

Photometry data in the VO Photometry data in the VO

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¹LAEFF-CAB-INTA-CSIC ²Spanish Virtual Observatory

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- More photometry in the VO: great!
 - Building and ploting SED's.
 - Analyzing those SED's..
- Photometry usually in catalogues.
 - as magnitudes.
 - not so useful.
- Problems:
 - What those magnitudes mean?
 - How to convert them to fluxes?
 - How to compare them with spectra?

Some use cases

svo

- Properly characterization of photometric values (understanding them)
- Building a SED and ploting it
- Using synthetic photometry to prepare observations (exposure time...)
- Estimate physical properties of an object by comparing observed photometry to theoretical models.



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At the Spanish VO we have developed VOSA, a tool that

- Reads user photometry tables.
- Queries VO photometry catalogs to improve/complete the observed SED.
- Fits observed data with synthetic photometry derived from VO-compliant theoretical spectra and estimate physical parameters for the objects.
- etc
- Bayo et al, 2008 A&A 429,277B

http://svo.laeff.inta.es/theory/vosa talk on theory session.

What is needed

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- To build a SED and, at least, plot it, we need
 - the magnitude
 - the zero point
 - a relevant λ ($\lambda_{eff}, \lambda_{mean}...$)
- To understand the value we need more info
 - instrument, facility...
 - filter width
- To be able to compare with spectra or theoretical models
 - filter transmission curve

(observed photometry must not be compared to spectra but to synthetic photometry!)

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Synthetic photometry



Synthetic photometry



Synthetic photometry



In some cases good fit does not mean that the photometric point is on the spectrum





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An observed magnitude should be given together with

- all the relevant information needed to understand it.
 - Filter name
 - Zero point
 - Relevant λ (λ_{eff}, λ_{mean}, λ₀, ...)
 - Filter transmission curve
 - Filter width (effective width, FWMH...)
 - ...
- or: a way to obtain that information.
 - A Unique filter ID so that all the information can be obtained somewhere else.
- or: a combination of both

Photometry/Filter Data model



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Photometry data in the VO

Activities (SVO+ESAVO)

• 5 SSAP services for photometry

- 4 TSAP for synthetic photometry for different models
- 1 pure SSAP for IUE photometry
- Registered in EuroVO registry (SVO)
- VOSpec (ESAVO)) adapted to consume these services
- Filter Profile Service
 - Client implemented by ESAVO and integrated in VOSpec
- 1 ConeSearch service for IUE photometry





• S3 service to fit observed photometry with theoretical data.

- Used by VOSA
- inputs: observed photometry + model param ranges
- Best fit model
- Physical parameters

SSAP IUE photometry



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Photometry data in the VO

SSAP synthetic photometry



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Motivation Activities

IUE photometry ConeSearch





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IUE photometry ConeSearch



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Filter profile service



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Filter Profile Service



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Filter Profile Service

Groups	CAHA	Filterid	λ_{mean}	$\boldsymbol{\lambda}_{eff}$	λ _{min}	λ _{max}	∆ _{eff}	$F_0^{}(Jy)$	Ph.System	Facility	Instrument	Short. Descrip		
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Generic														
Hipparcos		Filter ID:	CAHA/	BUSC	A.b									
INT		Short descrip.:	BUSCA	чь										
IRAS		Transmission curve					Eva	miner	(mbct a file					
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- Flexible approach.
- A lot of photometry can be integrated in the VO with little work
- Inputs from photometry providers are important (CDS, ESO...?)



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THANK YOU!

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