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J/A+A/591/A149 Hi-GAL. inner Milky Way: +68°±1° ≥70° (Molinari+, 2016)

Hi-GAL, the Herschel infrared Galactic Plane Survey: photometric maps and compact source catalogues.

First data release for the inner Milky Way: +68°±1° ≥70°.

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Pezzuto S., Swinyard B.M., Noriega-Crespo A., Bally J., Moore T.J.T.,
Plume R., Zavagno A., Di Giorgio A.M., Liu S.J., Pilbratt G.L.,
Mottram J.C., Russeil D., Piazzi L., Veneziani M., Benedettini M.,
Calzoletti L., Faustini F., Natoli P., Piacentini F., Merello M.,
Palmese A., Del Grande R., Polychroni D., Rygl K.L.J., Polenta G.,
Barlow M.J., Bernard J.-P., Martin P.G., Testi L., Ali B., Andre P.,
Beltran M.T., Billot N., Carey S., Cesaroni R., Compiègne M., Eden D.,
Fukui Y., Garcia-Lario P., Hoare M.G., Huang M., Joncas G., Lim T.L.,
Lord S.D., Martinavarro-Armengol S., Motte F., Paladini R., Paradis D.,
Peretto N., Robitaille T., Schilke P., Schneider N., Schulz B.,
Sibthorpe B., Strafella F., Thompson M.A., Umana G., Ward-Thompson D.,
Wyrowski F.
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[=2016A&A...591A.149M](#) (SIMBAD/NED BibCode)

ADC_Keywords: Surveys ; Milky Way ; Infrared sources

Keywords: dust, extinction - infrared: ISM - stars: formation - Galaxy: disk -
methods: data analysis - techniques: photometric

Abstract:

We present the first public release of high-quality data products (DR1) from Hi-GAL, the Herschel infrared Galactic Plane Survey. Hi-GAL is the keystone of a suite of continuum Galactic plane surveys from the near-IR to the radio and covers five wavebands at 70, 160, 250, 350 and 500μm, encompassing the peak of the spectral energy distribution of cold dust for 8≤T≤50K. This first Hi-GAL data release covers the inner Milky Way in the longitude range 68°±1°-70° in a |b|≤1° latitude strip.

Photometric maps have been produced with the ROMAGAL pipeline, which optimally capitalizes on the excellent sensitivity and stability of the bolometer arrays of the Herschel PACS and SPIRE photometric cameras. It delivers images of exquisite quality and dynamical range, absolutely calibrated with Planck and IRAS, and recovers extended emission at all wavelengths and all spatial scales, from the point-spread function to the size of an entire 2°x2° "tile" that is the unit observing block of the survey. The compact source catalogues were generated with the CuTex algorithm, which was specifically developed to optimise source detection and extraction in the extreme conditions of intense and spatially varying background that are found in the Galactic plane in the thermal infrared.

Hi-GAL DR1 images are cirrus noise limited and reach the 1σ-rms predicted by the Herschel Time Estimators for parallel-mode observations at 60"/s scanning speed in relatively low cirrus emission regions. Hi-GAL DR1 images will be accessible through a dedicated web-based image cutout service. The DR1 Compact Source Catalogues are delivered as single-band photometric lists containing, in addition to source position, peak, and integrated flux and source sizes, a variety of parameters useful to assess the quality and reliability of the extracted sources. Caveats and hints to help in this assessment are provided. Flux completeness limits in all bands are determined from extensive synthetic source experiments and greatly depend on the specific line of sight along the Galactic plane because the background strongly varies as a function of Galactic longitude. Hi-GAL DR1 catalogues contain 120581, 291858, 280143, 161946, and 85811 compact sources in the five bands.

Description:

This is the first public data release of high-quality products from the Herschel Hi-GAL survey. The release comes two years after the end of the Herschel observing campaign and is the result of extensive testing of the data reduction and extraction procedures created by members of the Hi-GAL consortium. The complexity and the large variation of the background conditions in all Herschel wavelength bands makes source extraction on the Galactic plane a challenging task. With Hi-GAL DR1, we provide access (<http://vialactea.iaps.inaf.it>) through a cutout service to high-quality images and compact source catalogues for the Galactic plane at 70, 160, 250, 350, and 500μm in the region 68°±1°-70° and |b|≤1°.

File Summary:

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
higalblu.dat	578	120581	Blue (PACS 70um) band HIGAL Herschel catalog
higalred.dat	578	291858	Red (PACS 160um) band HIGAL Herschel catalog
higalpsw.dat	558	280143	PSW (SPIRE 250um) band HIGAL Herschel catalog

higalpmw.dat	558	161946	PMW (SPIRE 350um) band HIGAL Herschel catalog
higalplw.dat	558	85811	PLW (SPIRE 500um) band HIGAL Herschel catalog
tableb1.dat	159	197	Clumps or clusters of saturated pixels, crossmatched with IRAS point sources and RMS sources

See also:

- [J/A+A/526/A151](#) : Hi-Gal sources distance determination (Russeil+, 2011)
[J/MNRAS/422/1071](#) : Cores in IR Dark Clouds for $300 \leq l \leq 330$ (Wilcock+, 2012)
[J/A+A/549/A130](#) : YSOs in Herschel-Hi-GAL survey (Veneziani+, 2013)
[J/ApJ/772/45](#) : Hi-GAL: star formation in the third quadrant (Elia+, 2013)
[J/A+A/579/A71](#) : Infrared emission of young HII regions (Cesaroni+, 2015)

[J/A+A/487/253](#) : RMS survey: ^{13}CO observations of YSOs (Urquhart+ 2008)
[J/A+A/501/539](#) : RMS survey. 6cm observations of YSOs (Urquhart+, 2009)
[J/ApJS/208/11](#) : Red MSX Source Survey: massive protostars (Lumsden+, 2013)

<http://vialactea.iaps.inaf.it> : Via Lactea Home Page

Byte-by-byte Description of file: [higalblu.dat](#) [higalred.dat](#)

Bytes	Format	Units	Label	Explanations
1- 6	I6	---	rowid	Sequential number
8- 29	A22	---	Name	Designation of the source (HIGALPXL.L1.L11+B.bbbb) (G1)
31- 40	F10.6	deg	GLON	Galactic longitude
42- 50	F9.6	deg	GLAT	Galactic latitude
52- 56	F5.2	deg	e_GLON	rms uncertainty on GLON
58- 62	F5.2	deg	e_GLAT	rms uncertainty on GLAT
64- 72	F9.5	deg	RAdeg	Right ascension (J2000)
74- 83	F10.6	deg	DEdeg	Declination (J2000)
85-109	A25	---	Image	Atlas image name (ATLAS_IMAGE)
111-118	F8.3	pix	Xpos	X position
120-127	F8.3	pix	Ypos	Y position
129-134	F6.3	pix	e_Xpos	rms uncertainty on Xpos
136-141	F6.3	pix	e_Ypos	rms uncertainty on Ypos
143-151	A9	---	Source	Source identification (SOURCE_ID)
153-161	F9.3	Jy	Fint	Source-integrated flux measured from the fitting process, uncorrected (FINT_UNCORR)
163-175	F13.7	Jy	Fintc	Source-integrated flux measured from the fitting process after applying photometric corrections as a function of the source size, to account for source non-Gaussianity and for scan speed (FINT)
177-184	F8.3	Jy	e_Fintc	Uncertainty on the integrated flux computed by multiplying the fitted source residual rms (RMS_TOTAL) by the fitted source area as estimated by FWHMA and FWHMB (ERR_FINT)
186-196	F11.3	MJy/sr	Fpeak	Source peak flux measured from the fitting process (FPEAK)
198-205	F8.3	MJy/sr	e_Fpeak	Uncertainty on the peak flux (ERR_FPEAK)
207-212	F6.2	arcsec	FWHMA	Full width at half maximum of the source along axis a of the elliptical Gaussian as determined by fitting engine
214-221	F8.2	arcsec	FWHMB	Full width at half maximum of the source along axis b of the elliptical Gaussian as determined by fitting engine
223-229	F7.2	arcsec	e_FWHMA	rms uncertainty on FWHMA (ERR_FWHMA)
231-237	F7.2	arcsec	e_FWHMB	rms uncertainty on FWHMB (ERR_FWHMB)
239-244	F6.1	deg	PA	[] Position angle of the elliptical Gaussian (N E)
246-250	F5.1	deg	e_PA	rms uncertainty on PA
252-263	F12.3	MJy/sr	Bckg	Background value determined at the source peak position (BACKGROUND)
265-277	F13.5	MJy/sr	Bckga	Coefficient a of the zero-order term of the background obtained by the fit at the source peak position (BACK_ACOEFF)
279-290	F12.5	MJy/sr	Bckgb	Coefficient b of the first-order term x of the background obtained by the fit at the source peak position (BACK_BCOEFF)
292-303	F12.5	MJy/sr/pix	Bckgc	Coefficient c of the first-order term y of the background obtained by the fit at the source peak position (BACK_CCOEFF)
305-315	F11.5	MJy/sr/pix2	Bckgd	Coefficient d of the second-order term x2 of the background obtained by the fit at the source peak position (BACK_DCOEFF)
317-327	F11.5	MJy/sr/pix2	Bckge	Coefficient e of the second-order term y2 of the background obtained by the fit at the source peak position (BACK_ECOEFF)
329-339	F11.5	MJy/sr/pix2	Bckgf	Coefficient f of the second-order term xy of the background obtained by the fit at the source peak position (BACK_FCOEFF)
341-353	F13.5	MJy/sr	rms	Standard deviation, loc, of the residuals computed within the source area defined by FWHMA and FWHMB after subtracting the

355-367	F13.5	MJy/sr	rmss	best fit (RMS_TOTAL) Standard deviation, loc, of the residuals computed within the fitting window after subtracting the best fit, excluding both the pixels that belong to the source and the pixels belonging to other sources that fall within the fitting window (RMS_SURROUND)
369-377	F9.5	---	SNR	Signal-to-noise ratio obtained by dividing FPEAK by the residual rms over a source area with FWHMA and FWHMB as semi-axes (SNR)

Basic detection information				

379-387	F9.3	---	detX	Relevance of the source in the second-derivative map along the x-axis defined as the ratio between the measured second derivative at source peak position and the adopted local threshold value (DET_X)
389-397	F9.3	---	detY	Relevance of the source in the second-derivative map along the y-axis defined as the ratio between the measured second derivative at source peak position and the adopted local threshold value (DET_Y)
399-407	F9.3	---	detX45	Relevance of the source in the second-derivative map along the bisector of the xy-axis defined as the ratio between the measured second derivative at source peak position and the adopted local threshold value (DET_X45)
409-417	F9.3	---	detY45	Relevance of the source in the second-derivative map along the bisector of the yx-axis defined as the ratio between the measured second derivative at source peak position and the adopted local threshold value (DET_Y45)
419-427	F9.3	MJy/sr/pix2	detlimX	Absolute value for the local detection limit threshold adopted for the second derivative along the x-axis coordinate (DETLIM_X)
429-437	F9.3	MJy/sr/pix2	detlimY	Absolute value for the local detection limit threshold adopted for the second derivative along the y-axis coordinate (DETLIM_Y)
439-447	F9.3	MJy/sr/pix2	detlimx45	Absolute value for the local detection limit threshold adopted for the second derivative along the bisector of the first and third quadrant (DETLIM_X45)
449-457	F9.3	MJy/sr/pix2	detlimy45	Absolute value for the local detection limit threshold adopted for the second derivative along the bisector of the second and fourth quadrant (DETLIM_Y45)
459	I1	---	Clump	Flag for confusion at detection level (CLUMP_FLAG) (G3)
461-462	I2	---	Ncomp	Number of Gaussian components used simultaneously in the fitting process (NCOMP) (G4)
464-467	I4	pix	Xcent	The x-pixel coordinate of the centre of the source fitting window in the original image (XCENT)
469-472	I4	pix	Ycent	The y-pixel coordinate of the centre of the source fitting window in the original image (YCENT)
474-475	I2	pix	Xwin	Half-width size of the source fitting window along x coordinate and centred at XCENT (XWINDOW)
477-478	I2	pix	Ywin	Half-width size of the source fitting window along y coordinate and centred at YCENT (YWINDOW)
480-481	I2	---	NCont	Number of other sources falling inside the fitting window whose presence is taken into account at fitting stage. Not all those other sources might have been fitted at the same time (NCONTAM)
483-486	F4.2	pix	Cent	Maximum variation in pixels for adjustment of the fit centre with respect to the position of detection, measured as the distance between the latter and the brightest local (within three pixels) pixel in the fitting window (CENT_TOL)
488-491	I4	---	DOF	Degrees of freedom of the source Gaussian fit

Quality flags				

493-507	F15.1	---	Chi2	chi ² determined by the fitting engine.
509-520	F12.2	---	Chi20	Estimator of the fidelity between the fit and the data computed as

					$\phi_i = (O(i) - F(i))^2 / F(i)$, where $O(i)$ is the observed data in the i pixel of the fitting window and $F(i)$ is the fitted value in the same position (CHI2OPP)
522	I1	---	fitst		[0/4] Flag returned from the fitting engine (FIT_STATUS) (G5)
524-525	A2	---	Guess		[ABC 0123456789] Flag on quality of guessed source parameters as determined at the detection stage (GUESS_FLAG) (G6)
527-533	A7	---	Group		[ABC 0123456789] Flag on quality of guessed source parameters as determined at the detection stage (GROUP_FLAG) (G6)
535	I1	---	Constr		Flag indicating the number of parameters that reached the tolerance limits allowed to the fit process (CONSTRAINS) (G8)

Basic extraction information

537-543	F7.3	---	rd2dx		Ratio between the second-derivative value along x direction expected by the fitted model of the source and the second derivative derivative measured at the detection stage (RDETP2DX) (G9)
545-552	F8.3	---	rd2dy		Ratio between the second-derivative value along y direction expected by the fitted model of the source and the second derivative measured at the detection stage. (RDETP2DY)
554-560	F7.3	---	rd2dx45		Ratio between the second-derivative value along the bisector of the xy direction expected by the fitted model of the source and the second derivative measured at the detection stage. (RDETP2DX45)
562-568	F7.3	---	rd2dy45		Ratio between the second-derivative value along the bisector of the yx direction expected by the fitted model of the source and the second derivative measured at the detection stage. (RDETP2DY45)
570-575	A6	---	ovlap		Flag to indicate whether the source has been detected and extracted in one or more adjacent tiles (OVERLAP_FLAG) (G10)
577-578	A2	---	ovflux		Flag to indicate which flux values were adopted if detected and extracted in two adjacent tiles (OVFLUX_FLAG) (G11)

Byte-by-byte Description of file: [higalpsw.dat](#) [higalpmw.dat](#) [higalplw.dat](#)

Bytes	Format	Units	Label	Explanations
1- 6	I6	---	rowid	Sequential number
8- 29	A22	---	Name	Designation of the source (HIGALPXL.L111+B.bbbb) (G1)
31- 40	F10.6	deg	GLON	Galactic longitude
42- 50	F9.6	deg	GLAT	Galactic latitude
52- 57	F6.2	deg	e_GLON	rms uncertainty on GLON
59- 64	F6.2	deg	e_GLAT	rms uncertainty on GLAT
66- 74	F9.5	deg	RAdeg	Right ascension (J2000)
76- 85	F10.6	deg	DEdeg	Declination (J2000)
87-111	A25	---	Image	Atlas image name (ATLAS_IMAGE)
113-121	F9.3	pix	Xpos	X position
123-131	F9.3	pix	Ypos	Y position
133-138	F6.3	pix	e_Xpos	rms uncertainty on Xpos
140-145	F6.3	pix	e_Ypos	rms uncertainty on Ypos
147-155	A9	---	Source	Source identification (SOURCE_ID)
157-165	F9.3	Jy	Fint	Source-integrated flux measured from the fitting process, uncorrected (FINT_UNCORR)
167-174	F8.3	Jy	e_Fint	Uncertainty on the integrated flux computed by multiplying the fitted source residual rms (RMS_TOTAL) by the fitted source area as estimated by FWHMA and FWHMB (ERR_FINT)
176-185	F10.3	MJy/sr	Fpeak	Source peak flux measured from the fitting process (FPEAK)
187-198	F12.3	MJy/sr	e_Fpeak	Uncertainty on the peak flux (ERR_FPEAK)
200-206	F7.2	arcsec	FWHMA	Full width at half maximum of the source along axis a of the elliptical Gaussian as determined by fitting engine
208-214	F7.2	arcsec	FWHMB	Full width at half maximum of the source along axis b of the elliptical Gaussian as determined by fitting engine
216-224	F9.2	arcsec	e_FWHMA	rms uncertainty on FWHMA (ERR_FWHMA)
226-234	F9.2	arcsec	e_FWHMB	rms uncertainty on FWHMB (ERR_FWHMB)
236-241	F6.1	deg	PA	[] Position angle of the elliptical Gaussian (N E)
243-247	F5.1	deg	e_PA	rms uncertainty on PA
249-258	F10.3	MJy/sr	Bckg	Background value determined at the source peak position (BACKGROUND)
260-271	F12.5	MJy/sr	Bckga	Coefficient a of the zero-order term of

273-283	F11.5	MJy/sr	Bckgb	the background obtained by the fit at the source peak position (BACK_ACOEFF)
285-296	F12.5	MJy/sr/pix	Bckgc	Coefficient b of the first-order term x of the background obtained by the fit at the source peak position (BACK_BCOEFF)
298-307	F10.5	MJy/sr/pix2	Bckgd	Coefficient c of the first-order term y of the background obtained by the fit at the source peak position (BACK_CCOEFF)
309-318	F10.5	MJy/sr/pix2	Bckge	Coefficient d of the second-order term x2 of the background obtained by the fit at the source peak position (BACK_DCOEFF)
320-330	F11.5	MJy/sr/pix2	Bckgf	Coefficient e of the second-order term y2 of the background obtained by the fit at the source peak position (BACK_ECOEFF)
332-342	F11.5	MJy/sr	rms	Coefficient f of the second-order term xy of the background obtained by the fit at the source peak position (BACK_FCOEFF)
344-354	F11.5	MJy/sr	rmss	Standard deviation, loc, of the residuals computed within the source area defined by FWHMA and FWHMB after subtracting the best fit (RMS_TOTAL)
356-364	F9.5	---	SNR	Standard deviation, loc, of the residuals computed within the fitting window after subtracting the best fit, excluding both the pixels that belong to the source and the pixels belonging to other sources that fall within the fitting window (RMS_SURROUND)

Basic detection information

366-373	F8.3	---	detX	Relevance of the source in the second-derivative map along the x-axis defined as the ratio between the measured second derivative at source peak position and the adopted local threshold value (DET_X)
375-382	F8.3	---	detY	Relevance of the source in the second-derivative map along the y-axis defined as the ratio between the measured second derivative at source peak position and the adopted local threshold value (DET_Y)
384-391	F8.3	---	detX45	Relevance of the source in the second-derivative map along the bisector of the xy-axis defined as the ratio between the measured second derivative at source peak position and the adopted local threshold value (DET_X45)
393-400	F8.3	---	detY45	Relevance of the source in the second-derivative map along the bisector of the yx-axis defined as the ratio between the measured second derivative at source peak position and the adopted local threshold value (DET_Y45)
402-408	F7.3	MJy/sr/pix2	detlimX	Absolute value for the local detection limit threshold adopted for the second derivative along the x-axis coordinate (DETLIM_X)
410-416	F7.3	MJy/sr/pix2	detlimY	Absolute value for the local detection limit threshold adopted for the second derivative along the y-axis coordinate (DETLIM_Y)
418-425	F8.3	MJy/sr/pix2	detlimx45	Absolute value for the local detection limit threshold adopted for the second derivative along the bisector of the first and third quadrant (DETLIM_X45)
427-433	F7.3	MJy/sr/pix2	detlimy45	Absolute value for the local detection limit threshold adopted for the second derivative along the bisector of the second and fourth quadrant (DETLIM_Y45)
435	I1	---	Clump	Flag for confusion at detection level (CLUMP_FLAG) (G3)
437	I1	---	Ncomp	Number of Gaussian components used simultaneously in the fitting process (NCOMP) (G4)
439-442	I4	pix	Xcent	The x-pixel coordinate of the centre of the source fitting window in the original image (XCENT)
444-447	I4	pix	Ycent	The y-pixel coordinate of the centre of the source fitting window in the original image (YCENT)
449-450	I2	pix	Xwin	Half-width size of the source fitting window along x coordinate and centred at XCENT (XWINDOW)
452-453	I2	pix	Ywin	Half-width size of the source fitting window along y coordinate and centred at YCENT (YWINDOW)
455-456	I2	---	NCont	Number of other sources falling inside

					the fitting window whose presence is taken into account at fitting stage. Not all those other sources might have been fitted at the same time (NCONTAM)
458-461	F4.2	pix	Cent		Maximum variation in pixels for adjustment of the fit centre with respect to the position of detection, measured as the distance between the latter and the brightest local (within three pixels) pixel in the fitting window (CENT_TOL)
463-466	I4	---	DOF		Degrees of freedom of the source Gaussian fit

Quality flags					

468-482	F15.3	---	Chi2		chi ² determined by the fitting engine.
484-497	F14.3	---	Chi20		Estimator of the fidelity between the fit and the data computed as $\phi_i = (O(i) - F(i))^2 / F(i)$, where $O(i)$ is the observed data in the i pixel of the fitting window and $F(i)$ is the fitted value in the same position (CHI2OPP)
499	I1	---	fitst		[0/4] Flag returned from the fitting engine (FIT_STATUS) (G5).
501-502	A2	---	Guess		[ABC 0123456789] Flag on quality of guessed source parameters as determined at the detection stage (GUESS_FLAG) (G6).
504-510	A7	---	Group		[ABC 0123456789] Flag on quality of guessed source parameters as determined at the detection stage (GROUP_FLAG) (G6).
512	I1	---	Constr		Flag indicating the number of parameters that reached the tolerance limits allowed to the fit process (CONSTRAINS) (G8)

Basic extraction information					

514-521	F8.3	---	rd2dx		Ratio between the second-derivative value along x direction expected by the fitted model of the source and the second derivative derivative measured at the detection stage (RDETP2DX) (G9).
523-531	F9.3	---	rd2dy		Ratio between the second-derivative value along y direction expected by the fitted model of the source and the second derivative measured at the detection stage. (RDETP2DY)
533-539	F7.3	---	rd2dx45		Ratio between the second-derivative value along the bisector of the xy direction expected by the fitted model of the source and the second derivative measured at the detection stage. (RDETP2DX45)
541-548	F8.3	---	rd2dy45		Ratio between the second-derivative value along the bisector of the yx direction expected by the fitted model of the source and the second derivative measured at the detection stage. (RDETP2DY45)
550-555	A6	---	ovlap		Flag to indicate whether the source has been detected and extracted in one or more adjacent tiles (OVERLAP_FLAG) (G10).
557-558	A2	---	ovflux		Flag to indicate which flux values were adopted if detected and extracted in two adjacent tiles (OVFLUX_FLAG) (G11).

Byte-by-byte Description of file: [tableb1.dat](#)

Bytes	Format	Units	Label	Explanations
1- 9	F9.5	deg	GLON	Galactic longitude (1).
11- 18	F8.5	deg	GLAT	Galactic latitude (1).
20- 23	A4	---	Map	Map designation (1NNN)
25- 26	I2	---	PixRed	?-- Number of saturated pixels in Red band
28- 29	I2	arcsec	ReRed	?-- Radius of the circularised area of the saturated pixels cluster in Red band
31- 33	I3	---	PixPSW	?-- Number of saturated pixels in PSW band
35- 36	I2	arcsec	RePSW	?-- Radius of the circularised area of the saturated pixels cluster in PSW band
38- 39	I2	---	PixPMW	?-- Number of saturated pixels in PMW band
41- 42	I2	arcsec	RePMW	?-- Radius of the circularised area of the saturated pixels cluster in PMW band
44- 45	I2	---	PixPLW	?-- Number of saturated pixels in PLW band
47- 48	I2	arcsec	RePLW	?-- Radius of the circularised area of the saturated pixels cluster in PLW band
50- 60	A11	---	IRAS	IRAS source <60° from the cluster barycentre
62-159	A98	---	RMS	RMS sources <40° from the cluster barycentre

Note (1): Centroid position of the cluster at the shortest wavelength where the

saturation conditions exists.

Global notes:

Note (G1): Designation of the source based on its Galactic position in the form LLL.Llll+b.bbbb. The naming convention for the Hi-GAL catalogue has the form HIGALPXLLL.Llll+b.bbbb, where HIGALP stands for the preliminary catalogue, X stands for the band where the source has been identified among the possible choices:

B - blue band; R - red band; S - PSW band; M - PMW band; L - PLW band.

Note (G3): A value equal to 0 means that the source was identified from an isolated group of pixels above the threshold in all the four derivative directions. Sources belonging to the extraction of the same atlas image having the same value of this flag belong to the same group of pixels above the threshold.

Note (G4): The number of Gaussian components includes the source, so the minimum value is 1, this number is greater than 1 if the source is fit with other nearby detections.

Note (G5): Possible values of the fitst flag are as follows:

- 0 = fit convergence failed
- 1 = convergence reached
- 2 = convergence reached despite the initial accuracy requested to fitting engine was set too low
- 3 = maximum number of iterations in the fitting process reached
- 4 = problems in fitting due to the initial guess

Note (G6): The form of the Guess and group flags are GN, where

G is a letter defined as:

A = optimal number of positions to estimate the size

B = sufficient number of positions to estimate the size

C = low number of positions to estimate the size

and N is a number defining the quality of initial guess size:

- 0 = initial estimate failed
- 1 = good initial estimate for sizes
- 2 = one of the two guessed sizes was initially estimate as smaller than the PSF
- 3 = initial estimates of source sizes were higher than three times the PSF.

Note (G8): Values of 4 indicate that the source flux has higher unreliability since either the centre and its sizes have reached the maximum (or the minimum) allowed for the fit engine.

Note (G9): Values closer to one indicate a higher reliability of the source

Note (G10): Overlap flag:

H indicates that the source has been detected in the tile named in column ATLAS_IMAGE

E,W indicate that the source is detected only in the eastern or western adjacent tile, respectively (east is higher Galactic longitude); if the source has been detected in both H and E or W, then the name of the adjacent tile is also listed (e.g. H_l060). In these cases, the entry in the catalogue is the one with the highest S/N.

Note (G11): Ovflux flag:

- 0 indicates that the source has been detected only once and therefore all fluxes refer to this detection
- 1 indicates that the two fluxes differ by more than 15%; the one listed is that with the highest S/N
- 1 indicates that both integrated fluxes lie within 15%, the one in the catalogue is that with the highest S/N
- 2 indicates that the integrated fluxes differ by more than 15% but FPEAK are within 15%; the one listed is that with the highest S/N

History:

Copied at <http://tools.asdc.asi.it/HiGAL.jsp>

(End)

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The document above follows the rules of the [Standard Description for Astronomical Catalogues](#): from this documentation it is possible to generate f77 program to load files [into arrays](#) or [line by line](#)

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