1 Table of Proposed Catalog Parameters

APM/SuperCOSMOS/INT WFC/CIRSI analysis produces 32 4-byte parameters per detected object. This has been enhanced to include extra parameters for flux estimation and error estimates. The following is the suggested list for the standard WFCAM pipeline:

No.	Name	Description
1	Seq. no.	Running number for ease of reference, in strict order of image detections
2	Isophotal flux	Standard definition of summed flux within detection isophote, apart from detection filter is used to define pixel connectivity and hence which pixels to include. This helps to reduce edge effects for all isophotally derived parameters.
3	X coord	Intensity–weighted isophotal centre–of–gravity in X
4	Error in X	estimate of centroid error
5	Y coord	Intensity–weighted isophotal centre–of–gravity in Y
6	Error in Y	estimate of centroid error
7	Gaussian sigma	These are derived from the three general intensity–weighted second moments.
8	Ellipticity	The equivalence between them and a generalised elliptical Gaussian distribution
9	Position angle	is used to derive Gaussian sigma $= (\sigma_a^2 + \sigma_b^2)^{1/2}$
		Ellipticity $= 1.0 - \sigma_a/\sigma_b$
		Position angle = angle of ellipse major axis wrt x axis
10	Areal profile 1	Number of pixels above a series of threshold levels relative to local sky.
11	Areal profile 2	Levels are set at T, 2T, 4T, 8T . . . 128T where T is the threshold. These
12	Areal profile 3	can be thought of as a sort of poor man's radial profile. Note that for now
13	Areal profile 4	deblended, *i.e.* overlapping images, only the first areal profile is computed
14	Areal profile 5	and the rest are set to −1 flagging the difficulty of computing accurate
15	Areal profile 6	profiles.
16	Areal profile 7	
17	Areal profile 8	
18	Peak height	in counts relative to local value of sky - also zeroth order core flux
19	Error in pkht	
20	Core flux	Best used if a single number is required to represent the flux for ALL objects. Basically aperture integration with radius rcore (in the FITS header) but modified to simultaneously fit 'cores' in case of overlapping images. Best scaled to ≈<FWHM> for site+instrument. Combined with later-derived aperture corrections for general photometry.
21	Error in flux	
22	Core 1 flux	A series of different radii core/aperture measures similar to parameter 20
23	Error in flux	
24	Core 2 flux	Together with parameter 18 these give a simple curve–of–growth analysis from
25	Error in flux	
26	Core 3 flux	peak pixel, $1/2\times$ rcore, rcore, $\sqrt{2}\times$ rcore, $2\times$ rcore, $2\sqrt{2}\times$ rcore,
27	Error in flux	$4\times$ rcore, $4\sqrt{2}\times$ rcore, $8\times$ rcore, $8\sqrt{2}\times$ rcore, $16\times$ rcore,
28	Core 4 flux	$16\sqrt{2}\times$ rcore, $32\times$ rcore
29	Error in flux	

30	Core 5 flux	4× basic core, ensures ∼ 99% of PSF flux
31	Error in flux	
32	Core 6 flux	Extras for generalised galaxy photometry further spaced
33	Error in flux	
34	Core 7 flux	by $\sqrt{2}$ in radius to ensure correct sampling out to
35	Error in flux	
36	Core 8 flux	reasonable range of aperture sizes
37	Error in flux	
38	Core 9 flux	Note these are all corrected for pixels from overlapping neighbouring images
39	Error in flux	
40	Core 10 flux	
41	Error in flux	
42	Core 12 flux	Biggest would be 32× rcore ie. ≈30 arcsec diameter
43	Error in flux	
44	Petrosian radius	r_p as defined in Yasuda et al. 2001 AJ 112 1104
45	Kron radius	r_k as defined in Bertin and Arnouts A&A Supp 117 393
46	FWHM radius	r_{fhwm} average image radius at half PeakHeight
47	Petrosian flux	Flux within circular aperture to $k \times r_p$
48	Error in flux	
49	Kron flux	Flux within circular aperture to $k \times r_k$
50	Error in flux	
51	FWHM flux	Flux within circular aperture to $k \times r_{fwhm}$ – simple alternative
52	Error in flux	
53	Error bit flag	Bit pattern listing various processing error flags
54	Sky level	Local interpolated sky level from background tracker
55	Sky variance	Local estimate of variation in sky level around image
56	Child/parent	Flag for parent or part of deblended deconstruct
		The following are accreted directly after standard catalog generation
57	RA	RA and Dec explicitly put in columns for overlay programs that cannot, in
58	Dec	general, understand astrometric solution coefficients. Derived exactly from
		WCS in header and XY in parameters 5 & 6
59	Classification	Flag indicating probable classification: eg. −1 stellar, +1 non–stellar, 0 noise
60	Statistic	An equivalent N(0,1) measure of how stellar–like an image is, used in
		deriving parameter 59 in a 'necessary but not sufficient' sense
		From the further processing pipeline after deriving a suitable PSF
61	PSF flux	Fitted flux from PSF
62	Error in flux	
63	X coord	Updated PSF-fitted X centroid
64	Error in coord	
65	Y coord	Updated PSF-fitted Y centroid
66	Error in coord	