# *Advanced VOSA*

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| object | RA | DEC | dis | Av | filter | flux | error | pntopts | objopts |
|---|---|---|---|---|---|---|---|---|---|
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

```
TYC_5273-16-1 --- --- 52
TYC_9023-815-1 --- ---
TYC_9083-198-1 --- ---
TYC_9241-249-1 --- ---
TYC_50_1383_1 --- ---
```

```
TYC_5273-16-1 --- --- 52+-4
TYC_9023-815-1 --- ---
TYC_9083-198-1 --- ---
TYC_9241-249-1 --- ---
TYC_50_1383_1 --- ---
```

# The role of extinction

| Object | RA | DEC | D (pc) | Model | $A_v$ | $\Delta A_v$ | $T_{eff}$ | $\Delta T_{eff}$ | logg | Δlogg | Meta. | ΔMeta. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HD302505 | 151.33561042 | -58.73908361 | 10 | Kurucz | --- | --- | 6250 | 125 | 4.00 | 0.25 | -0.50 | 0.25 |

**Basic data :**

**HD 302505** -- Star

Other object types: * (HD,ALS,...),I

**ICRS** coord. *(ep=J2000) :* 151.3356104 -58.7

**FK5** coord. *(ep=J2000 eq=2000) :* 10 05 20.547 -58

**FK4** coord. *(ep=B1950 eq=1950) :* 10 03 39.75 -58

**Gal** coord. *(ep=J2000) :* 282.7896 -02.522

Proper motions *mas/yr* : -6.6 3.6 [2.4 2.

Spectral type: B2 1995A&AS..1

Fluxes (6) :

U 9.41 [~] D 200

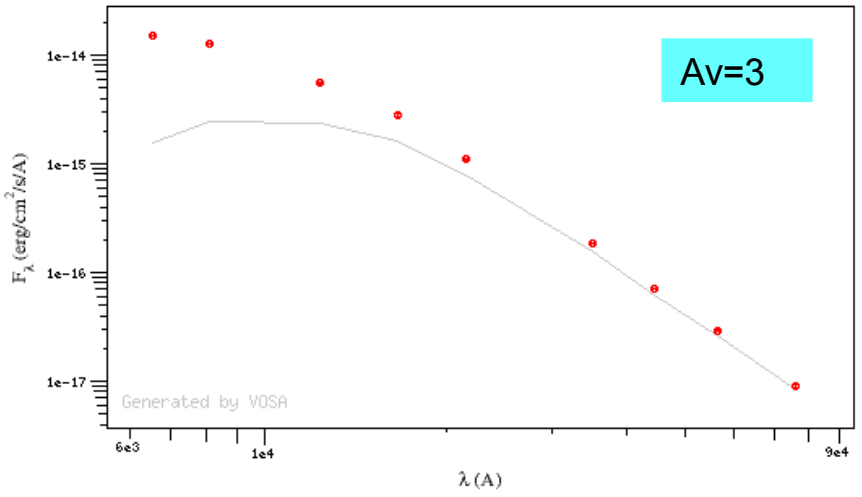
B 9.90 [~] C ~

V 9.60 [~] C ~

J 8.537 [0.020]

H 8.438 [0.051]

K 8.349 [0.021]

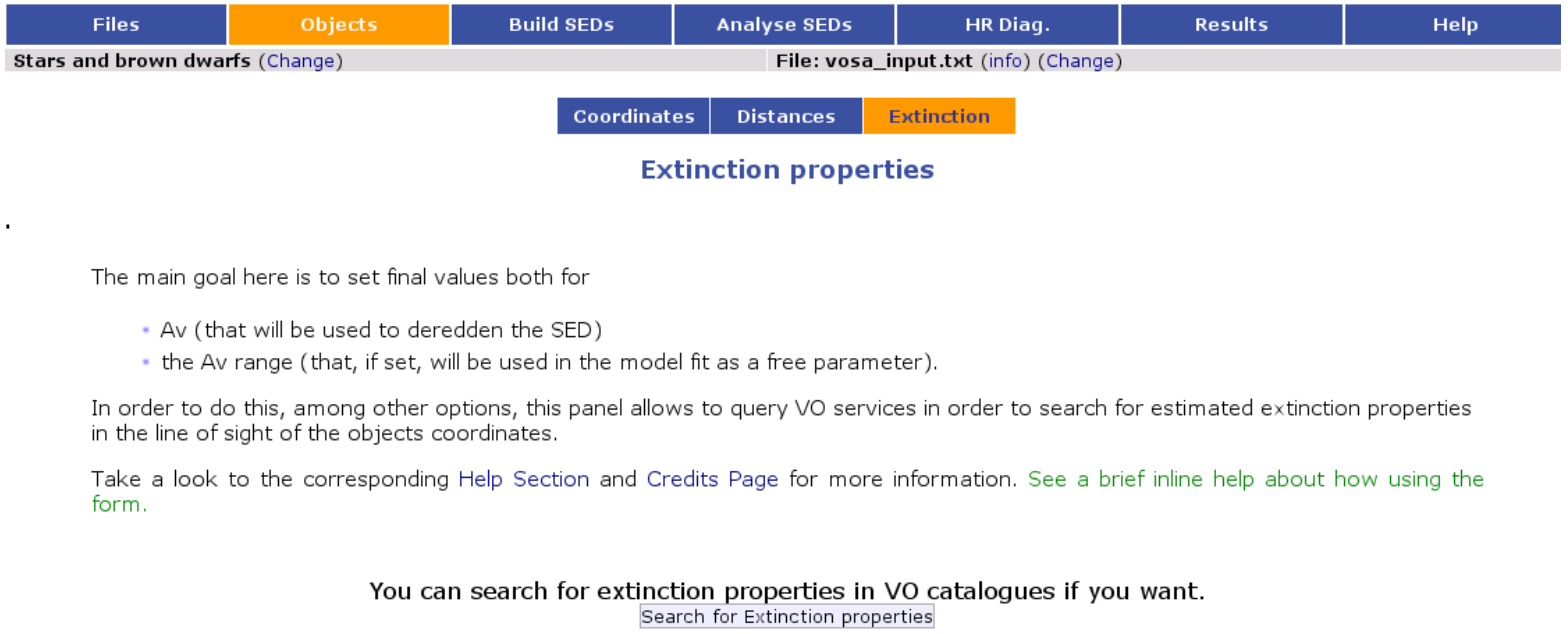


# The role of extinction

## I: Av provided by the user

| object | RA | DEC | dis | Av | filter | flux | error | pntopts | objopts |
|---|---|---|---|---|---|---|---|---|---|
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

## II: Av found in VO services



# The role of extinction

**First select what VO services you want to search for extinction properties.**

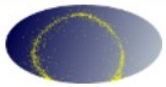
Mark All Unmark All

Search

☑ **UBV Photometry of O & B Stars in Vela (Denoyelle 1977)**

*The Spatial Distribution of Young Stars in Vela*
Info in catalogue: E(B-V)
More info
Search radius: 5 arcsec

☑ **Optically visible open clusters and Candidates (Dias+ 2002-2010)**

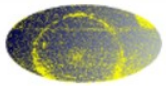


*New catalog of optically visible open clusters and candidates (V3.0)*
Info in catalogue: E(B-V)
More info
Search radius: 5 arcsec

☑ **SAI Open Clusters Catalog (Glushkova+, 2009)**

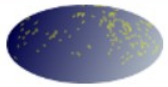
*Automated search for star clusters in large multiband surveys. II. Discovery and investigation of open clusters in the Galactic plane*
Info in catalogue: E(B-V)
More info
Search radius: 5 arcsec

☑ **Guarinos, 1992**



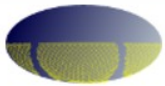
*Interstellar matter in the Galactic Disk (Guarinos J., 1992)*
Info in catalogue: $A_V$
More info
Search radius: 5 arcsec

☑ **Stellar Spectrophotometric Atlas**



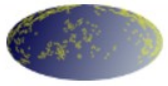
*Stellar Spectrophotometric Atlas*
Info in catalogue: $A_V$
More info
Search radius: 5 arcsec

☑ **6dF galaxy survey final redshift release (Jones+, 2009)**



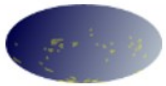
*6dF galaxy survey final redshift release (Jones+, 2009)*
Info in catalogue: $A_V$
More info
Search radius: 5 arcsec

☑ **Photometric Catalog of Northern Bright Galaxies (Kodaira+ 1992)**



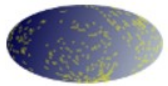
*Photometric Catalog of Northern Bright Galaxies*
Info in catalogue: $A_V$
More info
Search radius: 5 arcsec

☑ **Reddening and extinction at high galactic latitude (Larson+, 2005)**



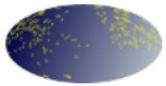
*Reddening and the extinction law at high galactic latitude.*
Info in catalogue: E(B-V)
More info
Search radius: 5 arcsec

☑ **RR Lyrae Metallicities (Layden 1994)**



*RR Lyrae data II. The Metallicities and Kinematics of Local RR Lyrae*
Info in catalogue: $A_V$
More info
Search radius: 5 arcsec

☑ **STELIB: A library of stellar spectra at R~2000 (Le Borgne+, 2003)**



*STELIB: A library of stellar spectra at R~2000*
Info in catalogue: $A_V$
More info
Search radius: 5 arcsec

# The role of extinction

(Hide this form)

**Add default user values**

Here you can give "User" values for those objects where there is not a previous value defined. When you click the 'Add user values' button these values will be saved as user values (Final Av values will not be affected)

$R_V$:

E(B-V):

$A_V$:

$A_V$ range: -

Only apply where there is not a previous user value

Add user values

**Which values do you trust better?**

Here you can set the "Final" value of Av for all the objects at the same time. Depending on the choices that you make, the changes will be done for all the objects in the file when you click the 'Save values' button.

Select values by ranking:

1: Morales 2: ---

(Your first option will be chosen for every object if there is a value available. For those objects with no value in the first option, the second option will be chosen. And so on). (If you don't mark this, User values will be selected first, then VO values in the same order that they are found, till a value for Av can be built).

Select only Av values in catalogues. Do not use Rv,E(B-V) to build a value for Av

Select Av values first if available. Then, if not, Rv,E(B-V) values to build a value for Av

Select any combination of values that permits that a value for Av can be built

Save values

**Combine final value/range for Av**

The main goal here is to set "Final" values both to Av and the Av range.
If, for some objects, you have set a value for one of the variables but not both, you can use this form to go further.

Set the final Av value based on the final Av range (when the range is already set)
Av = Minimum Av range

Set the final Av range based on the Av final value (when the value is set)
Av range min = * Av
Av range max = * Av

Apply even if there is a previous value

Set final values

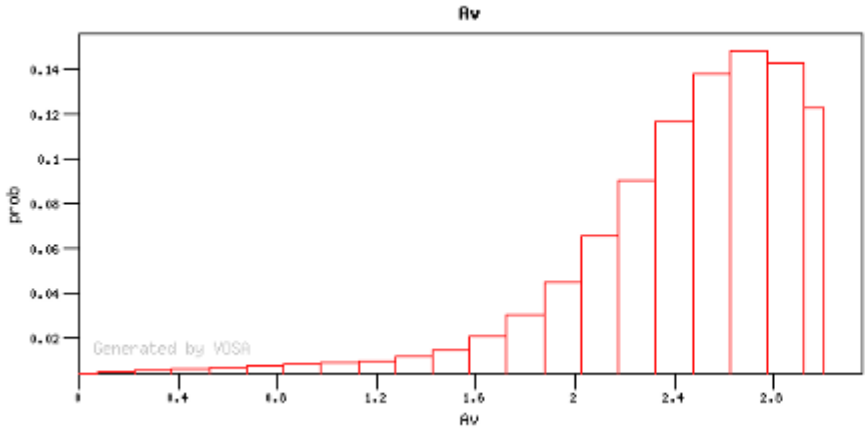
| Object | | | Final | | User | | | | VO Data | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | RA (deg) | DEC (deg) | Av | Av range | Rv | E(B-V) | Av | Av range | Δ (arcsec) | RA (deg) | DEC (deg) | Rv | E(B-V) | Av | Av range | Source |
| HD302505 | 151.33561042 | -58.73908361 | 2.32 | | | | | 0.0 - 3.0 | 0 | 151.335610416667 | -58.7390836111111 | 3.214906 | 0.7225 | 2.32 | --- | Extinction map. Morales+, 2006 (?) |
| | | | | | | | | | 0 | 151.33561042 | -58.73908361 | 3.214906 | 0.7225 | | --- | The Rv extinction factor, Morales+, 2006 (?) |

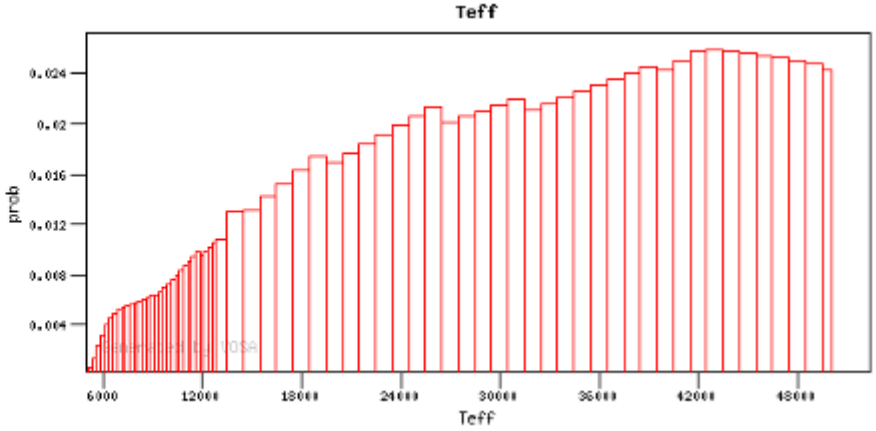
# The role of extinction

## III: Av as a free parameter

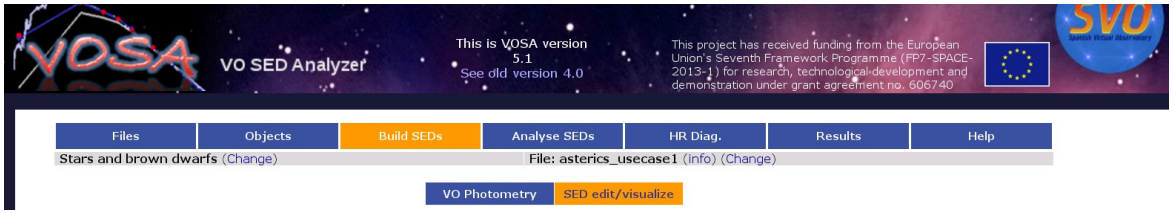
HD302505 --- --- --- --- --- --- --- --- Av:0.0/3.0


**Av / Teff degeneracy.**



# Reddening

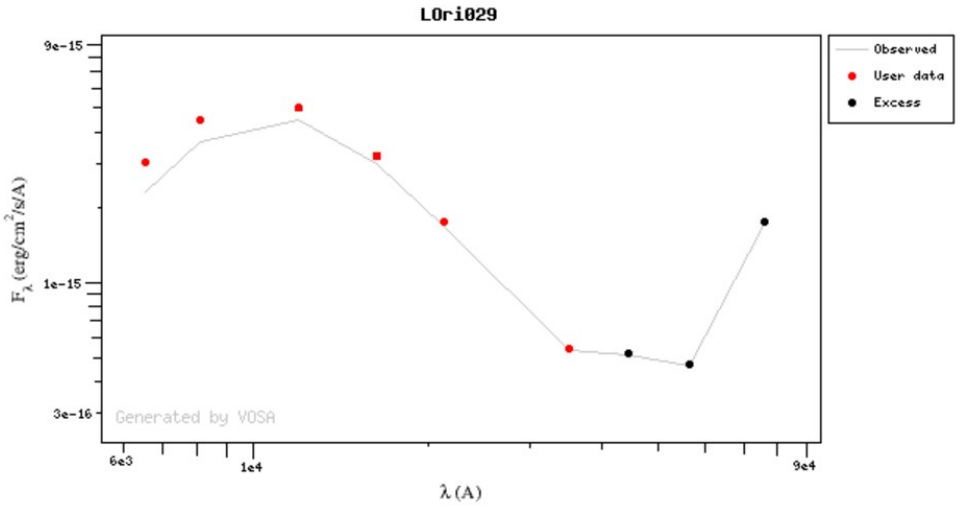



THE ASTRONOMICAL JOURNAL, 131:1574–1607, 2006 March


*SPITZER* OBSERVATIONS OF IC 348: THE DISK POPULATION AT 2–3 MILLION YEARS

CHARLES J. LADA, AUGUST A. MUENCH, K. L. LUHMAN, LORI ALLEN, LEE HARTMANN,
TOM MEGEATH, PHILIP MYERS, AND GIOVANNI FAZIO

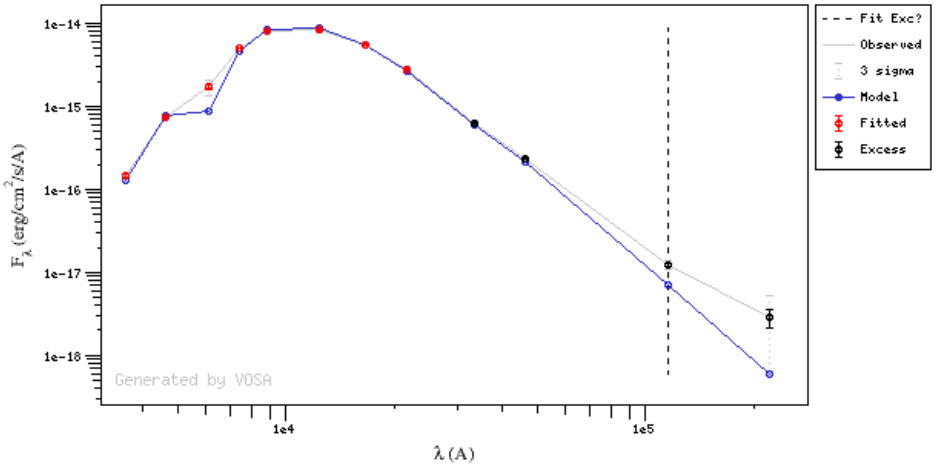
*"we find that diskless stars (i.e., stellar photospheres) can be characterized by < 2.56"..*

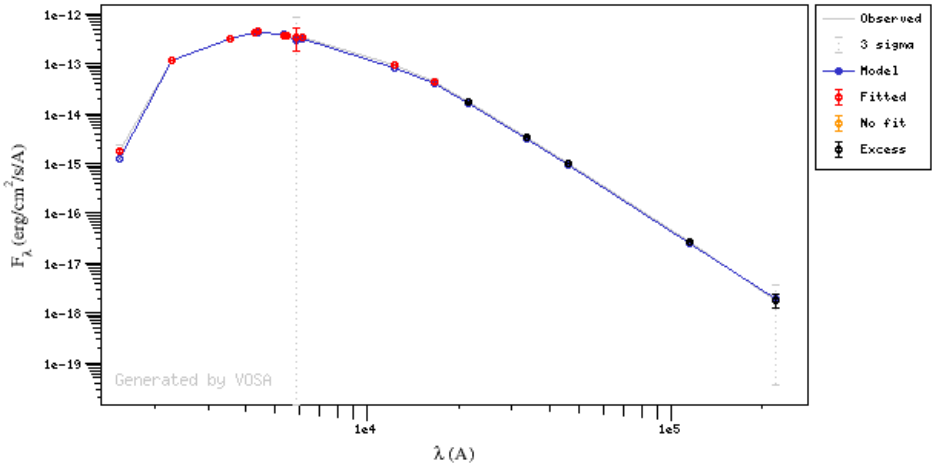


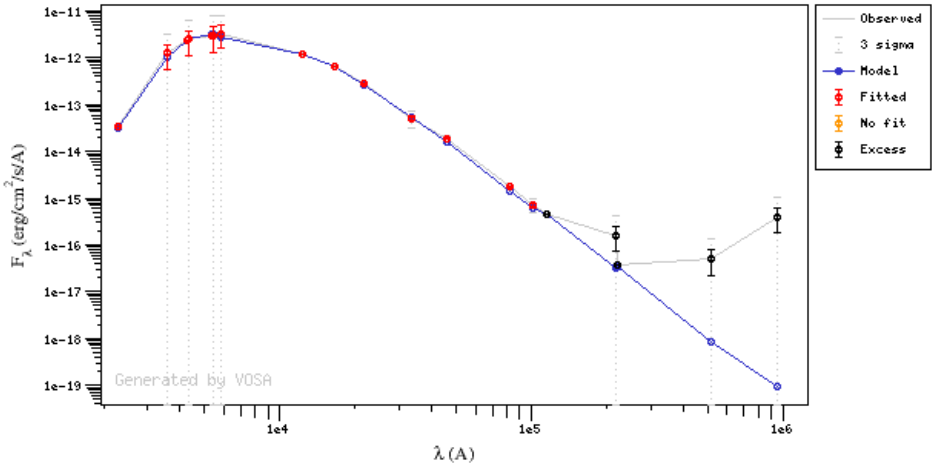
# Reddening: Refinement

$$\frac{F_{obs} - F_{mod}}{\Delta F_{obs}} > 3$$

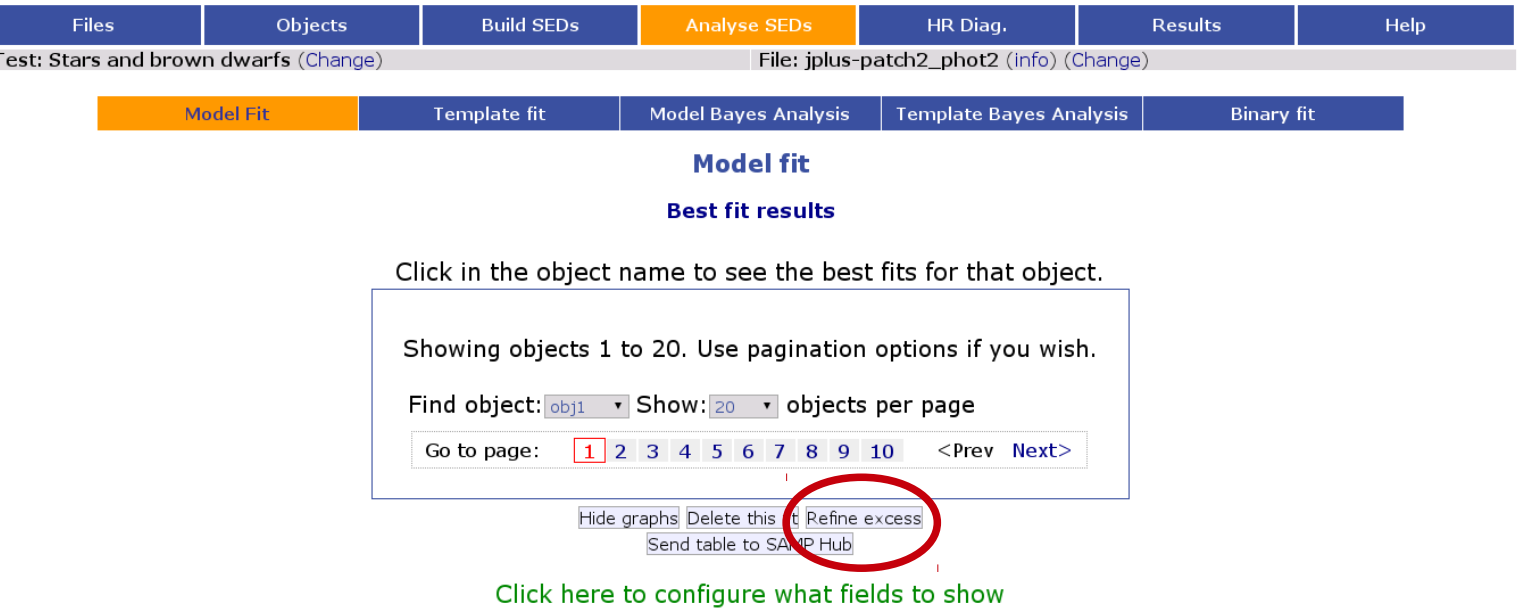
$$\frac{F_{obs} - F_{mod}}{F_{mod}} > 0.2$$



# Reddening: Refinement




| Object | RA | DEC | D (pc) | Model | $A_v$ | $T_{eff}$ | logg | Meta. | more | $\chi^2$ | $M_d$ | $F_{obs}/F_{tot}$ | $L_{bol}/L_{sun}$ | $\Delta L_{bol}/L_{sun}$ | $N_{fit}/N_{tot}$ | Data VOtables |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| obj1 | 117.590198605 | 41.5662259062 | 10 | BT-Settl CIFIST | --- | 2900 | 5.5 | 0 | --- | 1.521e+1 | 1.029e-21 | 0.49 | 1.311e-5 | 1.353e-6 | 8/13 | Syn.Spec. |
| obj10 | 120.626683896 | 38.1414616059 | 10 | BT-Settl CIFIST | --- | 3100 | 5.5 | 0 | --- | 2.217e+1 | 2.498e-22 | 0.53 | 4.082e-6 | 6.100e-7 | 9/13 | Syn.Spec. |

# Model fit: Include upper limits

Files | Objects | Build SEDs | Analyse SEDs | HR Diag. | Results | Help

Test: Stars and brown dwarfs (Change) File: jplus-patch2_phot2 (info) (Change)

Model Fit | Template fit | Model Bayes Analysis | Template Bayes Analysis

## Model fit

*GRAMS (Grid of Red supergiant and Asymptotic giant ModelS) is a grid of radiative transfer (RT) models for dust shells around red supergiant (RSG) and asymptotic giant branch (AGB) stars. This is the model grid for Carbon-rich stars*
*Note that no IR excess is considered when fitting with these models.*

*GRAMS (Grid of Red supergiant and Asymptotic giant ModelS) is a grid of radiative transfer (RT) models for dust shells around red supergiant (RSG) and asymptotic giant branch (AGB) stars. This is the model grid for Oxygen-rich stars*
*Note that no IR excess is considered when fitting with these models.*

☐ **TLUSTY OSTAR2002+BSTAR2006**

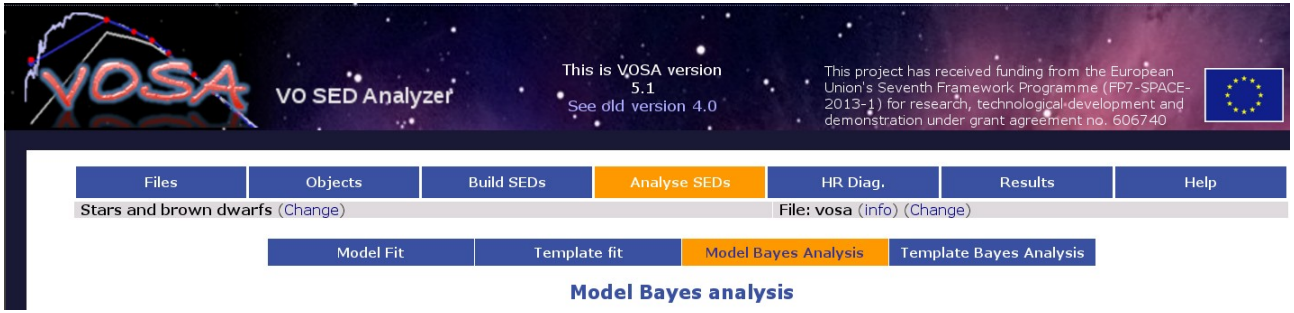
*TLUSTY OSTAR2002+BSTAR2006 Grid, The merged files use the BSTAR2006 models for effective temperatures up to 30,000 K and the OSTAR2002 models for higher temperatures.*

**Options for this fit**

- ☐ Include model spectrum in fit plots? *(The fit process will be slower, because getting the spectra from the VO can take some time)*
- ☐ Estimate fit parameter uncertainties using a statistical approach, performing a 100 iteration monte carlo simulation*(The fit process will be slower)*
- ☐ Use chi2 instead of the reduced chi2.
- ☐ Do not use upper limits in the fit.

$$\mathrm{Flx} = 0$$

$$\Delta\mathrm{Flx} = \mathrm{F}_{uplim}$$




- Then we assign a relative probability for each model as:

$$W_i = \exp(-\chi_i^2/2)$$

- Using this, the probability corresponding to a given parameter value $\alpha_j$ is given by:

$$P(\alpha_j) = \sum_i W_i$$

where the sum is performed over all the models with that value for that parameter.

- We finally normalize these probabilities, for each parameter, dividing by the total probability (the sum of the probilities obtained for each value).

$$P'(\alpha_j) = \frac{P(\alpha_j)}{\sum_i P(\alpha_i)}$$

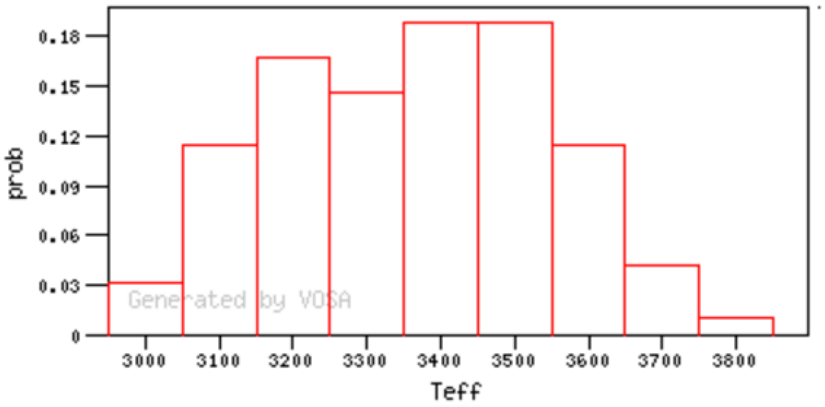

## $T_{eff}$

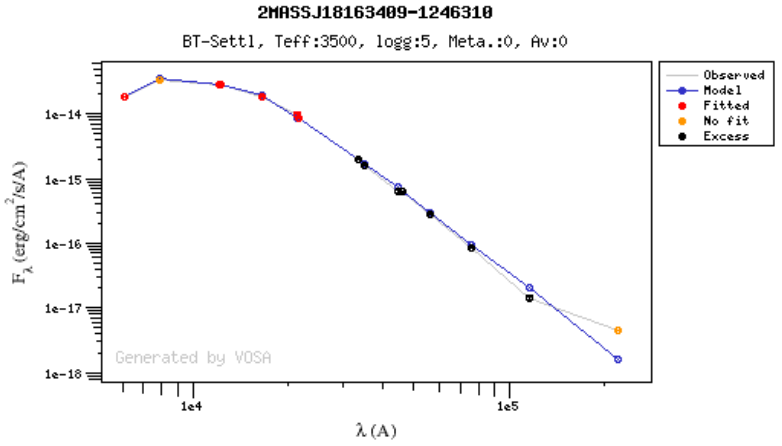
### Statistics

| | |
|---|---|
| Average | 3363.54 |
| Std. Dev (σ) | 185.313 |
| Mode | 3400/3500 |
| Median | 3322.22 |
| Skewness | 0.0140213 |
| Kurtosis | 2.18994 |
| μ2 | 34341 |
| μ3 | 89229.3 |
| μ4 | 2.58261e+9 |
| Q1 | 3162.5 |
| Q2 | 3322.22 |
| Q3 | 3455.56 |
| 68%CL-Min | 3108.5 |
| 68%CL--Max | 3505.82 |
| 96%CL-Min | 3000 |
| 96%CL-Max | 3677 |
| Norm_min | 0.75 |
| Norm_max | 0.9 |

### Value distribution

| $T_{eff}$ | $\Delta T_{eff}$ | min | max | prob |
|---|---|---|---|---|
| 3000 | 50 | 2950 | 3050 | 0.03125 |
| 3100 | 50 | 3050 | 3150 | 0.114583 |
| 3200 | 50 | 3150 | 3250 | 0.166667 |
| 3300 | 50 | 3250 | 3350 | 0.145833 |
| 3400 | 50 | 3350 | 3450 | 0.1875 |
| 3500 | 50 | 3450 | 3550 | 0.1875 |
| 3600 | 50 | 3550 | 3650 | 0.114583 |
| 3700 | 50 | 3650 | 3750 | 0.0416667 |
| 3800 | 50 | 3750 | 3850 | 0.0104167 |



# VOSA for galaxies