Working with Gaia data

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Status: Issued

gaia
European Space Agency

Outline

- Introduction
- Gaia DR1 contents
  - Main tables: gaia_source, tgas_source
  - Variable stars
  - External catalogues, pre-computed cross-matches
  - Other tables
- Documentation and resources
- Other interfaces
  - GAVO single object, ESA Sky, GAVO/CDS TAP, Topcat, Vaex, …
- Hands-on sessions: organisation, contents
- Conclusions

1. Introduction

Workflows

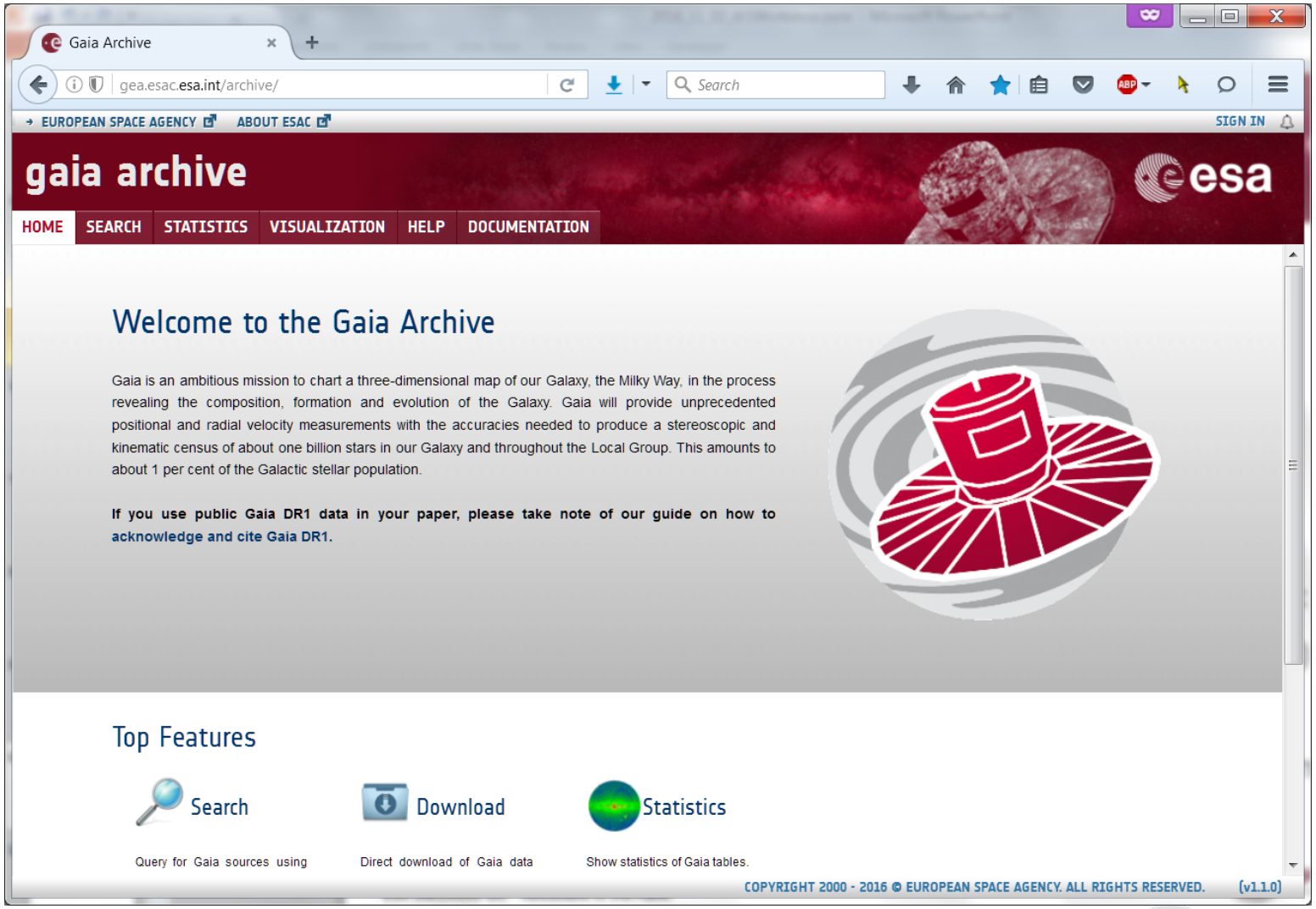
- There is no correct workflow! if it works, it is good
- Traditional (bring the data to the code)
  - Download tgas_source (~1GB) and/or gaia_source (~1TB)
  - Ingest it in your local supercomputer
  - Ingest additional catalogues. Ingest/do cross matches
  - Do science!
- Gaia archive (towards bringing the code to the data)
  - Selection (ADQL query) at Gaia Archive ➔ Reproducibility!
  - Refinement, also at Gaia Archive: Xmatch, simple computation, comparison with external data, share with colleagues
  - Download and do science! ➔ Data (size) reduction

The Gaia data

- Where?
  - Main Gaia archive: ESAC
  - Partner data centres: AIP, ARI, ASI, BCN, CDS
  - Affiliated and other data centres, enthusiasts: tens
- What?
  - tgas_source (~2M 5 parameter astrometry): all
  - gala_source (~1.1G positions): most
  - Variability (599 cepheids, 2595 RR Lyrae), QSOs (2191): ESAC+
  - Xmatch (2MASS, PPMXL, SDSS9 , UCAC4, URAT1, WISE): ESAC
  - External catalogues (for Xmatch): ESAC
- What else @ESAC?: TAP+ (data base, user space, share), cross-match

2. Gaia DR1 contents

The Gaia Archive



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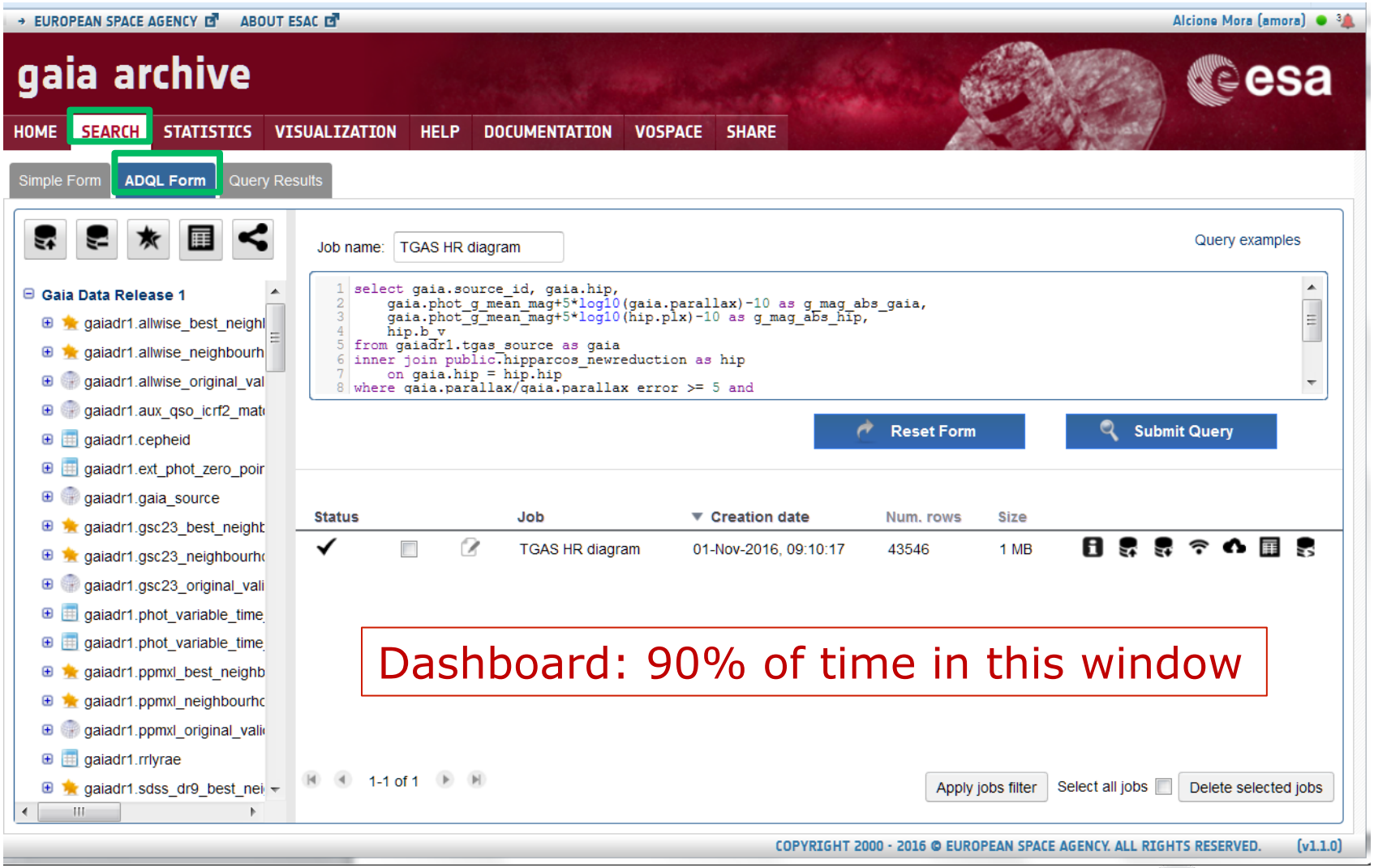
The ADQL search tab



Lots of tables!

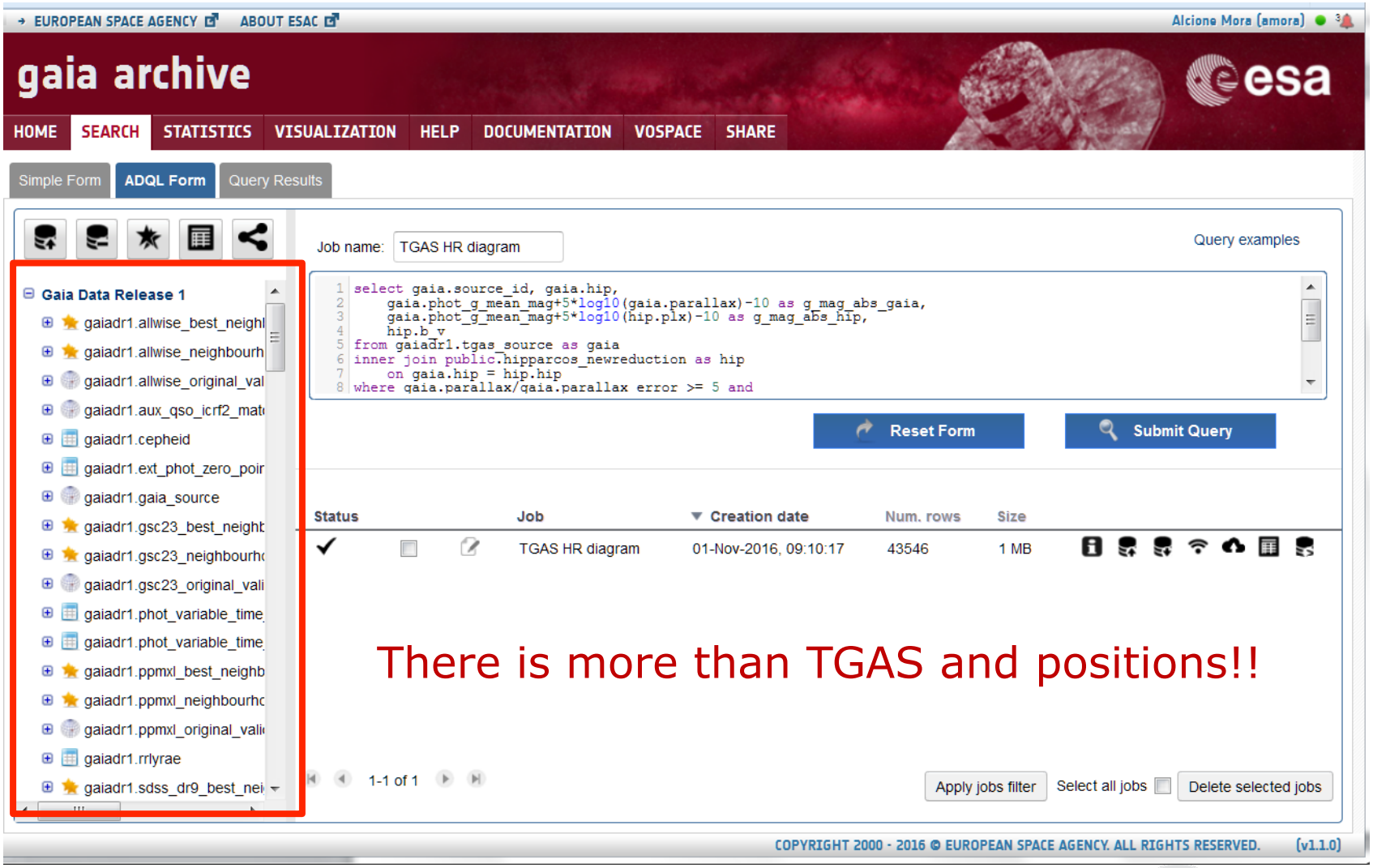


Table inspection: tree view

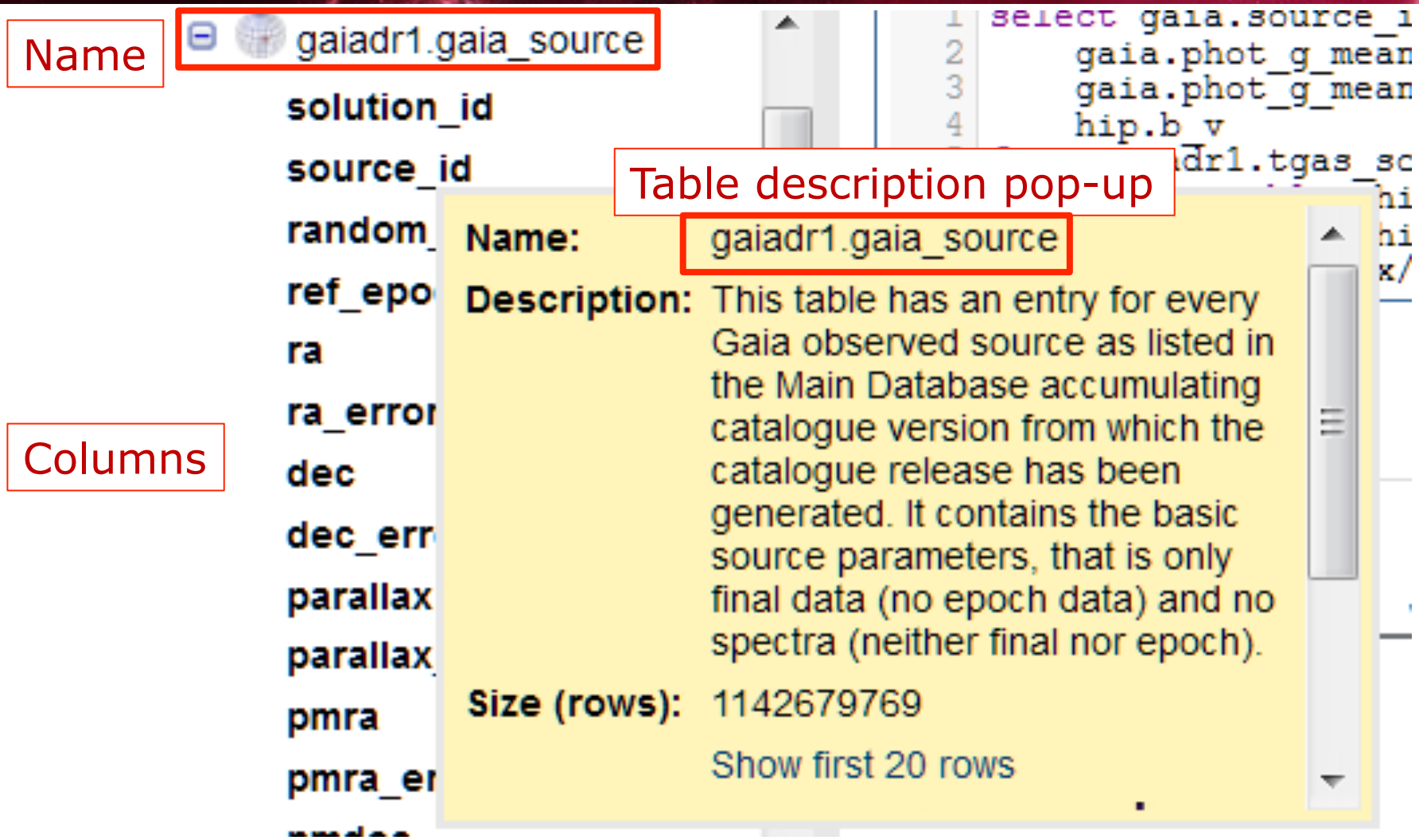


Table inspection: tree view

Name

Columns

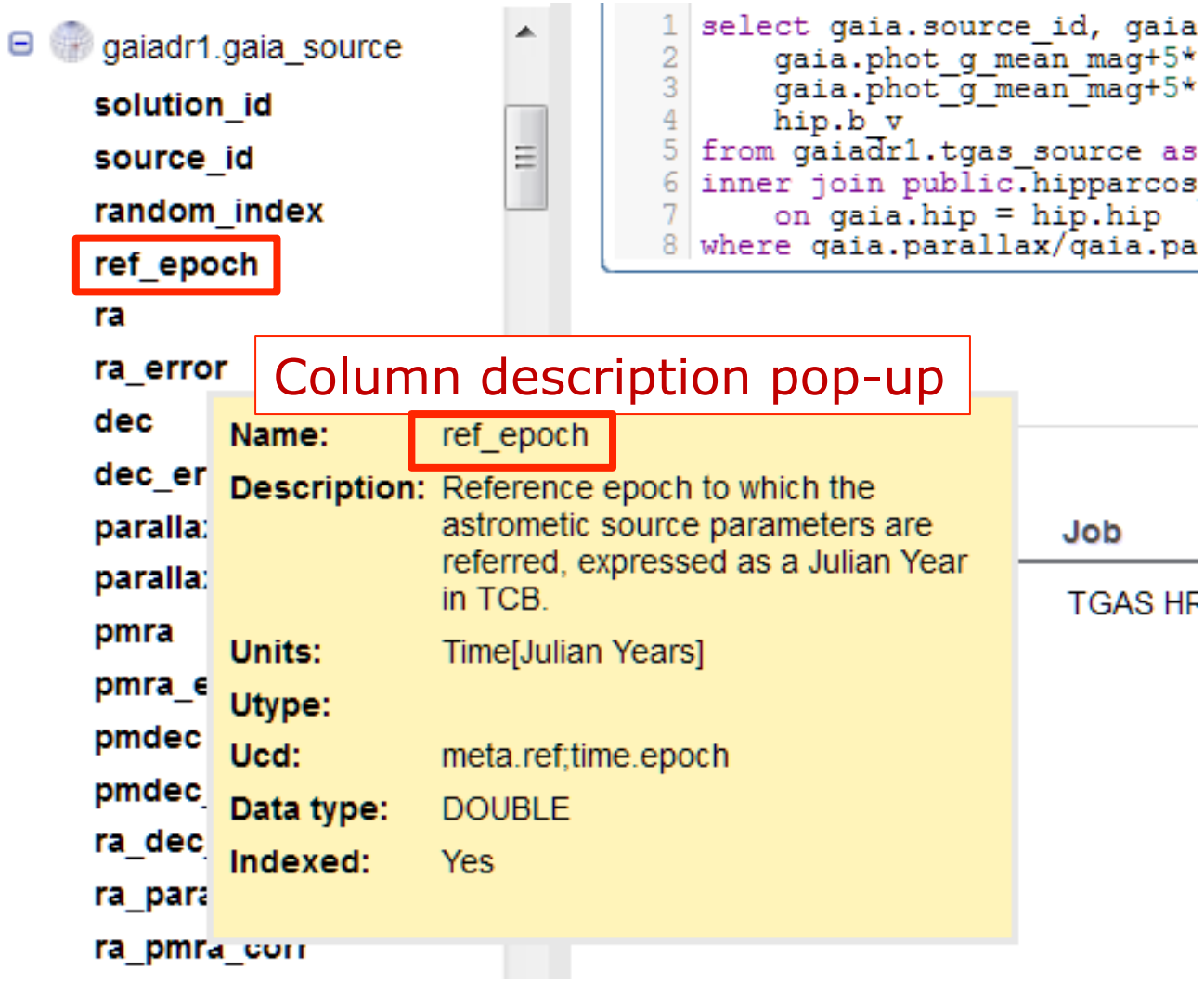
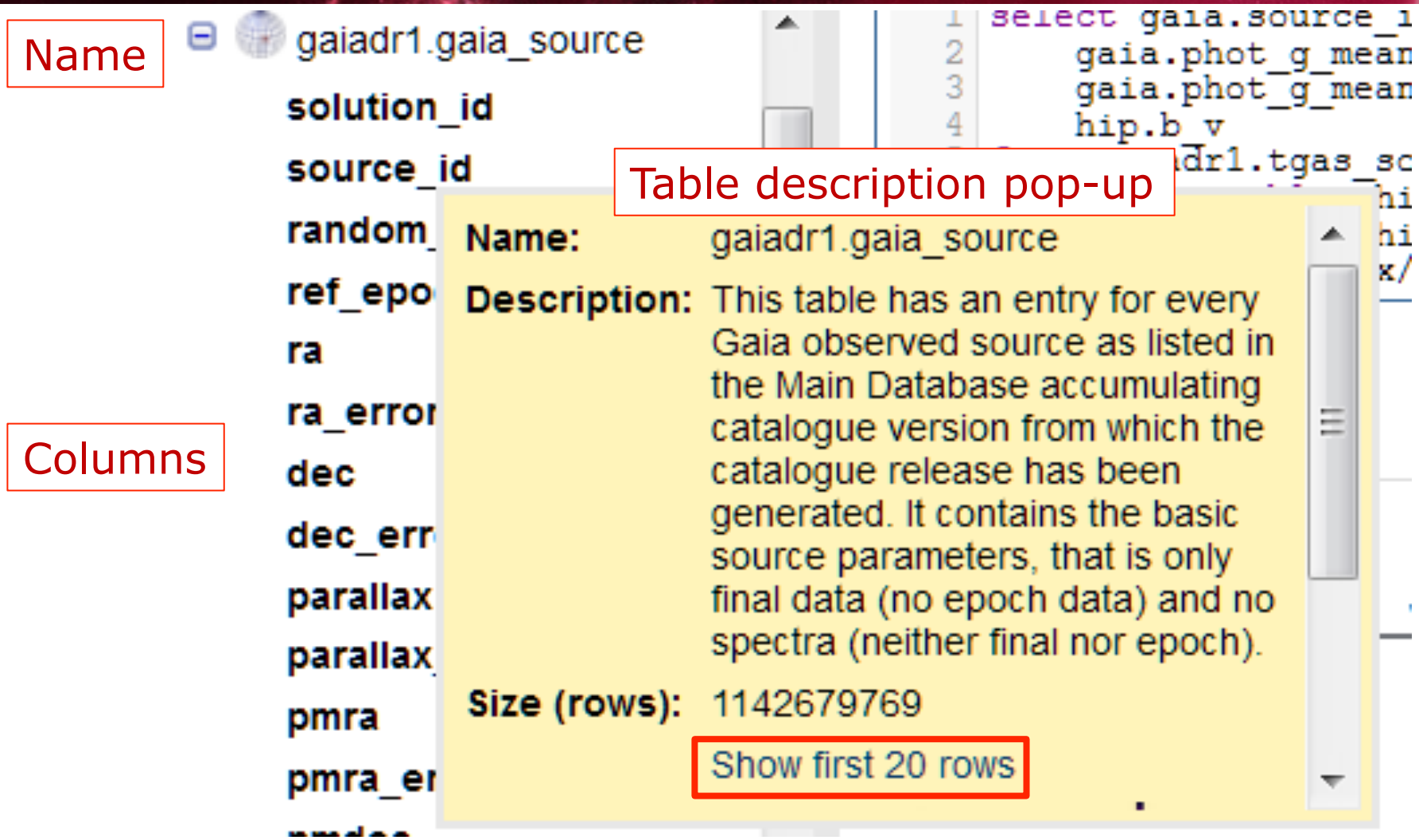
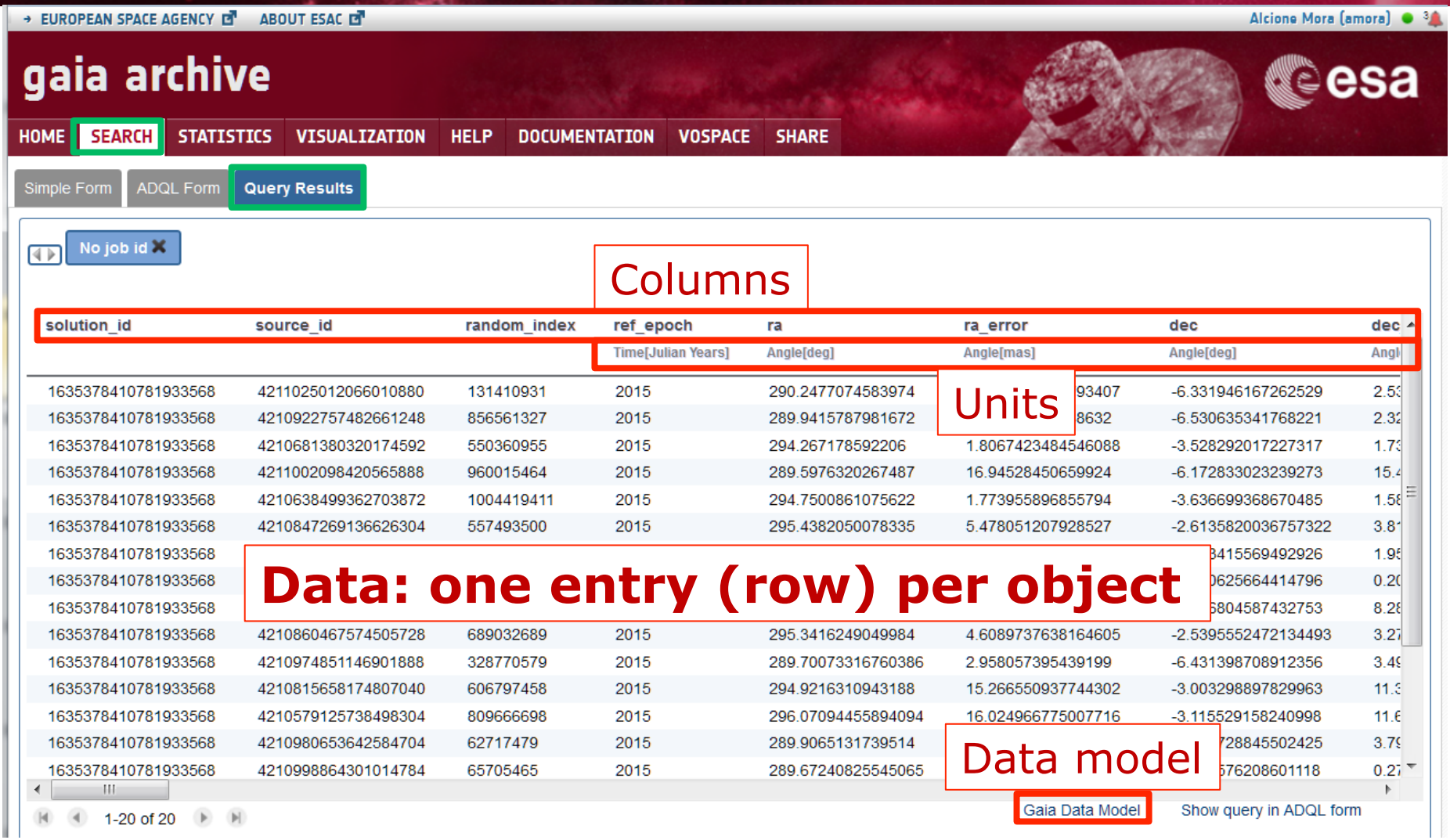


Table inspection: show data



Gaia source: main table



solution_id	source_id	random_index	ref_epoch	ra	ra_error	dec	dec
			Time[Julian Years]	Angle[deg]	Angle[mas]	Angle[deg]	Angl
1635378410781933568	4211025012066010880	131410931	2015	290.2477074583974	93407	-6.331946167262529	2.53
1635378410781933568	4210922757482661248	856561327	2015	289.9415787981672	8632	-6.530635341768221	2.32
1635378410781933568	4210681380320174592	550360955	2015	294.267178592206	1.8067423484546088	-3.528292017227317	1.73
1635378410781933568	4211002098420565888	960015464	2015	289.5976320267487	16.94528450659924	-6.172833023239273	15.4
1635378410781933568	4210638499362703872	1004419411	2015	294.7500861075622	1.773955896855794	-3.636699368670485	1.58
1635378410781933568	4210847269136626304	557493500	2015	295.4382050078335	5.478051207928527	-2.6135820036757322	3.81
1635378410781933568					3415569492926		1.95
1635378410781933568					0625664414796		0.20
1635378410781933568					6804587432753		8.28
1635378410781933568	4210860467574505728	689032689	2015	295.3416249049984	4.6089737638164605	-2.5395552472134493	3.27
1635378410781933568	4210974851146901888	328770579	2015	289.70073316760386	2.958057395439199	-6.431398708912356	3.49
1635378410781933568	4210815658174807040	606797458	2015	294.9216310943188	15.266550937744302	-3.003298897829963	11.3
1635378410781933568	4210579125738498304	809666698	2015	296.07094455894094	16.024966775007716	-3.115529158240998	11.6
1635378410781933568	4210980653642584704	62717479	2015	289.9065131739514	728845502425		3.79
1635378410781933568	4210998864301014784	65705465	2015	289.67240825545065	576208601118		0.27

Gaia source: ID, random index

solution_id	source_id	random_index
	Object unique identifier	Subsample selection
1635378410781933568	4211025012066010880	131410931
1635378410781933568	4210922757482661248	856561327
1635378410781933568	4210681380320174592	550360955
1635378410781933568	Unfriendly? Healpix info ➔ maps!	60015464
1635378410781933568	4210638499362703872	1004419411

Gaia source: positions

Superb positions for 1.14 G objects

ref_epoch	ra	dec
Time[Julian Years]	Angle[deg]	Angle[deg]
2015	300.28256808851535	0.338437679145764 6
2015	300.9181006192138	0.1760835589939723 8
2015	301.155818730799	2.166051944700376 5
2015	301.13075807613995	0.974879710173266

Astrometry plenaries ➔ L. Lindegren, X. Luri

Gaia source: parallax, p.motion

dec_error	parallax	parallax_error
Angle[mas]	Angle[mas]	Angle[mas]
4.222477311401552		
0.877009943786541		
5.370232362395689		
0.2682918545576926		
0.590824684236497 9		
0.16589110681746988	2.565956505686 5787	0.387983898472205
0.3618453402824 8944		

Only for the TGAS sample: 2.06 M

Null values in DR1➔ query refinement

Gaia source: covariance matrix

ra_dec_corr	ra_parallax_corr	ra_pmra_corr
Dimensionless[see description]	Dimensionless[see description]	Dimensionless[see description]
0.5236		
0.83865		
0.99365		
0.7458		
0.7047		
0.66424227	0.74679744	-0.39492953

ICRF only. Correlations can be large ➔ important

Gaia source: Galactic, ecliptic

Positions only ➔ queries ➔ error propagation needed

l Angle[deg]	b Angle[deg]	ecl_lon Angle[deg]	ecl_lat Angle[deg]
41.38468878603386	-15.2948815190363	302.55244993100195	20.420860886716046
41.54957214870157	-15.931305225209234	303.1766146763038	20.125151143357673
43.48093600509205	-15.186492969399442	303.8938529031075	22.01421700286302
42.38479706763641	-15.737318240748925	303.5847647472434	20.858039005278464
41.05387811053283	-15.265361681028155	302.3071538162389	20.19773504555001
42.51523401011449	-15.38608272577003	303.39086758342427	21.184224974378044
42.17499352274012	-15.07701814117554	302.9096768606321	21.140333305092366
41.52417929623358	-15.940371354511932	303.16687301481477	20.100764542386898
41.28130624404712	-15.380473521368659	302.55240932811836	20.289460110014772

Gaia source: scan direction

Concentration of scan directions. Order 1-4

scan_direction_strength_k1	scan_direction_strength_k2	scan_direction_mean_k1 Angle[deg]	scan_direction_mean_k2 Angle[deg]
0.26140147	0.61055505	-165.97098	-14.455755
0.35065272	0.6441233	-152.07622	-20.114878
0.6792484	0.73401165	-179.35593	-8.866455
0.55601114	0.7555873	-179.13919	-9.0965605
0.33699873	0.709895	171.71075	-16.000694
0.43528488	0.7146235	-177.74893	-9.335844
0.2079076	0.6589818	-167.61942	-14.168348

Gaia source: excess noise

astrometric_excess_noise	astrometric_excess_noise_sig
Angle[mas]	Disagreement between observations and best model Modelling errors, non-single source (binary, exoplanet)
0.307680910152251 5	99.3373176554083
0.4081069126237956 7	16.536542590328157
0.6881925593905477	42.233631122867 67
11.8694417892881	37.53590843434841
1.0136870231665451	0.7637338108272738
1.4735285444952082	0.4097262047369883
0.3192740894983116	0.3423657544280623

Probably significant

Probably not significant

Gaia source: photometry

Accurate and precise! ➔ absolute magnitudes

phot_g_mean_flux	phot_g_mean_flux_error	phot_g_mean_mag
Flux[e-/s]	Flux[e-/s]	Magnitude[mag] Vega
150.31850826353428	3.1894307668628454	20.082238920725686
232.3607167177248	2.59436363815793	19.60936329536646
380.15265581299195	4.383168176927559	19.07487491613946
130.3038843605325	1.9339587367770623	20.237376658265894
434.4102617243304	2.614265854156168	18.930019874612242

Errors only in flux ➔ conversion for magnitudes
Epoch photometry only for variables

Photometry plenary ➔ F. van Leeuwen

TGAS source

hip	tycho2_id	source_id	astrometric_delta_q
14113		44358422235136	0.25581256
	55-767-1	517457659828	
	48-748-1	824633722270	
13957		83150566993664	1.2712831
		493056	
	48-763-1	92599494964480	
	48-872-2	111600430360448	
	55-301-1	115723598973952	

Hipparcos/Gaia discrepancy
➔ non-linear motion?

Hipparcos or Tycho2 (multiplicity)
➔ Traceability ➔ no Xmatch

QSOs used for ICRF 2 match

aux_qso_icrf2_match: 2191 objects

source_id	icrf2_match	rot_flag
52907090779778048	J041243.6+230505	0
5294567676596390 4	J040145.1+211028	3
617638974600449 28	J032536.8+222400	3
65534775667061760	J035721.6+231953	0
72424521684231168	J021113.1+105134	0
74877325967391872	J023145.8+132254	3
76919015983802624	J015856.2+130702	0

ICRF2 designation

RA/DEC used?

Variable stars

- Multiple tables: plain data model, multiple types, separate light curve
  - Possibly more in forthcoming data releases
- variable_summary: variable type and fundamental frequency
- phot_variable_time_series_gfov: light curve
- phot_variable_time_series_gfov_statistical_parameters: light c. statistics
- cepheid: classification, period, phase, light curve and Fourier analysis
- rrlyrae: idem

Variability plenary ➔ L. Eyer

Variables: variable_summary

source_id	phot_variable_fundam_freq1 Frequency[day^-1]	classification Dimensionless[see description]
4656702360931582080	1.7638427158803185	RRLYR
4656714936595899008	3.2746480203135504	RRLYR
4656716414064729984	1.8483699441750445	RRLYR
4656720846471011200	2.915671848264129	RRLYR
4658879737581295744	2.031117366148958	RRLYR
4658882834232119936	1.7946151441295082	RRLYR
4658882868591839488	1.7148278768569303	RRLYR

Variables: light curve

One entry per object and epoch: 233,181 rows

observation_time Time[Barycentric JD in TCB - 2455197.5 (day)]	g_flux Flux[e-/s]	g_flux_error Flux[e-/s]	g_magnitude Magnitude[mag]
1666.4708409132627	323.3406240378528	6.139588887158467	19.25061938345054
1666.646999930693	286.7358824320857	56.91077458377935	19.381064952793295
1666.7210076079693	255.0714586668238	4.621548747960895	19.508115399450226
1666.8971667883682	473.9340937184366	3.8638062521973255	18.835475183940574
1666.9711745074405	368.06374709170376	4.482043542948077	19.1099624559301
1667.147333701442	270.0869075966821	2.90891365826153	19.446011232919545
1667.2213414646678	262.13781543831874	3.894873668425852	19.478445874202386

Table: phot_variable_time_series_gfov

Variables: light curve statistics

Time dimension

mean_obs_time	time_duration	range
Time[day]	Time[day]	Magnitude[mag]
1705.8687045339116	289.9337443315121	0.8719523050235196
1731.5943707573065	353.2290230745175	0.8681506172712261
1717.3163023643779	317.7498530999553	0.988890029720276
1705.1373071975547	317.4997351924594	0.48049571525382007
1725.8206347625362	354.47723964053193	0.8507854493324878
1739.5542246020586	354.4773354103081	0.881966840980219
1726.503664150165	354.4773252986647	0.8934308377195066

Table: phot_variable_time_series_gfov_statistical_parameters

Variables: light curve statistics

Magnitude dimension

std_dev	kurtosis	abbe
Magnitude[mag]	Dimensionless[see description]	Dimensionless[see description]
0.265654529194804 6	-0.768211479082093 8	1.155442836024809 2
0.188563071751560 56	0.219641809236421 96	1.143675868251519 3
0.294100739444842 33	-0.553402472083952 7	1.145724259434283 6
0.16544267159762 49	-1.516991317181373 1	1.156074872987434 6
0.28966804083197 56	-1.32733866425745	1.08682600056406 55
0.280955778717471 96	-1.329306644290305 4	0.91512924914560 63
0.291895083935055 37	-1.18890266020294 2	0.84497955808778 71

Table: phot_variable_time_series_gfov_statistical_parameters

Variables: cepheid

cepheid: 599 stars

type_best_classification	type2_best_sub_classification	mode_best_classification
Dimensionless[see description]	Dimensionless[see description]	Dimensionless[see description]
DCEP		FIRST_OVERTONE
T2CEP	W_VIR	NOT_APPLICABLE
DCEP		FIRST_OVERTONE
DCEP		FIRST_OVERTONE
DCEP		FIRST_OVERTONE
DCEP		FUNDAMENTAL
DCEP		FUNDAMENTAL

Variables: rrlyrae

rrlyrae: 2595 stars

best_classification
Dimensionless[see description]
RRAB
RRC
RRAB
RRC
RRAB
RRAB
RRAB

Variables: cepheid & rrlyrae

Period, phase (maximum)

p1 Time[day]	p1_error Time[day]	epoch_g Time[Barycentric JD in TCB - 2455197.5 (day)]
3.614729153978948	0.00003877310673582897	1657.3671603595308
12.344893037972328	0.0029671644081979607	1632.0907277189908
3.8386939678484437	0.00003322311364673833	1655.774012535319
3.6510754399038294	0.00003455253060180673	1656.6770714790302
2.562626343755672	0.000014967962864840254	1661.7027152130506
2.013016128515109	0.00001756885426988 73	1660.4638633891577
4.960585258111933	0.000041017498956737794	1656.231980782321

Variables: cepheid & rrlyrae

Light curve statistics

int_average_g Magnitude[mag]	int_average_g_error Magnitude[mag]	peak_to_peak_g Magnitude[mag]
14.954082877377754	0.00010246811418745811	0.307019960848785 8
17.27123110492655	0.0003669671362940 7184	0.127969834997252
14.788638034712074	0.0000726806590660 7311	0.276935176986683
14.82739673056611	0.0001094324150938 9919	0.294966764843577 4
15.190545171689973	0.0001010353270039 6919	0.373906137119263 35
16.258188929514205	0.0002113085285744678	0.687443064056919 8
14.910370364643 47	0.0000645514945617 1634	0.759775394211370 5

Variables: cepheid & rrlyrae

Light curve Fourier analysis

num_harmonics_for_p1	r21_g	phi21_g
Dimensionless[see description]	Dimensionless[see description]	Dimensionless[see description]
3	0.1926576256953489 4	4.139219692098457
4	0.1823749764102401	3.695100218427079
1		
2	0.30588877526667824	4.3444320110067665
2	0.04106847242968088	4.049381047468977
4	0.477281699583000 5	4.467698410741711
3	0.2034280995592613	4.138358246463358

Pre-computed cross-matches

- Gaia DR1 is just one data set. Other catalogues needed
  - Astrometry, radial velocities, photometry, stellar parameters, …
- Ambiguity: different resolution, wavelength, epoch, proper motion, …
  - Many to many relationship ➔ pivot tables needed
- Gaia Archive: catalogue copies and pre-computed cross-matches
  - Speed: indices. Efficiency: avoids ~100 M rows traffic
- 2MASS PSC: Skrutskie et al. 2006. 470,992,970 entries
- AllWISE: Cutri et al. 2013, 747,634,026 entries
- GSC2.3: Lasker et al. 2008. 945,592,683 entries
- PPMXL: Roeser et al. 2010. 910,468,688 entries
- SDSS DR9: Ahn et al. 2012. 469,029,929 entries
- UCAC4: Zacharias et al. 2013. 113,728,883 entries
- URAT-1: Zacharias et al. 2015. 228,276,482 entries

Xmatch plenary
➔ P. Marrese

Xmatch: neighbourhood

gsc23_oid	source_id	original_ext_source_id
185522891	6083712739771159808	S99R046506
185522891	6083712735454214528	S99R046506
185522891	6083712739771159424	S99R046506
185522891	6083712739771173760	S99R046506
186638244	6083717786336863360	S99R121241
186638244	6083717786336870400	S99R121241
186638244	6083717790654613888	S99R121241
186638244	6083717790654613760	S99R121241

Many to many relationship ➔ double entry ➔ one row per pair

ω Cen core

Xmatch: neighbourhood

gsc23_oid	source_id	original_ext_source_id
186167520	6083518091833868416	S99R056045
186168205	6083518091833868416	S99R055731
186172303	6083518091833868416	S99R120298
186176636	6083518091833868416	S99R056043
186194692	6083714492121489280	S99R055944
186208246	6083714492121489280	S99R055942
186211491	6083714492121489280	S99R139072
186211811	6083714492121489280	S99R139057

Many to many relationship ➔ double entry ➔ one row per pair

ω Cen core

Xmatch: neighbourhood

angular_distance	score	proper_motion_flag
Angle[arcsec]	Score is not just distance	Proper motion considered
0.3220457522588669	0.0030531237186999572	0
0.30026109668711304	0.0031604553064496 62	0
4.925147897295843	0.00000130375637792787 18	0
4.975373379605748	9.466356254920873e-7	0
0.0033175677839491 06	6.929684312915143	1
0.0071176384371319 96	5.485678580529783	1
0.0071176384371319 96	5.485678580529783	1
0.0071176384371319 96	5.485678580529783	1

ω Cen core

Xmatch: best neighbour

>0 ➔ other Gaia sources share best neighbour

number_of_neighbours	number_of_mates	best_neighbour_multiplicity
8	1	1
8	0	1
8	0	1
8	2	1
8	0	1
7	0	1
7	0	1

ω Cen core

Xmatch: external catalogues

Additional photometry

gsc23_oid	gsc23_identifier	b_mag Magnitude[mag]	v_mag Magnitude[mag]
90009004	SAR3000659	10.88700008392334	10.20300006866455
5007637	SAA9012064	10.119999885559082	8.829999923706055
5007638	SAA9012291	10.119999885559082	8.829999923706055
5007639	SAA9000005	10.513999938964844	8.97599983215332
55009439	S7VQ000023	12.503999710083008	11.593999862670898
95004547	S4CA000444	12.803000450134276	12.008999824523926
30008893	S7U1000662	11.416999816894531	11.093999862670898

Xmatch: external catalogues

Additional astrometry

gsc23_oid	ra Angle[deg]	dec Angle[deg]	position_epoch Time[Julian Years]
55019723	192.93459034684585	-65.92366935657593	1997.0905
55019724	193.97200779498252	-65.92366935657593	1980.112
55019725	85.61100631434635	-65.92366893523523	1978.9672
55019726	233.3024604486864	-65.92366865434145	1976.259
55019727	77.73486779760917	-65.92366837344765	1996.7677
55019728	200.0576073872929	-65.9236678116601	1997.096
55019729	125.76152103264121	-65.9236678116601	1991.1315

Other tables

- ext_phot_zero_point: photometric zero points (G, BP, RP; Vega)
- hipparcos: Hipparcos original data reduction (ESA 1997)
- hipparcos_newreduction: Hipparcos new reduction (van Leeuwen 2007)
- tycho2: Tycho2 catalogue (Høg et al. 2000)
- hubble_sc: Hubble source catalogue
- igsl_source: Initial Gaia Source List (IGSL, Smart & Nicastro 2014)
- igsl_source_catalog_ids: IGSL source identifiers in other catalogues
  - IGSL has been key in producing Gaia DR1, but…
  - It is superseded by Gaia DR1
  - Should NOT be used for cross-matching Gaia DR1

3. Documentation

Documentation and resources

- Gaia Archive. Includes help and tutorials
  - https://archives.esac.esa.int/gaia
- Gaia DR1 papers http://www.cosmos.esa.int/web/gaia/dr1#A&A
- Online documentation (361 pages)
  - http://gaia.esac.esa.int/documentation/GDR1/index.html
- Data model documentation
  - https://gaia.esac.esa.int/documentation/GDR1/datamodel/
- ADQL: GAVO short course, UK ROE cookbook
  - http://docs.g-vo.org/adql-gaia/html/index.html
  - https://gaia.ac.uk/science/gaia-data-release-1/adql-cookbook
- Gaia Helpdesk. https://support.cosmos.esa.int/gaia/

4. Other interfaces

Other interfaces (incomplete)

- Single object search: GAVO-ARI. http://gaia.ari.uni-heidelberg.de/
- Visual exploration: ESASky, Gaia Archive ➔ A.Moitinho, Gaia Sky
  - http://sky.esa.int/ http://ari-zah.github.io/gaiasky/
- Large dataset visualisation: Vaex ➔ M. Breddels http://vaex.astro.rug.nl/
- TAP: GAVO-ARI ➔ H. Heinl, Vizier (servers). Topcat ➔ M. Taylor (client)
  - http://gaia.ari.uni-heidelberg.de/
  - http://tapvizier.u-strasbg.fr/adql/
  - http://www.star.bris.ac.uk/~mbt/topcat/
- SQL: GAVO-AIP. https://gaia.aip.de/
- Cone search: GAVO-ARI. http://gaia.ari.uni-heidelberg.de/
- Cross-match: CDS. http://cdsxmatch.u-strasbg.fr/xmatch
- Simbad: forthcoming future. http://simbad.u-strasbg.fr/simbad/

Single object: GAVO-ARI

Single Source Search (on TGAS)

SAMP

By position | By ID | By list

Object name: ux ori

"ux ori" => 76.124950865°, -3.78730359°

OR

Position (ICRS;epoch=2015):

RA in degrees or HMS

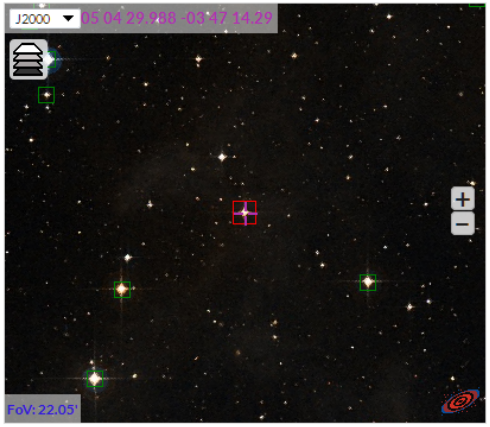
DEC in degrees or DMS

View | Reset

Closest source (0.05")

source_id	3212878014081665280
ra	76.124953973° +/- 0.20 mas
dec	-3.787318441° +/- 0.16 mas
l	203.634312450°
b	-25.442962097°
ecl_lon	74.494371742°
ecl_lat	-26.482818749°
parallax	2.89 mas +/- 0.28 mas
pmra	0.76 mas/yr +/- 0.14 mas/yr
pmdec	-3.86 mas/yr +/- 0.12 mas/yr
phot_g_mean_mag	10.49 mag

20 other candidates



The FoV is automatically reset at each request. Its default value is **generally** enough so that candidates are all visible.

But if you can not see all of them, you should unzoom the view either by scrolling down with the mouse or with the zoom buttons.

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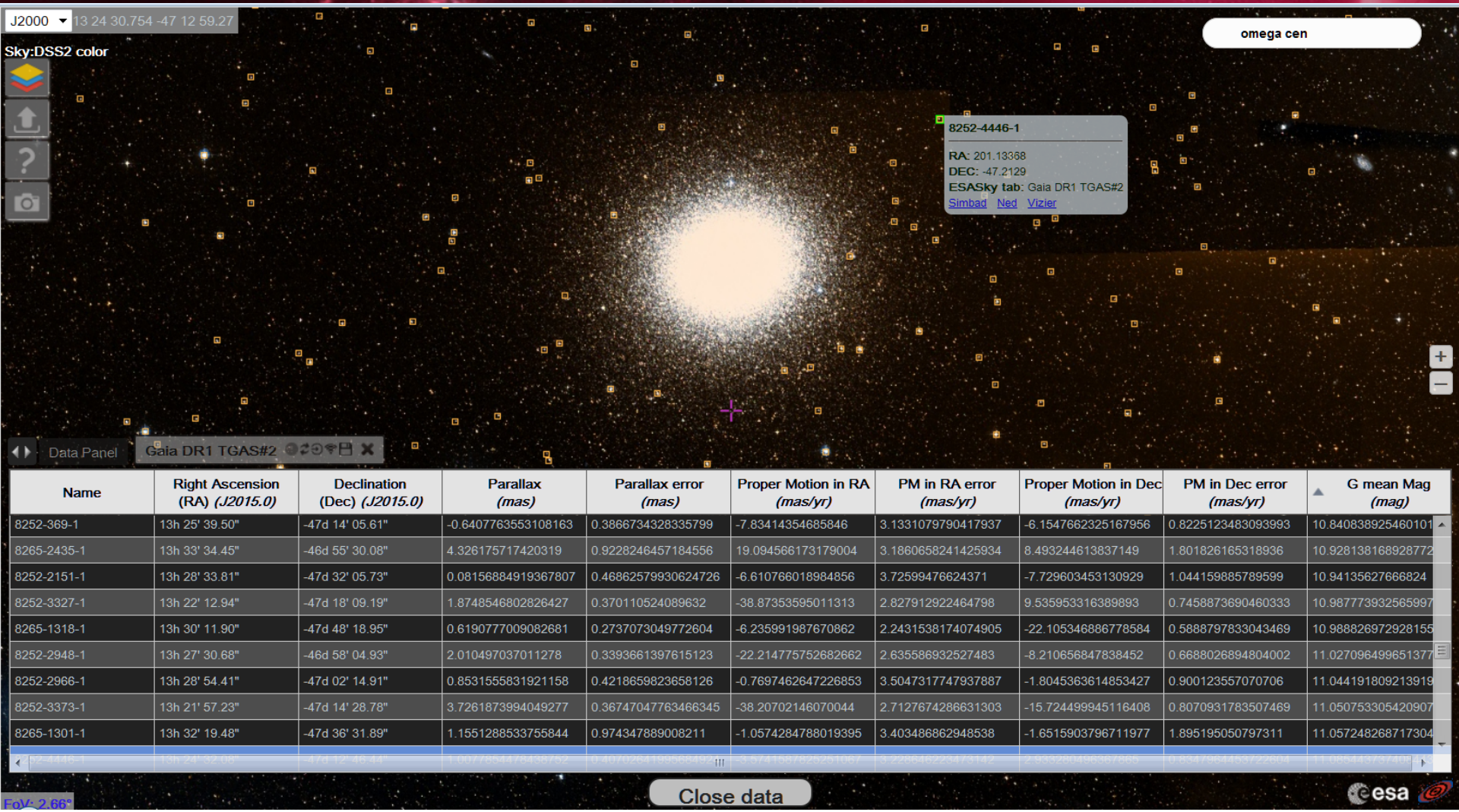
Visual exploration: ESASky



Name	Right Ascension (RA) *(J2015.0)*	Declination (Dec) *(J2015.0)*	Parallax *(mas)*	Parallax error *(mas)*	Proper Motion in RA *(mas/yr)*	PM in RA error *(mas/yr)*	Proper Motion in Dec *(mas/yr)*	PM in Dec error *(mas/yr)*	G mean Mag *(mag)*
8252-369-1	13h 25' 39.50"	-47d 14' 05.61"	-0.6407763553108163	0.3866734328335799	-7.83414354685846	3.1331079790417937	-6.1547662325167956	0.8225123483093993	10.840838925460101
8265-2435-1	13h 33' 34.45"	-46d 55' 30.08"	4.326175717420319	0.9228246457184556	19.094566173179004	3.1860658241425934	8.493244613837149	1.801826165318936	10.928138168928772
8252-2151-1	13h 28' 33.81"	-47d 32' 05.73"	0.08156884919367807	0.46862579930624726	-6.610766018984856	3.72599476624371	-7.729603453130929	1.044159885789599	10.94135627666824
8252-3327-1	13h 22' 12.94"	-47d 18' 09.19"	1.8748546802826427	0.370110524089632	-38.87353595011313	2.827912922464798	9.535953316389893	0.7458873690460333	10.987773932565997
8265-1318-1	13h 30' 11.90"	-47d 48' 18.95"	0.6190777009082681	0.2737073049772604	-6.235991987670862	2.2431538174074905	-22.105346886778584	0.5888797833043469	10.988826972928155
8252-2948-1	13h 27' 30.68"	-46d 58' 04.93"	2.010497037011278	0.3393661397615123	-22.214775752682662	2.635586932527483	-8.210656847838452	0.6688026894804002	11.027096499651377
8252-2966-1	13h 28' 54.41"	-47d 02' 14.91"	0.8531555831921158	0.4218659823658126	-0.7697462647226853	3.5047317747937887	-1.8045363614853427	0.900123557070706	11.044191809213919
8252-3373-1	13h 21' 57.23"	-47d 14' 28.78"	3.7261873994049277	0.36747047763466345	-38.20702146070044	2.7127674286631303	-15.724499945116408	0.8070931783507469	11.050753305420907
8265-1301-1	13h 32' 19.48"	-47d 36' 31.89"	1.1551288533755844	0.974347889008211	-1.0574284788019395	3.403486862948538	-1.6515903796711977	1.895195050797311	11.057248268717304

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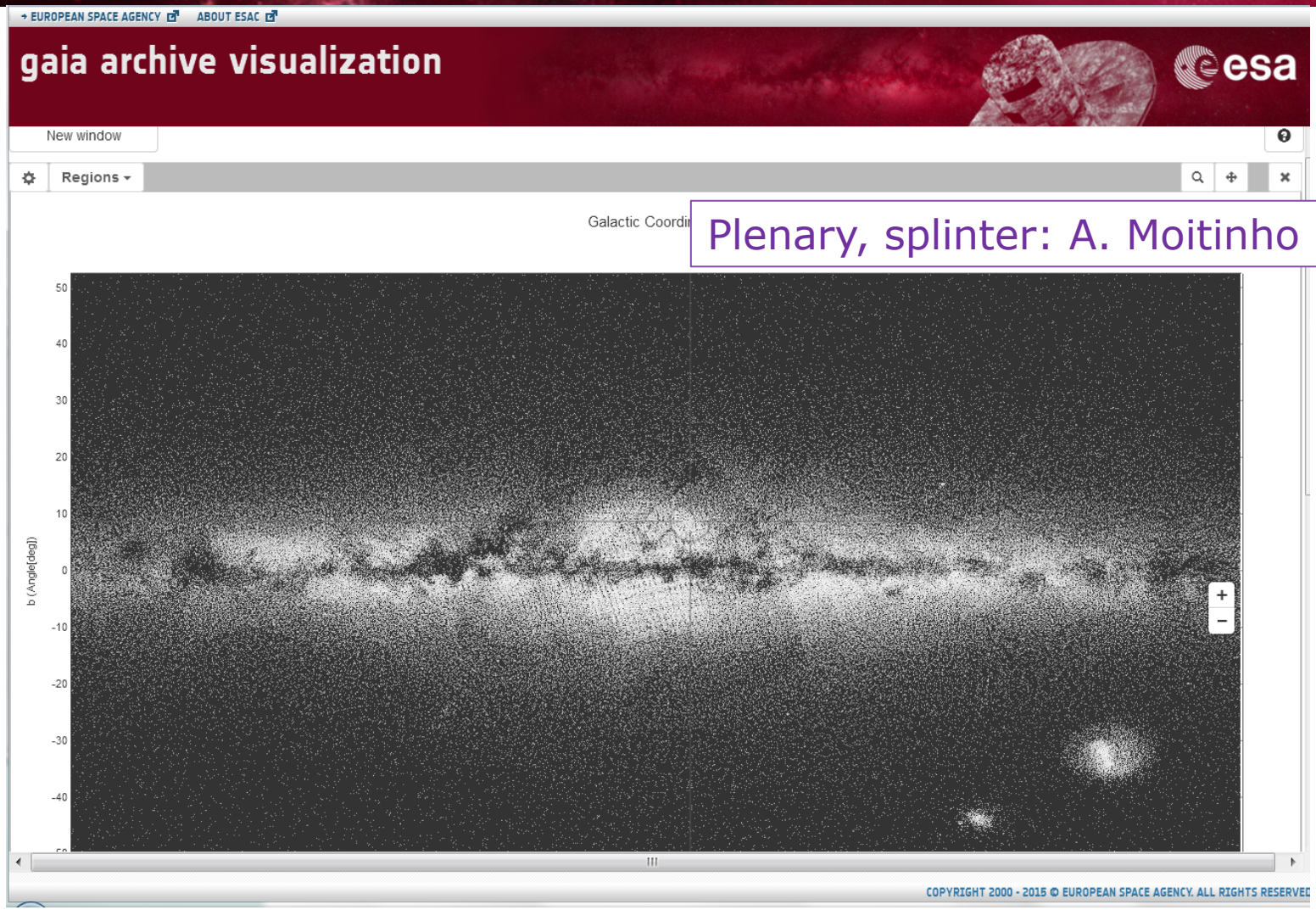
Visual exploration:Gaia archive



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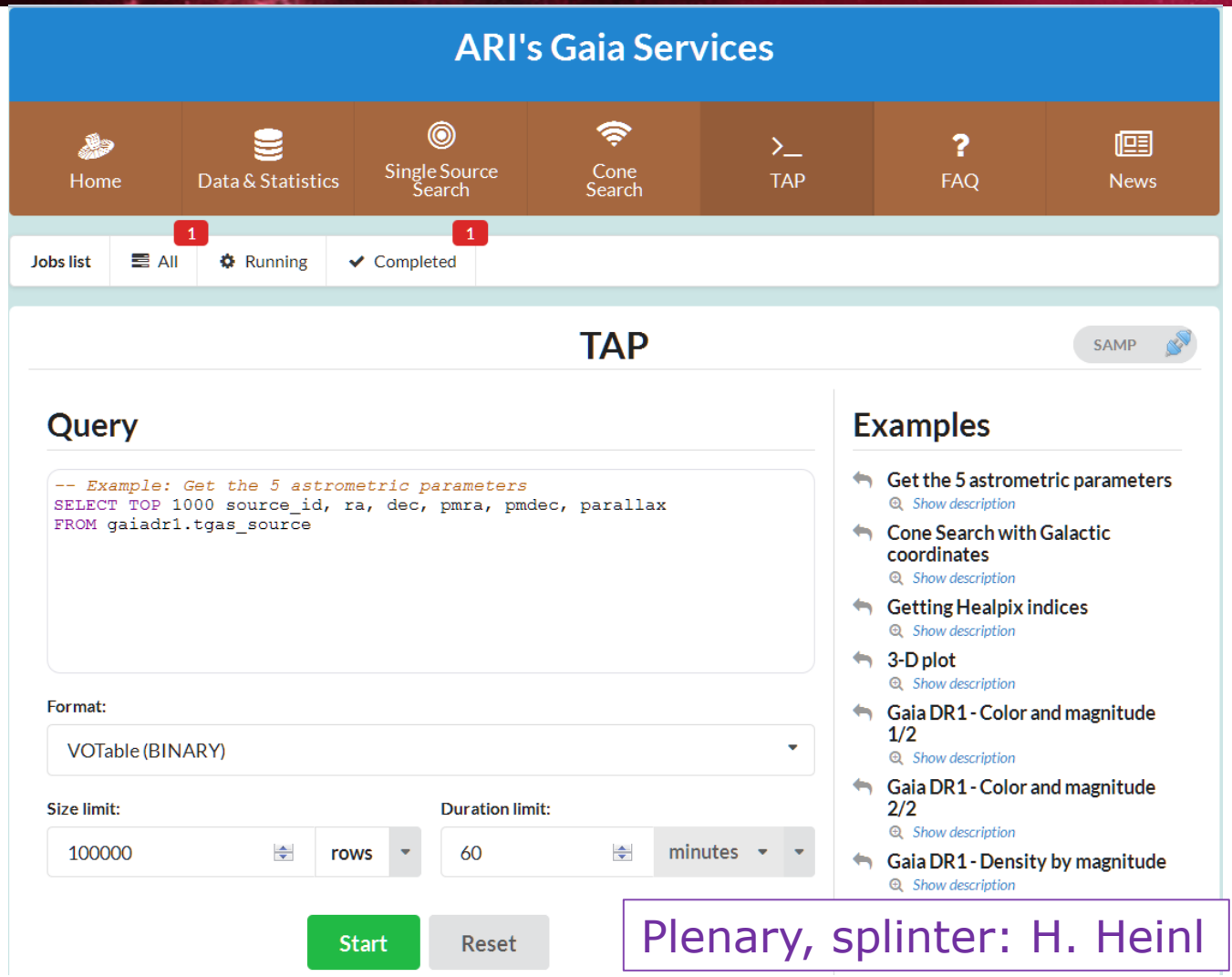
TAP: GAVO-ARI



Plenary, splinter: H. Heinl

TAP: Vizier

Columns and constraints

* Modify the query with the upper tabs.

Max records all limit **100** Update query

```
-- output format : csv
SELECT TOP 100 "I/337/gaia".ra, "I/337/gaia".ra_error, "I/337/gaia".dec, "I/337/gaia".dec_error, "I/337/gaia".source_id, "I/337/gaia".ref_epoch, "I/337/
"I/337/gaia".ra_dec_corr, "I/337/gaia".duplicated_source, "I/337/gaia".phot_g_mean_flux, "I/337/gaia".phot_g_mean_flux_error, "I/337/gaia".phot_g_mean_mag
FROM "I/337/gaia"
```

Query name "I/337/gaia" **Output format** csv Run Quickview Reset Test

Your query is correct !

List of your TAP queries Refresh Abort Destroy Properties

Show all entries Search:

name	phase	start	destruction	results
'I/337/gaia'	COMPLETED	Wed Nov 02 06:57:57 CET 2016	Mon Nov 07 06:57:57 CET 2016	download (csv)

Showing 1 to 1 of 1 entries First Previous Next Last

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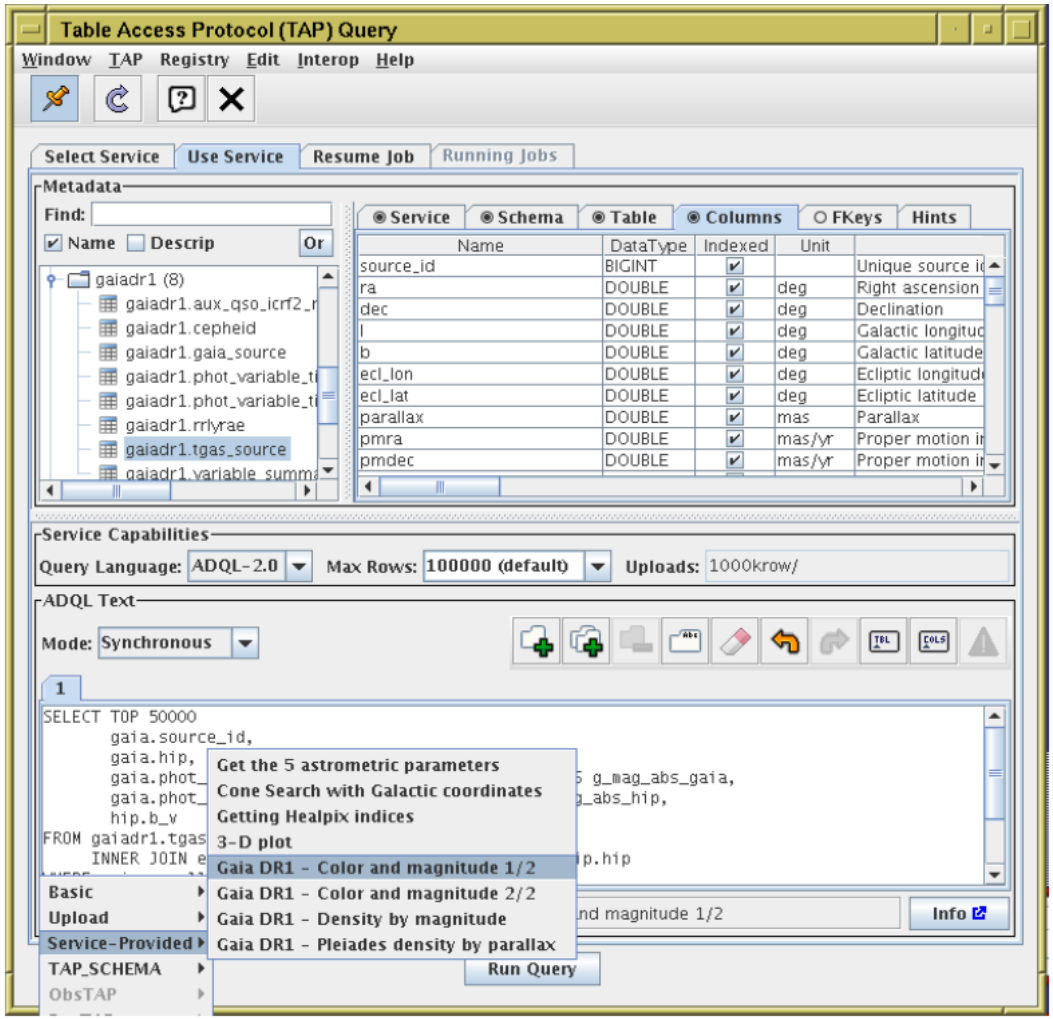
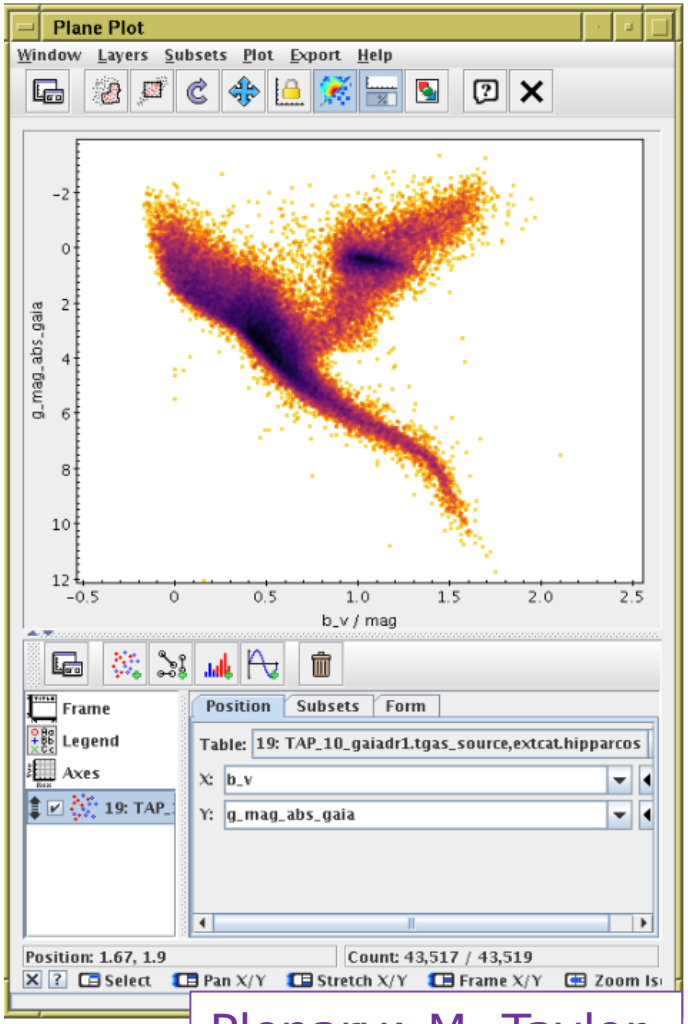
TAP & visualisation: Topcat





Plenary: M. Taylor

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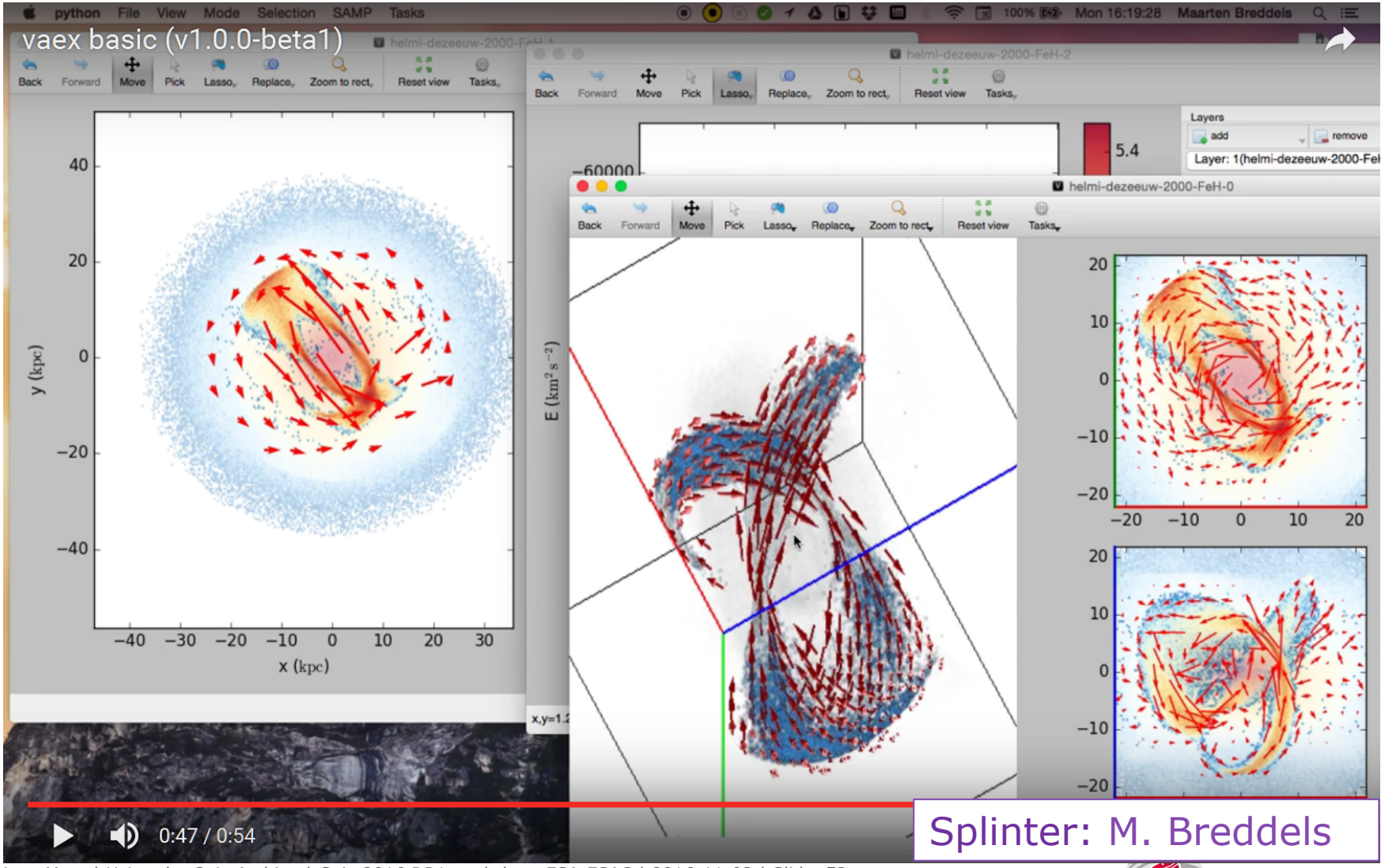
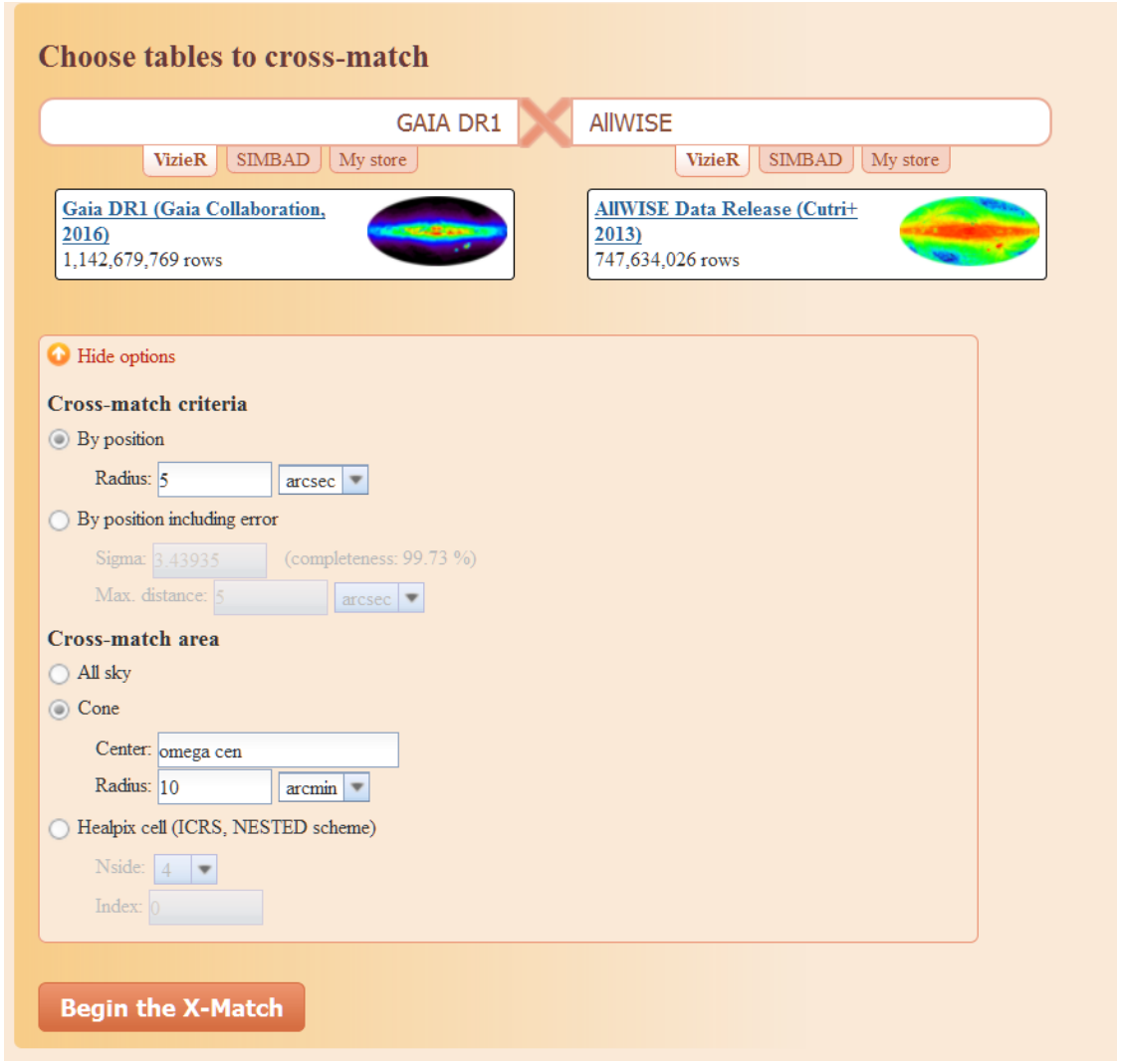
Advanced visualisation: Vaex



Cross-match: CDS

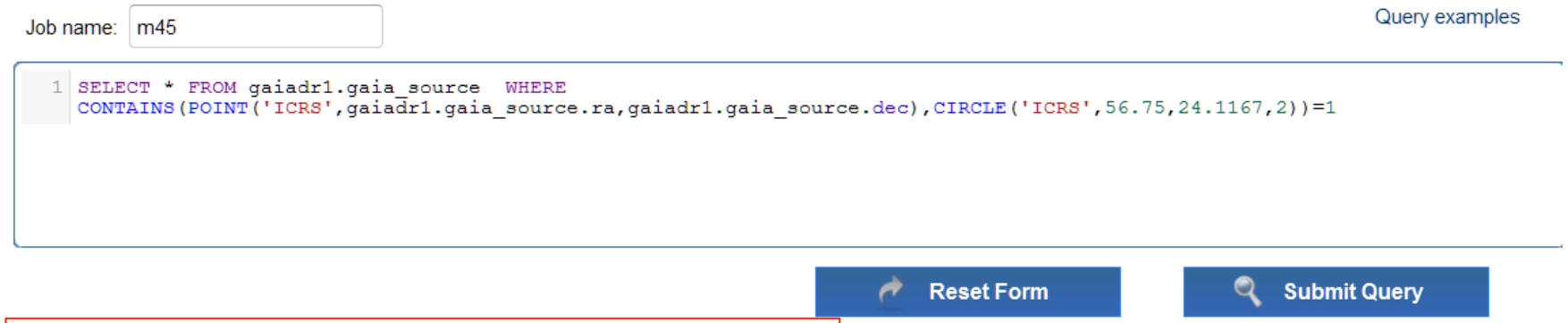


5. Hands-on sessions

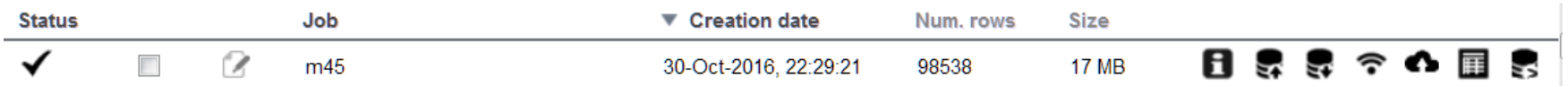
Hands-on sessions

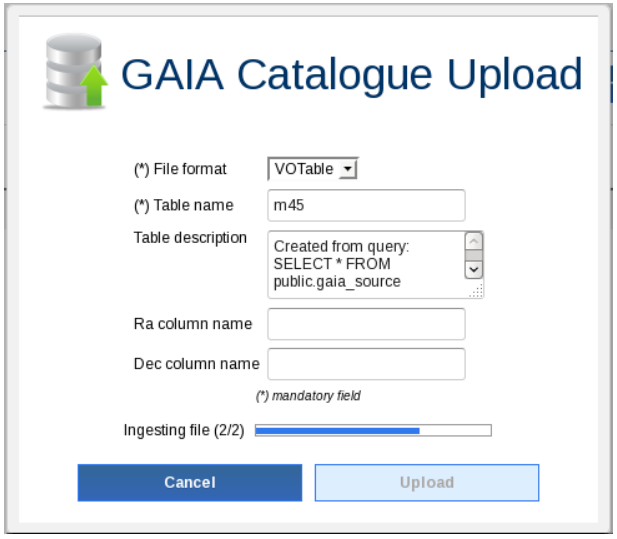
- Gaia Archive self registration! (non-DPAC members only)
- Practical seminar: script + self-study + tutors (ESDC & SOC) @B3/B5
- Unsure to start DIY? ➔ Wed splinter @D052: ADQL guided tutorial
- Slots: Wed 2 hr, Thu 2 hr, Fri 1 hr ➔ Register your preference
- Parallel sessions: always, Adam Riess on Friday
- Everybody always welcome. Priority for registered attendees
- Contents
  - Gaia Archive tutorials: white dwarfs exploration, cluster analysis
  - Gaia DR1 Brown et al. (2016) plots regeneration
  - SDSS to Gaia proper motion estimate (inspired Sergey Koposov)
  - Jupyter notebook: Python Gaia Archive access.
  - Your own: Bring questions and ask the Archive experts

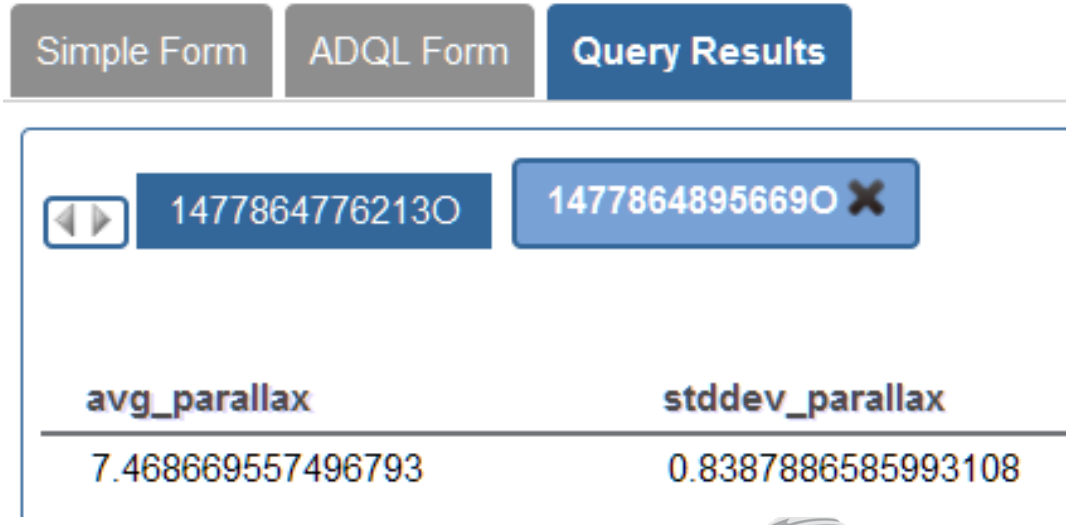
Hands-on: Archive tutorials



Authors: J. Salgado, R. Gutiérrez

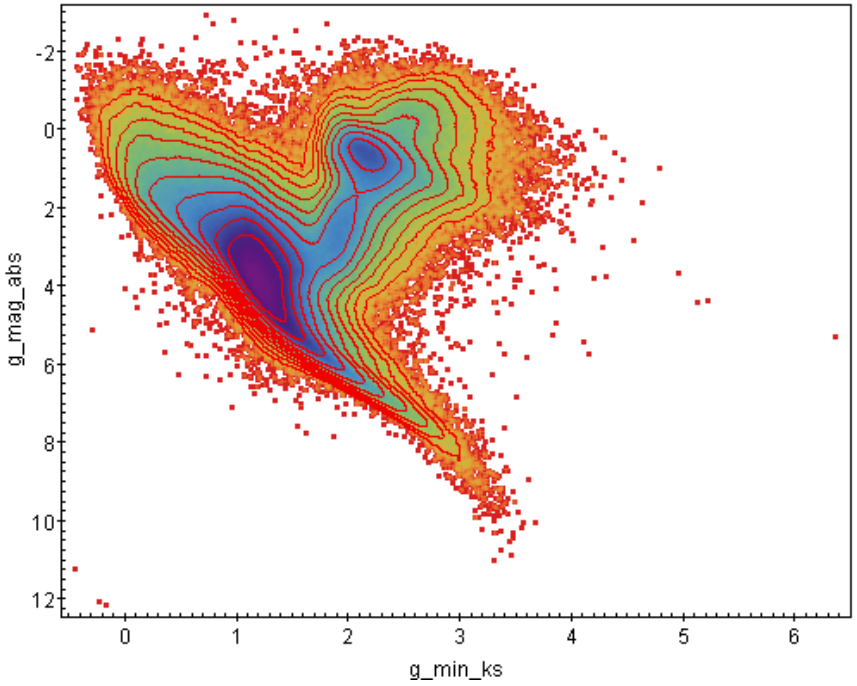


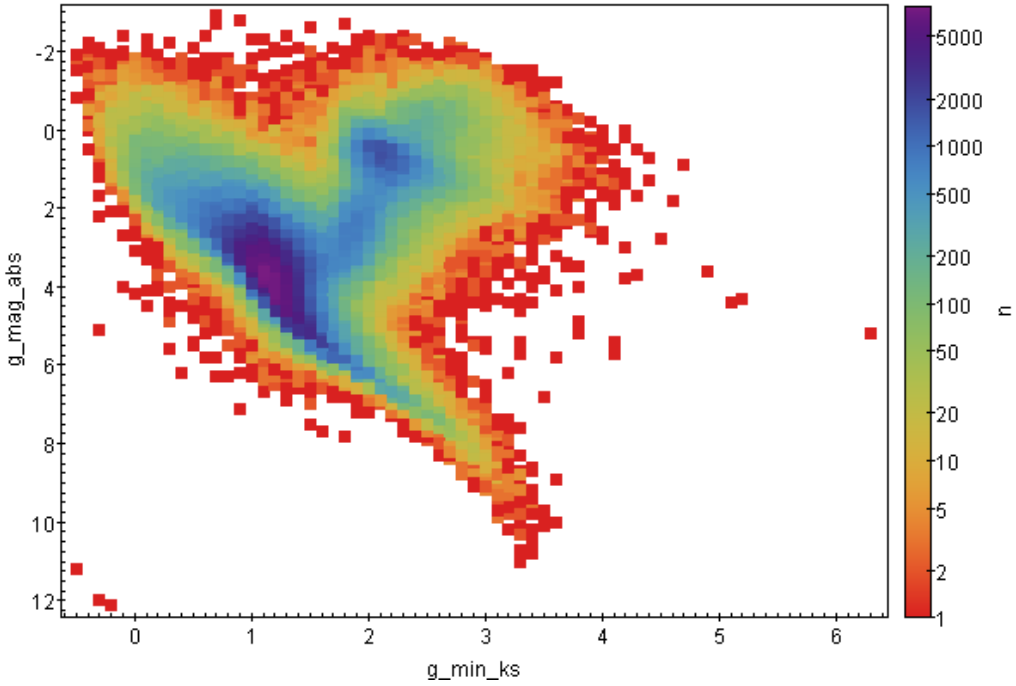




Hands-on: Brown+ 2016 plots

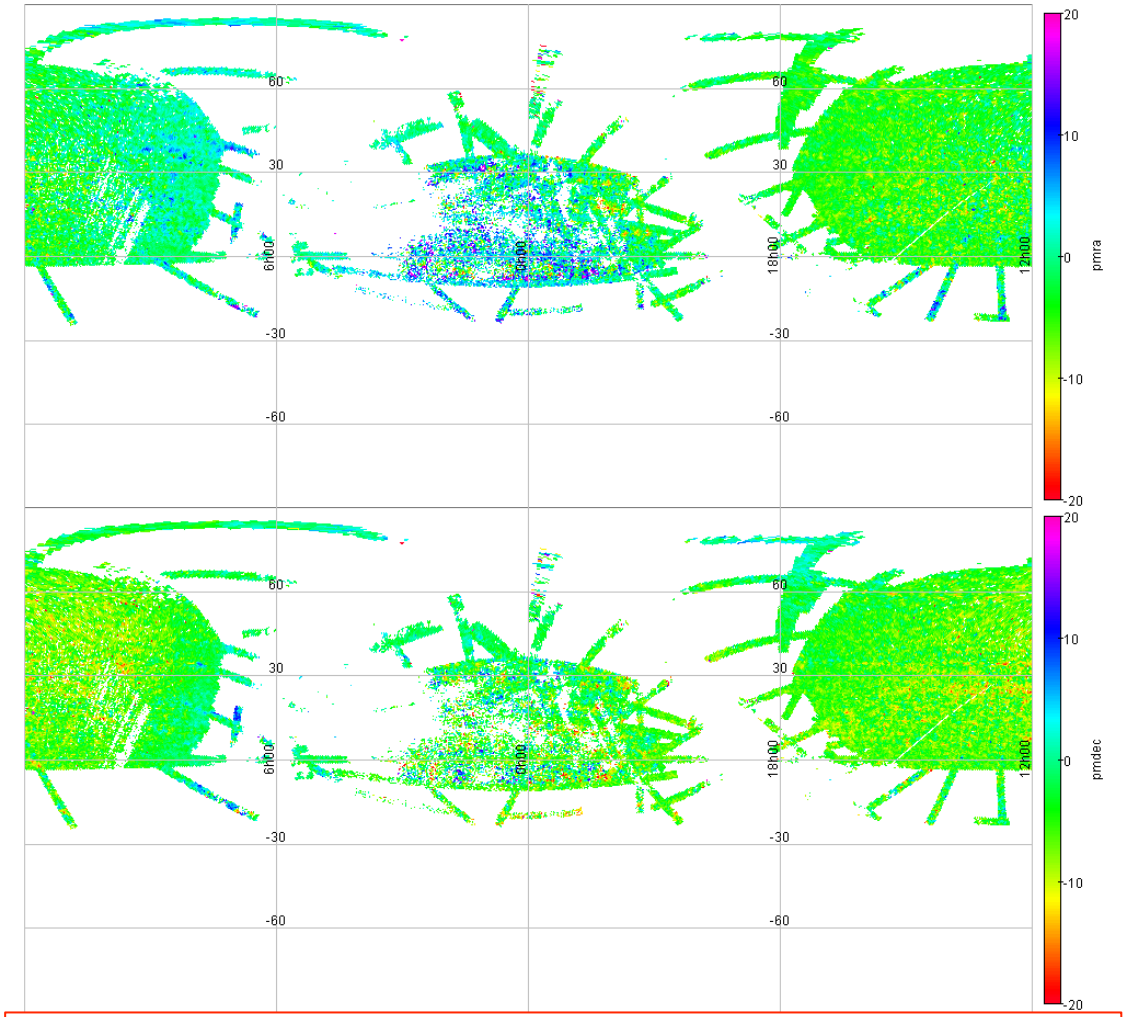
- Plots are reproducible! ADQL queries in the paper
- Histograms can be generated in the archive ➔ prepare for DR2+





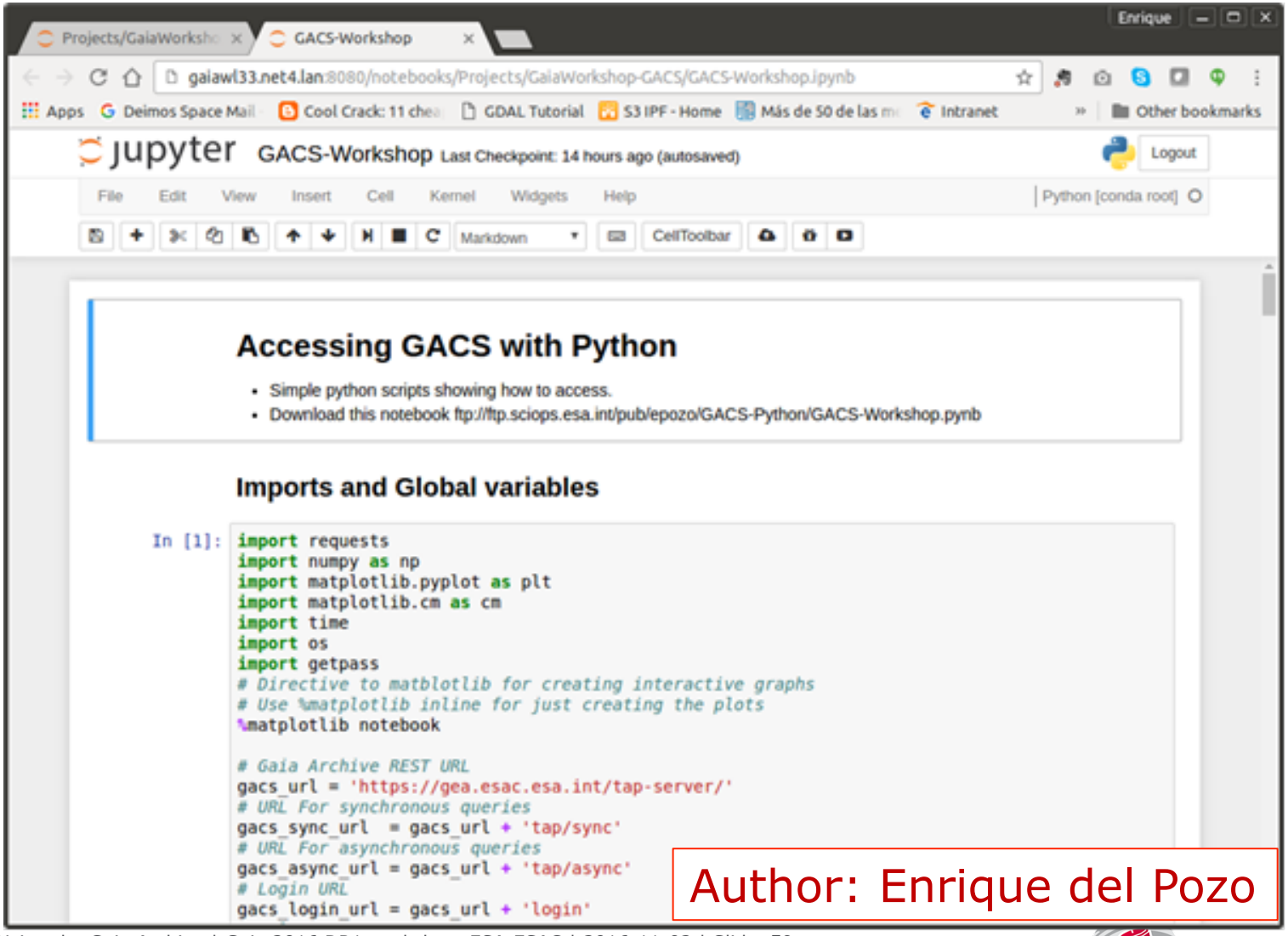
Hands-on: SDSS proper motion

- PM RA
- PM DEC



Inspired by Sergey Koposov. NYC sprint

Hands-on: Jupyter notebook



6. Conclusions

Conclusions

- Archive: http://gea.esac.esa.int/archive/.
- Helpdesk: https://support.cosmos.esa.int/gaia/
- Functionality: TAP+ (data base, user space, sharing), cross-match
- Data: main tables, TGAS, variables, QSO, Xmatch, external catalogues
- Bring code to the data: select, refine (ADQL, user tables) and download
- Prepare for DR2 (1+ G sources). Archive might be the only way forward
- Add ADQL queries to your papers (Brown et al. 2016) ➔ Reproducibility!
- Use it. User demand is a key driver for future developments
- Ask us. Via Helpdesk for additional support. Suggestions welcome
- Want to support Gaia? ➔ write papers! (and acknowledge)