

PolarBase

A data base of high resolution spectropolarimetric
stellar observations

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Data providers



ESPaDOnS@CFHT, NARVAL@TBL
(twin spectropolarimeters)

- Classical spectroscopy ($R= 65,000 - 76,000$)
- Optical domain (370 nm – 1,000 nm)
(including e.g. CaII H&K, H α , CaII IRT)
- Polarimetry (circular and/or linear)

Database content

- All stellar (public) data, in their **reduced** form
(ASCII format through web interface, FITS format through VO)
- **Cross-correlation** pseudo-line profiles
(using SIMBAD spectral type and assuming MS star of solar metallicity)

Standard VO definition of such models?

(normalized Stokes parameters as a function of radial velocity)

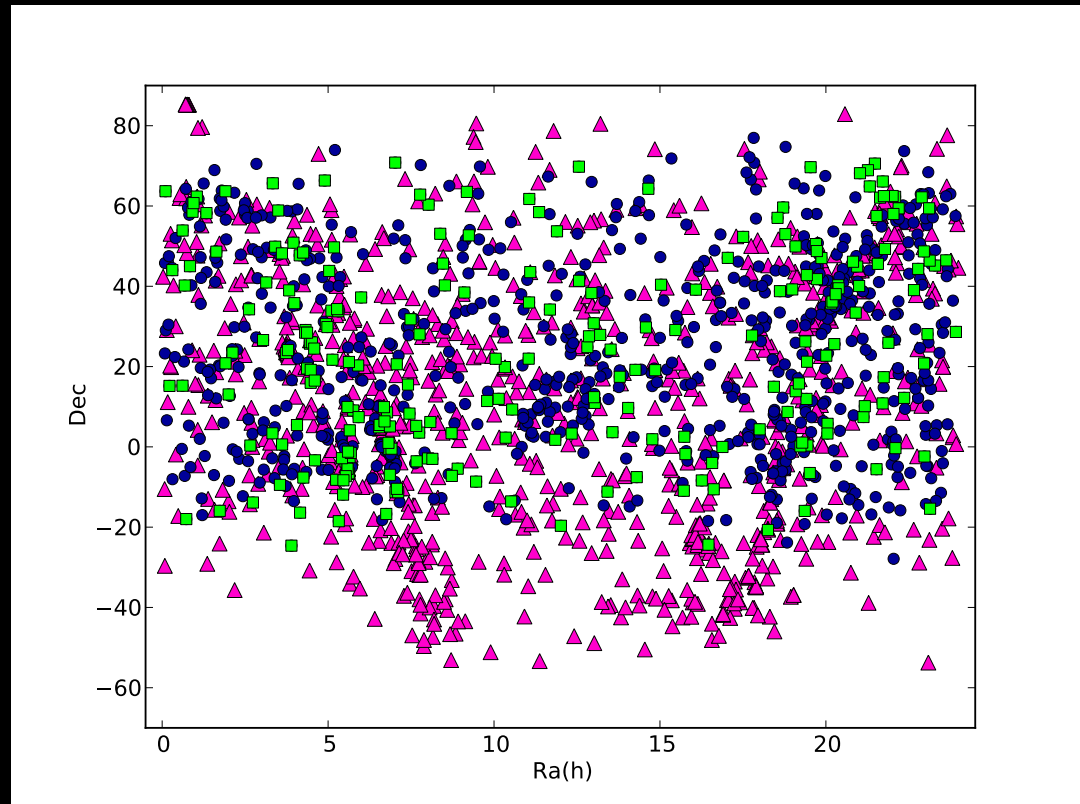
Data volume

- 2014 :
~ 160,000 spectra / 2,000 stars (2 To)
- 2017 (expected) :
~ 240,000 spectra / 3,000 stars (3 To)
- 2020 (expected, including SPIRou) :
~ 400,000 spectra / 5,000 stars (5 To)

PolarBase sky

- ~2,000 objects
- Denser sampling along Milky Way

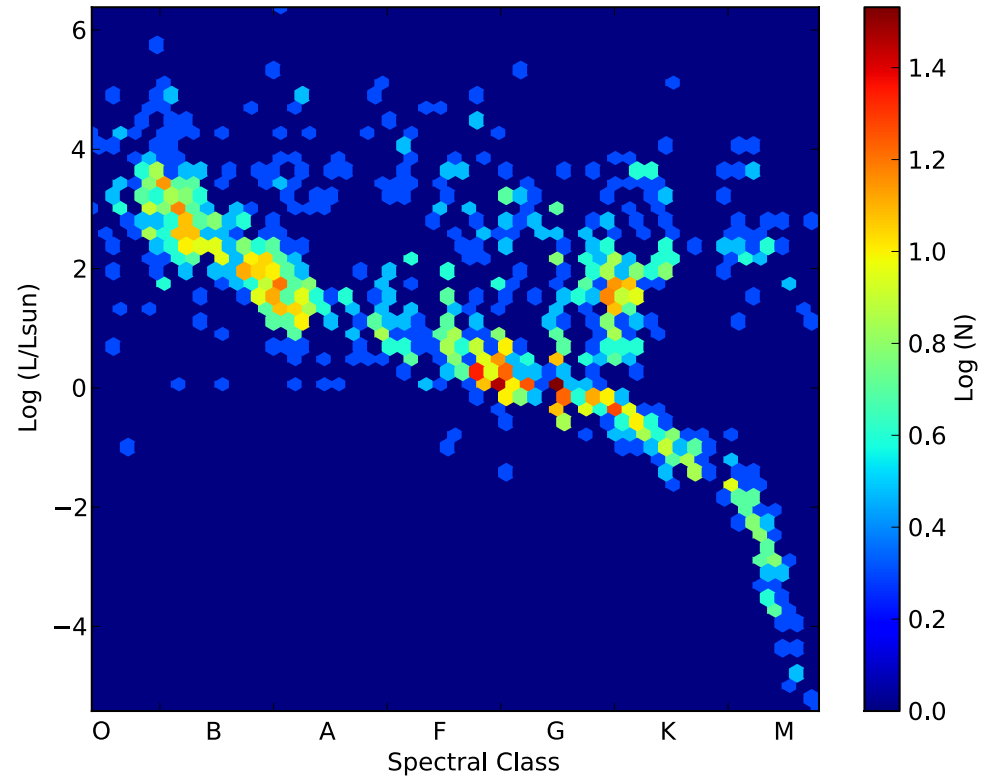
- ESPaDOnS (alone) in pink
- NARVAL (alone) in blue
- ESPaDOnS+NARVAL in green



HR Diagram

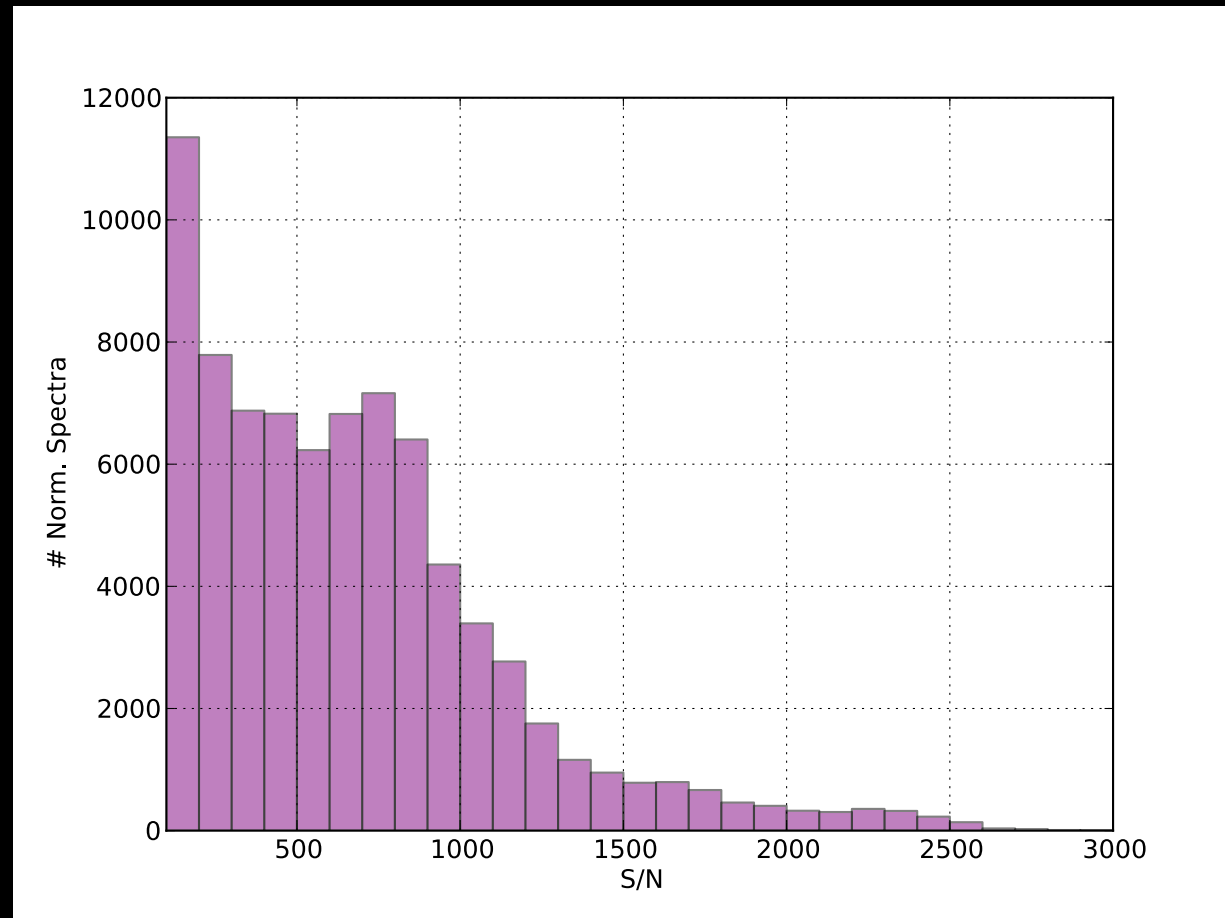
(SIMBAD) spectral types : O4 to M8 (60% cooler than F5)

- Main sequence
- TTS
- Evolved objects



S/N ratio

- 58% of data with S/N > 500
- 18% with S/N > 1,000



Web interface

The image displays the POLARBASE web interface, which is a stellar spectra database. The interface is divided into two main sections: a search form on the left and a main content area on the right.

Search Form (Left Panel):

- Buttons:** "Send Request" and "Clear Fields" (top and bottom).
- Object Parameters:**
 - Name:
 - RA:
 - DEC:
 - V Magnitude:
 - Spectral Type:
- Observation Parameters:**
 - Instrument: Narval Espadons
 - Observation date (UT):
 - Observation time (UT):
 - HJD (UTC):
 - GJD (UTC):
 - SNR (max):
 - SNR (550nm):
 - Obs. mode:
 - Stokes Param:
 - Airmass:
 - Hour angle:
 - LSD results: ANY I Only No detection
 - MARGINAL DEFINITE

Main Content Area (Right Panel):

- Header:** "POLARBASE: ESPaDOnS / NARVAL stellar spectra database" with a logo featuring a red star and a document.
- Navigation:** "Partners", "Query Results", "Documentation", "Contact".
- Logos:**
 - cnrs INSU Observer & comprendre
 - Observatoire Midi-Pyrénées OMP
 - CFH
 - Télescope Bernard L'Yvet BUL
 - UNIVERSITÉ TOULOUSE III PAUL SABATIER Université de Toulouse
- Background:** A photograph of a large astronomical telescope dome on a mountain peak at sunset.

<http://polarbase.irap.omp.eu>

Web interface

Send Request

Object Parameters

Name:

RA:

DEC:

V Magnitude:

Spectral Type:

Observation Parameters

Instrument: Narval Espadons

Observation date (UT):

Observation time (UT):

HJD (UTC):

GJD (UTC):

SNR (max):

SNR (550nm):

Obs. mode:


Stokes Param:

Airmass:

Hour angle:

LSD results: ANY I Only No detection

MARGINAL DEFINITE



POLARBASE:
E\$PaDOn\$ / NARVAL stellar spectra database

Partners **Query Results** Documentation Contact

Target Mv Spectral Type RA DEC
 HA UT time Airmass
 Inst. Mode Instrument
 Geo. JD UT date Hel. JD

Show entries Search:

Sel.	Plot	Target	Inst. mode	UT date	Instrument	Stokes	Bloc
<input type="checkbox"/>		V*V711Tau	pol	2005/12/14	espadons	I	3168
<input type="checkbox"/>		V*V711Tau	pol	2005/12/14	espadons	I	3169
<input type="checkbox"/>		V*V711Tau	pol	2005/12/14	espadons	V	542
<input type="checkbox"/>		V*V711Tau	pol	2005/12/14	espadons	I	3170
<input type="checkbox"/>		V*V711Tau	pol	2005/12/14	espadons	I	3171
<input type="checkbox"/>		V*V711Tau	pol	2005/12/16	espadons	I	3375
<input type="checkbox"/>		V*V711Tau	pol	2005/12/16	espadons	I	3376
<input type="checkbox"/>		V*V711Tau	pol	2005/12/16	espadons	V	574
<input type="checkbox"/>		V*V711Tau	pol	2005/12/16	espadons	I	3377
<input type="checkbox"/>		V*V711Tau	pol	2005/12/16	espadons	I	3378

Showing 1 to 10 of 563 entries ⊕ ⊖

Web interface

Object Parameters

Name:

RA:

DEC:

V Magnitude:

Spectral Type:

Observation Parameters

Instrument: Narval Espadons

Observation date (UT):

Observation time (UT):

HJD (UTC):

GJD (UTC):

SNR (max):

SNR (550nm):

Obs. mode:

Stokes Param:

Airmass:

Hour angle:

LSD results: ANY I Only No detection

MARGINAL DEFINITE

POLARBASE: EsPaDOnS / NARVAL stellar spectra database

Partners **Query Results** Documentation Contact

Target Mv Spectral Type RA DEC
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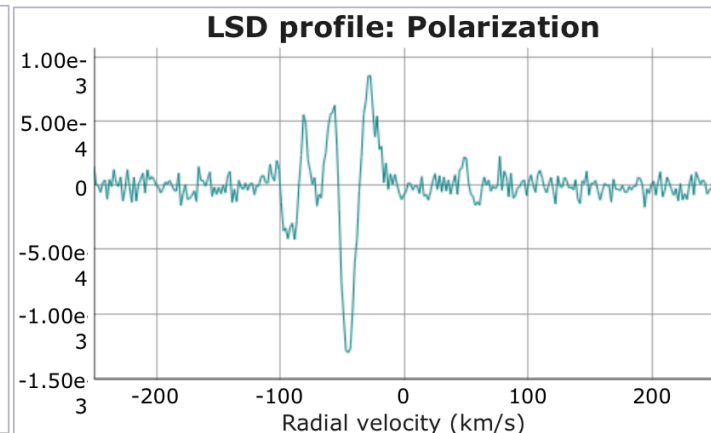
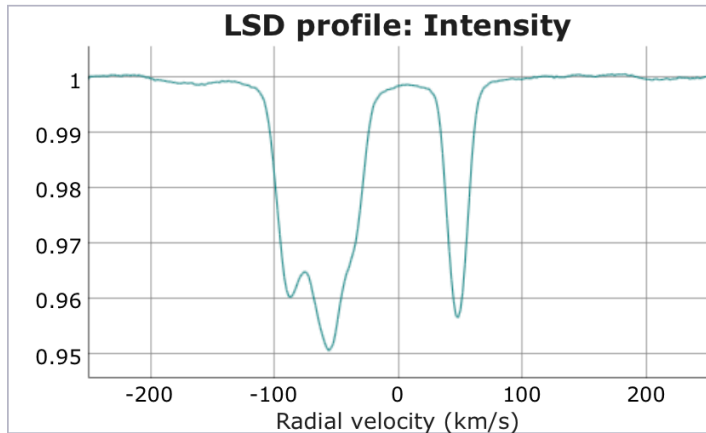
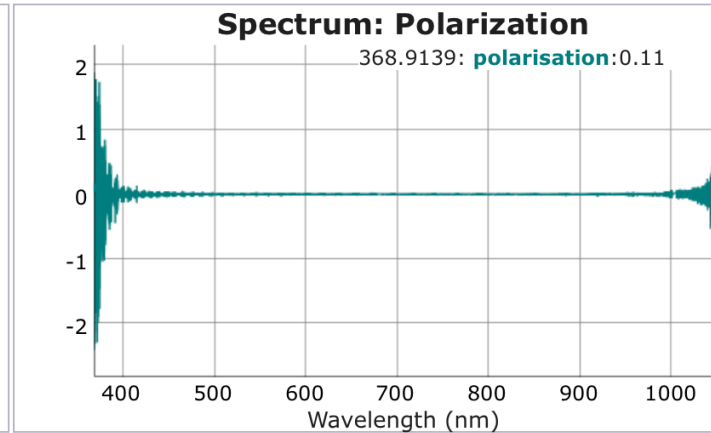
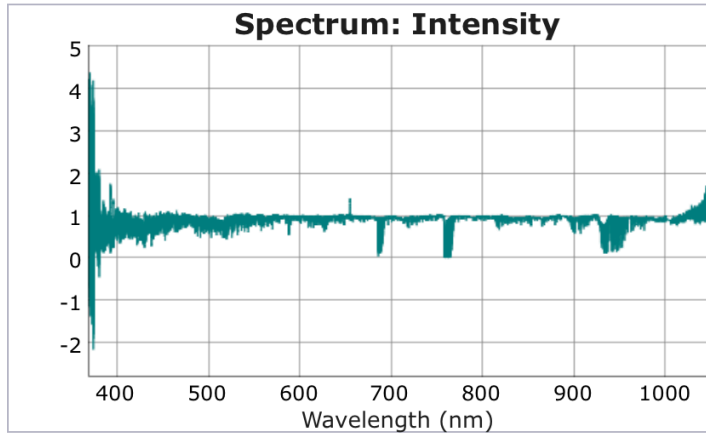
Show entries

Sel.	Plot	Target	Inst. mode	UT date	Instrument	Stokes	Bloc
<input type="checkbox"/>		V*V711Tau	pol	2005/12/14	espadons	I	3168
<input type="checkbox"/>		V*V711Tau	pol	2005/12/14	espadons	I	3169
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<input type="checkbox"/>		V*V711Tau	pol	2005/12/16	espadons	I	3378

Showing 1 to 10 of 563 entries

Web interface

To ZOOM: click, drag and release. To UNZOOM, double-click (and wait a little...)



Web interface

Vizier & Simbad results

Search fundamental parameters on VIZIER

Object : Database :

Adding or disabling parameters automatically starts a new request.

- Teff Abs Mag
 Log(g)
 [Fe/H]
 Vmic

Query ok... Results displayed

Vizier results :

1-12 (total:14)

source	description	Teff	Log(g)	[Fe/H]	Vmic
I/100A	Results of obs with the 6-inch transit circle (Hammond+	3.654	None		
I/113A	General Catalogue of 33342 stars (GC) (Boss 1937)	4696	None		
I/122	Bonner Durchmusterung (Argelander 1859-1903)	4620	None		
I/131A	SAO Star Catalog J2000 (SAO Staff 1966; USNO, ADC	4781	None		
I/141	Yale Zone Catalogues Integrated (Yale Univ 1939-1983)	4748	3.42		
I/144	First, Second and Third Herstmonceux Cats, 1950.0 (Tu	4834	3.51		
I/144	First, Second and Third Herstmonceux Cats, 1950.0 (Tu	4781	None		
I/146	Positions and Proper Motions - North (Roeser+, 1988)	4620	None		
I/154	Astrographic Catalogue, Zones -02 to +31 degrees (Roe	7832	None		
I/154	Astrographic Catalogue, Zones -02 to +31 degrees (Roe	4800	None		
I/40	WASHINGTON 20 Catalog (Morgan, 1933)	5080	None		
I/45	Catalogue de Zimmerman (Zimmerman 1948)	4811	4.33		

Simbad results :

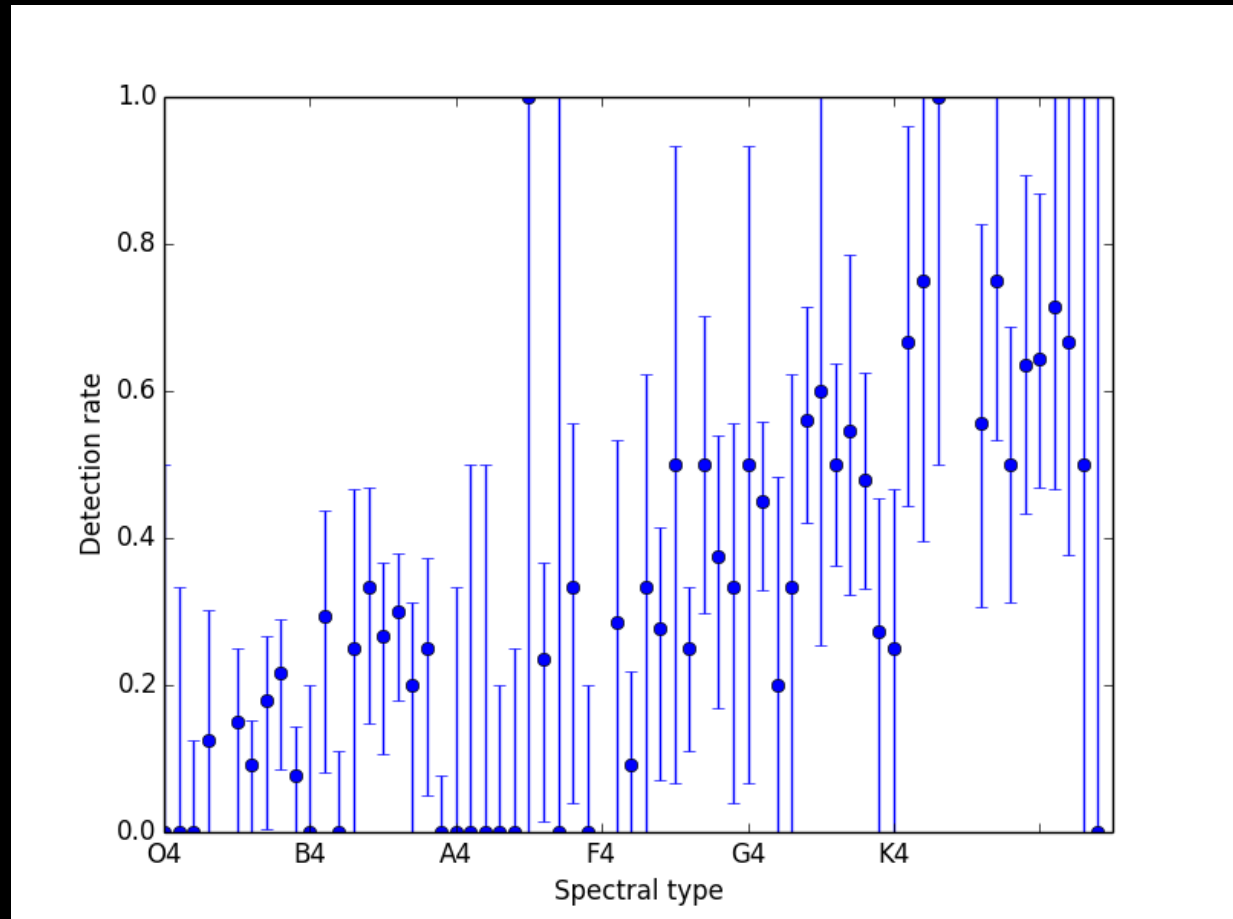
Web interface

Simbad results :

description	Value
Raw identifier as typed in the query	V*V711Tau
Angular distance from the center	none
object creation date	30-Sep-2006
Object last modification date	20-Sep-2013
Object internal identifier	@663971
Old Object Identifier (in Simbad3)	@144830,0
Coordinate box	4798
Main identifier for an object	V* V711 Tau
Object type	RSCVn
Right ascension	054.19704324
Declination	+00.58775909
Proper motion in RA	-31.45
Proper motion in DEC	-162.87
Parallax	32.59

Magnetism across HR diagram

- ~300 magnetic stars
- Detection rate anti-correlated with T_{eff}



Web interface

The image shows a screenshot of the POLARBASE web interface. On the left is a search form with two sections: "Object Parameters" and "Observation Parameters". The "Object Parameters" section includes input fields for Name, RA, DEC, V Magnitude, and Spectral Type. The "Observation Parameters" section includes checkboxes for "Narval" and "Espadons", and input fields for Observation date (UT), Observation time (UT), HJD (UTC), GJD (UTC), SNR (max), SNR (550nm), Obs. mode (dropdown), Stokes Param (dropdown), Airmass, and Hour angle. At the bottom of the form are "Send Request" and "Clear Fields" buttons. The main content area on the right features a navigation menu with "Partners", "Query Results", "Documentation" (circled in red), and "Contact". Below the menu is a large banner image of a telescope dome. Overlaid on the banner are logos for CNRS INSU (Observer & comprendre), Observatoire Midi-Pyrénées OMP, CFH, Telescopio Bernard L'Yrot BUL, and Université Toulouse III Paul Sabatier.

Object Parameters

Name:

RA:

DEC:

V Magnitude:

Spectral Type:

Observation Parameters

Instrument: Narval Espadons

Observation date (UT):

Observation time (UT):

HJD (UTC):

GJD (UTC):

SNR (max):

SNR (550nm):

Obs. mode:

Stokes Param:

Airmass:

Hour angle:

LSD results: ANY I Only No detection

MARGINAL DEFINITE

POLARBASE: ESPaDOnS / NARVAL stellar spectra database

Partners Query Results **Documentation** Contact

cnrs INSU
Observer & comprendre

Observatoire Midi-Pyrénées OMP CFH Telescopio Bernard L'Yrot BUL

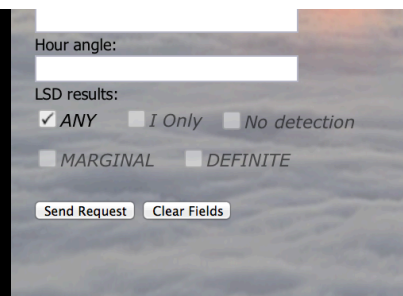
UNIVERSITÉ TOULOUSE III PAUL SABATIER Université de Toulouse

<http://polarbase.irap.omp.eu>

Web interface



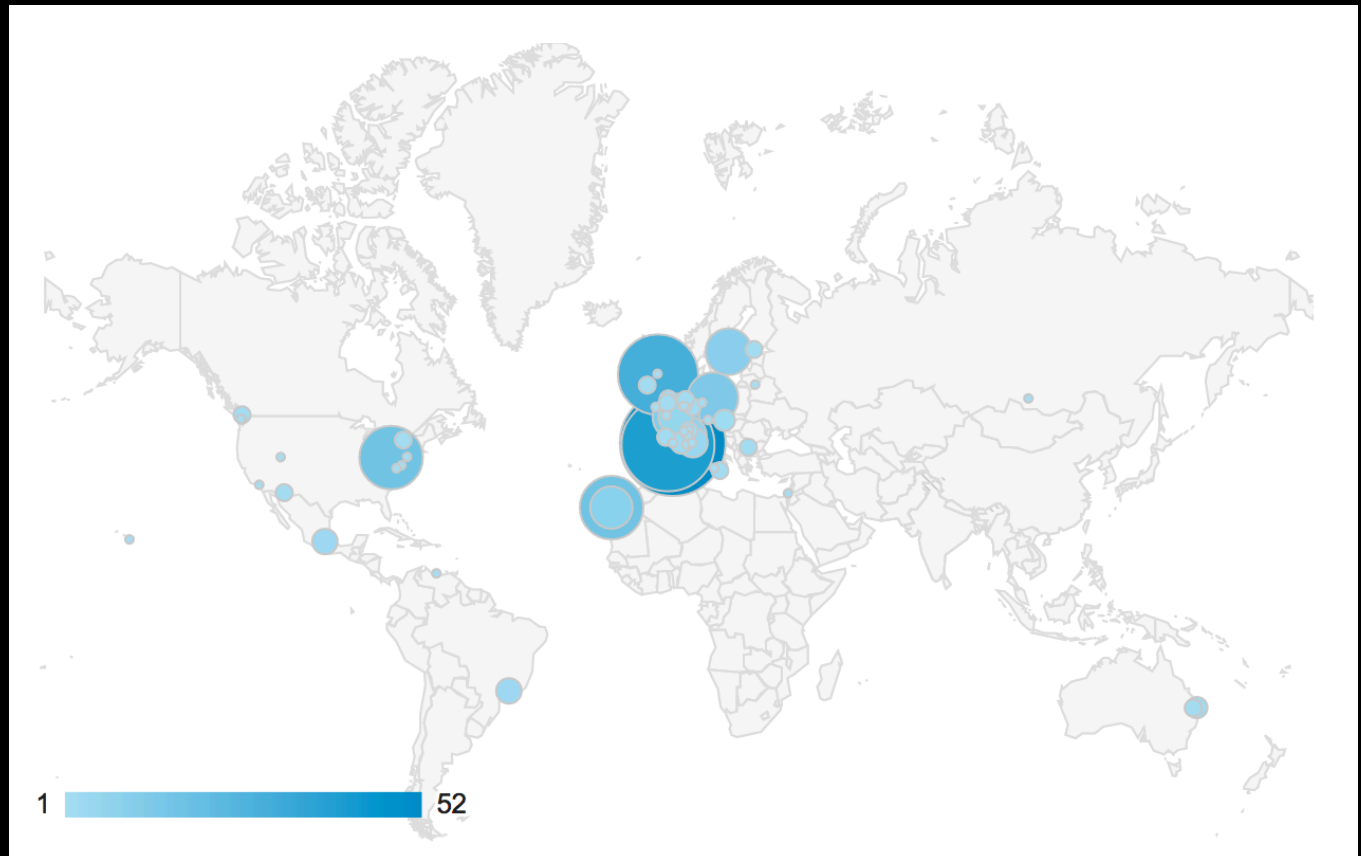
- Title:** PolarBase: a data base of high resolution spectropolarimetric stellar observations
- Authors:** [Petit, P.](#); [Louge, T.](#); [Théado, S.](#); [Paletou, F.](#); [Manset, N.](#); [Morin, J.](#); [Marsden, S. C.](#); [Jeffers, S. V.](#)
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- Comment:** 9 pages, 6 figures
- Bibliographic Code:** [2014arXiv1401.1082P](#)



<http://polarbase.irap.omp.eu>

Traffic statistics

- Google Analytics: interface traffic
- Homemade python scripts: download statistics (who downloads what)



Future plans

1. Offer **BI & Radial Velocities** from LSD profiles
2. Offer **S-index** from Stokes I spectra

→ **VizieR storage of measurements**

Future plans

1. Offer **BI & Radial Velocities** from LSD profiles
2. Offer **S-index** from Stokes I spectra
3. Get spectral classification tool (at least for FGK stars)
4. Explore inter-operability with **POLLUX**
5. Set up Australian mirror (USQ)
6. Get data from other instruments **SemelPol**, **MuSiCoS**.