substantial deviance from the linearity frames are masked as bad, and assigned zero weight in subsequent combinations.

Sky background correction: this removes large-scale background variation.

Jitter stacking: the set of individual jittered frames for one pawprint-filter combination are combined into a pawprint image, with bad-pixel rejection. These individual pawprint images in the J band are available in the data release (see below).

Photometric and astrometric calibration: This is based on matching with 2MASS stars (see details below).

Tiling: The six individual pawprint images for one filter are combined into a full tile image.

Grouting: When combining images into a full tile, there are non-negligible PSF variations, due mainly to seeing variations between the six individual pawprints, and also slight variation in image quality with off-axis distance. Different pairs of pawprints contribute to different regions in the tile, thus the aperture correction varies with position. A specific correction for this (aka "grouting") is applied to the photometry in the catalogues and is significantly improved in the latest version of the CASU pipeline.

Astrometric Calibration

The main astrometric calibration is based on 2MASS stars; there are typically 50 unsaturated 2MASS stars per VIRCAM detector, and astrometric transformations from detector coordinates to RA, Dec are derived from these. The typical rms is 0.15 arcsec per star per coordinate, which is dominated by photon noise in the 2MASS data.

External comparisons with UKIDSS and SDSS (in the GAMA09 region) show that the astrometry is good, with typical rms per coordinate around 0.09 arcsec and mean offsets below 0.03 arcsec. Small correlated residuals (generally between pawprints) are seen at the level of approx 0.05 arcsec; these may be improved in the future with the use of an astrometric solution based on Gaia data.

Photometric Calibration

Photometric calibration is also derived from 2MASS stars. A set of colour equations is used to predict VISTA native magnitudes from the observed 2MASS J,H,K_s colours; these are given by slight modifications of those for UKIDSS (see González-Fernández et al. 2018 MNRAS 474, 5459). The adopted VIKING colour terms are:

$$Z_V = J_{2M} + (0.86 \pm 0.08) \times (J_{2M} - Ks_{2M})$$
$$Y_V = J_{2M} + (0.46 \pm 0.02) \times (J_{2M} - Ks_{2M})$$
$$J_V = J_{2M} - (0.031 \pm 0.006) \times (J_{2M} - Ks_{2M})$$
$$H_V = H_{2M} + (0.015 \pm 0.005) \times (J_{2M} - Ks_{2M})$$
$$K_{sV} = K_{2M} - (0.006 \pm 0.007) \times (J_{2M} - Ks_{2M})$$

where in the above, subscript 2M denotes 2MASS and V denotes VISTA. The above equations give the predicted VISTA-system magnitudes of 2MASS stars, and comparing these to instrumental counts for these stars, a zeropoint is determined for each image (González-Fernández et al. 2018).

The *internal* photometric zeropoint stability, as deduced from repeated measurements of stars in overlapping regions of adjacent tiles, are stable to ∼0.03 mag rms.

Externally, comparison against UKIDSS measurements in the GAMA09 region shows good consistency in the H, K_s bands: the per-tile mean offset is close to zero, and tile-to-tile dispersion in the mean is typically 0.03 mag rms. For bluer bands, there are non-negligible mean zero point offsets, approximately 0.06 mag in J-band and 0.09 mag in the Y-band, both in the sense that VIKING magnitudes are brighter than UKIDSS for the same object. This is probably caused by a combination of two factors: the stellar locus in Y-J, J-K_s is slightly non-linear, and almost all the matching 2MASS stars are substantially later than A0 spectral type, so the extrapolation of the stellar locus using the above colour terms does not quite pass through (0,0).

As detailed in González-Fernández et al. (2018), the CASU photometric calibration has been compared to PanSTARRS photometry in Z and Y and can be corrected between with only small offsets (0.034±0.012 mag in Z and 0.003±0.009 mag in Y). Similar consistency between photometric calibration has been reported between HyperSuprimeCam and PanSTARRS data by Aihara et al. (2017), so while the reader is encouraged to confirm the relative photometry from VIKING to other data, the differences should be relatively small.

Star-galaxy classification

A star-galaxy classification parameter (ClassStat) is provided in the list files; this is intended to be approximately Gaussian N(0,1) for stellar objects, and extends to large positive values for galaxies. Also an integer-based paramter (Class) is provided that is derived from ClassStat and is intended to act as a "star or galaxy" classification. The band-merged catalogue file (_fsc_) contains also merged statistics based on a quasi-Bayesian combination of the single-band classifications.

In addition to the above, colour-based classification using near-infrared colours (especially including K_s band) can also provide an effective discriminant between stars and galaxies. For the current dataset, using the Z-J, J-K_s two-colour diagram appears to be the best choice (especially at faint magnitudes where the morphological classification becomes indecisive). This two-colour diagram shows a well-defined boomerang-shaped stellar locus, flattening off near J - K_s ∼0.80, and a large cloud of galaxies at redder J-K_s values, typically 1<J-K_s <2. (This behaviour is caused by a combination of several factors: late giant stars have redder J-K_s colours than dwarfs; galaxies can have internal extinction, while stars have minimal extinction in these high-latitude fields; and especially the 1.6 micron bump feature in the SED of late-type stars. Redshifting of the 1.6 micron bump towards the K_s filter causes galaxy J-K_s colours to shift redwards from z∼0 to z∼0.4, then flatten off above this).

Visible band (u, g, r, i) data is now available from the KiDS survey in their most recent DR4 release that includes VIKING photometry for each optical detection. So even better colour-based classification is now possible using for example the (g-i, J-K_s) two-colour diagram, as shown by Baldry et al (2010, MNRAS 404, 86).

Inspection of samples of "discrepant" objects, defined as those where the morphological and ZJK_s two-colour classifications disagree, shows the following general trends:

• The majority of "discrepant" objects arise from blending issues, e.g. close pairs of objects where the dominant component is a star, or objects affected by halos around bright stars.

• There are a small fraction of genuine blue galaxies close to the stellar colour locus, mostly bright low-z late-type galaxies.

• There are some quasars/AGNs appearing as stellar objects in the red cloud.

Merging of source catalogues

The released band-merged catalogues are created from the merger of single band catalogues also included in this release or in the previous one. This merging process involves the creation of a `vikingSource` table from the individual `vikingDetection` tables. The matching iterates through the catalogues for each band in turn (bluer to redder) and matches can include any combination of filters (one to five) depending on how many filters an object is detected in. The details of this process are described in the documentation on the Vista Science Archive (VSA) webpages (`http://horus.roe.ac.uk/vsa/dboverview.html`).

These tables are linked via reference ID numbers. The matching is done within a default radius of 2.0 arcsec and the selection between multiple potential matches can be made using the `priOrSec` (primary or secondary) flag. The PRIMARY_SOURCE flag has been added to provide an indication which one of the duplicates created in overlap regions between frames should be used. The user is advised to consult with the VSA documentation for more detail about these flags and the merging process.

Data files and conventions

The imaging data files have the following naming convention:

`viking_er5_HHhMM-DDDdMM_[tile/offN]_F_[type]_NNNNN.ext`

where HHhMM-DDDdMM labels RA/Dec of the pointing centre in hours/minutes of RA, and degrees/arcmins of Dec, `tile/offN` specifies if the image is of a full "tile" or one of the six constituent 'pawprints' in the coadded J images that are required to create a full "tile" `off0 - off5`, the filter `F` is one of `z, y, j, h or ks`, `type` is whether the file is a FITS image (`image`), confidence map (`conf`) or quicklook jpeg of each of these images (`jpeg`) and the final integer is a unique identifier assigned by the VSA to each image. For the J-band imaging, that comes in two visits, we release the single visit data (labelled as 'image') and the co-added data (labelled as 'deepimage') as well as the six individual pawprints that make up the full image tile.

The imaging files contain a header entry, PROCSOFT, that specifies the version of the CASU pipeline used, in this release `vircam version 1.3`.

The single band catalogue files have the following naming conventions:

`viking_er5_HHhMM-DDDdMM_tile_F_cat_NNNNNNN`

Meanings are as follows:

• HHhMM-DDDdMM labels RA/Dec of the pointing centre in hours/minutes of RA, and degrees/arcmins of Dec.

• F gives the filter observed for that observation with the addition of entries for each of the two visits in J, `j_1 and j_2`.

• The seven-digit integer NNNNNNN is a unique identifier assigned by the VSA to each single visit in the filter to that VIKING tile position. For the deep coadded J-band images an additional six-digit integer is added so all 'deepimage' files have a thirteen-digit integer at the end.

The band-merged catalogue files in this data release have the following naming conventions:

File names follow the general convention:

`viking_er5_HHhMM-DDDdMM_zyjhks_fsc_NNNNNNNNNNNNN`

Meanings are as follows:

• HHhMM-DDDdMM labels RA/Dec of the pointing centre in hours/minutes of RA, and degrees/arcmins of Dec.

• The thirteen-digit integer NNNNNNNNNNNNN is a unique identifier assigned by the VSA to each field.

Entries band-merged catalogues

The contents of the passband-merged catalogues are given by the **vikingSource** schema of the VSA database (http://horus.roe.ac.uk/vsa/www/VIKINGDR5/VIKINGDR5_TABLE_vikingSourceSchema.html).

The data release provided has an internal VSA identifier, VDFS_VIKINGv20181012, that is included in the catalogues in the header as PROCSOFT.

A summary of the most relevant parameters in the band-merged catalogue files is given below:

`ra, dec`:	RA, Dec in J2000 decimal degrees.
`l, b`:	Galactic coordinates, decimal degrees.
`zXi, zEta, yXi, yEta, etc`:	Source offsets from master position in each of the five bands Z, Y, Y, H, K_s; in arcsec East and North respectively.
`priOrSec`:	Integer flag for "primary" or "secondary" source. Objects with priOrSec = 0 are unique to this tile. Objects with priOrSec = frameSetID are "primary" objects on this tile, with a secondary detection on another tile. Objects with priOrSec>0 and priOrSec != framesetID are "secondary" objects with a "primary" detection on a different tile.
`zSeqNum, ySeqNum, etc`:	Sequence number, enabling matching this entry to the corresponding single-band detection.
`zmyPnt, ymjPnt, jmhPnt, hmksPnt`:	Respectively colours Z-Y, Y-J, J-H, H-K_s assuming a point source, from the corresponding AperMag3 values.
`zmyExt, ymjExt, jmhExt, hmksExt`:	Respectively colours Z-Y, Y-J, J-H, H-K_s assuming an extended source (using 2 arcsec aperture with no aperture correction).
`zAperMag3, zAperMag4, zAperMag6, zAperMagNoAperCorr3, zPetroMag, zSerMag, zPsfMag, etc`:	A subset of the various magnitude measures for all the single passbands, beginning with one of z,y,j,h,ks denoting passband. Here, a subset is given to reduce line length: of the many AperMagN values, only AperMag3,4,6 are given here, and the corresponding versions without aperture correction.
`zClass, zClassStat, etc`:	Respectively integer and real classification flag for each of the single bands.
`mergedClass, mergedClassStat`:	Band-merged integer and real classification, based on a quasi-Bayesian combination of the individual passbands. 1=galaxy, 0=noise,-1=stellar, -2=probableStar, -3=probableGalaxy and -9=saturated.
`pStar, pGalaxy`:	Probability that the object is stellar/galaxy, respectively.
`pNoise, pSaturated`:	Probability that the object is noise/saturated, respectively.
`zppErrBits, yppErrBits, etc`:	Integer error bits code for each of Z, Y, J, H, K_s bands. Value Zero = no warnings, 1-255 indicates "Warning" level, and any `ppErrBits` value >256 indicates potentially more serious problems.
`PRIMARY_SOURCE`	Integer flag to select between multiple entries in the catalogue. If the value is 1 then this is the 'primary' entry for the source, i.e. priOrSec=0 or priOrSec=frameSetID. If the value is 0 then that entry is a duplicated source, usually a source in an overlap region between fields or tiles.

We recommend that users should restrict their analysis to objects with `zppErrBits, yppErrBits, etc`<255 at all times and `zppErrBits`=0 if they require the most reliable subset of the sources. Values of `zppErrBits`=16 indicate that the source was deblended, `zppErrBits`=64 that at least one bad pixel was within the default aperture and `zppErrBits`=128 that the source was low confidence within the default aperture.

Catalogue and jpeg files have numbers NNNNNN matching the parent FITS image, while confidence maps have integer increased by 1 from the matching image. The extension `.ext` denotes file format, and is one of: .fits.fz (Rice-compressed FITS file).fits (uncompressed FITS file), or .jpg (JPEG image file).

Known problems

As noted in more detail above, there are likely to be modest zero-point offsets ($\approx$0.06 mag at J, $\approx$0.09 mag at Y-band) in the sense that VIKING magnitudes may be too bright. These appear relatively stable across tiles.

In the current release, the most common source of spurious images is associated with diffraction halos and filter-reflection ghosts around bright stars; these are localised around the parent star, and are easily recognised in the parent images. There are also occasional single-band linear features from artificial satellite trails, meteors or aircraft, which can cause a chain of spurious images. Most such spurious images do not match-up between passbands, therefore multi-band matched detections can be regarded as reliable (especially with 3 or more bands). Asteroids are very likely to appear as single band detections so we caution the reader that **all single-band**

detections should be treated as unreliable, unless verified by inspection of images and referenced against known Solar System object positions.

There are also "bad patches" on certain detectors, namely a large region on Detector#16 (South-East corner) which does not flat-field well, and a strip along an edge of detector#12 which likewise does not correct well and leads to occasional horizontal lines of spurious images.

Cross-talk between detector channels is essentially negligible.

Image persistence (latent images after a bright star lands on a pixel) is generally small, but not quite negligible: since VIRCAM has no shutter, very bright stars can occasionally cause curved "streaks" of persistence as they move in non-straight paths during telescope offsets.

There is a small number (<100) sources in the single band and band-merged catalogs that have very large (>100mag) errors due to them being close to the detection limit. These sources should be flagged manually and will be excluded in future releases. However, given they are so rare (<0.0006% of the band-merged sources) they should not be a major contaminant in any VIKING study.

Queries Questions concerning this data release should be addressed initially to alastair.edge@durham.ac.uk.

Acknowledgements Please use the following statement in any publication using these data: "This publication has made use of data from the VIKING survey from VISTA at the ESO Paranal Observatory, programme ID 179.A-2004. Data processing has been contributed by the VISTA Data Flow System at CASU, Cambridge and WFAU, Edinburgh".

Appendix 1: summary of all columns in the band-merged VIKING catalogue

Column Name	Type	Length (byte)	Unit	Description	Unified Content Descriptor
IAUNAME	string			IAU Name (not unique)	meta.id
sourceID	bigint	8		UID (unique over entire VSA via programme ID prefix) of this merged detection as assigned by merge algorithm	meta.id;meta.main
cuEventID	int	4		UID of curation event giving rise to this record	meta.bib
frameSetID	bigint	8		UID of the set of frames that this merged source comes from	meta.bib
ra	float	8	dg	Celestial Right Ascension	pos.eq.ra;meta.main
dec	float	8	deg	Celestial Declination	pos.eq.dec;meta.main
l	float	8	deg	Galactic longitude	pos.galactic.lon
b	float	8	deg	Galactic latitude	pos.galactic.lat
lambda	float	8	deg	SDSS system spherical co-ordinate 1	pos
eta	float	8	deg	SDSS system spherical co-ordinate 2	pos
priOrSec	bigint	8		Seam code for a unique (=0) or duplicated (!=0) source (eg. flags overlap duplicates).	meta.code
zmyPnt	real	4	mag	Point source colour Z-Y (using aperMag3)	phot.color;em.opt.I;em.IR.NIR
zmyPntErr	real	4	mag	Error on point source colour Z-Y	stat.error;em.opt.I;em.IR.NIR
ymjPnt	real	4	mag	Point source colour Y-J (using aperMag3)	phot.color;em.IR.NIR;em.IR.J
ymjPntErr	real	4	mag	Error on point source colour Y-J	stat.error;em.IR.NIR;em.IR.J
jmhPnt	real	4	mag	Point source colour J-H (using aperMag3)	phot.color;em.IR.J;em.IR.H
jmhPntErr	real	4	mag	Error on point source colour J-H	stat.error;em.IR.J;em.IR.H
hmksPnt	real	4	mag	Point source colour H-K_s (using aperMag3)	phot.color;em.IR.H;em.IR.K
hmksPntErr	real	4	mag	Error on point source colour H-K_s	stat.error;em.IR.H;em.IR.K
j_1mhPnt	real	4	mag	Point source colour J_1-H (using aperMag3)	phot.color;em.IR.J;em.IR.H
j_1mhPntErr	real	4	mag	Error on point source colour J_1-H	stat.error;em.IR.J;em.IR.H
ymj_2Pnt	real	4	mag	Point source colour Y-J_2 (using aperMag3)	phot.color;em.IR.NIR;em.IR.J
ymj_2PntErr	real	4	mag	Error on point source colour Y-J_2	stat.error;em.IR.NIR;em.IR.J
zmyExt	real	4	mag	Extended source colour Z-Y (using aperMagNoAperCorr3)	phot.color;em.opt.I;em.IR.NIR
zmyExtErr	real	4	mag	Error on extended source colour Z-Y	stat.error;em.opt.I;em.IR.NIR
ymjExt	real	4	mag	Extended source colour Y-J (using aperMagNoAperCorr3)	phot.color;em.IR.NIR;em.IR.J
ymjExtErr	real	4	mag	Error on extended source colour Y-J	stat.error;em.IR.NIR;em.IR.J
jmhExt	real	4	mag	Extended source colour J-H (using aperMagNoAperCorr3)	phot.color;em.IR.J;em.IR.H
jmhExtErr	real	4	mag	Error on extended source colour J-H	stat.error;em.IR.J;em.IR.H

hmksExt	real	4	mag	Extended source colour H-K$_s$ (using aperMagNoAperCorr3)	phot.color;em.IR.H;em.IR.K
hmksExtErr	real	4	mag	Error on extended source colour H-K$_s$	stat.error;em.IR.H;em.IR.K
j_1mhExt	real	4	mag	Extended source colour J_1-H (using aperMagNoAperCorr3)	phot.color;em.IR.J;em.IR.H
j_1mhExtErr	real	4	mag	Error on extended source colour J_1-H	stat.error;em.IR.J;em.IR.H
ymj_2Ext	real	4	mag	Extended source colour Y-J_2 (using aperMagNoAperCorr3)	phot.color;em.IR.NIR;em.IR.J
ymj_2ExtErr	real	4	mag	Error on extended source colour Y-J_2	stat.error;em.IR.NIR;em.IR.J
mergedClassStat	real	4		Merged N(0,1) stellarness-of-profile statistic	stat
mergedClass	smallint	2		Class flag from available measurements	meta.code
pStar	real	4		Probability that the source is a star	stat.probability
pGalaxy	real	4		Probability that the source is a galaxy	stat.probability
pNoise	real	4		Probability that the source is noise	stat.probability
pSaturated	real	4		Probability that the source is saturated	stat.probability
eBV	real	4		The galactic dust extinction value measured from the Schlegel, Finkbeiner & Davis (1998) maps. This uses the correction given in Bonifacio, Monai & Beers (2000). This correction reduces the extinction value in regions of high extinction (E(B-V)>0.1)	phys.absorption.gal
aZ	real	4	mag	The galactic extinction correction in the Z band for extragalactic objects	phys.absorption.gal
aY	real	4	mag	The galactic extinction correction in the Y band for extragalactic objects	phys.absorption.gal
aJ	real	4	mag	The galactic extinction correction in the J band for extragalactic objects	phys.absorption.gal
aH	real	4	mag	The galactic extinction correction in the H band for extragalactic objects	phys.absorption.gal
aKs	real	4	mag	The galactic extinction correction in the K$_s$ band for extragalactic objects	phys.absorption.gal

zMjd	float	8	days	Modified Julian Day in Z band	time.epoch
zPetroMag	real	4	mag	Extended source Z mag (Petrosian)	phot.mag;em.opt.I
zPetroMagErr	real	4	mag	Error in extended source Z mag (Petrosian)	stat.error;phot.mag;em.opt.I
zPsfMag	real	4	mag	Point source profile-fitted Z mag	phot.mag;em.opt.I
zPsfMagErr	real	4	mag	Error in point source profile-fitted Z mag	stat.error;phot.mag;em.opt.I
zSerMag2D	real	4	mag	Extended source Z mag (profile-fitted)	phot.mag;em.opt.I
zSerMag2DErr	real	4	mag	Error in extended source Z mag (profile-fitted)	stat.error;phot.mag;em.opt.I
zAperMag3	real	4	mag	Default point source Z aperture corrected mag (2.0 arcsec aperture diameter)	phot.mag;em.opt.I
zAperMag3Err	real	4	mag	Error in default point/extended source Z mag (2.0 arcsec aperture diameter)	stat.error;phot.mag;em.opt.I
zAperMag4	real	4	mag	Point source Z aperture corrected mag (2.8 arcsec aperture diameter)	phot.mag;em.opt.I
zAperMag4Err	real	4	mag	Error in point/extended source Z mag (2.8 arcsec aperture diameter)	stat.error;phot.mag;em.opt.I
zAperMag6	real	4	mag	Point source Z aperture corrected mag (5.7 arcsec aperture diameter)	phot.mag;em.opt.I
zAperMag6Err	real	4	mag	Error in point/extended source Z mag (5.7 arcsec aperture diameter)	stat.error;phot.mag;em.opt.I
zAperMagNoAperCorr3	real	4	mag	Default extended source Z aperture mag (2.0 arcsec aperture diameter)	phot.mag;em.opt.I
zAperMagNoAperCorr4	real	4	mag	Extended source Z aperture mag (2.8 arcsec aperture diameter)	phot.mag;em.opt.I
zAperMagNoAperCorr6	real	4	mag	Extended source Z aperture mag (5.7 arcsec aperture diameter)	phot.mag;em.opt.I
zHlCorSMjRadAs	real	4	arcsec	Seeing corrected half-light, semi-major axis in Z band	phys.angSize;em.opt.I
zGausig	real	4	pix	RMS of axes of ellipse fit in Z	src.morph.param;em.opt.I
zEll	real	4		1-b/a, where a/b=semi-major/minor axes in Z	src.ellipticity;em.opt.I
zPA	real	4	deg	ellipse fit celestial orientation in Z	pos.posAng;em.opt.I
zErrBits	int	4		processing warning/error bitwise flags in Z	meta.code;em.opt.I
zAverageConf	real	4		average confidence in 2 arcsec diameter default aperture Z	stat.likelihood;em.opt.I
zClass	smallint	2		discrete image classification flag in Z	src.class;em.opt.I
zClassStat	real	4		N(0,1) stellarness-of-profile statistic in Z	stat;em.opt.I
zppErrBits	int	4		additional WFAU post-processing error bits in Z	meta.code;em.opt.I
zSeqNum	int	4		the running number of the Z detection	meta.number;em.opt.I
zXi	real	4	arcsec	Offset of Z detection from master position (+east/-west)	pos.eq.ra;arith.diff;em.opt.I
zEta	real	4	arcsec	Offset of Z detection from master position (+north/-south)	pos.eq.dec;arith.diff;em.opt.I

yMjd	float	8	days	Modified Julian Day in Y band	time.epoch
yPetroMag	real	4	mag	Extended source Y mag (Petrosian)	phot.mag;em.IR.NIR
yPetroMagErr	real	4	mag	Error in extended source Y mag (Petrosian)	stat.error;phot.mag;em.IR.NIR
yPsfMag	real	4	mag	Point source profile-fitted Y mag	phot.mag;em.IR.NIR
yPsfMagErr	real	4	mag	Error in point source profile-fitted Y mag	stat.error;phot.mag;em.IR.NIR
ySerMag2D	real	4	mag	Extended source Y mag (profile-fitted)	phot.mag;em.IR.NIR
ySerMag2DErr	real	4	mag	Error in extended source Y mag (profile-fitted)	stat.error;phot.mag;em.IR.NIR
yAperMag3	real	4	mag	Default point source Y aperture corrected mag (2.0 arcsec aperture diameter)	phot.mag;em.IR.NIR
yAperMag3Err	real	4	mag	Error in default point/extended source Y mag (2.0 arcsec aperture diameter)	stat.error;phot.mag;em.IR.NIR
yAperMag4	real	4	mag	Point source Y aperture corrected mag (2.8 arcsec aperture diameter)	phot.mag;em.IR.NIR
yAperMag4Err	real	4	mag	Error in point/extended source Y mag (2.8 arcsec aperture diameter)	stat.error;phot.mag;em.IR.NIR
yAperMag6	real	4	mag	Point source Y aperture corrected mag (5.7 arcsec aperture diameter)	phot.mag;em.IR.NIR
yAperMag6Err	real	4	mag	Error in point/extended source Y mag (5.7 arcsec aperture diameter)	stat.error;phot.mag;em.IR.NIR
yAperMagNoAperCorr3	real	4	mag	Default extended source Y aperture mag (2.0 arcsec aperture diameter)	phot.mag;em.IR.NIR
yAperMagNoAperCorr4	real	4	mag	Extended source Y aperture mag (2.8 arcsec aperture diameter)	phot.mag;em.IR.NIR
yAperMagNoAperCorr6	real	4	mag	Extended source Y aperture mag (5.7 arcsec aperture diameter)	phot.mag;em.IR.NIR
yHlCorSMjRadAs	real	4	arcsec	Seeing corrected half-light, semi-major axis in Y band	phys.angSize;em.IR.NIR
yGausig	real	4	pix	RMS of axes of ellipse fit in Y	src.morph.param;em.IR.NIR
yEll	real	4		1-b/a, where a/b=semi-major/minor axes in Y	src.ellipticity;em.IR.NIR
yPA	real	4	deg	ellipse fit celestial orientation in Y	pos.posAng;em.IR.NIR
yErrBits	int	4		processing warning/error bitwise flags in Y	meta.code;em.IR.NIR
yAverageConf	real	4		average confidence in 2 arcsec diameter default aperture Y	stat.likelihood;em.IR.NIR
yClass	smallint	2		discrete image classification flag in Y	src.class;em.IR.NIR
yClassStat	real	4		N(0,1) stellarness-of-profile statistic in Y	stat;em.IR.NIR
yppErrBits	int	4		additional WFAU post-processing error bits in Y	meta.code;em.IR.NIR
ySeqNum	int	4		the running number of the Y detection	meta.number;em.IR.NIR
yXi	real	4	arcsec	Offset of Y detection from master position (+east/-west)	pos.eq.ra;arith.diff;em.IR.NIR
yEta	real	4	arcsec	Offset of Y detection from master position (+north/-south)	pos.eq.dec;arith.diff;em.IR.NIR

jMjd	float	8	days	Modified Julian Day of coadded J band	time.epoch
jPetroMag	real	4	mag	Extended source J mag (Petrosian)	phot.mag;em.IR.J
jPetroMagErr	real	4	mag	Error in extended source J mag (Petrosian)	stat.error;phot.mag;em.IR.J
jPsfMag	real	4	mag	Point source profile-fitted J mag	phot.mag;em.IR.J
jPsfMagErr	real	4	mag	Error in point source profile-fitted J mag	stat.error;phot.mag;em.IR.J
jSerMag2D	real	4	mag	Extended source J mag (profile-fitted)	phot.mag;em.IR.J
jSerMag2DErr	real	4	mag	Error in extended source J mag (profile-fitted)	stat.error;phot.mag;em.IR.J
jAperMag3	real	4	mag	Default point source J aperture corrected mag (2.0 arcsec aperture diameter)	phot.mag;em.IR.J
jAperMag3Err	real	4	mag	Error in default point/extended source J mag (2.0 arcsec aperture diameter)	stat.error;phot.mag;em.IR.J
jAperMag4	real	4	mag	Point source J aperture corrected mag (2.8 arcsec aperture diameter)	phot.mag;em.IR.J
jAperMag4Err	real	4	mag	Error in point/extended source J mag (2.8 arcsec aperture diameter)	stat.error;phot.mag;em.IR.J
jAperMag6	real	4	mag	Point source J aperture corrected mag (5.7 arcsec aperture diameter)	phot.mag;em.IR.J
jAperMag6Err	real	4	mag	Error in point/extended source J mag (5.7 arcsec aperture diameter)	stat.error;phot.mag;em.IR.J
jAperMagNoAperCorr3	real	4	mag	Default extended source J aperture mag (2.0 arcsec aperture diameter)	phot.mag;em.IR.J
jAperMagNoAperCorr4	real	4	mag	Extended source J aperture mag (2.8 arcsec aperture diameter)	phot.mag;em.IR.J
jAperMagNoAperCorr6	real	4	mag	Extended source J aperture mag (5.7 arcsec aperture diameter)	phot.mag;em.IR.J
jHlCorSMjRadAs	real	4	arcsec	Seeing corrected half-light, semi-major axis in J band	phys.angSize;em.IR.J
jGausig	real	4	pix	RMS of axes of ellipse fit in J	src.morph.param;em.IR.J
jEll	real	4		1-b/a, where a/b=semi-major/minor axes in J	src.ellipticity;em.IR.J
jPA	real	4	deg	ellipse fit celestial orientation in J	pos.posAng;em.IR.J
jErrBits	int	4		processing warning/error bitwise flags in J	meta.code;em.IR.J
jAverageConf	real	4		average confidence in 2 arcsec diameter default aperture J	stat.likelihood;em.IR.J
jClass	smallint	2		discrete image classification flag in J	src.class;em.IR.J
jClassStat	real	4		N(0,1) stellarness-of-profile statistic in J	stat;em.IR.J
jppErrBits	int	4		additional WFAU post-processing error bits in J	meta.code;em.IR.J
jSeqNum	int	4		the running number of the J detection	meta.number;em.IR.J
jXi	real	4	arcsec	Offset of J detection from master position (+east/-west)	pos.eq.ra;arith.diff;em.IR.J
jEta	real	4	arcsec	Offset of J detection from master position (+north/-south)	pos.eq.dec;arith.diff;em.IR.J

j_1Mjd	float	8	days	Modified Julian Day in J_1 band	time.epoch
j_1PetroMag	real	4	mag	Extended source J_1 mag (Petrosian)	phot.mag;em.IR.J
j_1PetroMagErr	real	4	mag	Error in extended source J_1 mag (Petrosian)	stat.error;phot.mag;em.IR.J
j_1PsfMag	real	4	mag	Point source profile-fitted J_1 mag	phot.mag;em.IR.J
j_1PsfMagErr	real	4	mag	Error in point source profile-fitted J_1 mag	stat.error;phot.mag;em.IR.J
j_1SerMag2D	real	4	mag	Extended source J_1 mag (profile-fitted)	phot.mag;em.IR.J
j_1SerMag2DErr	real	4	mag	Error in extended source J_1 mag (profile-fitted)	stat.error;phot.mag;em.IR.J
j_1AperMag3	real	4	mag	Default point source J_1 aperture corrected mag (2.0 arcsec aperture diameter)	phot.mag;em.IR.J
j_1AperMag3Err	real	4	mag	Error in default point/extended source J_1 mag (2.0 arcsec aperture diameter)	stat.error;phot.mag;em.IR.J
j_1AperMag4	real	4	mag	Point source J_1 aperture corrected mag (2.8 arcsec aperture diameter)	phot.mag;em.IR.J
j_1AperMag4Err	real	4	mag	Error in point/extended source J_1 mag (2.8 arcsec aperture diameter)	stat.error;phot.mag;em.IR.J
j_1AperMag6	real	4	mag	Point source J_1 aperture corrected mag (5.7 arcsec aperture diameter)	phot.mag;em.IR.J
j_1AperMag6Err	real	4	mag	Error in point/extended source J_1 mag (5.7 arcsec aperture diameter)	stat.error;phot.mag;em.IR.J
j_1AperMagNoAperCorr3	real	4	mag	Default extended source J_1 aperture mag (2.0 arcsec aperture diameter)	phot.mag;em.IR.J
j_1AperMagNoAperCorr4	real	4	mag	Extended source J_1 aperture mag (2.8 arcsec aperture diameter)	phot.mag;em.IR.J
j_1AperMagNoAperCorr6	real	4	mag	Extended source J_1 aperture mag (5.7 arcsec aperture diameter)	phot.mag;em.IR.J
j_1HlCorSMjRadAs	real	4	arcsec	Seeing corrected half-light, semi-major axis in J_1 band	phys.angSize;em.IR.J
j_1Gausig	real	4	pix	RMS of axes of ellipse fit in J_1	src.morph.param;em.IR.J
j_1Ell	real	4		1-b/a, where a/b=semi-major/minor axes in J_1	src.ellipticity;em.IR.J
j_1PA	real	4	deg	ellipse fit celestial orientation in J_1	pos.posAng;em.IR.J
j_1ErrBits	int	4		processing warning/error bitwise flags in J_1	meta.code;em.IR.J
j_1AverageConf	real	4		average confidence in 2 arcsec diameter default aperture J_1	stat.likelihood;em.IR.J
j_1Class	smallint	2		discrete image classification flag in J_1	src.class;em.IR.J
j_1ClassStat	real	4		N(0,1) stellarness-of-profile statistic in _1J	stat;em.IR.J
j_1ppErrBits	int	4		additional WFAU post-processing error bits in J_1	meta.code;em.IR.J
j_1SeqNum	int	4		the running number of the J_1 detection	meta.number;em.IR.J
j_1Xi	real	4	arcsec	Offset of J_1 detection from master position (+east/-west)	pos.eq.ra;arith.diff;em.IR.J
j_1Eta	real	4	arcsec	Offset of J_1 detection from master position (+north/-south)	pos.eq.dec;arith.diff;em.IR.J

j_2Mjd	float	8	days	Modified Julian Day in J_2 band	time.epoch
j_2PetroMag	real	4	mag	Extended source J_2 mag (Petrosian)	phot.mag;em.IR.J
j_2PetroMagErr	real	4	mag	Error in extended source J_2 mag (Petrosian)	stat.error;phot.mag;em.IR.J
j_2PsfMag	real	4	mag	Point source profile-fitted J_2 mag	phot.mag;em.IR.J
j_2PsfMagErr	real	4	mag	Error in point source profile-fitted J_2 mag	stat.error;phot.mag;em.IR.J
j_2SerMag2D	real	4	mag	Extended source J_2 mag (profile-fitted)	phot.mag;em.IR.J
j_2SerMag2DErr	real	4	mag	Error in extended source J_2 mag (profile-fitted)	stat.error;phot.mag;em.IR.J
j_2AperMag3	real	4	mag	Default point source J_2 aperture corrected mag (2.0 arcsec aperture diameter)	phot.mag;em.IR.J
j_2AperMag3Err	real	4	mag	Error in default point/extended source J_2 mag (2.0 arcsec aperture diameter)	stat.error;phot.mag;em.IR.J
j_2AperMag4	real	4	mag	Point source J_2 aperture corrected mag (2.8 arcsec aperture diameter)	phot.mag;em.IR.J
j_2AperMag4Err	real	4	mag	Error in point/extended source J_2 mag (2.8 arcsec aperture diameter)	stat.error;phot.mag;em.IR.J
j_2AperMag6	real	4	mag	Point source J_2 aperture corrected mag (5.7 arcsec aperture diameter)	phot.mag;em.IR.J
j_2AperMag6Err	real	4	mag	Error in point/extended source J_2 mag (5.7 arcsec aperture diameter)	stat.error;phot.mag;em.IR.J
j_2AperMagNoAperCorr3	real	4	mag	Default extended source J_2 aperture mag (2.0 arcsec aperture diameter)	phot.mag;em.IR.J
j_2AperMagNoAperCorr4	real	4	mag	Extended source J_2 aperture mag (2.8 arcsec aperture diameter)	phot.mag;em.IR.J
j_2AperMagNoAperCorr6	real	4	mag	Extended source J_2 aperture mag (5.7 arcsec aperture diameter)	phot.mag;em.IR.J
j_2HlCorSMjRadAs	real	4	arcsec	Seeing corrected half-light, semi-major axis in J_2 band	phys.angSize;em.IR.J
j_2Gausig	real	4	pix	RMS of axes of ellipse fit in J_2	src.morph.param;em.IR.J
j_2Ell	real	4		1-b/a, where a/b=semi-major/minor axes in J_2	src.ellipticity;em.IR.J
j_2PA	real	4	deg	ellipse fit celestial orientation in J_2	pos.posAng;em.IR.J
j_2ErrBits	int	4		processing warning/error bitwise flags in J_2	meta.code;em.IR.J
j_2AverageConf	real	4		average confidence in 2 arcsec diameter default aperture J_2	stat.likelihood;em.IR.J
j_2Class	smallint	2		discrete image classification flag in J_2	src.class;em.IR.J
j_2ClassStat	real	4		N(0,1) stellarness-of-profile statistic in _2J	stat;em.IR.J
j_2ppErrBits	int	4		additional WFAU post-processing error bits in J_2	meta.code;em.IR.J
j_2SeqNum	int	4		the running number of the J_2 detection	meta.number;em.IR.J
j_2Xi	real	4	arcsec	Offset of J_2 detection from master position (+east/-west)	pos.eq.ra;arith.diff;em.IR.J
j_2Eta	real	4	arcsec	Offset of J_2 detection from master position (+north/-south)	pos.eq.dec;arith.diff;em.IR.J

hMjd	float	8	days	Modified Julian Day in H band	time.epoch
hPetroMag	real	4	mag	Extended source H mag (Petrosian)	phot.mag;em.IR.H
hPetroMagErr	real	4	mag	Error in extended source H mag (Petrosian)	stat.error;phot.mag;em.IR.H
hPsfMag	real	4	mag	Point source profile-fitted H mag	phot.mag;em.IR.H
hPsfMagErr	real	4	mag	Error in point source profile-fitted H mag	stat.error;phot.mag;em.IR.H
hSerMag2D	real	4	mag	Extended source H mag (profile-fitted)	phot.mag;em.IR.H
hSerMag2DErr	real	4	mag	Error in extended source H mag (profile-fitted)	stat.error;phot.mag;em.IR.H
hAperMag3	real	4	mag	Default point source H aperture corrected mag (2.0 arcsec aperture diameter)	phot.mag;em.IR.H
hAperMag3Err	real	4	mag	Error in default point/extended source H mag (2.0 arcsec aperture diameter)	stat.error;phot.mag;em.IR.H
hAperMag4	real	4	mag	Point source H aperture corrected mag (2.8 arcsec aperture diameter)	phot.mag;em.IR.H
hAperMag4Err	real	4	mag	Error in point/extended source H mag (2.8 arcsec aperture diameter)	stat.error;phot.mag;em.IR.H
hAperMag6	real	4	mag	Point source H aperture corrected mag (5.7 arcsec aperture diameter)	phot.mag;em.IR.H
hAperMag6Err	real	4	mag	Error in point/extended source H mag (5.7 arcsec aperture diameter)	stat.error;phot.mag;em.IR.H
hAperMagNoAperCorr3	real	4	mag	Default extended source H aperture mag (2.0 arcsec aperture diameter)	phot.mag;em.IR.H
hAperMagNoAperCorr4	real	4	mag	Extended source H aperture mag (2.8 arcsec aperture diameter)	phot.mag;em.IR.H
hAperMagNoAperCorr6	real	4	mag	Extended source H aperture mag (5.7 arcsec aperture diameter)	phot.mag;em.IR.H
hHlCorSMjRadAs	real	4	arcsec	Seeing corrected half-light, semi-major axis in H band	phys.angSize;em.IR.H
hGausig	real	4	pix	RMS of axes of ellipse fit in H	src.morph.param;em.IR.H
hEll	real	4		1-b/a, where a/b=semi-major/minor axes in H	src.ellipticity;em.IR.H
hPA	real	4	deg	ellipse fit celestial orientation in H	pos.posAng;em.IR.H
hErrBits	int	4		processing warning/error bitwise flags in H	meta.code;em.IR.H
hAverageConf	real	4		average confidence in 2 arcsec diameter default aperture H	stat.likelihood;em.IR.H
hClass	smal	lint 2		discrete image classification flag in H	src.class;em.IR.H
hClassStat	real	4		N(0,1) stellarness-of-profile statistic in H	stat;em.IR.H
hppErrBits	int	4		additional WFAU post-processing error bits in H	meta.code;em.IR.H
hSeqNum	int	4		the running number of the H detection	meta.number;em.IR.H
hXi	real	4	arcsec	Offset of H detection from master position (+east/-west)	pos.eq.ra;arith.diff;em.IR.H
hEta	real	4	arcsec	Offset of H detection from master position (+north/-south)	pos.eq.dec;arith.diff;em.IR.H

ksMjd	float	8	days	Modified Julian Day in Ks band	time.epoch
ksPetroMag	real	4	mag	Extended source K_s mag (Petrosian)	phot.mag;em.IR.K
ksPetroMagErr	real	4	mag	Error in extended source K_s mag (Petrosian)	stat.error;phot.mag;em.IR.K
ksPsfMag	real	4	mag	Point source profile-fitted K_s mag	phot.mag;em.IR.K
ksPsfMagErr	real	4	mag	Error in point source profile-fitted K_s mag	stat.error;phot.mag;em.IR.K
ksSerMag2D	real	4	mag	Extended source K_s mag (profile-fitted)	phot.mag;em.IR.K
ksSerMag2DErr	real	4	mag	Error in extended source K_s mag (profile-fitted)	stat.error;phot.mag;em.IR.K
ksAperMag3	real	4	mag	Default point source K_s aperture corrected mag (2.0 arcsec aperture diameter)	phot.mag;em.IR.K
ksAperMag3Err	real	4	mag	Error in default point/extended source K_s mag (2.0 arcsec aperture diameter)	stat.error;phot.mag;em.IR.K
ksAperMag4	real	4	mag	Point source K_s aperture corrected mag (2.8 arcsec aperture diameter)	phot.mag;em.IR.K
ksAperMag4Err	real	4	mag	Error in point/extended source K_s mag (2.8 arcsec aperture diameter)	stat.error;phot.mag;em.IR.K
ksAperMag6	real	4	mag	Point source K_s aperture corrected mag (5.7 arcsec aperture diameter)	phot.mag;em.IR.K
ksAperMag6Err	real	4	mag	Error in point/extended source K_s mag (5.7 arcsec aperture diameter)	stat.error;phot.mag;em.IR.K
ksAperMagNoAperCorr3	real	4	mag	Default extended source K_s aperture mag (2.0 arcsec aperture diameter)	phot.mag;em.IR.K
ksAperMagNoAperCorr4	real	4	mag	Extended source K_s aperture mag (2.8 arcsec aperture diameter)	phot.mag;em.IR.K
ksAperMagNoAperCorr6	real	4	mag	Extended source K_s aperture mag (5.7 arcsec aperture diameter)	phot.mag;em.IR.K
ksHlCorSMjRadAs	real	4	arcsec	Seeing corrected half-light, semi-major axis in K_s band	phys.angSize;em.IR.K
ksGausig	real	4	pix	RMS of axes of ellipse fit in K_s	src.morph.param;em.IR.K
ksEll	real	4		1-b/a, where a/b=semi-major/minor axes in K_s	src.ellipticity;em.IR.K
ksPA	real	4	deg	ellipse fit celestial orientation in K_s	pos.posAng;em.IR.K
ksErrBits	int	4		processing warning/error bitwise flags in K_s	meta.code;em.IR.K
ksAverageConf	real	4		average confidence in 2 arcsec diameter default aperture K_s	stat.likelihood;em.IR.K
ksClass	smallint	2		discrete image classification flag in K_s	src.class;em.IR.K
ksClassStat	real	4		N(0,1) stellarness-of-profile statistic in K_s	stat;em.IR.K
ksppErrBits	int	4		additional WFAU post-processing error bits in K_s	meta.code;em.IR.K
ksSeqNum	int	4		the running number of the K_s detection	meta.number;em.IR.K
ksXi	real	4	arcsec	Offset of K_s detection from master position (+east/-west)	pos.eq.ra;arith.diff;em.IR.K
ksEta	real	4	arcsec	Offset of K_s detection from master position (+north/-south)	pos.eq.dec;arith.diff;em.IR.K
primary_source	smallint	2		to select between multiple entries in the catalogue	meta.code