

Genius at CAB (INTA-CSIC)

WP400: Data exploitation

Task 4.4: VO tools and services

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CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS



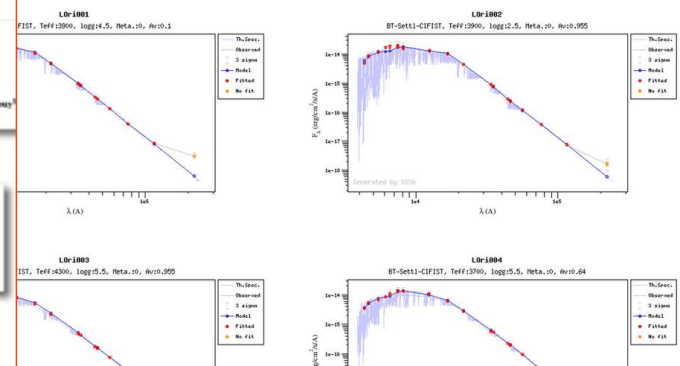
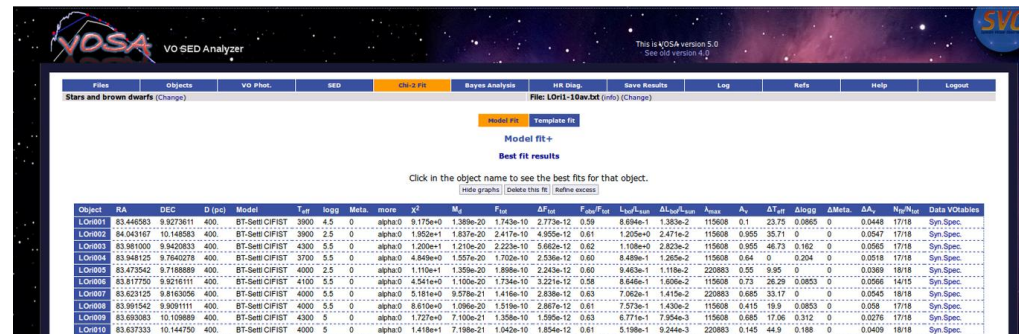
Instituto Nacional de
Técnica Aeroespacial

Available since 2008.

More than 800 users.

More than 1.000.000 objects.

More than 80 refereed papers.



SED building: Gaia DR1 included in the list of photometric catalogues VOSA uses to build the SED.



This is VOSA version 5.1
See old version 4.0

This project has received funding from the European Union's Seventh Framework Programme (FP7-SPACE-2013-1) for research, technological development and demonstration under grant agreement no. 606740

VO Photometry SED edit/visualize

Test: Stars and brown dwarfs (Change) File: RA:---, DEC:--- (info) (Change)

Search radius: arcsec
Show flux limits

☒ **FEPS Catalog**
FEPS Spitzer and Ancillary Data
Filters: ☒ Spitzer/IRAC.11 ☒ Spitzer/IRAC.12
☒ Spitzer/IRAC.13 ☒ Spitzer/IRAC.14
☒ Spitzer/MIPS.14mu ☒ Spitzer/MIPS.70mu
Search radius: arcsec
Show flux limits

☒ **UKIDSS Galactic Clusters Survey DR10**
UKIDSS Galactic Clusters Survey DR10
More Info.
The search is restricted to class -1 (star) or -2 (probable star) objects.
Filters: ☒ UKIRT/UKIDSS.Z ☒ UKIRT/UKIDSS.Y
☒ UKIRT/UKIDSS.J ☒ UKIRT/UKIDSS.H
☒ UKIRT/UKIDSS.K
Search radius: arcsec
Show magnitude limits

☒ **UKIDSS Ultra Deep Survey DR10**
UKIDSS Ultra Deep Survey DR10
More Info.
The search is restricted to class -1 (star) or -2 (probable star) objects.
Filters: ☒ UKIRT/UKIDSS.J ☒ UKIRT/UKIDSS.H
☒ UKIRT/UKIDSS.K
Search radius: arcsec
Show magnitude limits

☒ **WISE**
AllWISE Data Release (Cutri+ 2013)
More Info.
Filters: ☒ WISE/WISE.W1 ☒ WISE/WISE.W2
☒ WISE/WISE.W3 ☒ WISE/WISE.W4
Search radius: arcsec
Show magnitude limits

☒ **UKIDSS Large Area Survey DR10**
UKIDSS Large Area Survey DR10
More Info.
The search is restricted to class -1 (star) or -2 (probable star) objects.
Filters: ☒ UKIRT/UKIDSS.Y ☒ UKIRT/UKIDSS.J
☒ UKIRT/UKIDSS.K
Search radius: arcsec
Show magnitude limits

☒ **UKIDSS Galactic Plane Survey DR8**
UKIDSS Galactic Plane Survey DR8
More Info.
The search is restricted to class -1 (star) or -2 (probable star) objects.
Filters: ☒ UKIRT/UKIDSS.J ☒ UKIRT/UKIDSS.H
☒ UKIRT/UKIDSS.K
Search radius: arcsec
Show magnitude limits

☒ **UKIDSS Deep Extragalactic Survey DR10**
UKIDSS Deep Extragalactic Survey DR10
More Info.
The search is restricted to class -1 (star) or -2 (probable star) objects.
Filters: ☒ UKIRT/UKIDSS.J ☒ UKIRT/UKIDSS.H
☒ UKIRT/UKIDSS.K
Search radius: arcsec
Show magnitude limits

☒ **VVV - VISTA Variables in the Via Lactea, DR2**
The VVV survey will target the galactic bulge and a piece of the adjacent plane in Z, Y, J, H, and Ks. The total area of this survey is 520 square degrees and contains 355 open and 33 globular clusters.
More Info.
The search is restricted to class -1 (star) or -2 (probable star) objects.
Filters: ☒ Paranal/VISTA.J ☒ Paranal/VISTA.H
☒ Paranal/VISTA.Ks ☒ Paranal/VISTA.Y
☒ Paranal/VISTA.Z
Search radius: arcsec
Show magnitude limits

☒ **VIKING - VISTA Kilo-Degree Infrared Galaxy Survey, DR4**
VIKING - VISTA Kilo-Degree Infrared Galaxy Survey, DR4
More Info.

☒ **VHS - VISTA Hemisphere Survey, DR3**
VHS - VISTA Hemisphere Survey, DR3
More Info.

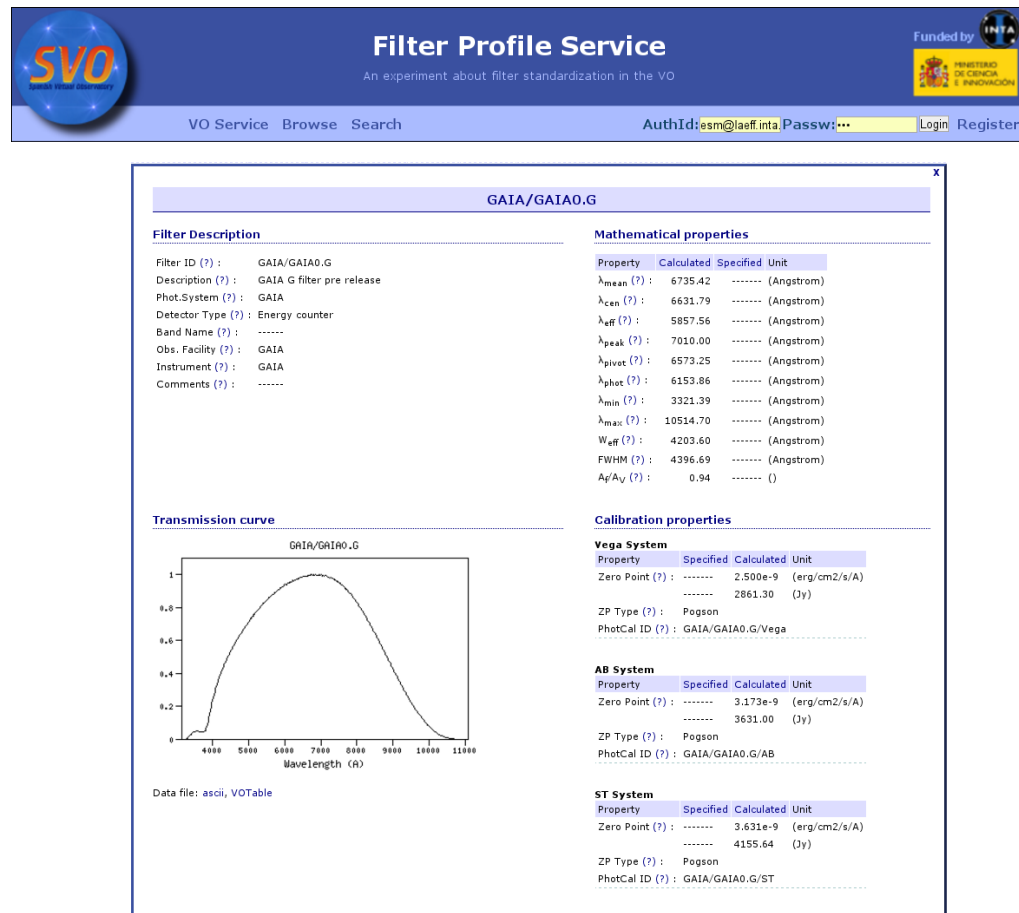
☒ **GAIA DR1**
Gaia DR1 contains positions (RA,DEC) and G magnitudes for all sources observed between 25 July 2014 and 16 September 2015 (1142679769 sources). [More Info.](#)
Filters: ☒ GAIA/GAIA0.G
Search radius: arcsec
You can apply limits so that magnitudes out of the specified range are not shown
Min mag <= GAIA/GAIA0.G <= Max mag
[Hide magnitude limits](#)

From magnitudes to fluxes: The SVO Filter Profile Service

<http://svo2.cab.inta-csic.es/svo/theory/fps/>

VOSA takes advantage of the Filter Profile Service to get the needed information (i.e. zeropoints and other filter properties to, for instance, estimate flux overlapping).

Photometric systems described following the VO Photometric Data Model.



Phys. parameter determination: TGAS distances available from VOSA to estimate bolometric luminosities.



New architecture to scale VOSA to Big Data:

Distributed environment.

Parallelized computing.

Asynchronous jobs.

Front-end redesigned

VOSA is now able to handle files with thousands of objects.

Files	Objects	Build SEDs	Analyse SEDs	HR Diag.	Results	Help
Test: Stars and brown dwarfs (Change)				File: jplus2 (info) (Change)		

Model Fit	Template fit	Model Bayes Analysis	Template Bayes Analysis	Binary fit
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Model fit

The fit process has been submitted asynchronously.

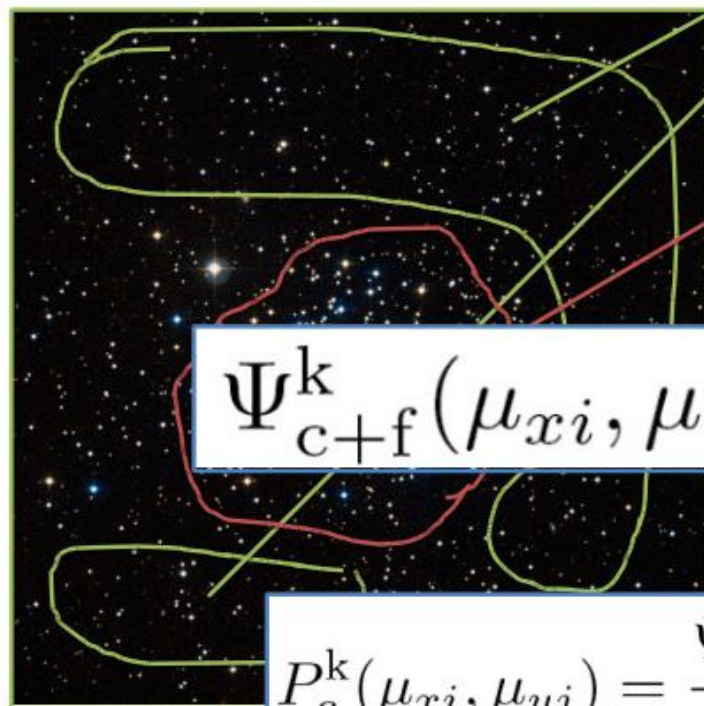


6.73% completed

I expect the whole process to take around 34 minutes to finish

Please, refresh this page again in a while for updated info

Non parametric method



$$\Psi_f^k(\mu_{xi}, \mu_{yj})$$

$$\Psi_{c+f}^k(\mu_{xi}, \mu_{yj})$$

$$\Psi_{c+f}^k(\mu_{xi}, \mu_{yj}) - \Psi_f^k(\mu_{xi}, \mu_{yj})$$

$$P_c^k(\mu_{xi}, \mu_{yj}) = \frac{\Psi_{c+f}^k(\mu_{xi}, \mu_{yj}) - \Psi_f^k(\mu_{xi}, \mu_{yj})}{\Psi_{c+f}^k(\mu_{xi}, \mu_{yj})}$$

Clusterix 2.0

Clusterix 2.0 is an interactive web-based application to calculate the grouping probability of a list of objects using proper motions and the non parametric method described in Galadí-Enríquez et al. 1998. It also allows the possibility of gathering physical parameters (parallaxes, radial velocities, proper motions,...) from Vizier and estimating effective temperatures, surface gravities and metallicities using VOSA.

Step 1/3: Information gathering (coordinates and physical parameters)

Search by Id

Usage: ID

Radius arcmin ▾

Catalogue GAIA/DR1 ▾

Search by Coordinates

Usage: RAJ2000(deg),DEJ2000(deg)

Radius arcmin ▾

Catalogue GAIA/DR1 ▾

Search in Webda

ngc2682 ▾

Search

Membership from proper motions

Search by file?

Choose file No file chosen

Clear

A list of 8783 objects has been created

Download

J2000 ▾ 08 51 30.411 +11 49 54.08

FeV: 5.65'

Clusterix 2.0

Clusterix 2.0 is an interactive web-based application to calculate the grouping probability of a list of objects using proper motions and the non parametric method described in [Galadi-Enriquez et al. 1998](#). It also allows the possibility of gathering physical parameters (parallaxes, radial velocities, proper motions,...) from Vizier and estimating effective temperatures, surface gravities and metallicities using [VOSA](#).

Step 1/3: Information gathering (coordinates and physical parameters)

Gather information from VO services

☐ Proper Motion

Radius

arcsec ▼

TGAS ▼

☐ Radial Velocity

Radius

arcsec ▼

Gaia ESO ▼

☐ Parallax

Radius

arcsec ▼

TGAS ▼

☐ VOSA Photometry [?](#)

Clusterix 2.0

Step 2/3: Region selection

Cluster info: ngc2682

Selection of the "cluster" and "field" regions

Area type: ☐ Polygon ☒ Circle

Cluster (shift):

132.86499075502223,11

Field (ctrl):

132.46894916352724,11

Membership determination parameters

Maximum μ (mas/yr):

15.0

Maximum μ err (mas/yr):

10.0

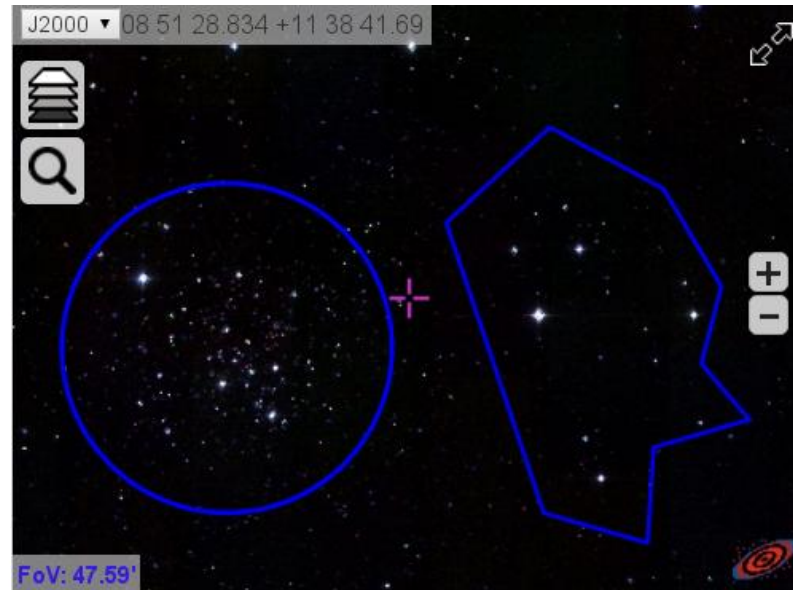
Smooth param (no unit):

2.273286441

Silverman rule: 2.273286441

γ threshold:

3.0



To draw areas select the area type (polygon or circle) in the radio button and press **left-shift** key for defining a **cluster** or **left-ctrl** key for defining a **field**.

- Polygons: Keep pressing **shift** or **ctrl** and start clicking on the image. After the second point you will see the edges of the polygon. When you are done release **shift/ctrl** and click on the image. That will close the polygon.
- Circle: Keep pressing **shift/ctrl** and click in the center of the polygon. A small blue circle will appear to remember you the center. Release the **shift/ctrl** key and click on the desired outer limit/radius of the circle you want to draw. The blue circle will disappear and the final circle will appear.

Step 3/3. Determination of membership probabilities

SAMP

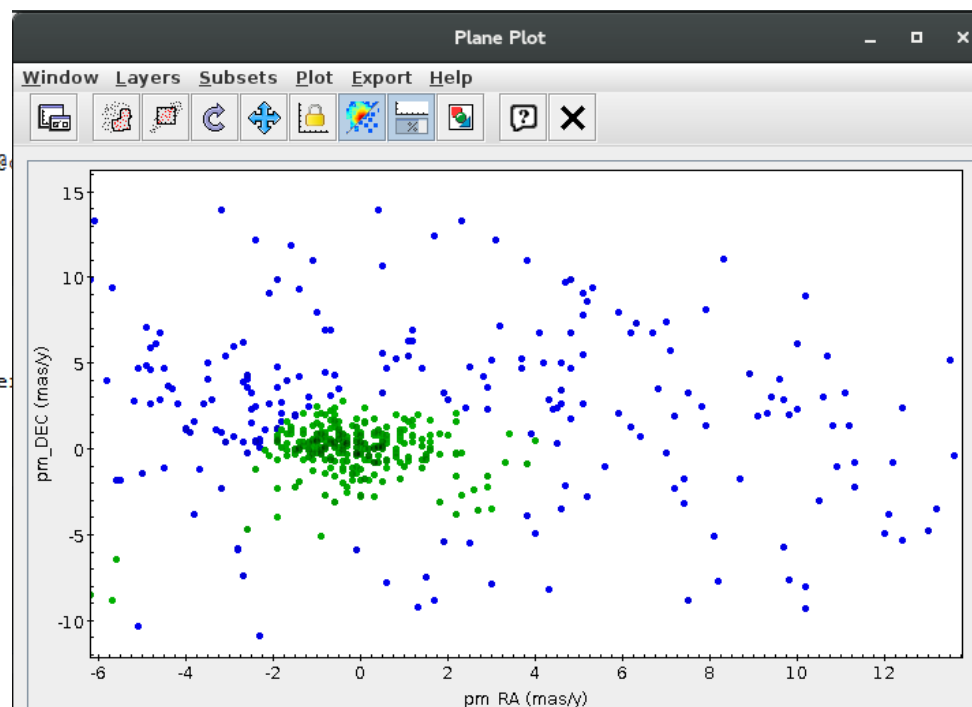
Save as

Clusterix Results

SAMP

```
#
# Results were retrieved using Clusterix software
# http://clusterix.cab.inta-csic.es/
# In case of problems, please, report to: clusterix_archive_support@
#
# Labels:
#
#   STAR_NO  identificator of star retrieved from the input data
#   RA       right ascension of a star
#   DEC      declination of a star
#   RA_PM    proper motion in alpha
#   DEC_PM   proper motion in delta
#   PROB     probability that star belongs to evaluated open cluster
#
# Parameters:
#
#   CLUSTER RA: 132.816497803
#   CLUSTER DEC: 11.752399921
#   CLUSTER INNER RADIUS: 20 arcmins
#   CLUSTER OUTER RADIUS: 40.00 arcmins
#   PROPER MOTION CUTOFF: 15.00 mas/yr
#   PROPER MOTION ERR CUTOFF: 10.00 mas/yr
#   SMOOTH PARAMETER: 1.50
#   GAMMA FACTOR: 3.00
#
# EXPECTED NUMBER OF MEMBERS: 290
```

#STAR_NO	RA	DEC	RA_PM	DEC_PM	PROB	FLAG
23	132.714996	11.802800	-6.10	13.30	0.98	T
2152	133.046005	11.530400	-10.60	-3.70	0.98	T
218	132.925995	11.835400	-10.70	-4.20	0.98	T



Future enhancements:

Tangencial velocities instead of proper motions.

Access to Gaia DR2 data.

N-dimensional scenario.

Asynchronous jobs.