

## Appendix C: Catalogue Columns

**Table C.1.** List of columns available in the catalogue, together with the units and brief description of the column content.

No	Column	Units	Description
1	name		Source designation (JHHMMSS.ss+DDMMSS.s) without IGAPS prefix.
2	RA	deg	J2000 RA (Gaia DR2 reference frame).
3	DEC	deg	J2000 DEC (Gaia DR2 reference frame).
4	gal_long	deg	Galactic Longitude.
5	gal_lat	deg	Galactic Latitude.
6	sourceID		Unique source identification string (run-ccd-detectionnumber).
7	posErr	arcsec	Astrometric fit error (rms) across the CCD.
8	mergedClass		1=galaxy, 0=noise, -1=star, 99=if different filters don't agree. See sect. 7.1.
9	pStar		Probability that the source is stellar.
10	pGalaxy		Probability that the source is extended.
11	pNoise		Probability that the source is noise.
12	i	mag	IPHAS i mag (Vega) using the 2.3 arcsec aperture.
13	iErr	mag	Random uncertainty for i. When r is not available and no colour term has been used, 0.05 mag has been added in quadrature.
14	iAB	mag	IPHAS i mag (AB) using the 2.3 arcsec aperture.
15	iEll		Ellipticity in the i-band.
16	iClass		1=galaxy, 0=noise, -1=star, -2=probableStar, -3=probableGalaxy for the i band.
17	iDeblend		True if the i source is blended with a nearby neighbour.
18	iSaturated		True if the i source is saturated.
19	iVignetted		True if the i source is in a part of focal plane where there is vignetting.
20	iTrail		True if the i source is close to a linear artifact.
21	iTruncated		True if the i source is close to the CCD boundary.
22	iBadPix		True if there are bad pixel(s) in the i source aperture.
23	iMJD		Modified Julian Date at the start of the i-band exposure.
24	iSeeing	arcsec	Average FWHM in the i-band exposure.
25	iDetectionID		Unique i-band detection identifier (run-ccd-detectionnumber).
26	iDeltaRA	arcsec	Position offset of the i-band detection in RA.
27	iDeltaDEC	arcsec	Position offset of the i-band detection in DEC.
28	ha	mag	IPHAS H-alpha mag (Vega) using the 2.3 arcsec aperture.
29	haErr	mag	Random uncertainty for ha.
30	haAB	mag	IPHAS ha mag (AB) using the 2.3 arcsec aperture.
31	haEll		Ellipticity in ha band.
32	haClass		1=galaxy, 0=noise, -1=star, -2=probableStar, -3=probableGalaxy for the ha band.
33	haDeblend		True if the ha source is blended with a nearby neighbour.
34	haSaturated		True if the ha source is saturated.
35	haVignetted		True if the ha source is in a part of focal plane where there is vignetting.
36	haTrail		True if the ha source is close to a linear artifact.
37	haTruncated		True if the ha source is close to the CCD boundary.
38	haBadPix		True if there are bad pixel(s) in the ha source aperture.
39	haMJD		Modified Julian Date at the start of the ha exposure.
40	haSeeing	arcsec	Average FWHM in the ha exposure.
41	haDetectionID		Unique ha detection identifier (run-ccd-detectionnumber).
42	haDeltaRA	arcsec	Position offset of the ha-band detection in RA.
43	haDeltaDEC	arcsec	Position offset of the ha-band detection in DEC.
44	r_I	mag	IPHAS r mag (Vega) using the 2.3 arcsec aperture.
45	rErr_I	mag	Random uncertainty for r_I.
46	rAB_I	mag	IPHAS r mag (AB) using the 2.3 arcsec aperture.
47	rEll_I		Ellipticity in r_I.
48	rClass_I		1=galaxy, 0=noise, -1=star, -2=probableStar, -3=probableGalaxy for the r_I band.
49	rDeblend_I		True if the r_I source is blended with a nearby neighbour.
50	rSaturated_I		True if the r_I source is saturated.
51	rVignetted_I		True if the r_I source is in a part of focal plane where there is vignetting.
52	rTrail_I		True if the r_I source is close to a linear artifact.
53	rTruncated_I		True if the r_I source is close to the CCD boundary.
54	rBadPix_I		True if there are bad pixel(s) in the r_I source aperture.
55	rMJD_I		Modified Julian Date at the start of the r_I exposure.
56	rSeeing_I	arcsec	Average FWHM in the r_I exposure.
57	rDetectionID_I		Unique r_I detection identifier (run-ccd-detectionnumber).

58	r_U	mag	UVEX r mag (Vega) using the 2.3 arcsec aperture.
59	rErr_U	mag	Random uncertainty for r_U.
60	rAB_U	mag	UVEX r mag (AB) using the 2.3 arcsec aperture.
61	rEll_U		Ellipticity in r_U.
62	rClass_U		1=galaxy, 0=noise, -1=star, -2=probableStar, -3=probableGalaxy for the r_U band.
63	rDeblend_U		True if the r_U source is blended with a nearby neighbour.
64	rSaturated_U		True if the r_U source is saturated.
65	rVignetted_U		True if the r_U source is in a part of focal plane where there is vignetting.
66	rTrail_U		True if the r_U source is close to a linear artifact.
67	rTruncated_U		True if the r_U is close to the CCD boundary.
68	rBadPix_U		True if there are bad pixel(s) in the r_U source aperture.
69	rMJD_U		Modified Julian Date at the start of the r_U exposure.
70	rSeeing_U	arcsec	Average FWHM in the r_U exposure.
71	rDetectionID_U		Unique r_U detection identifier (run-ccd-detectionnumber).
72	rDeltaRA_U	arcsec	Position offset of the r_U detection in RA.
73	rDeltaDEC_U	arcsec	Position offset of the r_U detection in DEC.
74	g	mag	UVEX g mag (Vega) using the 2.3 arcsec aperture.
75	gErr	mag	Random uncertainty for g. When r is not available and no colour term has been used, 0.05 mag has been added in quadrature.
76	gAB	mag	UVEX g mag (AB) using the 2.3 arcsec aperture.
77	gEll		Ellipticity in the g-band.
78	gClass		1=galaxy, 0=noise, -1=star, -2=probableStar, -3=probableGalaxy for the g band.
79	gDeblend		True if the g source is blended with a nearby neighbour.
80	gSaturated		True if the g source is saturated.
81	gVignetted		True if the g source is in a part of focal plane where there is vignetting.
82	gTrail		True if the g source is close to a linear artifact.
83	gTruncated		True if the g source is close to the CCD boundary.
84	gBadPix		True if there are bad pixel(s) in the g source aperture.
85	gmask		Source located in the inner (1) or outer (2) degraded area in the g-band filter.
86	gMJD		Modified Julian Date at the start of the g-band exposure.
87	gSeeing	arcsec	Average FWHM in the g-band exposure.
88	gDetectionID		Unique g-band detection identifier (run-ccd-detectionnumber).
89	gDeltaRA	arcsec	Position offset of the g-band detection in RA.
90	gDeltaDEC	arcsec	Position offset of the g-band detection in DEC.
91	U_RGO	mag	UVEX U_RGO mag (Vega) using the 2.3 arcsec aperture. Default pipeline calibration.
92	UErr	mag	Random uncertainty for U_RGO. Pipeline random error only.
93	UEll	mag	Ellipticity in U_RGO band.
94	UClass		1=galaxy, 0=noise, -1=star, -2=probableStar, -3=probableGalaxy for the U_RGO band.
95	UDeblend		True if the U_RGO source is blended with a nearby neighbour.
96	USaturated		True if the U_RGO source is saturated.
97	UVignetted		True if the U_RGO source is in a part of focal plane where there is vignetting.
98	UTrail		True if the U_RGO is close to a linear artifact.
99	UTruncated		True if the U_RGO is close to the CCD boundary.
100	UBadPix		True if there are bad pixel(s) in the U_RGO source aperture.
101	UMJD		Modified Julian Date at the start of the U_RGO exposure.
102	USeeing	arcsec	Average FWHM in the U_RGO exposure.
103	UDetectionID		Unique U_RGO detection identifier (run-ccd-detectionnumber).
104	UDeltaRA	arcsec	Position offset of the U_RGO-band detection in RA.
105	UDeltaDEC	arcsec	Position offset of the U_RGO-band detection in DEC.
106	brightNeighb		True if a very bright star is nearby.
107	deblend		True if the source is blended with a nearby neighbour in one or more bands.
108	saturated		True if saturated in one or more bands.
109	nBands		Number of bands in which the source is detected.
110	errBits		Bitmask indicating: bright neighbour (1), source blending (2), trail (4), saturation (8), outer gmask (16), vignetting (64), inner gmask (128), truncation (256) and bad pixels (32768).
111	nObs_I		Number of repeat IPHAS observations of this source.
112	nObs_U		Number of repeat UVEX observations of this source.
113	fieldID_I		Survey field identifier in IPHAS.
114	fieldID_U		Survey field identifier in UVEX.
115	fieldGrade_I		Internal quality control score of the IPHAS field. A to D scale.
116	fieldGrade_U		Internal quality control score of the UVEX field. A to D scale.
117	emitter		2 if good candidate for H $\alpha$ line emission, 1 if marginal, 0 if tested and in main locus, null if not tested.

118	variable		True if difference between the IPHAS and UVEX $r$ measurements exceeds $5\sigma$ and 0.2 mag.
119	2SourceID		SourceID of the object in the second detection.
120	i2	mag	IPHAS $i$ mag (Vega) for the secondary detection.
121	i2Err	mag	Random uncertainty for $i2$ . When $r2$ is not available and no colour term has been used, 0.05 mag has been added in quadrature.
122	i2Class		1=galaxy, 0=noise, -1=star, -2=probableStar, -3=probableGalaxy for the $i2$ band.
123	i2Seeing	arcsec	Average FWHM in the $i2$ exposure.
124	i2MJD		Modified Julian Date at the start of the $i2$ exposure.
125	i2DeltaRA	arcsec	Position offset of the $i2$ -band detection in RA.
126	i2DeltaDEC	arcsec	Position offset of the $i2$ -band detection in DEC.
127	i2DetectionID		Unique $i2$ detection identifier (run-ccd-detectionnumber).
128	i2ErrBits		Bitmask indicating bright neighbour (1), source blending (2), trail (4), saturation (8), vignetting (64), truncation (256) and bad pixels (32768) for $i2$ .
129	ha2	mag	IPHAS H-alpha mag (Vega) for secondary detection.
130	ha2Err	mag	Random uncertainty for $ha2$ .
131	ha2Class		1=galaxy, 0=noise, -1=star, -2=probableStar, -3=probableGalaxy for the $ha2$ band.
132	ha2Seeing	arcsec	Average FWHM in the $ha2$ exposure.
133	ha2MJD		Modified Julian Date at the start of the $ha2$ exposure.
134	ha2DeltaRA	arcsec	Position offset of the $ha2$ -band detection in RA.
135	ha2DeltaDEC	arcsec	Position offset of the $ha2$ -band detection in DEC.
136	ha2DetectionID		Unique $ha2$ detection identifier (run-ccd-detectionnumber).
137	ha2ErrBits		Bitmask indicating bright neighbour (1), source blending (2), trail (4), saturation (8), vignetting (64), truncation (256) and bad pixels (32768) for $ha2$ .
138	r2_I	mag	IPHAS $r$ mag (Vega) for the secondary detection.
139	r2Err_I	mag	Random uncertainty for $r2_I$ .
140	r2Class_I		1=galaxy, 0=noise, -1=star, -2=probableStar, -3=probableGalaxy for the $r2_I$ band.
141	r2Seeing_I	arcsec	Average FWHM in the $r2_I$ exposure.
142	r2MJD_I		Modified Julian Date at the start of the $r2_I$ exposure.
143	r2DeltaRA_I	arcsec	Position offset of the $r2_I$ -band detection in RA.
144	r2DeltaDEC_I	arcsec	Position offset of the $r2_I$ -band detection in DEC.
145	r2DetectionID_I		Unique $r2_I$ detection identifier (run-ccd-detectionnumber).
146	r2ErrBits_I		Bitmask indicating bright neighbour (1), source blending (2), trail (4), saturation (8), vignetting (64), truncation (256) and bad pixels (32768) for $r2_I$ .
147	r2_U	mag	UVEX $r$ mag (Vega) for the secondary detection.
148	r2Err_U	mag	Random uncertainty for $r2_U$ .
149	r2Class_U		1=galaxy, 0=noise, -1=star, -2=probableStar, -3=probableGalaxy for the $r2_U$ band.
150	r2Seeing_U	arcsec	Average FWHM in the $r2_U$ exposure.
151	r2MJD_U		Modified Julian Date at the start of the $r2_U$ exposure.
152	r2DeltaRA_U	arcsec	Position offset of the $r2_U$ -band detection in RA.
153	r2DeltaDEC_U	arcsec	Position offset of the $r2_U$ -band detection in DEC.
154	r2DetectionID_U		Unique $r2_U$ detection identifier (run-ccd-detectionnumber).
155	r2ErrBits_U		Bitmask indicating bright neighbour (1), source blending (2), trail (4), saturation (8), vignetting (64), truncation (256) and bad pixels (32768) for $r2_U$ .
156	g2	mag	UVEX $g$ mag (Vega) for the secondary detection.
157	g2Err	mag	Random uncertainty for $g2$ . When $r2$ is not available and no colour term has been used, 0.05 mag has been added in quadrature.
158	g2Class		1=galaxy, 0=noise, -1=star, -2=probableStar, -3=probableGalaxy for the $g2$ band.
159	g2Seeing	arcsec	Average FWHM in the $g2$ exposure.
160	g2MJD		Modified Julian Date at the start of the $g2$ exposure.
161	g2DeltaRA	arcsec	Position offset of the $g2$ -band detection in RA.
162	g2DeltaDEC	arcsec	Position offset of the $g2$ -band detection in DEC.
163	g2DetectionID		Unique $g2$ detection identifier (run-ccd-detectionnumber).
164	g2ErrBits		Bitmask indicating bright neighbour (1), source blending (2), trail (4), saturation (8), outer gmask (16), vignetting (64), inner gmask (128), truncation (256) and bad pixels (32768) for $g2$ .
165	U_RGO2	mag	UVEX U_RGO mag (Vega) for the secondary detection. Default pipeline calibration.
166	U2Err	mag	Random uncertainty for U_RGO2.
167	U2Class		1=galaxy, 0=noise, -1=star, -2=probableStar, -3=probableGalaxy for the U_RGO2 band.
168	U2Seeing	arcsec	Average FWHM in the U_RGO2 exposure.
169	U2MJD		Modified Julian Date at the start of the U_RGO2 exposure.
170	U2DeltaRA	arcsec	Position offset of the U_RGO2-band detection in RA.
171	U2DeltaDEC	arcsec	Position offset of the U_RGO2-band detection in DEC.
172	U2DetectionID		Unique U_RGO2 detection identifier (run-ccd-detectionnumber).

173	U2ErrBits	Bitmask indicating bright neighbour (1), source blending (2), trail (4), saturation (8), vignetting (64), truncation (256) and bad pixels (32768) for U_RGO2.
174	errBits2	Global bitmask for the second detection indicating: bright neighbour (1), source blending (2), trail (4), saturation (8), outer gmask (16), vignetting (64), inner gmask (128), truncation (256) and bad pixels (32768).