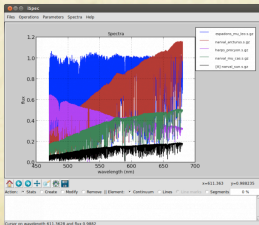
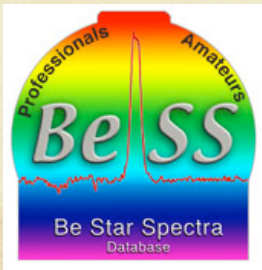
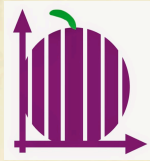
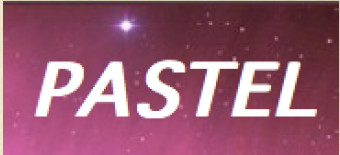


# Les services de Spectroscopie Astronomique en France

Philippe Prugniel, CRAL-Observatoire de Lyon







# A galaxy of services

- More than a dozen of services to support large surveys
  - VO compliant (SSAP) ... many since +10 years
- Organization & current status
- Data analysis tools
- Interoperability - VO

ULYSS

PASTEL

VO compliant (SSAP) ... many since +10 years

Organization & current status

Data analysis tools

Interoperability - VO

PÉGASE

GA PAR

ASPIC

BeSS  
Be Star Spectra  
database

PHOENIX

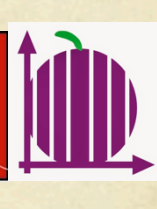
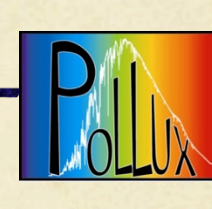
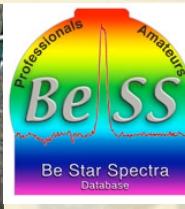
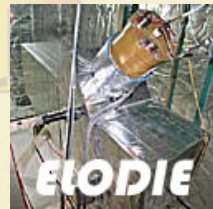


# Organization

- Initiatives to organize the access to spectroscopic data

National workshops 2003 – 2006

Elodie/Sophie  
BeSS  
Pollux  
CASSIS  
PolarBase



ULYSS

PASTEL

SOPHIE

ELODIE

PÉGASE

OMBRE

POLAR

GALPAR



PHOENIX





# Organization

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IWSSL 2011 - 2013 - 2017 - 2021

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BeSS  
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ULYSS

PASTEL

SOPHIE

PÉGASE

ELODIE



POLAR

POLLUX

GALPAR





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PolarBase

ULYSS

PASTEL

SOPHIE

PÉGASE

ELODIE



POLAR

POLLUX

GALPAR





# Status

- Initiatives to organize the access to spectroscopic data

National workshops 2003 – 2006 ... 2016

- Data access is not anymore the main concern
  - Still, care of preservation
  - Need exchanges and coordination between the services
  - Creation of the PTNS
    - Observational data
    - Synthetic (theoretical) spectra
    - Data analysis tools
    - *Prospective*

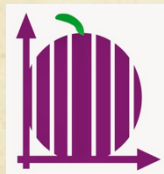


# Status

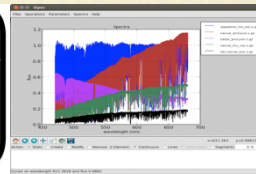
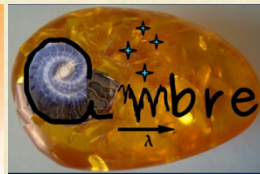
- Initiatives to organize the access to spectroscopic data

National workshops 2003 – 2006 ... 2016

- Data access is not anymore the main concern
  - Still, care of preservation
  - Need exchanges and coordination between the services
  - Creation of the PTNS
- First priority: Data analysis tools



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PÉGASE

PHOENIX

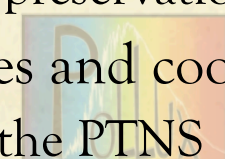
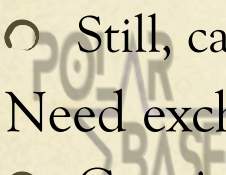
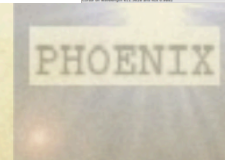
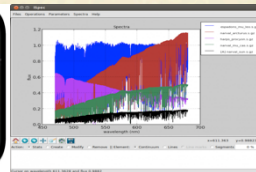
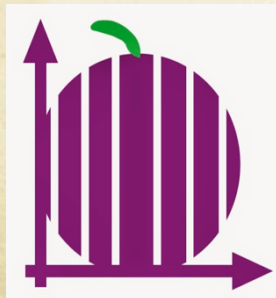


# Data analysis tools

- Initiatives to organize the access to spectroscopic data

National workshops 2003 – 2006 ... 2016

- Data access is not anymore the main concern
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  - Need exchanges and coordination between the services
  - Creation of the PTNS
- First priority: Data analysis tools



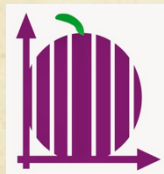


# Data analysis tools

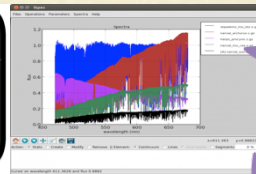
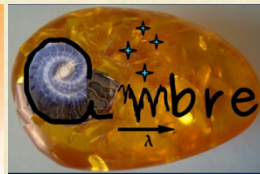
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- First priority: Data analysis tools



Be Star Spectra  
database



TAPAS



PÉGASE



# Data analysis tools

- Initiatives to organize the access to spectroscopic data

National workshops 2003 – 2006 ... 2016

- Data access is not anymore the main concern
  - Still, care of preservation
  - Need exchanges and coordination between the services
  - Creation of the PTNS
- First priority: Data analysis tools
  - For the last twenty years, the internal precision on the temperature or abundances of a star, or for the mass and metallicity of a galaxy are 0.03 dex ... but the accuracy (external precision) is 0.3 dex.



# Data analysis tools

- Initiatives to organize the access to spectroscopic data

National workshops 2003 - 2006 ... 2016

- Data access is not anymore the main concern
  - Still, care of preservation
  - Need exchanges and coordination between the services
  - Creation of the PTNS
- First priority: Data analysis tools
  - Dominated by systematics: Physics, data processing, implementation
  - Need: open source code, modularity, *standardized* interfaces

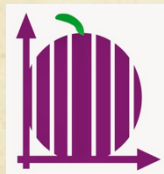


# Data analysis tools

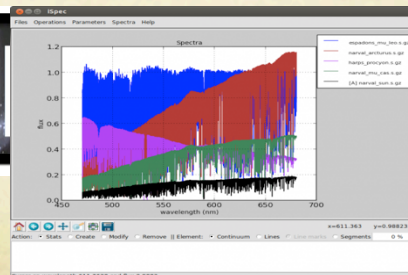
- Initiatives to organize the access to spectroscopic data

National workshops 2003 – 2006 ... 2016

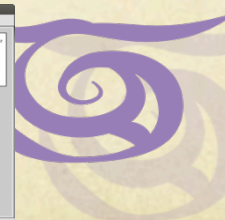
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  - Creation of the PTNS
- First priority: Data analysis tools



Be Star Spectra  
database



iSpec



PÉGASE



# Interoperability – Virtual Observatory

- Initiatives to organize the access to spectroscopic data

National workshops 2003 – 2006 ... **2016**

- Data access is not anymore the main concern

- Still, care of preservation

- Need exchanges and coordination between the services

- Creation of the PTNS

- First priority: Data analysis tools

- Interoperability

- The services use VO standards (SSAP) wherever relevant

- The VO is not much used by the final users (compared to images or tables)



# Interoperability – Virtual Observatory

- The spectro VO is not much used by the final users
  - How much are the services used at all?
  - Do we need or want the VO?
  - Why is it so, and what can we improve?



# Interoperability – Virtual Observatory

- How much are the services used?

Service	Year (start)	Publications
Elodie/Sophie	2004	50 citations/year
Polarbase	2014	6 citations/year ↗
BeSS	2008	5 citations/year
Pollux	2010	6 citations/an
CASSIS	2004	30 citations/an
ULySS	2009	35 citations/an
TAPAS	2014	10 citations/an ↗
iSpec	2014	10 citations/an ↗
GAZPAR		
- LePhare	1999	40 citations/an
- Cigale	2005	20 citations/an



# Interoperability – Virtual Observatory

- How much are the services used?
  - VO:
    - CASSIS: Main access!
    - Other services: Little
      - Elodie/Sophie: Less than 1% of the data access.



# Interoperability – Virtual Observatory

- Do we need or want the VO?
  - Yes
  - E. g. round tables at IWSSL in 2010, 2013 and 2017
  - High expectation and enthusiasm
  - People wait for easy access to the collections, are ready do do some efforts to make their data available (if they have some help)



# Interoperability – Virtual Observatory

- Why is the VO little used (and what can we improve)?
  - The standard are not suited (SSAP)?
    - There are clearly clearly some annoying limitations or features.
    - **This shall not prevent using them**



# Interoperability – Virtual Observatory

- Why is the VO little used (and what can we improve)?
  - The standard are not suited (SSAP)?
  - Lack the services?
    - Only 10% of the registered services pass VOParis validation
    - When accessing through VO, it is hard to understand what the data are ... at then end go to the web interface.
    - Some large collections are missing (maybe they will come?)



# Interoperability – Virtual Observatory




Portal Simbad **VizieR** Aladin X-Match Other... Help

## Search associated data among the VizieR catalogues

This web page is an access to the [VizieR](#) Associated data (images, spectra, timeseries, SED) which comes from publications. This tool is the result of the documentation assigned by the authors of the catalogues and **VO compatibility**

The meta-data and the search engine are built according to the **VO** framework ([SIA](#), [SSA](#), [ObsTAP](#)) and can so be queried by VO softwares. The data are gathered with the [Saada](#) engines, and the VO data model [O](#)

Simple search [ObsTAP Query](#)

Search by position :   radius

Search by spectral band : min  max   $\mu\text{m}$   -

Search by time data : start  stop  (MJD)

Search by catalog:  Identifier:



Spectrum / Time series  Image

500 entries max



Show 10 entries

2 entries

Preview	Target	Data collection	Ra	Dec	Band min (nm)	Band max (nm)	Begin time (MJD)	End time (MJD)	Facility	
	<a href="#">HD000358</a>	<a href="#">III/251</a>	2.097	29.091	390.000	680.000	51,571.751	50,832.769	OHP	<input type="button" value="Download"/> <input type="button" value="Search"/> <input type="button" value="Header"/> 
	<a href="#">HD000358</a>	<a href="#">III/251</a>	2.097	29.091	390.000	680.000	51,571.751	50,832.769	OHP	<input type="button" value="Download"/> <input type="button" value="Search"/> <input type="button" value="Header"/> 



# Interoperability – Virtual Observatory

- Why is the VO little used (and what can we improve)?
  - The standard are not suited (SSAP)?
  - Lack the services?
  - Clients are deficient?
    - VOSPEC ... dead
    - SPLAT-VO ... Maintened, and the developer is responsive. Still hard to get valuable output from it (complex, need to learn a lot more than on a web interface, without more capabilities)
    - CASSIS (as a VO-client) ... Maintened, and developer very responsive. Best client yet. Still (too) complex to use



# Interoperability – Virtual Observatory

- Why is the VO little used (and what can we improve)?
  - The standard are not suited (SSAP)?
  - Lack the services?
  - Clients are deficient?
  - We shall strengthen the links between the spectroscopists and the VO specialists



# Conclusion

- A lot of activities and needs in spectroscopy, large sets of data are coming...
- Priority: Data analysis tools
- High expectations in the VO, currently not satisfied
- Seeking for interoperability between the VO spectroscopy specialists, and the final users