VOSA: A short introduction

SEDs in the Virtual Observatory

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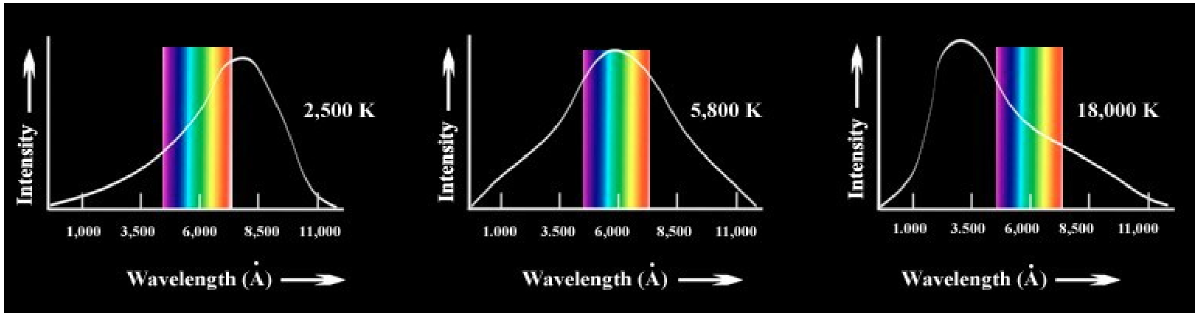
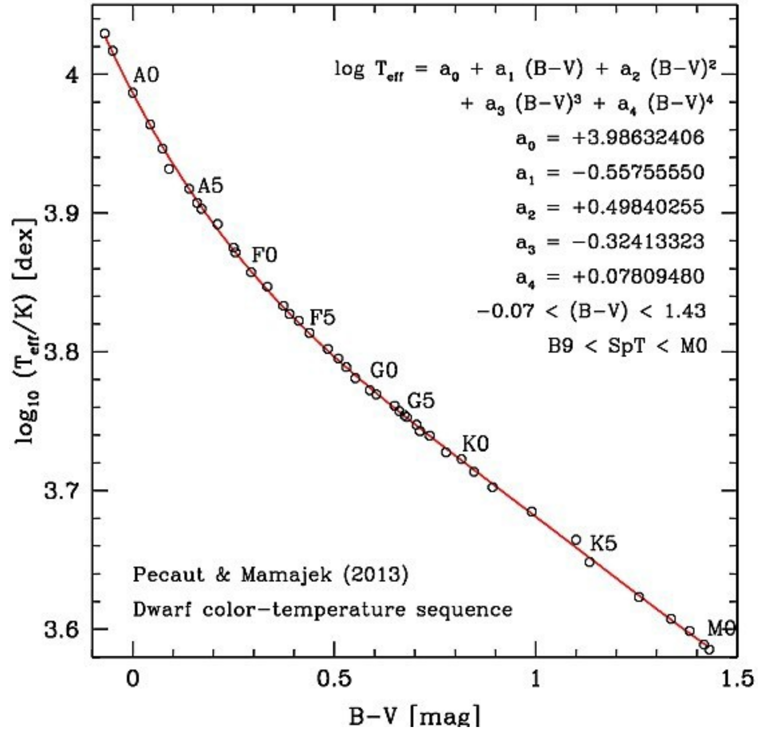
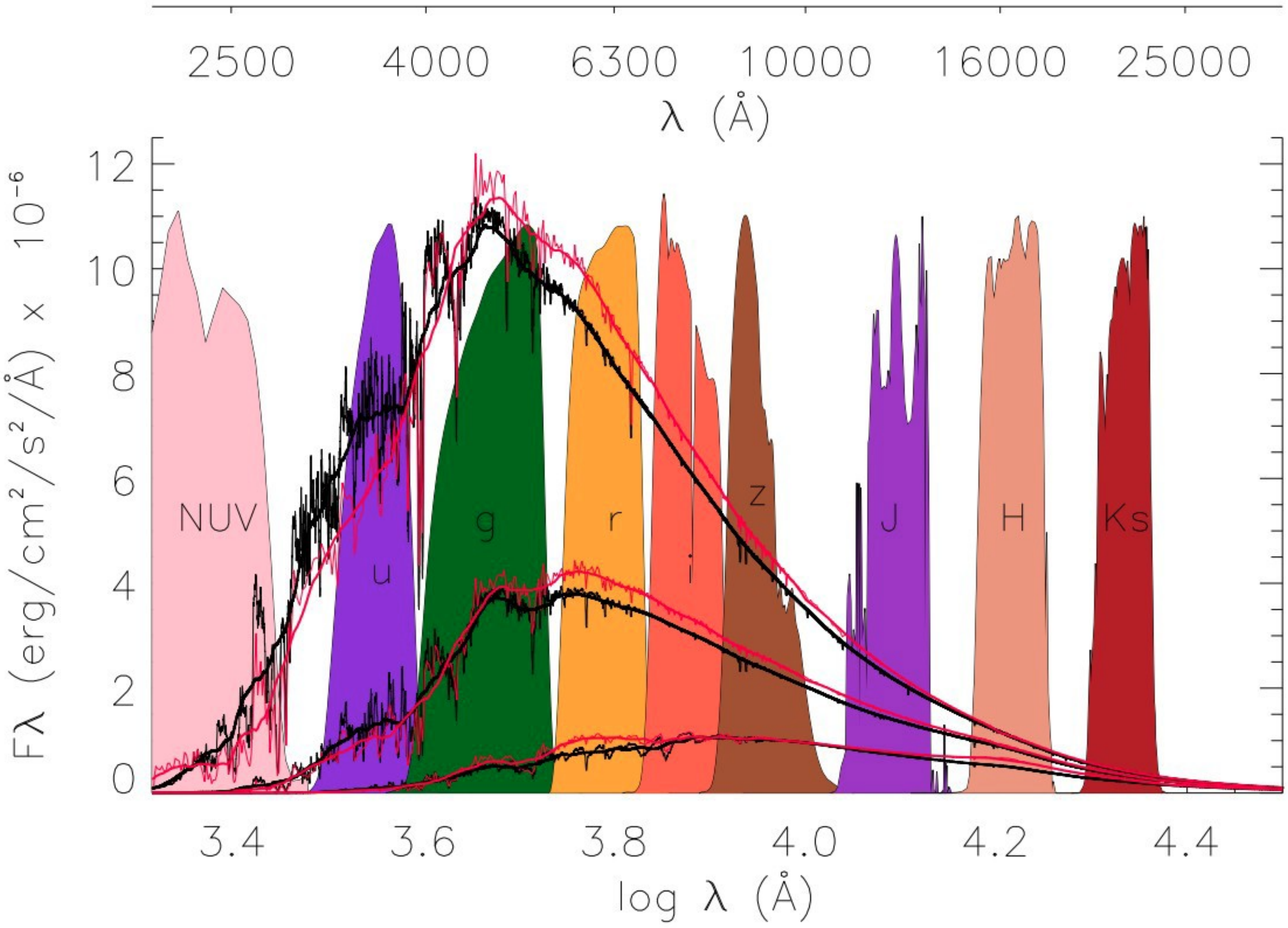
Why using SEDs?





Why using SEDs?

Why using SEDs?



Building SEDs: difficulties

Searching for information:

Observational photometry and Theoretical models.

2MASS All-Sky Point Source Catalog
2MASS has uniformly scanned the entire sky in three near-infrared bands to detect and characterize point sources brighter than about 1 mJy in each band, with signal-to-noise ratio (SNR) greater than 1
More Info.
Filters: 2MASS/2MASS.J 2MASS/2MASS.H 2MASS/2MASS.Ks
Search radius: 5 arcsec
Show magnitude limits

DENIS Catalogue
This catalogue is the latest incremental release of the DENIS project. It consists of a set of 355,220,325 point sources detected by the DENIS survey in 3662 strips (covering each 30 degrees in declination and 12 arcmin in right ascension)
More Info.
Filters: DENIS/DENIS.I DENIS/DENIS.J DENIS/DENIS.Ks
Search radius: 5 arcsec
Show magnitude limits

IRAS Catalog of Point Sources, Version 2.0
This is a catalog of some 250,000 well-confirmed infrared point sources observed by the Infrared Astronomical Satellite, i.e., sources with angular extents less than approximately 0.5, 0.5, 1.0, and 2.0 arcmin in the in-scan direction at 12, 25, 60, and 1
More Info.
Filters: IRAS/IRAS.12mu IRAS/IRAS.25mu IRAS/IRAS.60mu IRAS/IRAS.100mu
Search radius: 20 arcsec
Show flux limits

IRAS Faint Source Catalog
The Faint Source Survey (FSS) is the definitive Infrared Astronomical Satellite data set for faint point sources.
More Info.
Filters: IRAS/IRAS.12mu IRAS/IRAS.25mu IRAS/IRAS.60mu IRAS/IRAS.100mu
Search radius: 20 arcsec
Show flux limits

MSX6C Infrared Point Source Catalog
Version 2.3 of the Midcourse Space Experiment (MSX) Point Source Catalog (PSC), which supersedes the version (1.2) that was released in 1999 (Cat. V/107), contains over 100,000 more sources than the previous version.
More Info.
Filters: MSX/MSX.A MSX/MSX.C MSX/MSX.D MSX/MSX.E
Search radius: 5 arcsec
Show flux limits

AKARI/IRC mid-IR all-sky Survey (ISAS/JAXA, 2010)
The AKARI/IRC Point Source Catalogue Version 1.0 provides positions and fluxes for 870,973 sources observed with the InfraRed Camera (IRC)
More Info.
Filters: AKARI/IRC.S9W AKARI/IRC.L18W
Search radius: 5 arcsec
Show flux limits

AKARI/FIS All-Sky Survey Point Source Catalogues (ISAS/JAXA, 2010)
The AKARI/FIS All-Sky Survey Bright Source Catalog Version 1.0 provides positions and fluxes for 427071 point sources in the 4 far-infrared wavelengths centered at 65, 90, 140 and 160μm
More Info.
Filters: AKARI/FIS.N60 AKARI/FIS.WIDE-S AKARI/FIS.WIDE-L AKARI/FIS.N160
Search radius: 5 arcsec
Show flux limits

C2D Spitzer and Ancillary Data
C2D Fall '07 Full CLOUDS Catalog (CHA_II, LUP, OPH, PER, SER)
Filters: Spitzer/IRAC.I1 Spitzer/IRAC.I2 Spitzer/IRAC.I3 Spitzer/IRAC.I4 Spitzer/MIPS.24mu Spitzer/MIPS.70mu
Search radius: 5 arcsec
Show flux limits

AMES-Dusty 2000
The AMES-Dusty Model grid of theoretical spectra. Brown dwarfs/extrasolar planets atmosphere models without irradiation but including dust opacity (fully efficient dust settling). Wavelengths have been converted to air wavelengths.

AMES-Cond 2000
The AMES-Cond Model grid of theoretical spectra. Brown dwarfs/extrasolar planets atmosphere models without irradiation and no dust opacity (no dust settling). Wavelengths have been converted to air wavelengths.

Kurucz ODFNEW /NOVER models
ATLAS9 Kurucz ODFNEW /NOVER models. Newly computed ODFs with better opacities and better abundances have been used.

Husfeld et al models for non-LTE Helium-rich stars
Husfeld et al models for non-LTE Helium-rich stars

BT-Settl-CIFIST
The BT-Settl Model grid of theoretical spectra. With a cloud model, valid across the entire parameter range and using the Caffau et al. (2011) solar abundances. Wavelengths have been converted to air wavelengths.

BT-Settl
The BT-Settl Model grid of theoretical spectra; With a cloud model, valid across the entire parameter range. Wavelengths have been converted to air wavelengths.

BT-COND
The BT-COND Model grid of theoretical spectra. Brown dwarfs/extrasolar planets atmosphere models without irradiation and no dust opacity (no dust settling) but updated abundances. Wavelengths have been converted to air wavelengths.

BT-DUSTY
The BT-DUSTY Model grid of theoretical spectra. Brown dwarfs/extrasolar planets atmosphere models without irradiation but including dust opacity (fully efficient dust settling) and updated abundances. Wavelengths have been converted to air wavelengths.

BT-NextGen (AGSS2009)
The NextGen Model grid of theoretical spectra; Gas phase only, valid for Teff > 2700 K. Updated opacities. Wavelengths have been converted to air wavelengths.

BT-NextGen (GNS93)
The NextGen Model grid of theoretical spectra; Gas phase only, valid for Teff > 2700 K. Updated opacities. Wavelengths have been converted to air wavelengths.

Black Body
Black Body flux. Teff from 10 to 200000 K

Koester
The NextGen Model grid of theoretical spectra. Only for solar metallicity.

NextGen
The NextGen Model grid of theoretical spectra.

DRIFT-PHOENIX
Drift-Phoenix is a computer code that simulates the structure of an atmosphere including the formation of clouds. The code is part of the Phoenix-code family. Drift describes the formation of mineral clouds and allows to predict cloud details, like the size of the cloud particles and their composition

Morley 2012
Morley et al. 2012 T/Y dwarf models

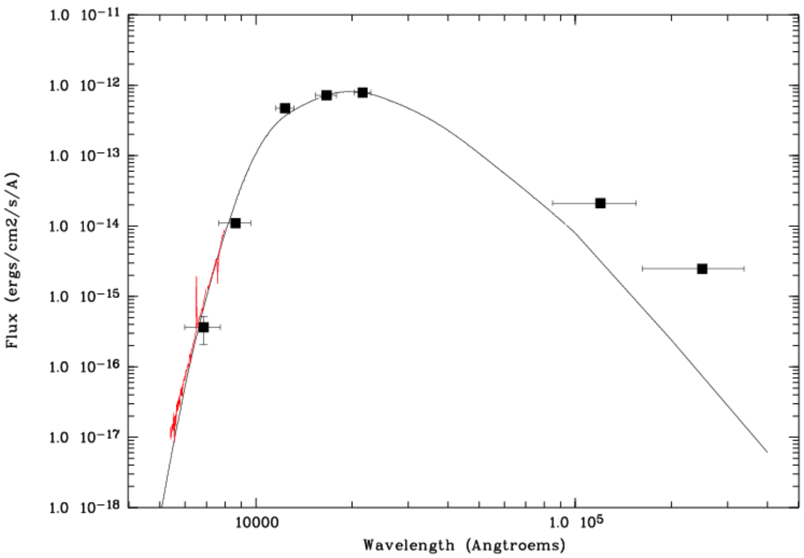
Morley 2014
Morley et al. 2014 Y dwarf and exoplanet models

Saumon 2012
Saumon et al. 2012 T dwarf models

TMAP (Grid 1)
TMAP. Hydrogen+Helium NLTE Models

Building SEDs: difficulties

Data: from magnitudes to fluxes



I/337/gaia — Post annotation

Gaia DR1 (Gaia Collaboration, 2016 — GaiaSource data (**Download** Gaia Sc

start AladinLite

Full	RA_ICRS deg	DE_ICRS deg	<Gmag> mag
1	063.4107528711	-89.9888879972	17.965
2	037.5117084305	-89.9858176527	16.664
3	084.7593492719	-89.9781776713	18.553
4	081.5942616579	-89.9832765720	20.472
5	070.9024070024	-89.9715663343	19.829
6	060.8702751299	-89.9781334323	19.492
7	073.1733654732	-89.9817426647	20.019
8	027.3236159503	-89.9767950251	17.006
9	029.9573489468	-89.9759664621	18.649
10	020.0044580076	-89.9836077196	19.202

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GAIA DATA RELEASE DOCUMENTATION

esa

Gaia Data Release 1 Documentation release D.0

[-] Gaia Data Release 1 Documentation release D.0

I Introduction to Gaia DR1

[+] II Gaia Data Processing

5 Photometry

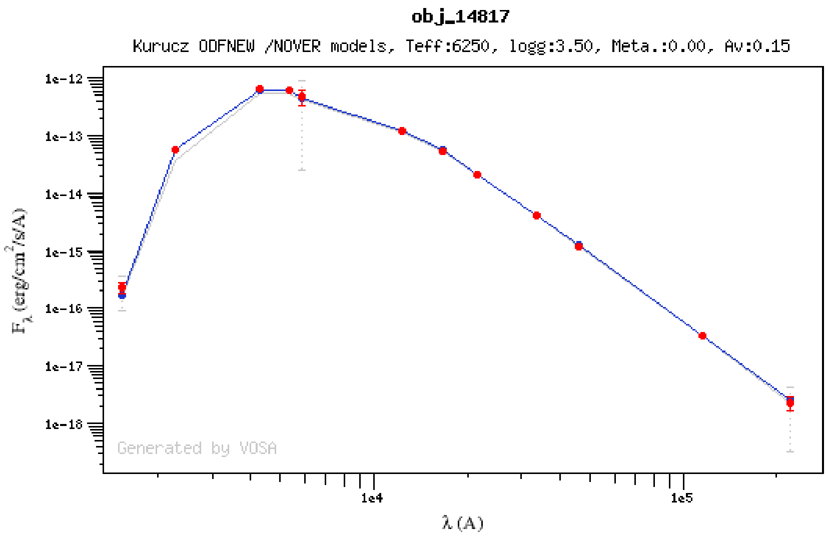
5.2 Properties of the input data — 5.4 Processing steps

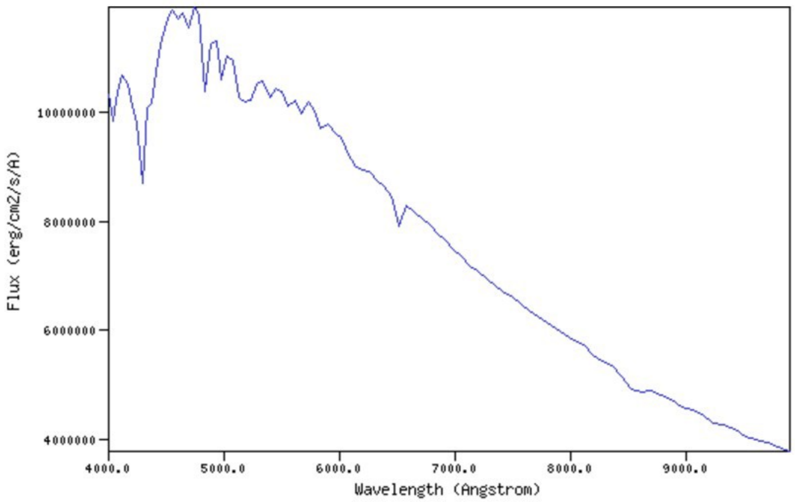
5.3 Calibration models

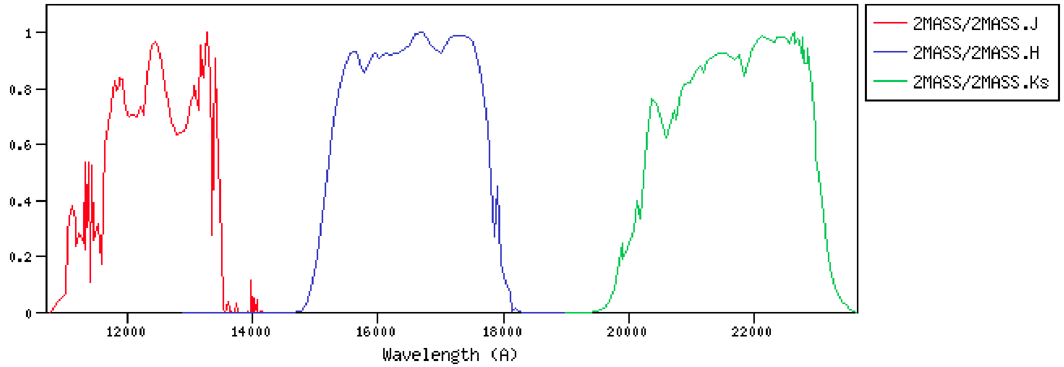
$$m_x = -2.5\log_{10}\left(\frac{F_x}{F_{x,0}}\right),$$

Building SEDs: difficulties

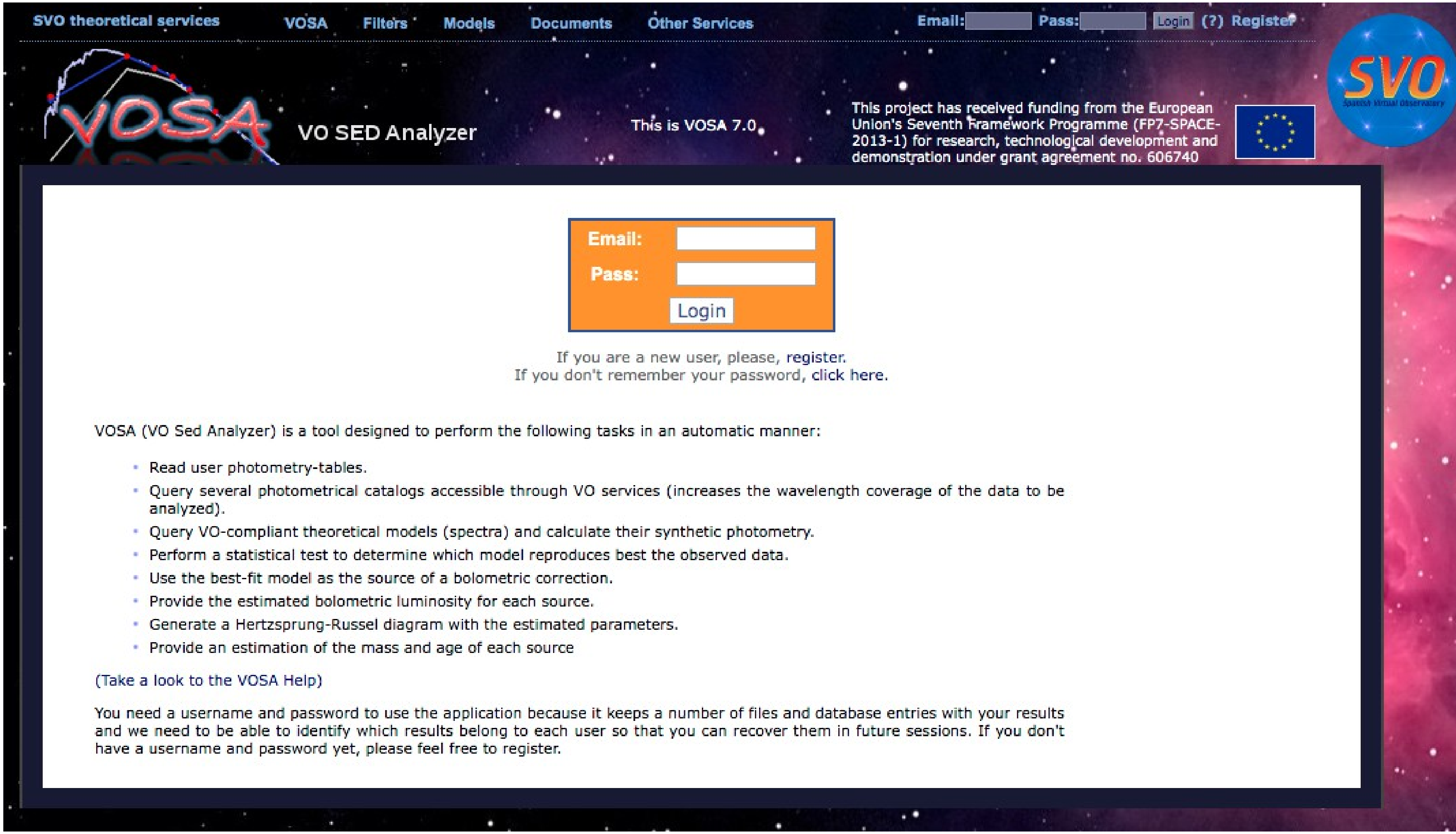
Data: from theoretical spectra to synthetic photometry







VOSA: the ***VO S***ED ***A***nalyzer



SVO theoretical services VOSA Filters Models Documents Other Services Email: Pass: Login (?) Register

VO SED Analyzer

This is VOSA 7.0

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

Email:
Pass:
Login

If you are a new user, please, register.
If you don't remember your password, click here.

VOSA (VO Sed Analyzer) is a tool designed to perform the following tasks in an automatic manner:

- Read user photometry-tables.
- Query several photometrical catalogs accessible through VO services (increases the wavelength coverage of the data to be analyzed).
- Query VO-compliant theoretical models (spectra) and calculate their synthetic photometry.
- Perform a statistical test to determine which model reproduces best the observed data.
- Use the best-fit model as the source of a bolometric correction.
- Provide the estimated bolometric luminosity for each source.
- Generate a Hertzsprung-Russel diagram with the estimated parameters.
- Provide an estimation of the mass and age of each source

(Take a look to the VOSA Help)

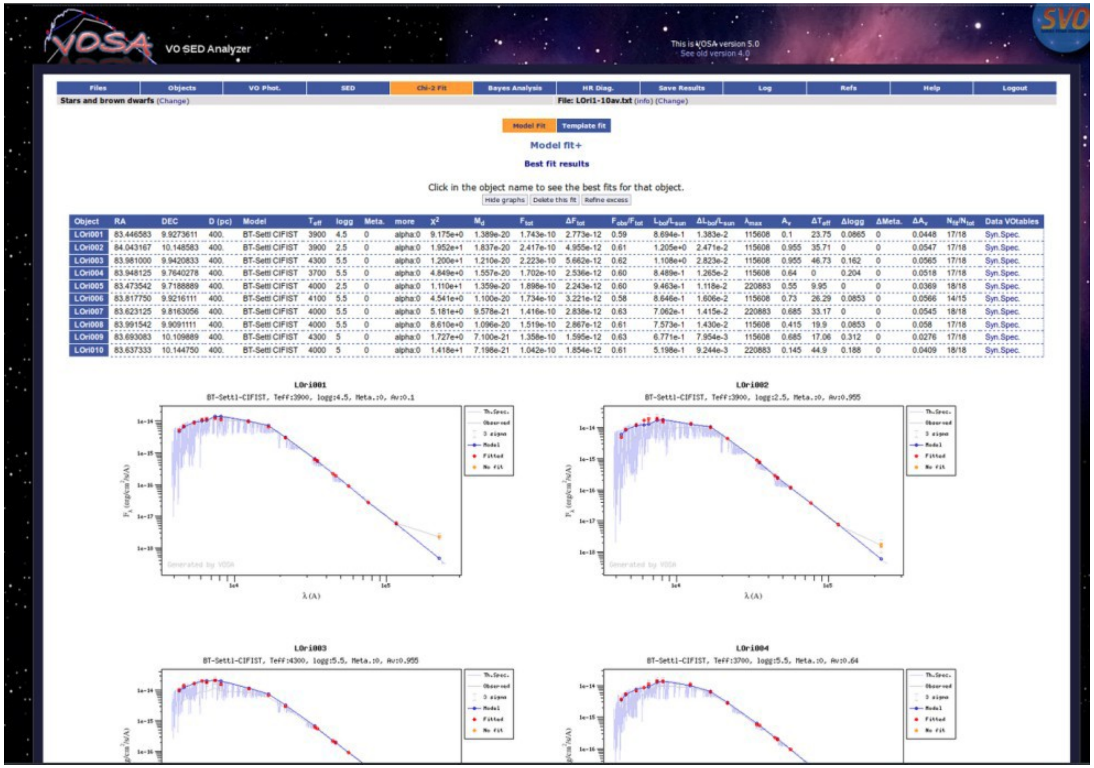
You need a username and password to use the application because it keeps a number of files and database entries with your results and we need to be able to identify which results belong to each user so that you can recover them in future sessions. If you don't have a username and password yet, please feel free to register.

http://svo2.cab.inta-csic.es/theory/vosa/

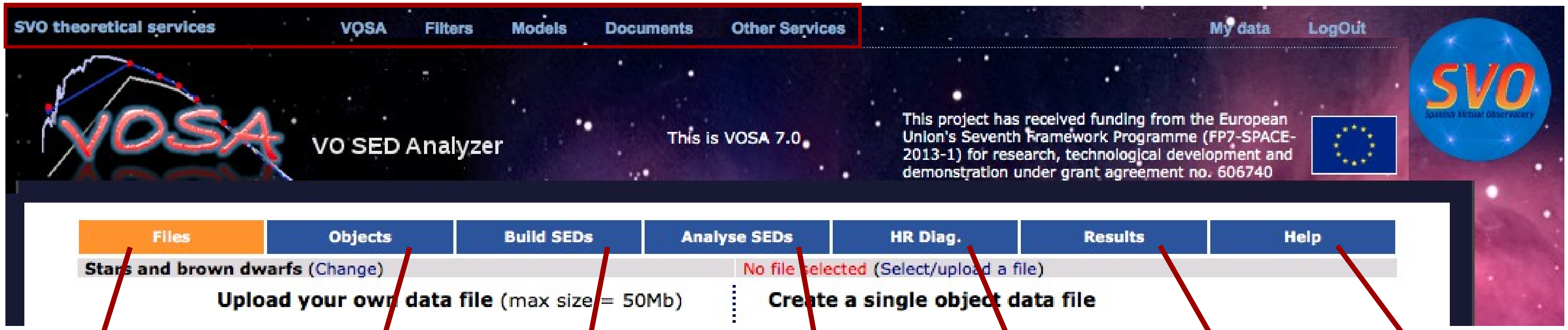
VOSA: the ***VO S***ED ***A***nalyzer

http://svo2.cab.inta-csic.es/theory/vosa/

- Available since 2008
- > 2 600 users
- > 10 000 000 objects
- > 220 refereed papers



VOSA: the tool



Upload files
Select objects

Objects
- Coordinates
- Distances
- Extinction

Build SEDs
- VO Photometry
- SED edit/visualize

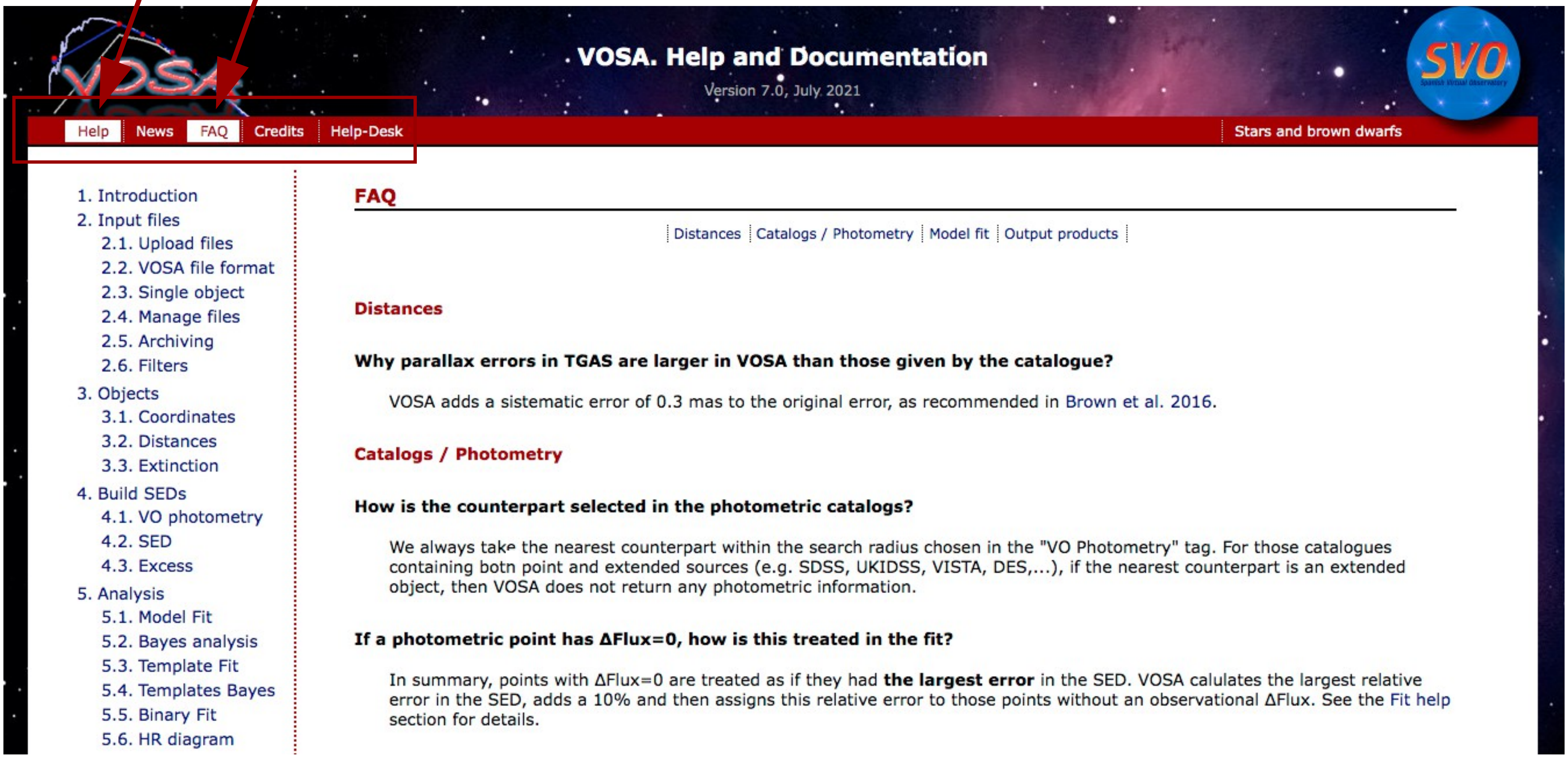
Analyse SEDs
- Chi-square Fit
- Template fit
- Model Bayes Analysis
- Template Bayes Analysis

Generate HR diagram

Results
- Download Results
- Activity Log
- References

Access detailed help files

VOSA: documentation



Science case

THE ASTRONOMICAL JOURNAL

Accurate Empirical Radii and Masses of Planets and Their Host Stars with *Gaia* Parallaxes

Keivan G. Stassun[1,2], Karen A. Collins[1,2], and B. Scott Gaudi[3,4]

Published 2017 March 2 •

The Astronomical Journal, Volume 153, Number 3

Science case

KNOW THE STAR, KNOW THE PLANET

$$\Delta F = \left(\frac{R_{planet}}{R_{star}}\right)^2$$

$$M_p = \frac{K_{\rm RV}\sqrt{1-e^2}}{\sin i}\left(\frac{P}{2\pi G}\right)^{1/3} M_\star^{2/3}$$

SED fitting → F_{bol} and T_{eff}

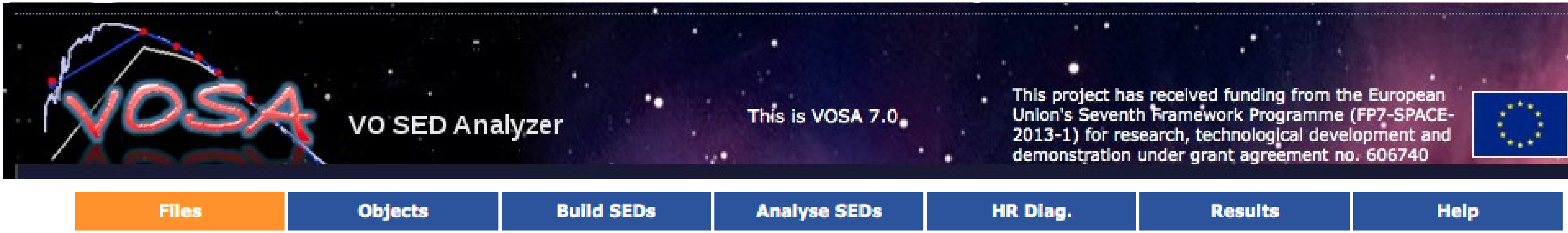
$L = 4\pi D^2 F_{bol}$ (D from Gaia-DR2 parallaxes)

$R=\mathrm{sqrt}(L/(4\pi\sigma T_{eff}^4))$

$g = G\, M / R^2$

The tutorial

Estimation of radii and masses of planet-host stars using VOSA.



Step 4
File upload

Steps 8-9
SED building
SED visualis.

Step 13

Steps 5-7
Coordinates
Distances

Steps 10-12
SED fitting

Steps 14-15
Log
Download

Don't forget:

Turn off your microphone/video. Please, write your questions in the chat.