

# The COSMOS2015 catalogue

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December 19, 2016

**Data Collection:** UltraVISTA  
**Release number** 2.1  
**Data provider:** Clotilde Laigle, Jim Dunlop  
**Date:** December 19, 2016

## 1 Abstract

This document describes the COSMOS2015 catalogue which contains precise photometric redshifts and stellar masses for more than half a million objects over the  $2 \text{ deg}^2$  COSMOS field. Including  $YJHK_s$  images from the UltraVISTA-DR2 survey,  $Y$ -band from Subaru/Hyper-Suprime-Cam and infrared data from SPLASH Spitzer legacy program, this near-infrared selected catalogue is highly optimised for the study of galaxy evolution and environments in the early Universe.

### 1.1 Acknowledging this catalogue

If you use this catalog, please cite the following paper: "The COSMOS2015 catalog: exploring the  $1 < z < 6$  universe with half a million galaxies" (Laigle et al. 2016, ApJS, 224, 24)

You must also include the following standard acknowledgement:

**"Based on data products from observations made with ESO Telescopes at the La Silla Paranal Observatory under ESO programme ID 179.A-2005 and on data products produced by TERAPIX and the Cambridge Astronomy Survey Unit on behalf of the UltraVISTA consortium."**

You are additionally encouraged to cite the papers representing the data included in the catalogue (such as McCracken et al. 2012 for UltraVISTA); see Laigle et al. (2016).

## 2 Context and changes with respect to the published catalogue

As stated in Laigle et al. (2016), the catalogue was initially made available via anonymous ftp<sup>1</sup>, with the aim of adding additional distribution channels, such as ESO’s Phase 3, which is what this document concerns. Since the catalogue includes photometry in  $YJHK_s$  from the UltraVISTA DR2 images, ESO has given this catalogue release a release number of 2.1 (i.e. DR2.1) in the UltraVISTA Phase 3 collection. This DR2.1 catalogue release supplements rather than supersedes the DR2 image release.

With respect to the catalogue made available via anonymous ftp, some noteworthy changes are:

- Some column names were changed: the dot in `FLUX_XMM_0.5_2`, `FLUX_CHANDRA_0.5_2` and `FLUX_CHANDRA_0.5_10` was removed, `OFFSET` was changed to `OFFSET_MAG`, and an underscore was inserted in the 11 absolute magnitude columns, now called `M_NUV`, `M_U`, `...`, `M_K`.
- The original catalogue used different real numbers to indicate bad or missing data; e.g. `-99.9` for fluxes, magnitudes and their errors, `99` additionally for the ISO and AUTO magnitudes and their errors, `-99.9`, `-99` or `9.99` for `PHOTOZ`, and `-999` for e.g. `SFR_BEST` and `MASS_BEST`. To follow the Phase 3 standard all these real-valued “NULL values” were changed to the correct NULL value of NaN (not a number).
- It was discovered that a small fraction of the absolute magnitudes were wrong (in the interval  $\sim [-105, -90]$ ), and these were set to NaN. This concerns about 2% of the `M_NUV` values and 0.1% of the values in the 10 other absolute magnitude columns (`M_U`, `...`, `M_K`). The 3 log luminosity columns (`L_NU`, `L_R`, `L_K`) do not have this problem.
- Negative (i.e. unphysical) values of the 50% flux radius column (`FLUX_RADIUS`) were set to NaN.
- 17 likely fake objects with `ALPHA_J2000 > 150.887` (all having no data in the 5 bands used to construct the detection image) were “removed” by setting `ALPHA_J2000` and `DELTA_J2000` to NaN (thus keeping the number of rows and their order unchanged).
- UCDs (unified content descriptors) were added to the header for all columns. The UCDs describe the columns using a standardised vocabulary<sup>2</sup>. The UCDs can be seen in the header doing e.g. `dfits -x 1 ADP*.fits` or viewed online in the ESO catalogue facility at <http://www.eso.org/qi/>
- Units were already present for most columns, but units for a few extra columns were added. The units can be viewed in the same way as the UCDs.
- Descriptions (comments) were added in the header for all columns; these can also be seen in Sect. 3.2.
- The primary header was updated to comply with the Phase 3 standard.

The number of rows (1,182,108) and the number of columns (536) was not changed.

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<sup>1</sup>[ftp://ftp.iap.fr/pub/from\\_users/hjmcc/COSMOS2015/](ftp://ftp.iap.fr/pub/from_users/hjmcc/COSMOS2015/)

<sup>2</sup>e.g. <http://www.ivoa.net/documents/REC/UCD/UCDlist-20070402.html>

### 3 Release Content

We present a catalogue containing photometry and physical parameters for more than half a million objects over the  $2 \text{ deg}^2$  COSMOS field. This catalogue is largely identical to the one which has already been presented in Laigle et al. (2016). It has been reformatted by the UltraVISTA consortium to comply with ESO’s Phase 3 requirements (cf. Sect. 2). The catalogue contains in total 536 columns together with 1,182,108 rows. The number “half a million” is mentioned since the number of objects with the “best” data is 536,077; these objects are selected using these flags:

`(FLAG_HJMCC==0) & (FLAG_COSMOS==1) & (FLAG_PETER==0)`

(see also Sect. 3.1).

The photometry has been extracted from PSF-homogenised COSMOS optical near-infrared data and infrared data. Each near-infrared and optical band has been convolved so the final seeing (measured using a fit to a Moffat profile) corresponds to  $0.8''$ . Sources are selected from a chi-squared sum of the optical  $z++$  (zpp) band (SuprimeCam) and the 4 NIR  $YJHKs$  bands (UltraVISTA-DR2). This ensures that the catalogue contains both redder and bluer objects. It contains the NIR photometric data obtained at the ESO-VISTA telescope by the UltraVista collaboration, as processed at IAP-TERAPIX and made publicly available, the imaging data publicly available from the COSMOS collaboration including Subaru and CFHT, Y band taken with HSC Subaru, and the IR data taken with Spitzer as a part the SPLASH Spitzer legacy program. It contains also a match with the MIPS 24  $\mu\text{m}$  catalog. Physical parameters have been computed with Le Phare at Laboratoire d’Astrophysique de Marseille and have been calibrated using spectroscopic data. In order to compute photometric redshifts with this catalogue, some additional corrections have to be applied to the magnitudes provided here. They are fully described in Laigle et al. (2016).

We provide also the matches with ACS, X-Ray, UV, IR, FIR, Radio catalogs and previous versions of the multi-band catalogue on COSMOS field. When the photometry is not described in Laigle et al. (2016), the corresponding references are mentioned below. What follows in Sect. 3.1 is a description of each column taken from the README file distributed with the original catalogue. Additionally, in Sect. 3.2 we provide a list of all the 536 columns (number, name, description).

#### 3.1 Description of catalogue columns (from the README file)

```
#####  
0) object identification  
#####  
  
#   name = 'NUMBER'  
  
Right Ascension and Declination  
#   name = 'ALPHA_J2000' ; unit = 'deg'
```

```

# name = 'DELTA_J2000'; unit = 'deg'

Positions in pixels
# name = 'X_IMAGE';
# name = 'Y_IMAGE';
# name = 'ERRX2_IMAGE'; variance on X_IMAGE
# name = 'ERRY2_IMAGE'; variance on Y_IMAGE
# name = 'ERRXY_IMAGE'; covariance of X_iIMAGE,Y_IMAGE

#####
2) Regions Flags. see the Readme file COSMOS2015_Flags.pdf
for a full description of the regions.
#####

UltraVISTA area
# name = 'FLAG_HJMCC'; 0: UltraVISTA area, >=1 out of UltraVISTA

UltraVISTA Ultra-deep stripes
# name = 'FLAG_DEEP'; 1: Ultra-deep stripes, 0: deep stripes

COSMOS 2deg^2 area
# name = 'FLAG_COSMOS'; 1: 2deg2 COSMOS area

Saturated objects and bad areas
# name = 'FLAG_PETER'; 0: good area, >=1 masked in optical broad-bands (P. Capak)

#####
3) Galactic extinction (Schlegel et al. 1998) at the object position
#####

# name = 'EBV';

#####
4) Photometry.
#####

Non-detection convention (unless otherwise specified) Flux, Fluxerr,
mag, magerr = NaN in a particular band: there is no data (or pixels are
flagged as saturated) in this band at this position. Flux + Fluxerr
>0 and mag, magerr = NaN: flux is negative at this position, but flux
error is consistent.

# name = 'FLUX_RADIUS'; radius enclosing 0.5 of the total flux (FLUX_AUTO)

```

#####

A) Optical and NIR photometry

[# is the filter name. Below is the filter list:

CFHT: u

SuprimeCam: B V r ip zpp IB427 IB464 IA484 IB505 IA527 IB574

IA624 IA679 IA738 IA767 IB709 IB827 NB711 NB816

Hyper Suprime-Cam: yHSC (Y band)

UltraVISTA-DR2: Y,J,H,Ks

WIRCam: Hw (H),Ksw (Ks)]

Fluxes and Fluxes errors:

2 diameter apertures fluxes

# name = #\_FLUX\_APER2'; unit = 'uJy'

# name = #\_FLUXERR\_APER2'; unit = 'uJy'

3 diameter apertures fluxes

# name = #\_FLUX\_APER3'; unit = 'uJy'

# name = #\_FLUXERR\_APER3'; unit = 'uJy'

AB Magnitudes and Magnitudes errors:

2 diameter apertures magnitudes

# name = #\_MAG\_APER2'; unit = 'mag'

# name = #\_MAGERR\_APER2'; unit = 'mag'

3 diameter apertures magnitudes

# name = #\_MAG\_APER3'; unit = 'mag'

# name = #\_MAGERR\_APER3'; unit = 'mag'

automatic apertures magnitudes

# name = #\_MAG\_AUTO'; unit = 'mag'

# name = #\_MAGERR\_AUTO'; unit = 'mag'

Isophotal magnitudes

# name = #\_MAG\_ISO'; unit = 'mag'

# name = #\_MAGERR\_ISO'; unit = 'mag'

Flags from SExtractor

# name = #\_FLAGS';

- 1 The object has neighbours, bright and close enough to significantly bias the MAG AUTO photometry, or bad pixels (more than 10% of the integrated area affected),
- 2 The object was originally blended with another one,
- 4 At least one pixel of the object is saturated (or very close to),

```

8 The object is truncated (too close to an image boundary),
16 Objects aperture data are incomplete or corrupted,
32 Objects isophotal data are incomplete or corrupted,
64 A memory overflow occurred during deblending,
128 A memory overflow occurred during extraction.
# name = #_IMAFLAGS_ISO'; Object flags indicating saturation

#####
B) IRAC filters (# is the filter name: SPLASH_1 (ch1, 3.6um),
SPLASH_2 (ch2, 4.5um), SPLASH_3 (ch3, 5.8um), SPLASH_4 (ch4, 8.0um)):

fluxes and fluxes errors in a 3 aperture:
# name = #_FLUX; unit = 'uJy'
# name = #_FLUX_ERR'; unit = 'uJy'

Magnitudes and Magnitudes errors in a 3 aperture:
# name = #_MAG'; unit = 'mag'
# name = #_MAGERR'; unit = 'mag'

#####
C) MIPS 24 micrometer photometry (Match with the 24um catalog by 1")
(based on Le Floc'h 2009)

fluxes and fluxes errors:
# name = FLUX_24; unit = 'uJy'
# name = FLUXERR_24'; unit = 'uJy'

Magnitudes and Magnitudes errors:
# name = MAG_24'; unit = 'mag'
# name = MAGERR_24'; unit = 'mag'

ID in the 24um catalog:
# name = ID_A24';

#####
D) PACS/PEP photometry (Lutz et al. 2011)
fluxes and fluxes errors 100um:
# name = FLUX_100; unit = 'mJy'
# name = FLUXERR_100'; unit = 'mJy'

fluxes and fluxes errors 160um:

```

```
# name = FLUX_160; unit = 'mJy'
# name = FLUXERR_160'; unit = 'mJy'
```

```
#####
```

```
E) SPIRE/HERMES photometry (Oliver et al. 2012)
```

```
fluxes and fluxes errors 250um:
```

```
# name = FLUX_250; unit = 'mJy'
# name = FLUXERR_250'; unit = 'mJy' (instrumental noise)
# name = FLUXERRTOT_250'; unit = 'mJy' (total (inst+conf) noise)
```

```
fluxes and fluxes errors 350um:
```

```
# name = FLUX_350; unit = 'mJy'
# name = FLUXERR_350'; unit = 'mJy' (instrumental noise)
# name = FLUXERRTOT_350'; unit = 'mJy' (total (inst+conf) noise)
```

```
fluxes and fluxes errors 500um:
```

```
# name = FLUX_500; unit = 'mJy'
# name = FLUXERR_500'; unit = 'mJy' (instrumental noise)
# name = FLUXERRTOT_500'; unit = 'mJy' (total (inst+conf) noise)
```

```
#####
```

```
F) GALEX photometry (Zamojski et al. 2007, Capak et al. 2007)
```

```
fluxes and fluxes errors FUV:
```

```
# name = MAG_GALEX_FUV; unit = 'mag'
# name = MAGERR_GALEX_FUV'; unit = 'mag'
# name = FLUX_GALEX_FUV; unit = uJy'
# name = FLUXERR_GALEX_FUV'; unit = uJy'
```

```
fluxes and fluxes errors NUV:
```

```
# name = MAG_GALEX_NUV; unit = 'mag'
# name = MAGERR_GALEX_NUV'; unit = 'mag'
# name = FLUX_GALEX_FUV; unit = uJy'
# name = FLUXERR_GALEX_FUV'; unit = uJy'
```

```
#####
```

```
G) X-Ray photometry
```

```
nan value if there is no corresponding object in the matched catalog.
```

```
match from the new Chandra COSMOS catalog (Civano et al. 2016, Marchesi et al. 2016):
```

```
The match is described in Laigle et al. 2016.
```

```
# name = 'ID_CHANDRA16'; format = '9A'
```

```
fluxes and fluxes errors from the previous Chandra COSMOS catalog (Elvis et al. 2009)
# name = 'ID_CHANDRA09'; format = 'J'; null = -2147483648
# name = 'FLUX_CHANDRA_05_2; format = 'D'; unit = 'erg/cm2/s' (0.5-2 keV band flux)
# name = 'FLUX_CHANDRA_2_10'; format = 'D'; unit = 'erg/cm2/s' (2-10 keV band flux)
# name = 'FLUX_CHANDRA_05_10'; format = 'D'; unit = 'erg/cm2/s'(0.5-10 keV band flux)
```

fluxes and fluxes errors from XMM/Newton (Cappelluti et al. 2009):

```
# name = 'ID_XMM'; format = 'J'; null = -2147483648
# name = 'FLUX_XMM_05_2; format = 'E' (0.2-2 keV band flux)
# name = 'FLUX_XMM_2_10'; format = 'E' (2-10 keV band flux)
# name = 'FLUX_XMM_5_10'; format = 'E' (5-10 keV band flux)
# name = 'HARDNESS_XMM'; format = 'E' (hardness ratio)
```

fluxes and fluxes errors from Nustar (Civano et al. 2015):

```
# name = 'ID_NUSTAR'; format = '20A'
# name = 'FLUX_NUSTAR_3_24'; format = 'E' (3-24 keV band flux)
# name = 'FLUXERR_NUSTAR_3_24; format = 'E' (3-24 keV band flux error)
# name = 'FLUX_NUSTAR_3_8; format = 'E' (3-8 keV band flux)
# name = 'FLUXERR_NUSTAR_3_8; format = 'E' (3-8 keV band flux error)
# name = 'FLUX_NUSTAR_8_24'; format = 'E' (8-24 keV band flux)
# name = 'FLUXERR_NUSTAR_8_24'; format = 'E' (8-24 keV band flux error)
# name = 'HARDNESS_NUSTAR'; format = 'E' (hardness ratio)
# name = 'HARDNESSLOW_NUSTAR'; format = 'E' (hardness ratio lower bound)
# name = 'HARDNESSUP_NUSTAR'; format = 'E' (hardness ratio upper bound)
# name = 'FLAG_XRAYBLEND'; format = 'I'; null = -32768 (flag for blended sources)
```

#####

H) Match with the ACS catalog (Leauthaud et al. 2007)

fluxes and fluxes errors F814W:

```
# name = FLUX_814W'; unit = 'mJy'
# name = FLUXERR_814W'; unit = 'mJy'
```

#####

I) Radio VLA photometry:

To do the match, 90cm catalog is merged with the 20cm catalog using a 6 radius.  
The 20cm catalog to the optical catalog with a 2 radius.

fluxes and fluxes errors 20cm:

```
# name = FLUXPEAK_20CM'; unit = 'mJy' (peak flux of the radio source)
# name = FLUXPEAKERR_20CM'; unit = 'mJy' (rms uncertainty in the peak
```



```

    flux of the radio source)
# name = FLUXINT_20CM'; unit = 'mJy' (total integrated flux of the
    radio source)
# name = FLUXINTERR_20CM'; unit = 'mJy'(rms uncertainty total
    integrated flux of the radio source)
# name = RMSBKG_20CM'; unit = 'mJy' (measured local rms noise at the
    source position)

```

fluxes and fluxes errors 90cm:

```

# name = FLUXPEAK_90CM'; unit = 'mJy' (peak flux of the radio source)
# name = FLUXPEAKERR_90CM'; unit = 'mJy' (rms uncertainty in the peak
    flux of the radio source)
# name = FLUXINT_90CM'; unit = 'mJy' (total integrated flux of the
    radio source)
# name = FLUXINTERR_90CM'; unit = 'mJy' (rms uncertainty total
    integrated flux of the radio source)
# name = RMSBKG_90CM'; unit = 'mJy' (measured local rms noise at the
    source position)
name of the sources in VLA 90cm catalog
# name = NAME_VLA90CM';
name of the sources in JVL Deep catalog
# name = NAME_JVLDEEP';
name of the sources in JVL Large catalog
# name = NAME_JVLLARGE';

```

```

#####
5) Match with previous multi-band catalogs
#####

```

```

1st version of the catalog from Capak et al. 2007
    name= 'ID2006'
2ndversion of the catalog from Capak et al. 2007
    name= 'ID2008'
catalog from Ilbert et al. 2013
    name= 'ID2013'

```

```

#####
6) Main parameters computed with LePhare
derived using a method similar to Ilbert et al. (2009, 2013)
#####

```

```

# name= 'OFFSET_MAG' (offset applied to the aperture magnitudes to obtain
total quantities)
# name= 'PHOTOZ' (z= zPDF if galaxy [median of the likelihood
distribution], z= 0 if star, z= NaN if Xray source based on Chandra
(Civano program), z= NaN if masked area in flag_Capak)

# name= 'TYPE' (Given even in masked regions; type=0 if galaxy; type=1
if star[mainly based on the chi2, only for objects detected in NIR
or 3.6]; type=2 if Xray source; type=-9 if failure in the fit [most
of these objects have less than 1 band])

#####

Best fit obtained with the galaxy templates warning: every source has
a redshift, regardless of the type or if it is in a masked area or not

# name= 'ZPDF' (photo-z measured using the galaxy templates. Median of
the likelihood distribution.)

# name= 'ZPDF_L68' (lower limit, 68% confidence level [a comparison
photo-z/spec-z shows that these errors could be underestimated by a
factor 0.1*I-0.8 at I>20 and 1.2 at I<20])

# name= 'ZPDF_U68' (upper limit, 68% confidence level [a comparison
photo-z/spec-z shows that these errors could be underestimated by a
factor 0.1*I-0.8 at I>20 and 1.2 at I<20]) name= 'ZMIN_CHI2' (photo-z
measured using the galaxy templates. Photo-z defines as the minimum
of the chi2 distribution.)

# name= 'CHI2_BEST' (reduced chi2 for zMinChi2)

# name= 'ZP_2' (second photo-z solution if a second peak is detected
with P>5% in the PDF)

# name= 'CHI2_2' (reduced chi2 for the second photo-z solution)
# name= 'NBFILT' (Number of filters used in the fit)

```

#####

Best fit obtained with the AGN templates, in LePhare standard modality, but NOT optimised for Xray detected sources (no prior based on morphology, no variability correction, etc.) !!!! Warning: PLEASE use photos from Marchesi et al 2016 for the Xray selected sources. This mentioned paper revises also the counterparts, so it supersedes

Salvato+09, Salvato+11, Civano+11, and Brusa+10.

```
# name= 'ZQ'          (photoz for the AGN library.)
# name= 'CHIQ'        (reduced chi2 )
# name= 'MODQ'        (best fit template)
```

#####

Best fit obtained with the STAR templates

```
# name= 'MODS'        (model for the star library)
# name= 'CHIS'        (reduced chi2)
```

#####

PHYSICAL PROPERTIES

derived from the BC03 best-fit templates at zPDF (Chabrier IMF; cosmo:70,0.3,0.7; BC03 tau+delayed models described in Ilbert et al. 2015).

#####

Best fit BC03 model at zPDF

```
# name = 'MODEL'
# name = 'AGE'
# name = 'EXTINCTION'
```

#####

Absolute magnitudes

```
# name = 'M_NUV'  NUV galex
# name = 'M_U'    u* CFHT
# name = 'M_B'    B Subaru
# name = 'M_V'    V Subaru
# name = 'M_R'    r+ Subaru
# name = 'M_I'    i+ Subaru
# name = 'M_Z'    z Subaru   (new filter)
# name = 'M_Y'    VISTA
# name = 'M_J'    VISTA
# name = 'M_H'    VISTA
# name = 'M_K'    VISTA
```

#####

Dust corrected color at zPDF

```
# name = 'MNUV_MR'  corrected from dust-extinction.
```

#####

Classification quiescent/star-forming

```

# name = 'CLASS'    0:quiescent/1:star-forming based on the NUV-R/R-J

#####
Mass
# name = 'MASS_MED'      log Stellar mass from BC03 best-fit template. median of the PDF
# name = 'MASS_MED_MIN68' lower limit, 68% confidence level
# name = 'MASS_MED_MAX68' upper limit, 68% confidence level
# name = 'MASS_BEST' log Stellar mass from BC03 best-fit
  template. Taken at the minimum chi2

#####
SFR !Warning: computed without IR, large uncertainties with such methods
# name = 'SFR_MED'      log SFR from BC03 best-fit template. median of the PDF
# name = 'SFR_MED_MIN68' lower limit, 68% confidence level
# name = 'SFR_MED_MAX68' upper limit, 68% confidence level
# name = 'SFR_BEST'      log SFR from BC03 best-fit template. Taken at the minimum chi2
# name = 'SSFR_MED'      log sSFR from BC03 best-fit template. median of the PDF
# name = 'SSFR_MED_MIN68' lower limit, 68% confidence level
# name = 'SSFR_MED_MAX68' upper limit, 68% confidence level
# name = 'SSFR_BEST'      log sSFR from BC03 best-fit template. Taken at the minimum chi2

#####
Luminosities
# name = 'L_NU'      log(dust corrected luminosity in erg/s/Hz) in NUV filter
# name = 'L_R'      log(dust corrected luminosity in erg/s/Hz) in r filter
# name = 'L_K'      log(dust corrected luminosity in erg/s/Hz) in K filter

```

### 3.2 Complete list of catalogue columns

The following is a list of column number, name and description. This information was derived from the original README file and from Laigle et al. (2016), with the small update that it has been noted that the 3 log luminosity columns (L\_NU, L\_R, L\_K) are dust corrected (i.e. corrected for dust attenuation).

No.	Name	Description
1	ALPHA_J2000	Right ascension of barycenter in decimal degrees (J2000)
2	DELTA_J2000	Declination of barycenter in decimal degrees (J2000)
3	NUMBER	Running object number
4	X_IMAGE	Object position along x
5	Y_IMAGE	Object position along y
6	ERRX2_IMAGE	Variance of position along X
7	ERRY2_IMAGE	Variance of position along Y
8	ERRXY_IMAGE	Covariance of position X / Y
9	FLAG_HJMCC	Bad region flag

10	FLUX_RADIUS	Radius of aperture containing half the flux of MAG_AUTO
11	KRON_RADIUS	Kron apertures in units of A or B
12	EBV	Galactic reddening E(B-V) based on Schlegel et al (1998) dust maps
13	FLAG_PETER	Flag Saturated objects and bad areas
14	FLAG_COSMOS	1: 2deg2 COSMOS area
15	FLAG_DEEP	1: Ultra-deep stripes, 0: deep stripes
16	FLAG_SHALLOW	Shallow Flag
17	Ks_FLUX_APER2	Ks fixed aperture flux (2",AB) [detection image]
18	Ks_FLUXERR_APER2	Ks fixed aperture flux error (2",AB) [detection image]
19	Ks_FLUX_APER3	Ks fixed aperture flux (3",AB) [detection image]
20	Ks_FLUXERR_APER3	Ks fixed aperture flux error (3",AB) [detection image]
21	Ks_MAG_APER2	Ks fixed aperture magnitude (2",AB) [detection image]
22	Ks_MAGERR_APER2	Ks fixed aperture mag error (2",AB) [detection image]
23	Ks_MAG_APER3	Ks fixed aperture magnitude (3",AB) [detection image]
24	Ks_MAGERR_APER3	Ks fixed aperture mag error (3",AB) [detection image]
25	Ks_MAG_AUTO	Ks auto magnitude (AB) [detection image]
26	Ks_MAGERR_AUTO	Ks auto mag error (AB) [detection image]
27	Ks_MAG_ISO	Isophotal magnitude
28	Ks_MAGERR_ISO	rms uncertainty on magK
29	Ks_FLAGS	Internal Flag
30	Ks_IMAFLAGS_ISO	External Flag
31	Y_FLUX_APER2	Y fixed aperture flux (2",AB) [detection image]
32	Y_FLUXERR_APER2	Y fixed aperture flux error (2",AB) [detection image]
33	Y_FLUX_APER3	Y fixed aperture flux (3",AB) [detection image]
34	Y_FLUXERR_APER3	Y fixed aperture flux error (3",AB) [detection image]
35	Y_MAG_APER2	Y fixed aperture magnitude (2",AB)
36	Y_MAGERR_APER2	Y fixed aperture mag error (2",AB)
37	Y_MAG_APER3	Y fixed aperture magnitude (3",AB)
38	Y_MAGERR_APER3	Y fixed aperture mag error (3",AB)
39	Y_MAG_AUTO	Y auto magnitude (AB)
40	Y_MAGERR_AUTO	Y auto mag error (AB)
41	Y_MAG_ISO	Isophotal magnitude
42	Y_MAGERR_ISO	rms uncertainty on magY
43	Y_FLAGS	Internal Flag
44	Y_IMAFLAGS_ISO	External Flag
45	H_FLUX_APER2	H fixed aperture flux (2",AB) [detection image]
46	H_FLUXERR_APER2	H fixed aperture flux error (2",AB) [detection image]
47	H_FLUX_APER3	H fixed aperture flux (3",AB) [detection image]
48	H_FLUXERR_APER3	H fixed aperture flux error (3",AB) [detection image]
49	H_MAG_APER2	H fixed aperture magnitude (2",AB)
50	H_MAGERR_APER2	H fixed aperture mag error (2",AB)
51	H_MAG_APER3	H fixed aperture magnitude (3",AB)
52	H_MAGERR_APER3	H fixed aperture mag error (3",AB)
53	H_MAG_AUTO	H auto magnitude (AB)
54	H_MAGERR_AUTO	H auto mag error (AB)
55	H_MAG_ISO	Isophotal magnitude

56	H_MAGERR_ISO	rms uncertainty on magH
57	H_FLAGS	Internal Flag
58	H_IMAFLAGS_ISO	External Flag
59	J_FLUX_APER2	J fixed aperture flux (2",AB) [detection image]
60	J_FLUXERR_APER2	J fixed aperture flux error (2",AB) [detection image]
61	J_FLUX_APER3	J fixed aperture flux (3",AB) [detection image]
62	J_FLUXERR_APER3	J fixed aperture flux error (3",AB) [detection image]
63	J_MAG_APER2	J fixed aperture magnitude (2",AB)
64	J_MAGERR_APER2	J fixed aperture mag error (2",AB)
65	J_MAG_APER3	J fixed aperture magnitude (3",AB)
66	J_MAGERR_APER3	J fixed aperture mag error (3",AB)
67	J_MAG_AUTO	J auto magnitude (AB)
68	J_MAGERR_AUTO	J auto mag error (AB)
69	J_MAG_ISO	Isophotal magnitude
70	J_MAGERR_ISO	rms uncertainty on magJ
71	J_FLAGS	Internal Flag
72	J_IMAFLAGS_ISO	External Flag
73	B_FLUX_APER2	B fixed aperture flux (2",AB) [detection image]
74	B_FLUXERR_APER2	B fixed aperture flux error (2",AB) [detection image]
75	B_FLUX_APER3	B fixed aperture flux (3",AB) [detection image]
76	B_FLUXERR_APER3	B fixed aperture flux error (3",AB) [detection image]
77	B_MAG_APER2	B fixed aperture magnitude (2",AB)
78	B_MAGERR_APER2	B fixed aperture mag error (2",AB)
79	B_MAG_APER3	B fixed aperture magnitude (3",AB)
80	B_MAGERR_APER3	B fixed aperture mag error (3",AB)
81	B_MAG_AUTO	B auto magnitude (AB)
82	B_MAGERR_AUTO	B auto mag error (AB)
83	B_MAG_ISO	Isophotal magnitude
84	B_MAGERR_ISO	rms uncertainty on magB
85	B_FLAGS	Internal Flag
86	B_IMAFLAGS_ISO	External Flag
87	V_FLUX_APER2	V fixed aperture flux (2",AB) [detection image]
88	V_FLUXERR_APER2	V fixed aperture flux error (2",AB) [detection image]
89	V_FLUX_APER3	V fixed aperture flux (3",AB) [detection image]
90	V_FLUXERR_APER3	V fixed aperture flux error (3",AB) [detection image]
91	V_MAG_APER2	V fixed aperture magnitude (2",AB)
92	V_MAGERR_APER2	V fixed aperture mag error (2",AB)
93	V_MAG_APER3	V fixed aperture magnitude (3",AB)
94	V_MAGERR_APER3	V fixed aperture mag error (3",AB)
95	V_MAG_AUTO	V auto magnitude (AB)
96	V_MAGERR_AUTO	V auto mag error (AB)
97	V_MAG_ISO	Isophotal magnitude
98	V_MAGERR_ISO	rms uncertainty on magV
99	V_FLAGS	Internal Flag
100	V_IMAFLAGS_ISO	External Flag
101	ip_FLUX_APER2	ip fixed aperture flux (2",AB) [detection image]

102	ip_FLUXERR_APER2	ip fixed aperture flux error (2",AB) [detection image]
103	ip_FLUX_APER3	ip fixed aperture flux (3",AB) [detection image]
104	ip_FLUXERR_APER3	ip fixed aperture flux error (3",AB) [detection image]
105	ip_MAG_APER2	ip fixed aperture magnitude (2",AB)
106	ip_MAGERR_APER2	ip fixed aperture mag error (2",AB)
107	ip_MAG_APER3	ip fixed aperture magnitude (3",AB)
108	ip_MAGERR_APER3	ip fixed aperture mag error (3",AB)
109	ip_MAG_AUTO	ip auto magnitude (AB)
110	ip_MAGERR_AUTO	ip auto mag error (AB)
111	ip_MAG_ISO	Isophotal magnitude
112	ip_MAGERR_ISO	rms uncertainty on magIP
113	ip_FLAGS	Internal Flag
114	ip_IMAFLAGS_ISO	External Flag
115	r_FLUX_APER2	r fixed aperture flux (2",AB) [detection image]
116	r_FLUXERR_APER2	r fixed aperture flux error (2",AB) [detection image]
117	r_FLUX_APER3	r fixed aperture flux (3",AB) [detection image]
118	r_FLUXERR_APER3	r fixed aperture flux error (3",AB) [detection image]
119	r_MAG_APER2	r fixed aperture magnitude (2",AB)
120	r_MAGERR_APER2	r fixed aperture mag error (2",AB)
121	r_MAG_APER3	r fixed aperture magnitude (3",AB)
122	r_MAGERR_APER3	r fixed aperture mag error (3",AB)
123	r_MAG_AUTO	r auto magnitude (AB)
124	r_MAGERR_AUTO	r auto mag error (AB)
125	r_MAG_ISO	Isophotal magnitude
126	r_MAGERR_ISO	rms uncertainty on magr
127	r_FLAGS	Internal Flag
128	r_IMAFLAGS_ISO	External Flag
129	u_FLUX_APER2	u fixed aperture flux (2",AB) [detection image]
130	u_FLUXERR_APER2	u fixed aperture flux error (2",AB) [detection image]
131	u_FLUX_APER3	u fixed aperture flux (3",AB) [detection image]
132	u_FLUXERR_APER3	u fixed aperture flux error (3",AB) [detection image]
133	u_MAG_APER2	u fixed aperture magnitude (2",AB)
134	u_MAGERR_APER2	u fixed aperture mag error (2",AB)
135	u_MAG_APER3	u fixed aperture magnitude (3",AB)
136	u_MAGERR_APER3	u fixed aperture mag error (3",AB)
137	u_MAG_AUTO	u auto magnitude (AB)
138	u_MAGERR_AUTO	u auto mag error (AB)
139	u_MAG_ISO	Isophotal magnitude
140	u_MAGERR_ISO	rms uncertainty on magU
141	u_FLAGS	Internal Flag
142	u_IMAFLAGS_ISO	External Flag
143	zp_FLUX_APER2	zp fixed aperture flux (2",AB) [detection image]
144	zp_FLUXERR_APER2	zp fixed aperture flux error (2",AB) [detection image]
145	zp_FLUX_APER3	zp fixed aperture flux (3",AB) [detection image]
146	zp_FLUXERR_APER3	zp fixed aperture flux error (3",AB) [detection image]
147	zp_MAG_APER2	zp fixed aperture magnitude (2",AB)

148	zp_MAGERR_APER2	zp fixed aperture mag error (2",AB)
149	zp_MAG_APER3	zp fixed aperture magnitude (3",AB)
150	zp_MAGERR_APER3	zp fixed aperture mag error (3",AB)
151	zp_MAG_AUTO	zp auto magnitude (AB)
152	zp_MAGERR_AUTO	zp auto mag error (AB)
153	zp_MAG_ISO	Isophotal magnitude
154	zp_MAGERR_ISO	rms uncertainty on magZP
155	zp_FLAGS	Internal Flag
156	zp_IMAFLAGS_ISO	External Flag
157	zpp_FLUX_APER2	zpp fixed aperture flux (2",AB) [detection image]
158	zpp_FLUXERR_APER2	zpp fixed aperture flux error (2",AB) [detection image]
159	zpp_FLUX_APER3	zpp fixed aperture flux (3",AB) [detection image]
160	zpp_FLUXERR_APER3	zpp fixed aperture flux error (3",AB) [detection image]
161	zpp_MAG_APER2	zpp fixed aperture magnitude (2",AB)
162	zpp_MAGERR_APER2	zpp fixed aperture mag error (2",AB)
163	zpp_MAG_APER3	zpp fixed aperture magnitude (3",AB)
164	zpp_MAGERR_APER3	zpp fixed aperture mag error (3",AB)
165	zpp_MAG_AUTO	zpp auto magnitude (AB)
166	zpp_MAGERR_AUTO	zpp auto mag error (AB)
167	zpp_MAG_ISO	Isophotal magnitude
168	zpp_MAGERR_ISO	rms uncertainty on magZPP
169	zpp_FLAGS	Internal Flag
170	zpp_IMAFLAGS_ISO	External Flag
171	IA484_FLUX_APER2	IA484 fixed aperture flux (2",AB) [detection image]
172	IA484_FLUXERR_APER2	IA484 fixed aperture flux error (2",AB) [detection image]
173	IA484_FLUX_APER3	IA484 fixed aperture flux (3",AB) [detection image]
174	IA484_FLUXERR_APER3	IA484 fixed aperture flux error (3",AB) [detection image]
175	IA484_MAG_APER2	IA484 fixed aperture magnitude (2",AB)
176	IA484_MAGERR_APER2	IA484 fixed aperture mag error (2",AB)
177	IA484_MAG_APER3	IA484 fixed aperture magnitude (3",AB)
178	IA484_MAGERR_APER3	IA484 fixed aperture mag error (3",AB)
179	IA484_MAG_AUTO	IA484 auto magnitude (AB)
180	IA484_MAGERR_AUTO	IA484 auto mag error (AB)
181	IA484_MAG_ISO	Isophotal magnitude
182	IA484_MAGERR_ISO	rms uncertainty on magIA484
183	IA484_FLAGS	Internal flag
184	IA484_IMAFLAGS_ISO	External Flag
185	IA527_FLUX_APER2	IA527 fixed aperture flux (2",AB) [detection image]
186	IA527_FLUXERR_APER2	IA527 fixed aperture flux error (2",AB) [detection image]
187	IA527_FLUX_APER3	IA527 fixed aperture flux (3",AB) [detection image]
188	IA527_FLUXERR_APER3	IA527 fixed aperture flux error (3",AB) [detection image]
189	IA527_MAG_APER2	IA527 fixed aperture magnitude (2",AB)
190	IA527_MAGERR_APER2	IA527 fixed aperture mag error (2",AB)
191	IA527_MAG_APER3	IA527 fixed aperture magnitude (3",AB)
192	IA527_MAGERR_APER3	IA527 fixed aperture mag error (3",AB)
193	IA527_MAG_AUTO	IA527 auto magnitude (AB)



194	IA527_MAGERR_AUTO	IA527 auto mag error (AB)
195	IA527_MAG_ISO	Isophotal magnitude
196	IA527_MAGERR_ISO	rms uncertainty on magIA527
197	IA527_FLAGS	Internal Flag
198	IA527_IMAFLAGS_ISO	External Flag
199	IA624_FLUX_APER2	IA624 fixed aperture flux (2",AB) [detection image]
200	IA624_FLUXERR_APER2	IA624 fixed aperture flux error (2",AB) [detection image]
201	IA624_FLUX_APER3	IA624 fixed aperture flux (3",AB) [detection image]
202	IA624_FLUXERR_APER3	IA624 fixed aperture flux error (3",AB) [detection image]
203	IA624_MAG_APER2	IA624 fixed aperture magnitude (2",AB)
204	IA624_MAGERR_APER2	IA624 fixed aperture mag error (2",AB)
205	IA624_MAG_APER3	IA624 fixed aperture magnitude (3",AB)
206	IA624_MAGERR_APER3	IA624 fixed aperture mag error (3",AB)
207	IA624_MAG_AUTO	IA624 auto magnitude (AB)
208	IA624_MAGERR_AUTO	IA624 auto mag error (AB)
209	IA624_MAG_ISO	Isophotal magnitude
210	IA624_MAGERR_ISO	rms uncertainty on magIA624
211	IA624_FLAGS	Internal Flag
212	IA624_IMAFLAGS_ISO	External Flag
213	IA679_FLUX_APER2	IA679 fixed aperture flux (2",AB) [detection image]
214	IA679_FLUXERR_APER2	IA679 fixed aperture flux error (2",AB) [detection image]
215	IA679_FLUX_APER3	IA679 fixed aperture flux (3",AB) [detection image]
216	IA679_FLUXERR_APER3	IA679 fixed aperture flux error (3",AB) [detection image]
217	IA679_MAG_APER2	IA679 fixed aperture magnitude (2",AB)
218	IA679_MAGERR_APER2	IA679 fixed aperture mag error (2",AB)
219	IA679_MAG_APER3	IA679 fixed aperture magnitude (3",AB)
220	IA679_MAGERR_APER3	IA679 fixed aperture mag error (3",AB)
221	IA679_MAG_AUTO	IA679 auto magnitude (AB)
222	IA679_MAGERR_AUTO	IA679 auto mag error (AB)
223	IA679_MAG_ISO	Isophotal magnitude
224	IA679_MAGERR_ISO	rms uncertainty on magIA679
225	IA679_FLAGS	Internal Flag
226	IA679_IMAFLAGS_ISO	External Flag
227	IA738_FLUX_APER2	IA738 fixed aperture flux (2",AB) [detection image]
228	IA738_FLUXERR_APER2	IA738 fixed aperture flux error (2",AB) [detection image]
229	IA738_FLUX_APER3	IA738 fixed aperture flux (3",AB) [detection image]
230	IA738_FLUXERR_APER3	IA738 fixed aperture flux error (3",AB) [detection image]
231	IA738_MAG_APER2	IA738 fixed aperture magnitude (2",AB)
232	IA738_MAGERR_APER2	IA738 fixed aperture mag error (2",AB)
233	IA738_MAG_APER3	IA738 fixed aperture magnitude (3",AB)
234	IA738_MAGERR_APER3	IA738 fixed aperture mag error (3",AB)
235	IA738_MAG_AUTO	IA738 auto magnitude (AB)
236	IA738_MAGERR_AUTO	IA738 auto mag error (AB)
237	IA738_MAG_ISO	Isophotal magnitude
238	IA738_MAGERR_ISO	rms uncertainty on magIA738
239	IA738_FLAGS	Internal Flag

240 IA738\_IMAFLAGS\_ISO External Flag  
241 IA767\_FLUX\_APER2 IA767 fixed aperture flux (2",AB) [detection image]  
242 IA767\_FLUXERR\_APER2 IA767 fixed aperture flux error (2",AB) [detection image]  
243 IA767\_FLUX\_APER3 IA767 fixed aperture flux (3",AB) [detection image]  
244 IA767\_FLUXERR\_APER3 IA767 fixed aperture flux error (3",AB) [detection image]  
245 IA767\_MAG\_APER2 IA767 fixed aperture magnitude (2",AB)  
246 IA767\_MAGERR\_APER2 IA767 fixed aperture mag error (2",AB)  
247 IA767\_MAG\_APER3 IA767 fixed aperture magnitude (3",AB)  
248 IA767\_MAGERR\_APER3 IA767 fixed aperture mag error (3",AB)  
249 IA767\_MAG\_AUTO IA767 auto magnitude (AB)  
250 IA767\_MAGERR\_AUTO IA767 auto mag error (AB)  
251 IA767\_MAG\_ISO Isophotal magnitude  
252 IA767\_MAGERR\_ISO rms uncertainty on magIA767  
253 IA767\_FLAGS Internal Flag  
254 IA767\_IMAFLAGS\_ISO External Flag  
255 IB427\_FLUX\_APER2 IB427 fixed aperture flux (2",AB) [detection image]  
256 IB427\_FLUXERR\_APER2 IB427 fixed aperture flux error (2",AB) [detection image]  
257 IB427\_FLUX\_APER3 IB427 fixed aperture flux (3",AB) [detection image]  
258 IB427\_FLUXERR\_APER3 IB427 fixed aperture flux error (3",AB) [detection image]  
259 IB427\_MAG\_APER2 IB427 fixed aperture magnitude (2",AB)  
260 IB427\_MAGERR\_APER2 IB427 fixed aperture mag error (2",AB)  
261 IB427\_MAG\_APER3 IB427 fixed aperture magnitude (3",AB)  
262 IB427\_MAGERR\_APER3 IB427 fixed aperture mag error (3",AB)  
263 IB427\_MAG\_AUTO IB427 auto magnitude (AB)  
264 IB427\_MAGERR\_AUTO IB427 auto mag error (AB)  
265 IB427\_MAG\_ISO Isophotal magnitude  
266 IB427\_MAGERR\_ISO rms uncertainty on magIB427  
267 IB427\_FLAGS internal Flag  
268 IB427\_IMAFLAGS\_ISO External Flag  
269 IB464\_FLUX\_APER2 IB464 fixed aperture flux (2",AB) [detection image]  
270 IB464\_FLUXERR\_APER2 IB464 fixed aperture flux error (2",AB) [detection image]  
271 IB464\_FLUX\_APER3 IB464 fixed aperture flux (3",AB) [detection image]  
272 IB464\_FLUXERR\_APER3 IB464 fixed aperture flux error (3",AB) [detection image]  
273 IB464\_MAG\_APER2 IB464 fixed aperture magnitude (2",AB)  
274 IB464\_MAGERR\_APER2 IB464 fixed aperture mag error (2",AB)  
275 IB464\_MAG\_APER3 IB464 fixed aperture magnitude (3",AB)  
276 IB464\_MAGERR\_APER3 IB464 fixed aperture mag error (3",AB)  
277 IB464\_MAG\_AUTO IB464 auto magnitude (AB)  
278 IB464\_MAGERR\_AUTO IB464 auto mag error (AB)  
279 IB464\_MAG\_ISO Isophotal magnitude  
280 IB464\_MAGERR\_ISO rms uncertainty on magIB464  
281 IB464\_FLAGS Internal Flag  
282 IB464\_IMAFLAGS\_ISO External Flag  
283 IB505\_FLUX\_APER2 IB505 fixed aperture flux (2",AB) [detection image]  
284 IB505\_FLUXERR\_APER2 IB505 fixed aperture flux error (2",AB) [detection image]  
285 IB505\_FLUX\_APER3 IB505 fixed aperture flux (3",AB) [detection image]

286	IB505_FLUXERR_APER3	IB505 fixed aperture flux error (3",AB) [detection image]
287	IB505_MAG_APER2	IB505 fixed aperture magnitude (2",AB)
288	IB505_MAGERR_APER2	IB505 fixed aperture mag error (2",AB)
289	IB505_MAG_APER3	IB505 fixed aperture magnitude (3",AB)
290	IB505_MAGERR_APER3	IB505 fixed aperture mag error (3",AB)
291	IB505_MAG_AUTO	IB505 auto magnitude (AB)
292	IB505_MAGERR_AUTO	IB505 auto mag error (AB)
293	IB505_MAG_ISO	Isophotal magnitude
294	IB505_MAGERR_ISO	rms uncertainty on magIB505
295	IB505_FLAGS	internal Flag
296	IB505_IMAFLAGS_ISO	External flag
297	IB574_FLUX_APER2	IB574 fixed aperture flux (2",AB) [detection image]
298	IB574_FLUXERR_APER2	IB574 fixed aperture flux error (2",AB) [detection image]
299	IB574_FLUX_APER3	IB574 fixed aperture flux (3",AB) [detection image]
300	IB574_FLUXERR_APER3	IB574 fixed aperture flux error (3",AB) [detection image]
301	IB574_MAG_APER2	IB574 fixed aperture magnitude (2",AB)
302	IB574_MAGERR_APER2	IB574 fixed aperture mag error (2",AB)
303	IB574_MAG_APER3	IB574 fixed aperture magnitude (3",AB)
304	IB574_MAGERR_APER3	IB574 fixed aperture mag error (3",AB)
305	IB574_MAG_AUTO	IB574 auto magnitude (AB)
306	IB574_MAGERR_AUTO	IB574 auto mag error (AB)
307	IB574_MAG_ISO	Isophotal magnitude
308	IB574_MAGERR_ISO	rms uncertainty on magIB574
309	IB574_FLAGS	Internal Flag
310	IB574_IMAFLAGS_ISO	External Flag
311	IB709_FLUX_APER2	IB709 fixed aperture flux (2",AB) [detection image]
312	IB709_FLUXERR_APER2	IB709 fixed aperture flux error (2",AB) [detection image]
313	IB709_FLUX_APER3	IB709 fixed aperture flux (3",AB) [detection image]
314	IB709_FLUXERR_APER3	IB709 fixed aperture flux error (3",AB) [detection image]
315	IB709_MAG_APER2	IB709 fixed aperture magnitude (2",AB)
316	IB709_MAGERR_APER2	IB709 fixed aperture mag error (2",AB)
317	IB709_MAG_APER3	IB709 fixed aperture magnitude (3",AB)
318	IB709_MAGERR_APER3	IB709 fixed aperture mag error (3",AB)
319	IB709_MAG_AUTO	IB709 auto magnitude (AB)
320	IB709_MAGERR_AUTO	IB709 auto mag error (AB)
321	IB709_MAG_ISO	Isophotal magnitude
322	IB709_MAGERR_ISO	rms uncertainty on magIB709
323	IB709_FLAGS	Internal Flag
324	IB709_IMAFLAGS_ISO	External Flag
325	IB827_FLUX_APER2	IB827 fixed aperture flux (2",AB) [detection image]
326	IB827_FLUXERR_APER2	IB827 fixed aperture flux error (2",AB) [detection image]
327	IB827_FLUX_APER3	IB827 fixed aperture flux (3",AB) [detection image]
328	IB827_FLUXERR_APER3	IB827 fixed aperture flux error (3",AB) [detection image]
329	IB827_MAG_APER2	IB827 fixed aperture magnitude (2",AB)
330	IB827_MAGERR_APER2	IB827 fixed aperture mag error (2",AB)
331	IB827_MAG_APER3	IB827 fixed aperture magnitude (3",AB)

332 IB827\_MAGERR\_APER3 IB827 fixed aperture mag error (3",AB)  
333 IB827\_MAG\_AUTO IB827 auto magnitude (AB)  
334 IB827\_MAGERR\_AUTO IB827 auto mag error (AB)  
335 IB827\_MAG\_ISO Isophotal magnitude  
336 IB827\_MAGERR\_ISO rms uncertainty on magIB827  
337 IB827\_FLAGS Internal Flag  
338 IB827\_IMAFLAGS\_ISO External Flag  
339 NB711\_FLUX\_APER2 NB711 fixed aperture flux (2",AB) [detection image]  
340 NB711\_FLUXERR\_APER2 NB711 fixed aperture flux error (2",AB) [detection image]  
341 NB711\_FLUX\_APER3 NB711 fixed aperture flux (3",AB) [detection image]  
342 NB711\_FLUXERR\_APER3 NB711 fixed aperture flux error (3",AB) [detection image]  
343 NB711\_MAG\_APER2 NB711 fixed aperture magnitude (2",AB)  
344 NB711\_MAGERR\_APER2 NB711 fixed aperture mag error (2",AB)  
345 NB711\_MAG\_APER3 NB711 fixed aperture magnitude (3",AB)  
346 NB711\_MAGERR\_APER3 NB711 fixed aperture mag error (3",AB)  
347 NB711\_MAG\_AUTO NB711 auto magnitude (AB)  
348 NB711\_MAGERR\_AUTO NB711 auto mag error (AB)  
349 NB711\_MAG\_ISO Isophotal magnitude  
350 NB711\_MAGERR\_ISO rms uncertainty on magNB711  
351 NB711\_FLAGS Internal Flag  
352 NB711\_IMAFLAGS\_ISO External Flag  
353 NB816\_FLUX\_APER2 NB816 fixed aperture flux (2",AB) [detection image]  
354 NB816\_FLUXERR\_APER2 NB816 fixed aperture flux error (2",AB) [detection image]  
355 NB816\_FLUX\_APER3 NB816 fixed aperture flux (3",AB) [detection image]  
356 NB816\_FLUXERR\_APER3 NB816 fixed aperture flux error (3",AB) [detection image]  
357 NB816\_MAG\_APER2 NB816 fixed aperture magnitude (2",AB)  
358 NB816\_MAGERR\_APER2 NB816 fixed aperture mag error (2",AB)  
359 NB816\_MAG\_APER3 NB816 fixed aperture magnitude (3",AB)  
360 NB816\_MAGERR\_APER3 NB816 fixed aperture mag error (3",AB)  
361 NB816\_MAG\_AUTO NB816 auto magnitude (AB)  
362 NB816\_MAGERR\_AUTO NB816 auto mag error (AB)  
363 NB816\_MAG\_ISO Isophotal magnitude  
364 NB816\_MAGERR\_ISO rms uncertainty on magNB816  
365 NB816\_FLAGS Internal Flag  
366 NB816\_IMAFLAGS\_ISO External Flag  
367 SPLASH\_1\_FLUX SPLASH\_1 flux in a 3" aperture  
368 SPLASH\_1\_FLUX\_ERR SPLASH\_1 flux error in a 3" aperture  
369 SPLASH\_1\_MAG SPLASH\_1 magnitude in a 3" aperture  
370 SPLASH\_1\_MAGERR SPLASH\_1 magnitude error in a 3" aperture  
371 SPLASH\_2\_FLUX SPLASH\_2 flux in a 3" aperture  
372 SPLASH\_2\_FLUX\_ERR SPLASH\_2 flux error in a 3" aperture  
373 SPLASH\_2\_MAG SPLASH\_2 magnitude in a 3" aperture  
374 SPLASH\_2\_MAGERR SPLASH\_2 magnitude error in a 3" aperture  
375 SPLASH\_3\_FLUX SPLASH\_3 flux in a 3" aperture  
376 SPLASH\_3\_FLUX\_ERR SPLASH\_3 flux error in a 3" aperture  
377 SPLASH\_3\_MAG SPLASH\_3 magnitude in a 3" aperture

378	SPLASH_3_MAGERR	SPLASH_3 magnitude error in a 3" aperture
379	SPLASH_4_FLUX	SPLASH_4 flux in a 3" aperture
380	SPLASH_4_FLUX_ERR	SPLASH_4 flux error in a 3" aperture
381	SPLASH_4_MAG	SPLASH_4 magnitude in a 3" aperture
382	SPLASH_4_MAGERR	SPLASH_3 magnitude error in a 3" aperture
383	Hw_FLUX_APER2	Hw fixed aperture flux (2",AB) [detection image]
384	Hw_FLUXERR_APER2	Hw fixed aperture flux error (2",AB) [detection image]
385	Hw_FLUX_APER3	Hw fixed aperture flux (3",AB) [detection image]
386	Hw_FLUXERR_APER3	Hw fixed aperture flux error (3",AB) [detection image]
387	Hw_MAG_APER2	Hw fixed aperture magnitude (2",AB)
388	Hw_MAGERR_APER2	Hw fixed aperture mag error (2",AB)
389	Hw_MAG_APER3	Hw fixed aperture magnitude (3",AB)
390	Hw_MAGERR_APER3	Hw fixed aperture mag error (3",AB)
391	Hw_MAG_AUTO	Hw auto magnitude (AB)
392	Hw_MAGERR_AUTO	Hw auto mag error (AB)
393	Hw_MAG_ISO	Isophotal magnitude
394	Hw_MAGERR_ISO	rms uncertainty on magHw
395	Hw_FLAGS	Internal Flag
396	Hw_IMAFLAGS_ISO	External Flag
397	Ksw_FLUX_APER2	Ksw fixed aperture flux (2",AB) [detection image]
398	Ksw_FLUXERR_APER2	Ksw fixed aperture flux error (2",AB) [detection image]
399	Ksw_FLUX_APER3	Ksw fixed aperture flux (3",AB) [detection image]
400	Ksw_FLUXERR_APER3	Ksw fixed aperture flux error (3",AB) [detection image]
401	Ksw_MAG_APER2	Ksw fixed aperture magnitude (2",AB)
402	Ksw_MAGERR_APER2	Ksw fixed aperture mag error (2",AB)
403	Ksw_MAG_APER3	Ksw fixed aperture magnitude (3",AB)
404	Ksw_MAGERR_APER3	Ksw fixed aperture mag error (3",AB)
405	Ksw_MAG_AUTO	Ksw auto magnitude (AB)
406	Ksw_MAGERR_AUTO	Ksw auto mag error (AB)
407	Ksw_MAG_ISO	Isophotal magnitude
408	Ksw_MAGERR_ISO	rms uncertainty on magKsw
409	Ksw_FLAGS	Internal Flag
410	Ksw_IMAFLAGS_ISO	External Flag
411	yHSC_FLUX_APER2	yHSC fixed aperture flux (2",AB) [detection image]
412	yHSC_FLUXERR_APER2	yHSC fixed aperture flux error (2",AB) [detection image]
413	yHSC_FLUX_APER3	yHSC fixed aperture flux (3",AB) [detection image]
414	yHSC_FLUXERR_APER3	yHSC fixed aperture flux error (3",AB) [detection image]
415	yHSC_MAG_APER2	yHSC fixed aperture magnitude (2",AB)
416	yHSC_MAGERR_APER2	yHSC fixed aperture mag error (2",AB)
417	yHSC_MAG_APER3	yHSC fixed aperture magnitude (3",AB)
418	yHSC_MAGERR_APER3	yHSC fixed aperture mag error (3",AB)
419	yHSC_MAG_AUTO	yHSC auto magnitude (AB)
420	yHSC_MAGERR_AUTO	yHSC auto mag error (AB)
421	yHSC_MAG_ISO	Isophotal magnitude
422	yHSC_MAGERR_ISO	rms uncertainty on magyHSC
423	yHSC_FLAGS	Internal Flag

424	yHSC_IMAFLAGS_ISO	External Flag
425	FLUX_24	MIPS 24 mum flux
426	FLUXERR_24	MIPS 24 mum mJy flux uncertainty
427	MAG_24	m(24) the apparent isophotal magnitude
428	MAGERR_24	Error in mag-24
429	ID_A24	ID in the 24um catalog
430	FLUX_100	PACS/PEP 100 mum flux
431	FLUXERR_100	PACS/PEP 100 mum mJy flux uncertainty
432	FLUX_160	PACS/PEP 160 mum flux
433	FLUXERR_160	PACS/PEP 160 mum mJy flux uncertainty
434	FLUX_250	SPIRE/HERMES 250 mum flux
435	FLUXERR_250	SPIRE/HERMES 250 mum mJy flux uncertainty (instrumental noise)
436	FLUXERRTOT_250	SPIRE/HERMES 250 mum mJy flux uncertainty (total (inst+conf) noise)
437	FLUX_350	SPIRE/HERMES 350 mum flux
438	FLUXERR_350	SPIRE/HERMES 250 mum mJy flux uncertainty (instrumental noise)
439	FLUXERRTOT_350	SPIRE/HERMES 250 mum mJy flux uncertainty (total (inst+conf) noise)
440	FLUX_500	SPIRE/HERMES 500 mum flux
441	FLUXERR_500	SPIRE/HERMES 500 mum mJy flux uncertainty (instrumental noise)
442	FLUXERRTOT_500	SPIRE/HERMES 500 mum mJy flux uncertainty (total (inst+conf) noise)
443	ID_CHANDRA2016	Observation ID in Chandra COSMOS catalog
444	ID2006	Observation ID in the 1st version of the catalog from Capak
445	ID2008	Observation ID in the 2ndversion of the catalog from Capak
446	ID2013	Observation ID ( catalog from Ilbert et al. 2013)
447	MAG_GALEX_NUV	GALEX magnitude NUV
448	MAGERR_GALEX_NUV	GALEX magnitude error NUV
449	MAG_GALEX_FUV	GALEX FUV magnitude
450	MAGERR_GALEX_FUV	GALEX FUV magnitude error
451	FLUX_GALEX_NUV	GALEX NUV calibrated flux
452	FLUXERR_GALEX_NUV	GALEX NUV flux error
453	FLUX_GALEX_FUV	GALEX FUV flux
454	FLUXERR_GALEX_FUV	GALEX FUV flux error
455	FLUX_814W	flux F814W
456	FLUXERR_814W	flux error F814W
457	NAME_VLA90CM	name of the sources in VLA 90cm catalog
458	FLUXPEAK_90CM	peak flux of the radio source
459	FLUXPEAKERR_90CM	rms uncertainty in the peak flux of the radio source
460	FLUXINT_90CM	total integrated flux of the radio source
461	FLUXINTERR_90CM	rms uncertainty total integrated flux of the radio source
462	RMSBKG_90CM	measured local rms noise at the source position
463	NAME_JVLDEEP	name of the sources in JVL Deep catalog
464	NAME_JVLLARGE	name of the sources in JVL Large catalog
465	FLUXPEAK_20CM	peak flux of the radio source
466	FLUXPEAKERR_20CM	rms uncertainty in the peak flux of the radio source
467	FLUXINT_20CM	total integrated flux of the radio source
468	FLUXINTERR_20CM	rms uncertainty total integrated flux of the radio source
469	RMSBKG_20CM	measured local rms noise at the source position

470	ID_XMM	Observation ID XMM-Newton
471	FLUX_XMM_05_2	0.5-2 keV band flux from XMM/Newton
472	FLUX_XMM_2_10	2-10 keV band flux from XMM/Newton
473	FLUX_XMM_5_10	5-10 keV band flux from XMM/Newton
474	HARDNESS_XMM	hardness ratio
475	ID_CHANDRA09	Observation ID Chandra COSMOS catalog
476	FLUX_CHANDRA_05_2	0.5-2 keV band flux from Chandra COSMOS catalog
477	FLUX_CHANDRA_2_10	2-10 keV band flux from Chandra COSMOS catalog
478	FLUX_CHANDRA_05_10	0.5-10 keV band flux from Chandra COSMOS catalog
479	ID_NUSTAR	Observation ID Nustar
480	FLUX_NUSTAR_3_24	3-24 keV band flux from Nustar catalog
481	FLUXERR_NUSTAR_3_24	3-24 keV band flux error from Nustar catalog
482	FLUX_NUSTAR_3_8	3-8 keV band flux from Nustar catalog
483	FLUXERR_NUSTAR_3_8	3-8 keV band flux error from Nustar catalog
484	FLUX_NUSTAR_8_24	8-24 keV band flux from Nustar catalog
485	FLUXERR_NUSTAR_8_24	8-24 keV band flux error from Nustar catalog
486	HARDNESS_NUSTAR	hardness ratio
487	HARDNESSLOW_NUSTAR	hardness ratio lower bound
488	HARDNESSUP_NUSTAR	hardness ratio upper bound
489	FLAG_XRAYBLEND	flag for blended sources
490	OFFSET_MAG	offset applied to the aperture magnitudes to obtain total quantities
491	PHOTOZ	median of the likelihood distribution
492	TYPE	Type
493	ZPDF	photo-z measured using the galaxy templates
494	ZPDF_L68	lower limit, 68% confidence level
495	ZPDF_H68	upper limit, 68% confidence level
496	ZMINCHI2	photo-z measured using the galaxy templates
497	CHI2_BEST	reduced chi2 [-99 if less than 3 filters] for zMinChi2
498	ZP_2	second photo-z solution
499	CHI2_2	reduced chi2 for the second photo-z solution
500	NBFILT	Number of filters used in the fit
501	ZQ	photoz for the AGN library
502	CHIQ	reduced chi2
503	MODQ	best fit template
504	MODS	model for the star library
505	CHIS	reduced chi2
506	MODEL	BC03 model at zPDF
507	AGE	BC03 age
508	EXTINCTION	Extinction
509	M_NUV	Absolute magnitude of NUV galex
510	M_U	Absolute magnitude of Subaru u* band
511	M_B	Absolute magnitude of Subaru B band
512	M_V	Absolute magnitude of Subaru V band
513	M_R	Absolute magnitude of Subaru r+ band
514	M_I	Absolute magnitude of Subaru i+ band
515	M_Z	Absolute magnitude of Subaru z-band (new filter)

516	M_Y	Absolute magnitude of VISTA Y-band
517	M_J	Absolute magnitude of VISTA J-band
518	M_H	Absolute magnitude of VISTA H-band
519	M_K	Absolute magnitude of VISTA Ks-band
520	MNUV_MR	Dust corrected M(NUV)-M(R) color at zPDF
521	CLASS	0:quiescent/1:star-forming based on the NUV-R/R-J
522	MASS_MED	log Stellar mass from BC03 best-fit template. median of the PDF
523	MASS_MED_MIN68	lower limit, 68% confidence level
524	MASS_MED_MAX68	upper limit, 68% confidence level
525	MASS_BEST	log Stellar mass from BC03 best-fit template
526	SFR_MED	log SFR from BC03 best-fit template. median of the PDF
527	SFR_MED_MIN68	lower limit, 68% confidence level
528	SFR_MED_MAX68	upper limit, 68% confidence level
529	SFR_BEST	log SFR from BC03 best-fit template. Taken at the minimum chi2
530	SSFR_MED	log sSFR from BC03 best-fit template. median of the PDF
531	SSFR_MED_MIN68	lower limit, 68% confidence level
532	SSFR_MED_MAX68	upper limit, 68% confidence level
533	SSFR_BEST	log sSFR from BC03 best-fit template. Taken at the minimum chi2
534	L_NU	log(dust corr lum in erg/s/Hz) in NUV filter
535	L_R	log(dust corr lum in erg/s/Hz) in r filter
536	L_K	log(dust corr lum in erg/s/Hz) in K filter

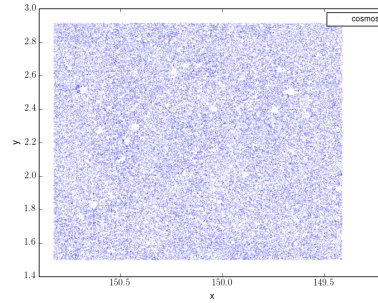
## 4 Appendix: flags and regions

This Appendix explains graphically each of the different regions present in catalogue file and how they may be selected. The region files (represented as DS9 polygon files) are available here: [ftp://ftp.iap.fr/pub/from\\_users/hjmcc/COSMOS2015/region-files.tar.gz](ftp://ftp.iap.fr/pub/from_users/hjmcc/COSMOS2015/region-files.tar.gz).



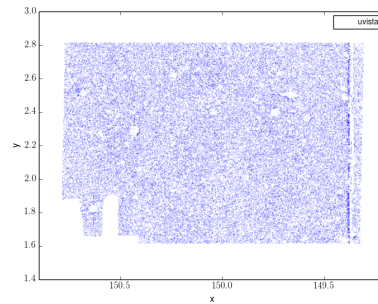
=====COSMOS=====

Area **2deg2**  
 Description tangent pt= [150.1163213,2.20973097]  
 Nbr of objects **773118**  
 File\_Name **cosmos\_cen.reg**  
 Keyword **FLAG\_COSMOS==1**



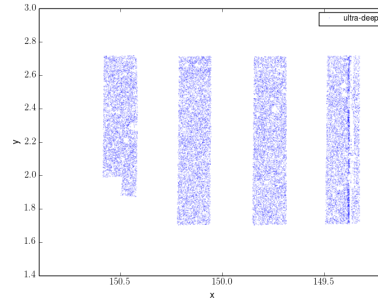
=====UVISTA=====

Area **1.70deg2**  
 Description The area covered by UVISTA  
 Nbr of objects **646939**  
 File\_Name **polygon\_UVISTA-dr2\_Ks\_08\_15.reg**  
 Keyword **FLAG\_HJMCC==0+FLAG\_HJMCC==2**



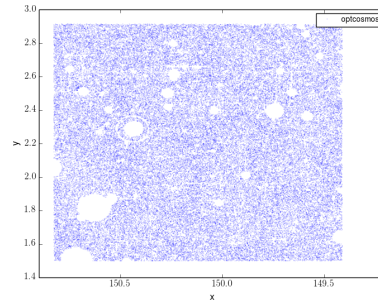
=====UDEEP=====

Area **0.62 deg2**  
 Description The area covered by UDeep stripes  
 Nbr of objects **247203**  
 File\_Name **Deep-stripes.reg**  
 Keyword **FLAG\_DEEP==1**



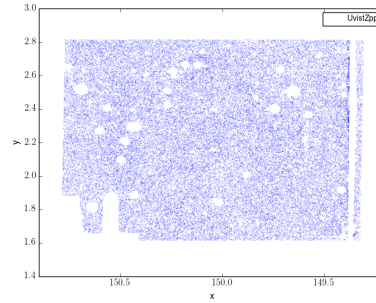
===== !OPT & COSMOS =====

Area **1.77 deg2**  
 Description Safe objects inside the 2deg2 COSMOS square  
 Nbr of objects **694478**  
 File\_Name **cosmos\_cen.reg & COSMOS.Peter2.reg**  
 Keyword **FLAG\_PETER==0+FLAG\_COSMOS==1**



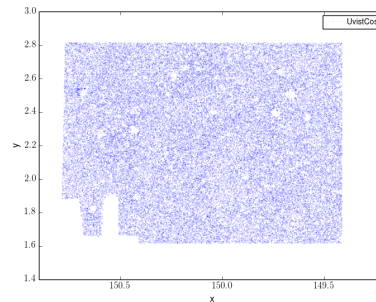
=====UVISTA & zpp=====

Area 1.59 deg2  
 Description Good area in the chi2 images  
 Nbr of objects **606887**  
 File\_Name **Polygon\_UVISTA-dr2\_Ks\_08\_15.reg**  
 Keyword **FLAG\_HJMCC==0**



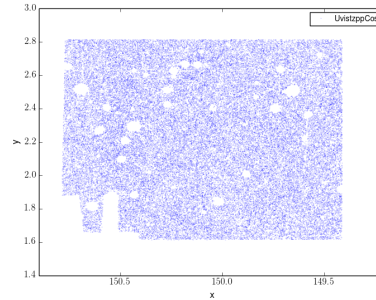
=====UVISTA & COSMOS=====

Area 1.58 deg2  
 Description Intersection Uvista and 2deg2 COSMOS  
 Nbr of objects **604265**  
 File\_Name **cosmos\_cen.reg & Polygon\_UVISTA-dr2\_Ks\_08\_15.reg**  
 Keyword **(FLAG\_HJMCC==0 + FLAG\_HJMCC==2) & FLAG\_COSMOS==1**



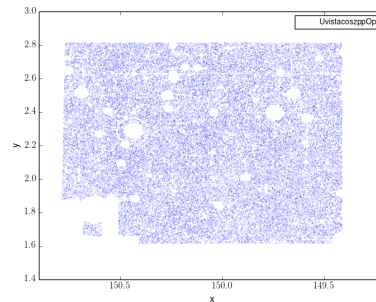
=====UVISTA & zpp & COSMOS=====

Area 1.51 deg2  
 Description Intersection Good area in the chi2 image and 2deg2 COSMOS  
 Nbr of objects **576762**  
 File\_Name **cosmos\_cen.reg & Polygon\_UVISTA-dr2\_Ks\_08\_15.reg**  
 Keyword **FLAG\_HJMCC==0 & FLAG\_COSMOS==1**



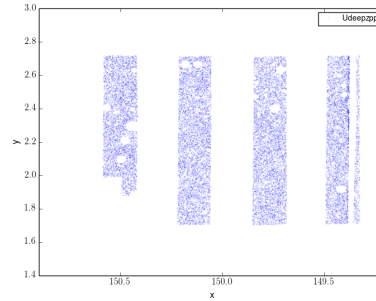
=====UVISTA & zpp & COSMOS & !OPT=====

Area 1.38 deg2  
 Description Intersection Good area in the chi2 image and 2deg2 COSMOS and not masked in optical  
 Nbr of objects **536077**  
 File\_Name **cosmos\_cen.reg & Polygon\_UVISTA-dr2\_Ks\_08\_15.reg & Cosmos.Peter2.reg**  
 Keyword **FLAG\_HJMCC==0 & FLAG\_COSMOS==1 & FLAG\_PETER==0**



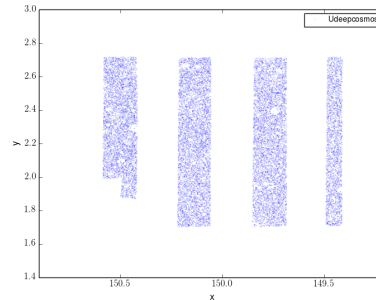
=====UDEEP & zpp=====

Area 0.56 deg2  
 Description Intersection Good area in the chi2 image and 2deg2 COSMOS  
 Nbr of objects 227278  
 File\_Name Deep-stripes.reg & Polygon\_UVISTA-dr2\_Ks\_08\_15.reg  
 Keyword FLAG\_HJMCC==0 & FLAG\_Deep==1



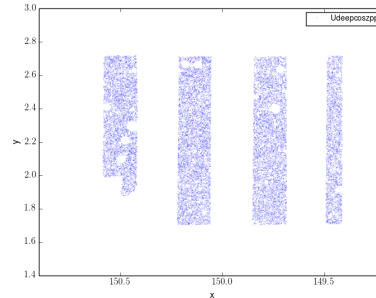
=====UDEEP & COSMOS=====

Area 0.53 deg2  
 Description Intersection Deep stripes and 2deg2 COSMOS  
 Nbr of objects 213716  
 File\_Name Deep-stripes.reg & cosmos\_cen.reg  
 Keyword FLAG\_Cosmos==1 & FLAG\_Deep==1



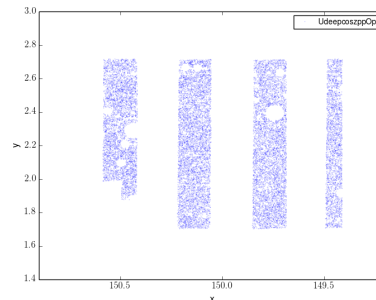
=====UDEEP & COSMOS & zpp =====

Area 0.51 deg2  
 Description Intersection Deep stripes and 2deg2 COSMOS and good area in chi2  
 Nbr of objects 204275  
 File\_Name Deep-stripes.reg & cosmos\_cen.reg & polygon\_UVISTA-dr2\_Ks\_08\_15.reg  
 Keyword FLAG\_Cosmos==1 & FLAG\_Deep==1 & FLAG\_HJMCC==0



=====UDEEP & COSMOS & zpp & !Opt=====

Area 0.46 deg2  
 Description Intersection Deep stripes and 2deg2 COSMOS and good area in chi2 and non masked in optics  
 Nbr of objects 190650  
 File\_Name Deep-stripes.reg & cosmos\_cen.reg & polygon\_UVISTA-dr2\_Ks\_08\_15.reg & Cosmos.Peter2.reg  
 Keyword FLAG\_Cosmos==1 & FLAG\_Deep==1 & FLAG\_HJMCC==0 & FLAG\_PETER==0



## 5 Acknowledgements

This research has made use of the VizieR catalogue access tool provided by the CDS, Strasbourg, France. JPUF and BMJ acknowledge support from the ERC-StG grant EGG-278202. The Dark Cosmology Centre is funded by the Danish National Research Foundation. OLF, CSJ, LT acknowledge support from the ERC advanced grant ERC-2010-AdG-268107. JH acknowledges support from NWO. JSD acknowledges the support of the Royal Society via a Wolfson Research Merit award, and also the support of the European Research Council via the award of an Advanced Grant. The UltraVISTA team would like to thank ESO staff for scheduling and making the UltraVISTA observations, and the Cambridge Astronomy Survey Unit for providing us with pre-processed UltraVISTA images. We thank G. Hasinger for supplying us with the Pan-STARRS images used here, and E. Bertin for many useful discussions concerning the usage of the *Astromatic* tool set. C.L. is supported by the ILP LABEX (under reference ANR-10-LABX-63 and ANR-11-IDEX-0004-02). This work is partially supported by grants ANR-13-BS05-0005 of the French Agence Nationale de la Recherche. H.J.M.C.C. acknowledges financial support from the “Programme national cosmologie et galaxies” (PNCG). O.I. acknowledges the funding of the French Agence Nationale de la Recherche for the project “SAGACE”. J.D.S. is supported by JSPS KAKENHI Grant Number 26400221, the World Premier International Research Center Initiative (WPI), MEXT, Japan and by CREST, JST. S.T. and M.S. acknowledge support from the ERC Consolidator Grant funding scheme (project ConText, grant number No. 648179). This research is also partly supported by the Centre National d’Etudes Spatiales (CNES). VS acknowledges the European Union’s Seventh Framework programme under grant agreement No. 337595.

A full list of references for the data sources used in this catalogue can be found in Laigle et al. (2016).

## References

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- McCracken, H. J., Milvang-Jensen, B., Dunlop, J., et al. 2012, *A&A*, 544, A156