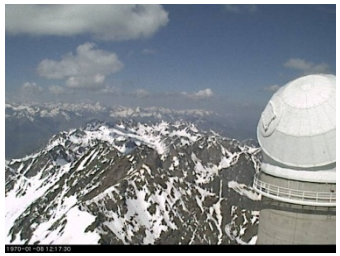
Observations simulées
Synergie TBL Legacy – POLLUX



A. Palacios, A. Lèbre, P. Maeght, M. Sanguillon

Observatoire Virtuel – Grand Sud Ouest (OV – GSO)

Présentation de l'application VOSPECFLOW

développement effectué dans le cadre de l'OV-GSO

Comparaison entre des spectres stellaires

observés (TBLegacy)
et
théoriques (POLLUX)

Télescope Bernard Lyot
Narval archive

Archive *Science Ready* des données spectropolarimétriques de l'instrument NARVAL du TBL.

Spectres haute résolution normalisés ou non au continu, dans le domaine spectral [375 nm; 1050 nm].

Données contenant l'information spectrale + l'information de polarisation (paramètres de Stokes).

Pollux Database for High Resolution Synthetic Stellar Spectra and SEDs

Base de données de spectres synthétiques très haute résolution (R = 120 000) dans l'optique [300 nm; 1200 nm].

Spectres pour étoiles de tous types (sauf B, en cours de production).

Spectres fournis donnant le flux absolu et le flux normalisé au continu

SEDs entre 5 nm et 20 000 nm (domaine dépendant du type spectral)

Bases de données inscrites sur les registry de l'OV comme services SSAP

L'application VOSPECFLOW : ses objectifs

Spectre observé – Archives de télescope (TBLegacy)

Spectre calculé – Bases de Données de spectres théoriques (POLLUX)

Module de convolution
(macroturbulence, rotation, profil instrumental)

Observation simulée, directement comparable à la donnée NARVAL

Problème :
Spectre observé et Spectre calculé sont des fichiers de structure différente.
Leurs bases de données s'interrogent aussi avec des requêtes différentes.

Mise en œuvre : à partir d'un nom d'étoile,

Requêtes automatiques sur SIMBAD, VizieR, TBLegacy et POLLUX
Protocoles OV entre ces services OV

Module de convolution (sur des portions de spectres de 100 à 500 Å)

Interface graphique de vérification

Exportation des données sous applications graphiques OV (VOspec)

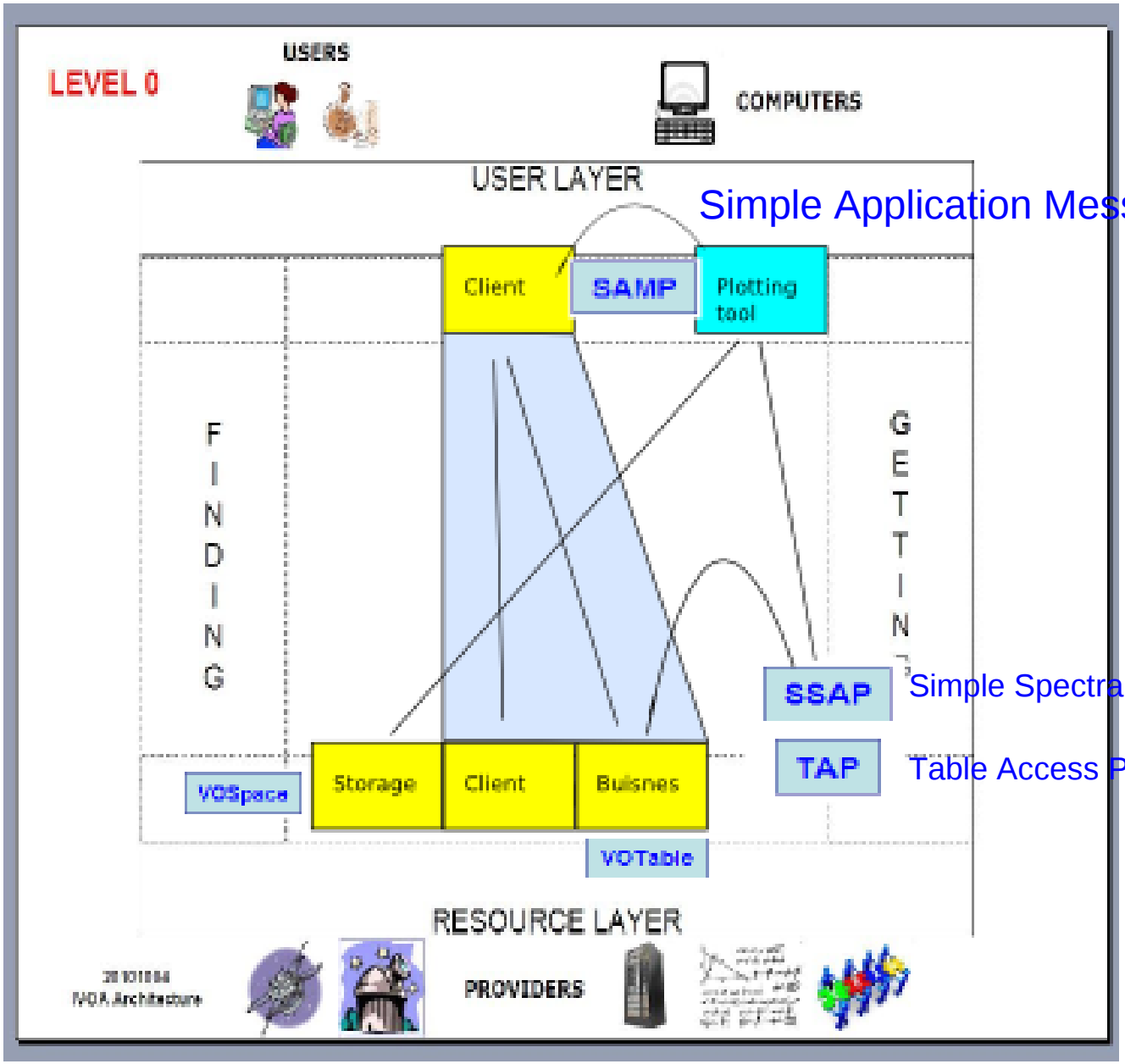
L'application VOSPECFLOW a pour but de dégrossir une analyse,
ou de vérifier la nature d'une cible.

Ce n'est pas un outil de détermination automatique de paramètres stellaires.

Un objectif peut être de vérifier

l'activité d'un objet
la présence ou non de certains éléments dans le spectre

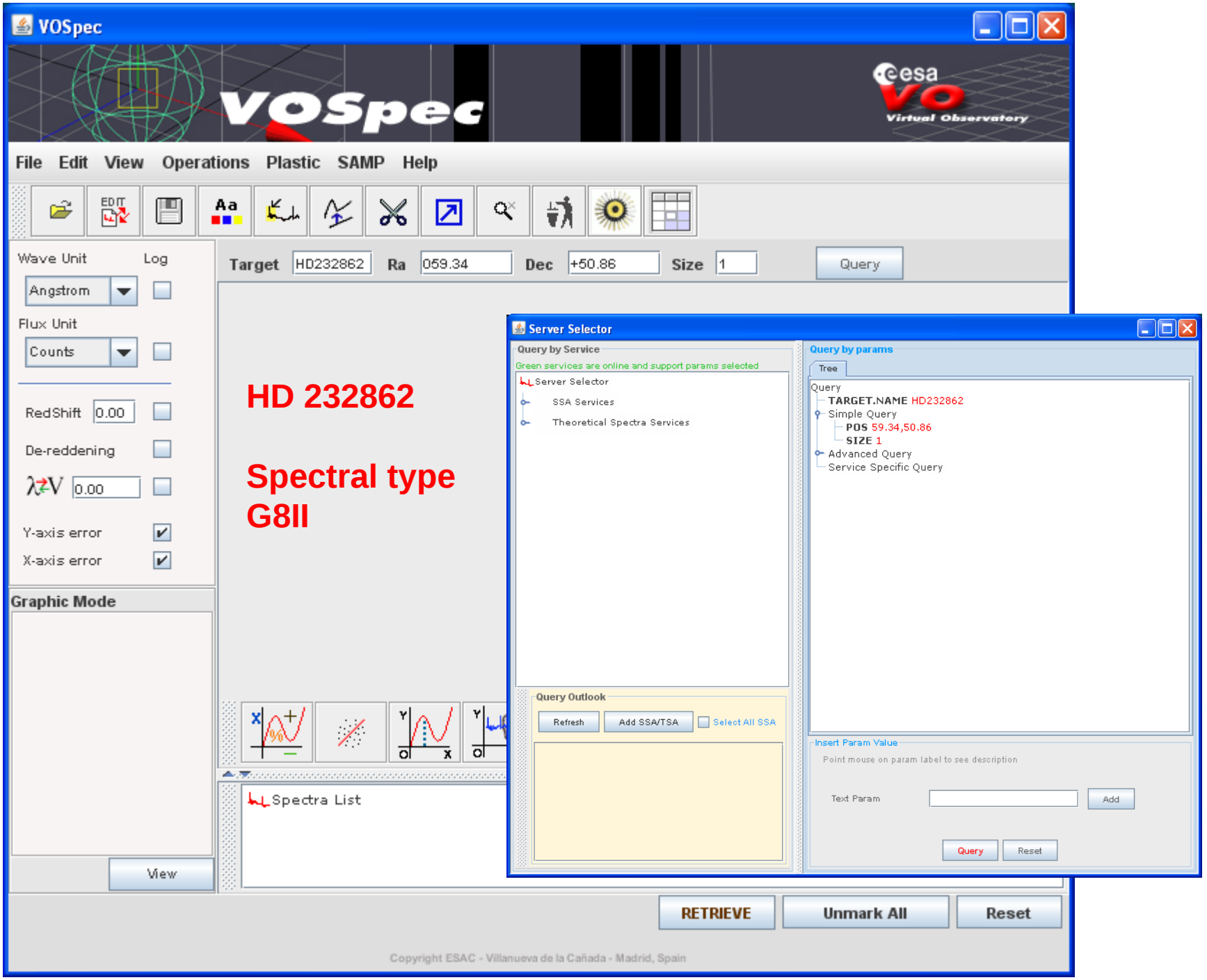
Protocoles et fonctionnement de VOSPECFLOW dans le cadre de l'OV



Simple Application Messaging Protocol

Simple Spectra Access Protocol

Table Access Protocol


VOSpec
VOSpec
esa
VO
Virtual Observatory
File Edit View Operations Plastic SAMP Help
Wave Unit
Log
Angstrom
Flux Unit
Counts
RedShift 0.00
De-reddening
0.00
Y-axis error
X-axis error
Graphic Mode
View
Target HD232862 Ra 059.34 Dec +50.86 Size 1
Query
HD 232862
Spectral type
G8II
Server Selector
Query by Service
Green services are online and support params selected
Server Selector
SSA Services
Theoretical Spectra Services
Query Outlook
Refresh
Add SSA/TSA
Select All SSA
Query by params
Tree
Query
TARGET.NAME HD232862
Simple Query
POS 59.34,50.86
SIZE 1
Advanced Query
Service Specific Query
Insert Param Value
Point mouse on param label to see description
Text Param
Add
Query
Reset
Spectra List
RETRIEVE
Unmark All
Reset
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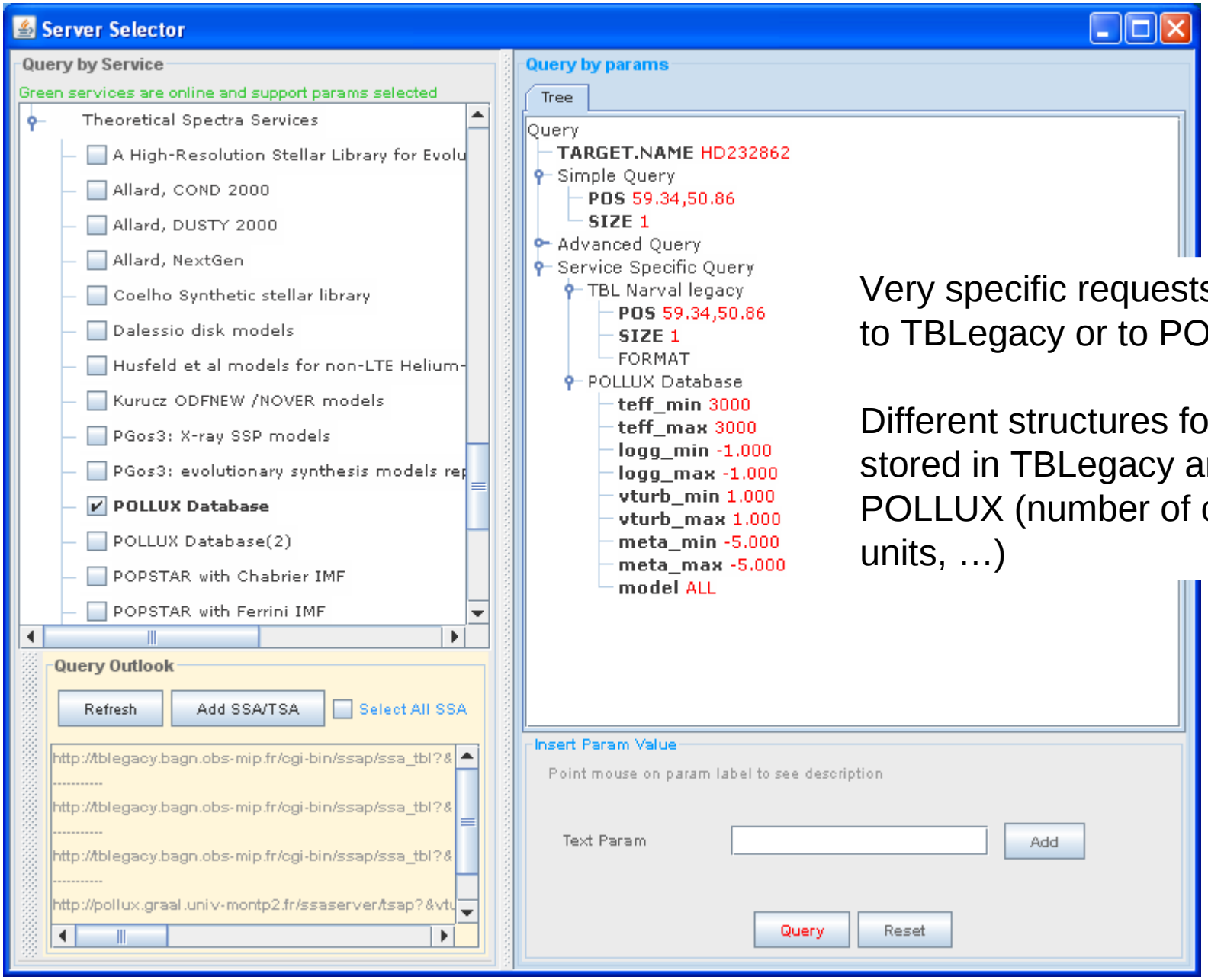

Very specific requests to access to TBLegacy or to POLLUX.

Different structures for the files stored in TBLegacy and in POLLUX (number of columns, units, …)

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poste5.bagn.obs-mip.fr/votp/votp.php?oruaqcv5144go6njl0qlfa6cr0&TP=pollux

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WebSampConnector

...

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Links

VO tools

EURO-VO

VOSpec

Splat VO

VOPlot

Databases

CDAB/tblegacy

Pollux

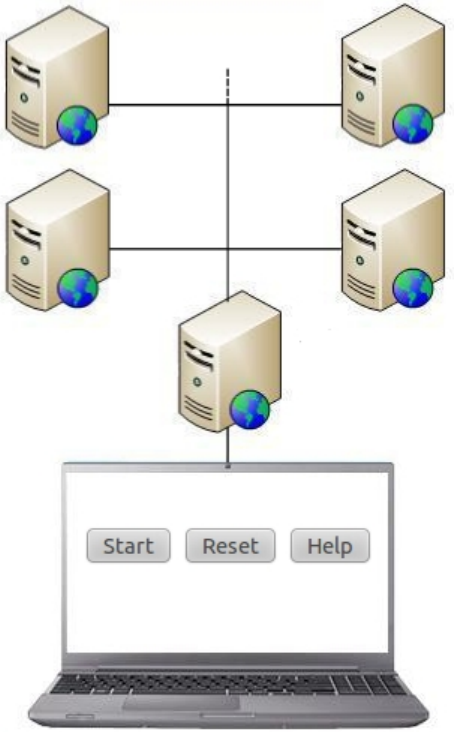
Demo

LUPM:

Pollux Database

LUPM:

Convolution



CDS:

Simbad

Vizier/Pastel

CDAB:

TBL Narval Legacy

OV-GSO:

VOSPECFLOW space

Start on HD 232862, a G8II cool giant.

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cdab.bagn.obs-mip.fr/votp/votp.php?PHPSESSID=buc11av5j38go4v8gg4ef531h7&TP=pollux

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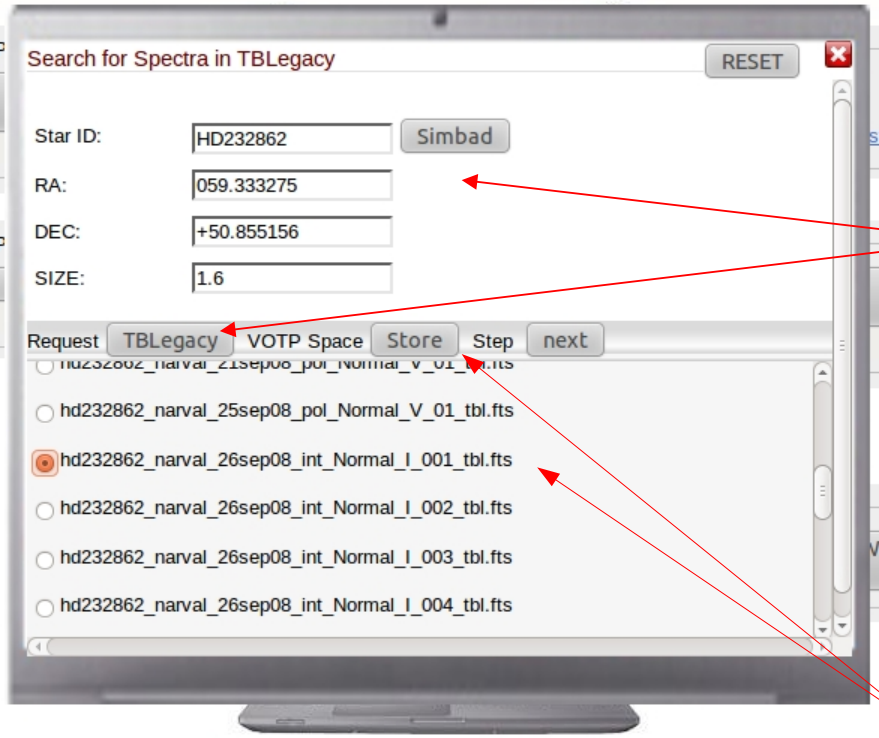

Step 1:

Retrieve coordinates from SIMBAD and, from these values, retrieve spectra from TBLegacy

Store selected spectra in VOspace

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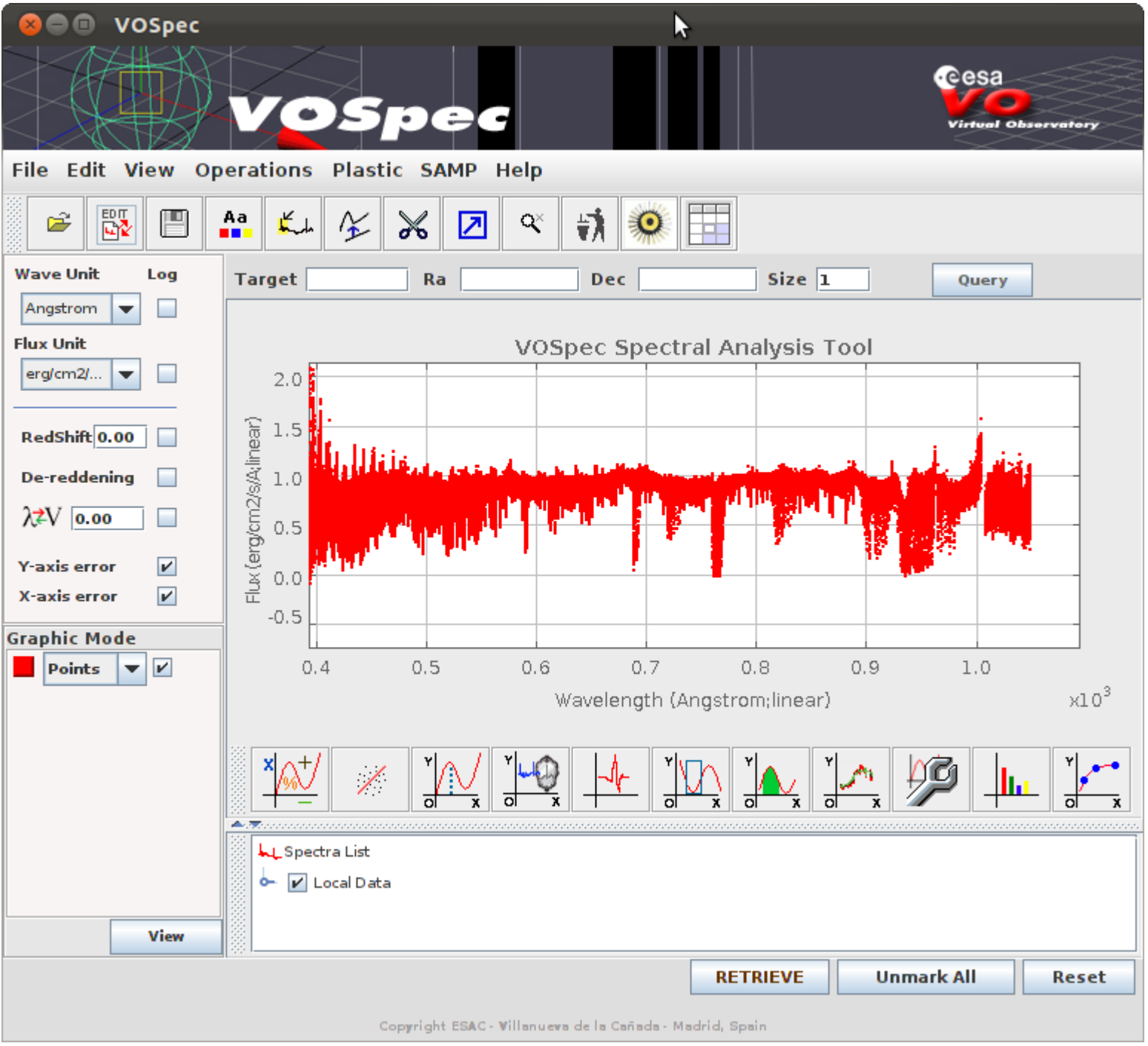

NARVAL spectrum broadcasted to VOSPEC via SAMP

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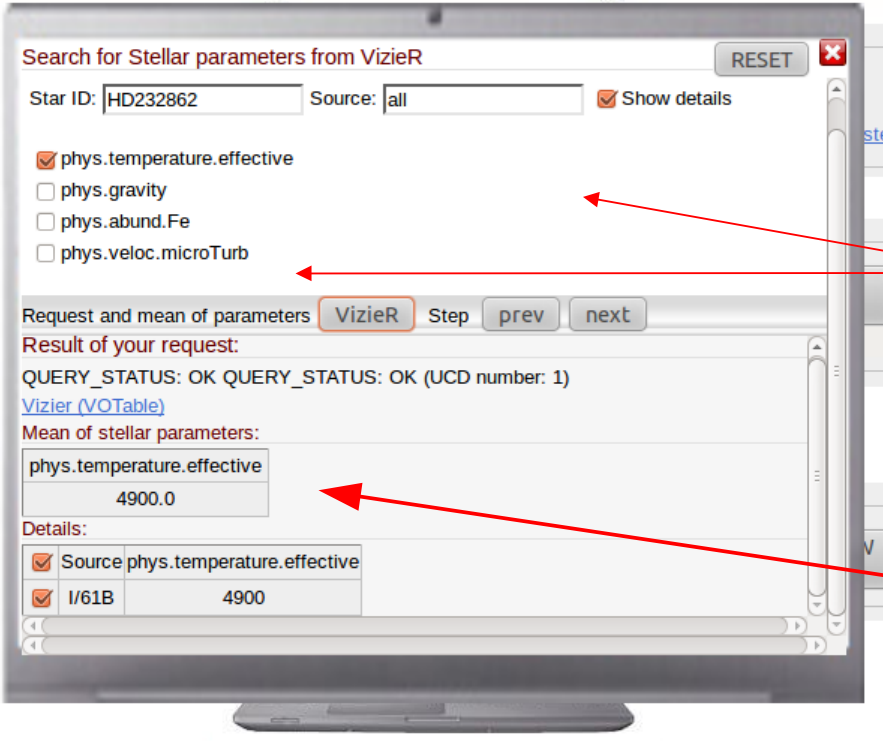
- Pollux

Demo



Step 2:

Retrieve selected stellar parameters from VizieR and, from these values, compute the mean parameters

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Applet démarré.

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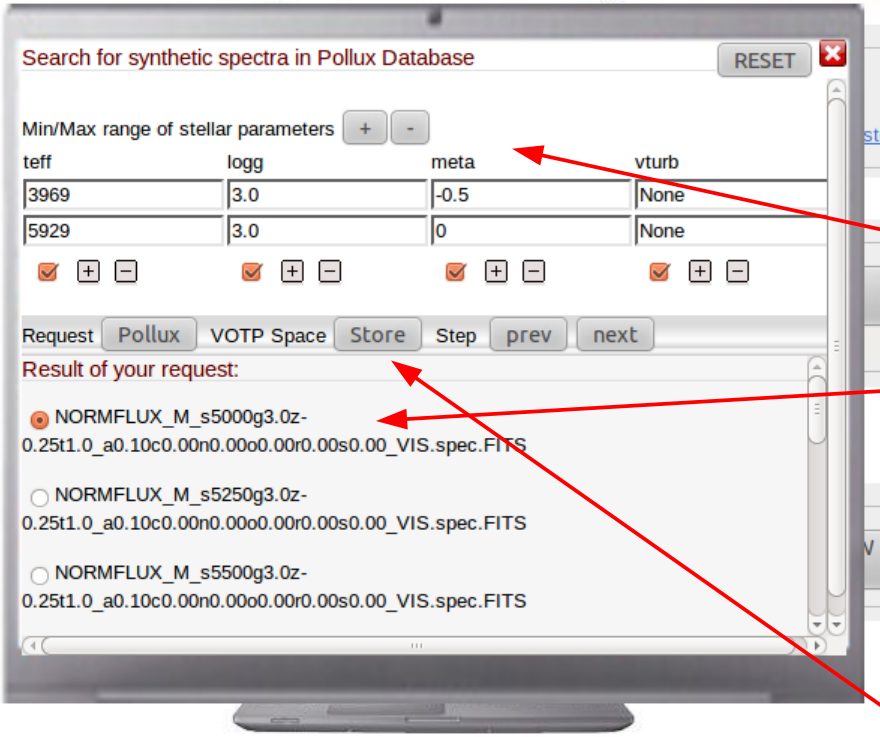
Demo



Step 3:

From the mean values of stellar parameters, define parameter ranges to retrieve synthetic spectra from POLLUX

Store selected spectra in VOspace

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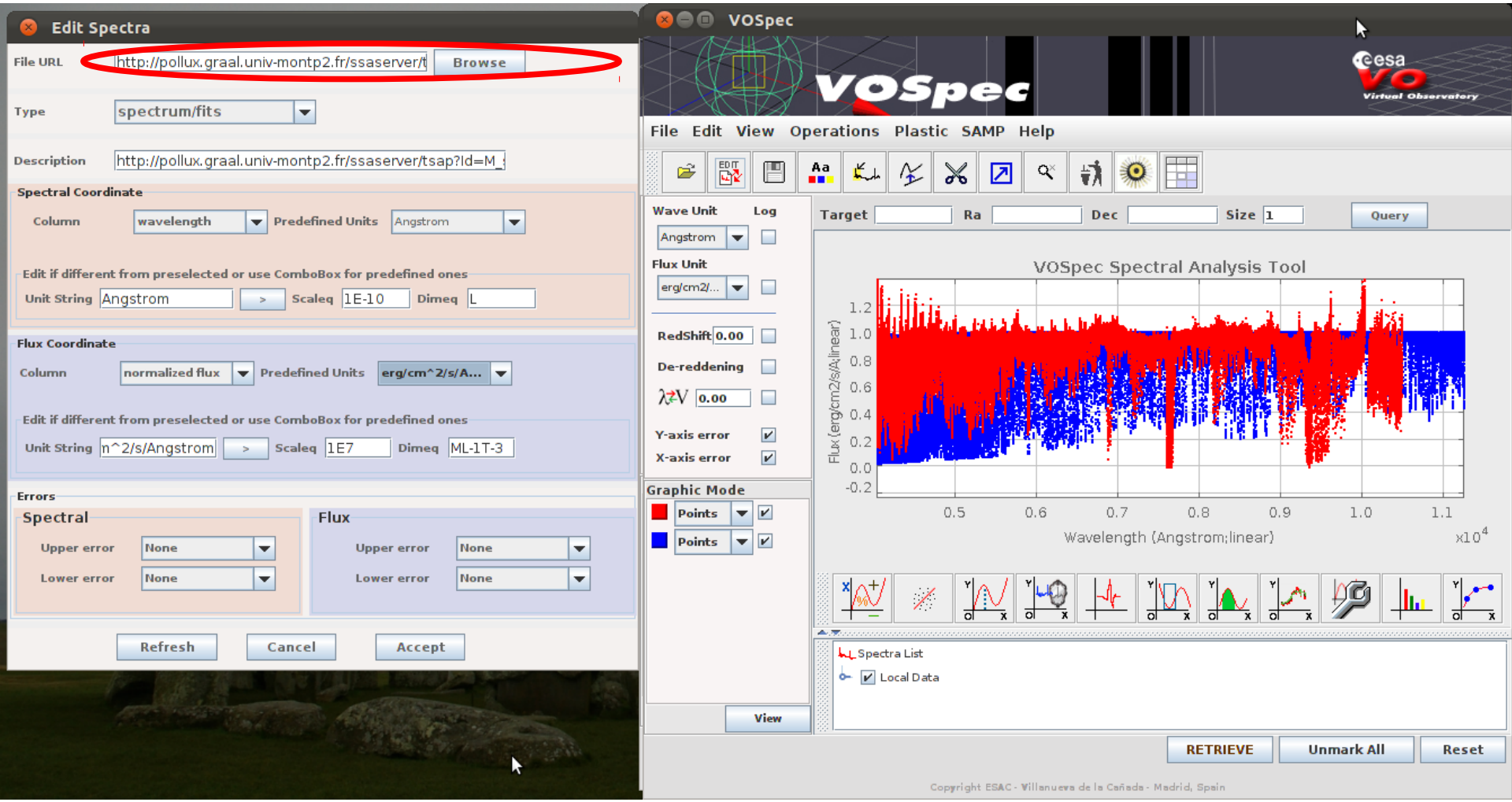
Send the selected spectrum to VOSPEC



POLLUX theoretical spectruml braadcasted to VOSPEC via SAMP

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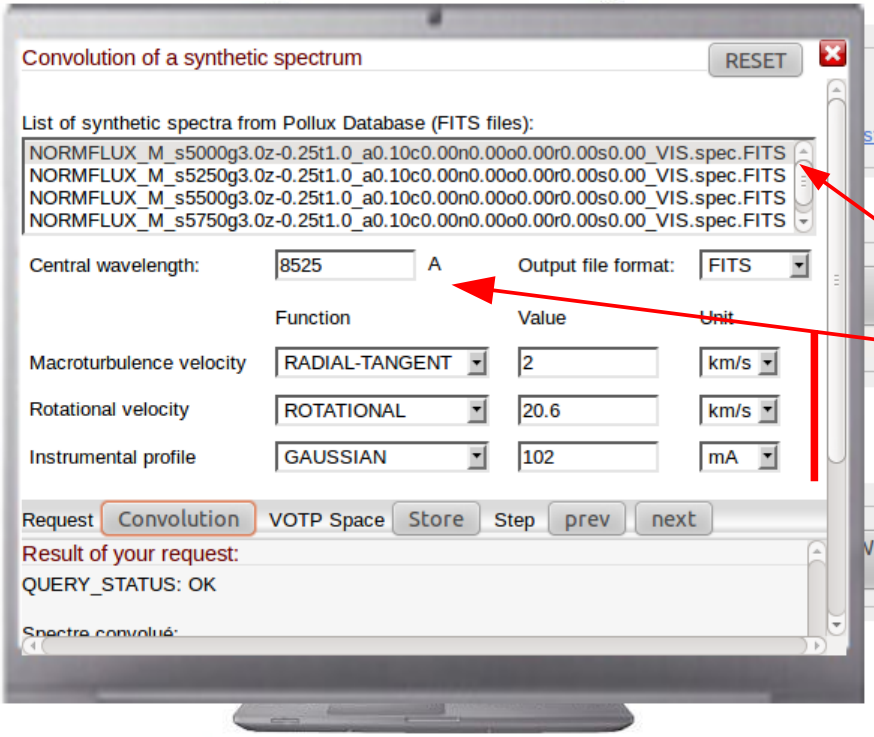

Step 4:

On a selected POLLUX spectrum, and over a 100 A wide spectral domain, perfom up to three successive operations of convolution.

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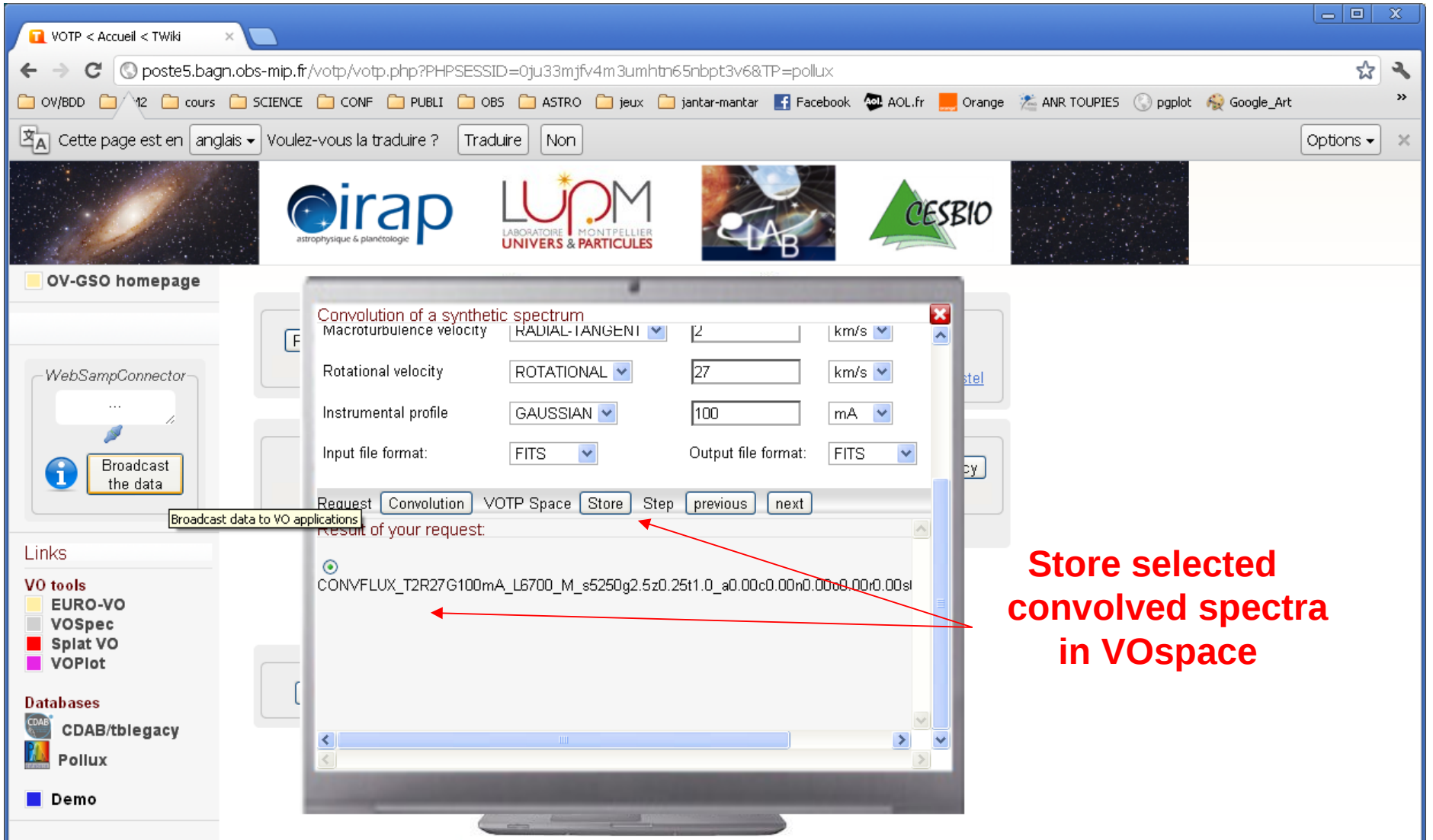
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Demo
Convolution of a synthetic spectrum
Macroturbulence velocity RADIAL-TANGENT 2 km/s
Rotational velocity ROTATIONAL 27 km/s
Instrumental profile GAUSSIAN 100 mA
Input file format: FITS Output file format: FITS
Request Convolution VOTP Space Store Step previous next
Result of your request:
CONVFLUX_T2R27G100mA_L6700_M_s5250g2.5z0.25t1.0_a0.00c0.00n0.00o0.00r0.00s
Store selected convolved spectra in VOspace
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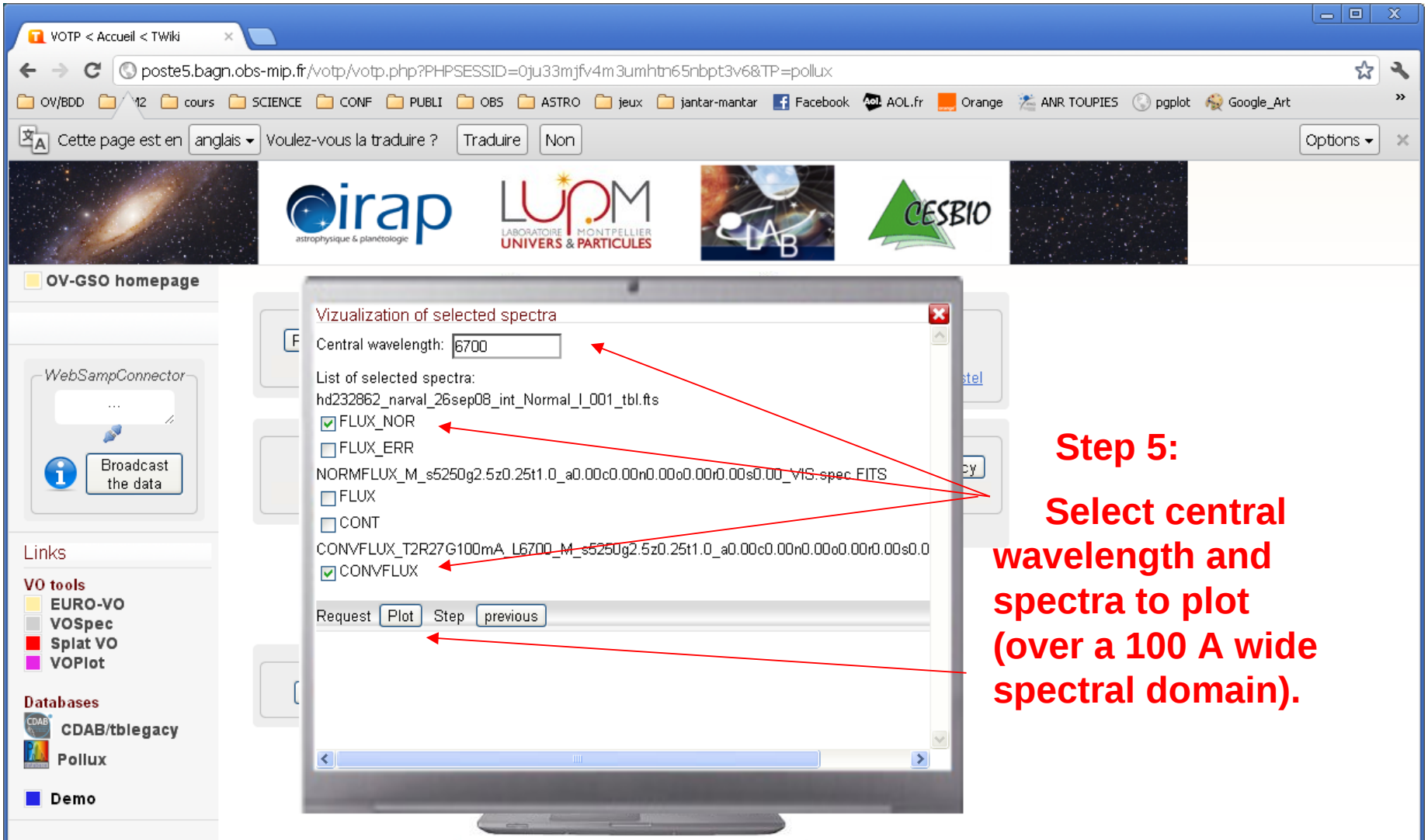
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Demo
Vizualization of selected spectra
Central wavelength: 6700
List of selected spectra:
hd232862_narval_26sep08_int_Normal_I_001_tbl.fts
FLUX_NOR
FLUX_ERR
NORMFLUX_M_s5250g2.5z0.25t1.0_a0.00c0.00n0.00o0.00r0.00s0.00_VIS.spec.FITS
FLUX
CONT
CONVFLUX_T2R27G100mA_L6700_M_s5250g2.5z0.25t1.0_a0.00c0.00n0.00o0.00r0.00s0.0
CONVFLUX
Request Plot Step previous
Step 5:
Select central wavelength and spectra to plot (over a 100 A wide spectral domain).
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- Splat VO
- VOPlot

Databases
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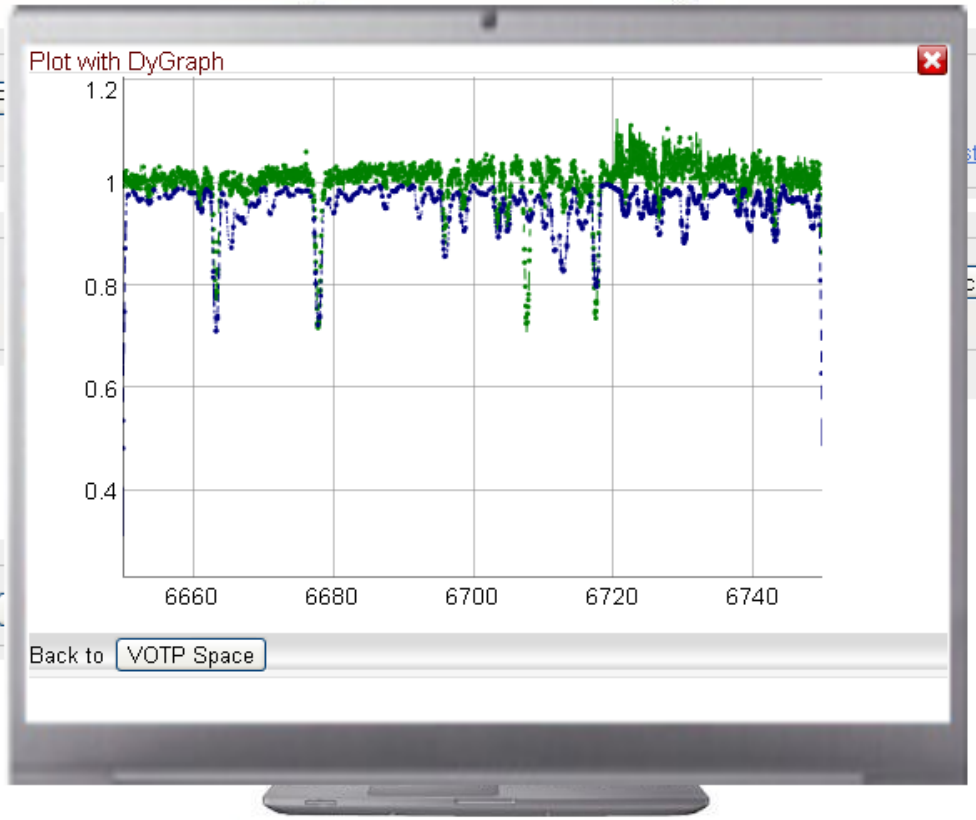
- Pollux

- Demo



Select a portion to zoom in. Double click to zoom out.

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OV/BDD | 12 | cours | SCIENCE | CONF | PUBLI | OBS | ASTRO | jeux | jantar-mantar | Facebook | AOL.fr | Orange | ANR TOUPIES | pgplot | Google_

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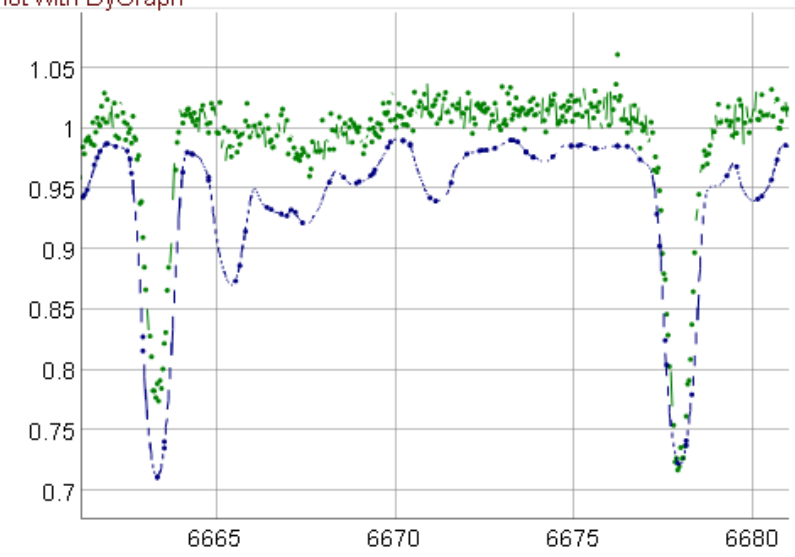
Demo

Plot with DyGraph



Back to VOTP Space

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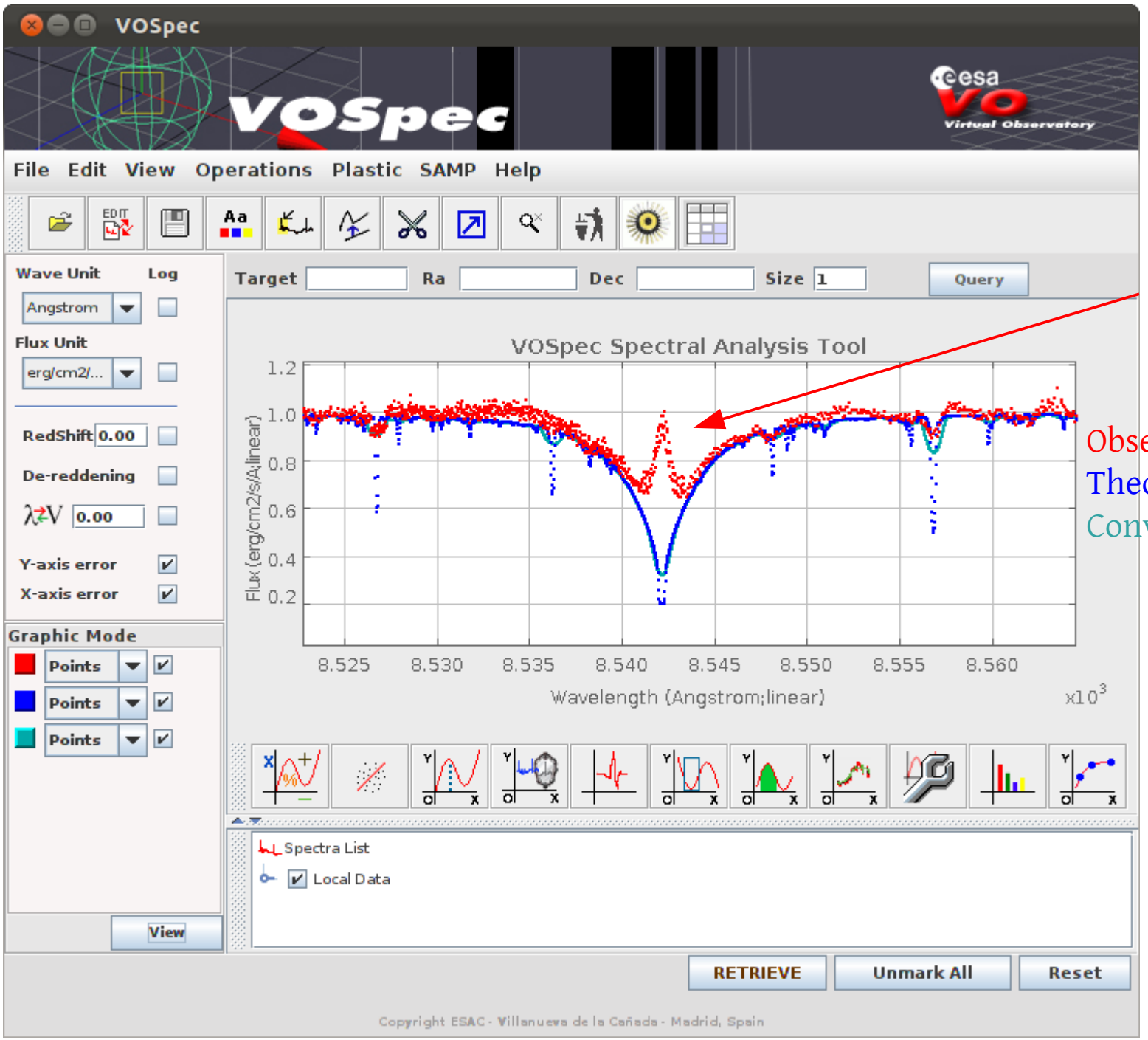
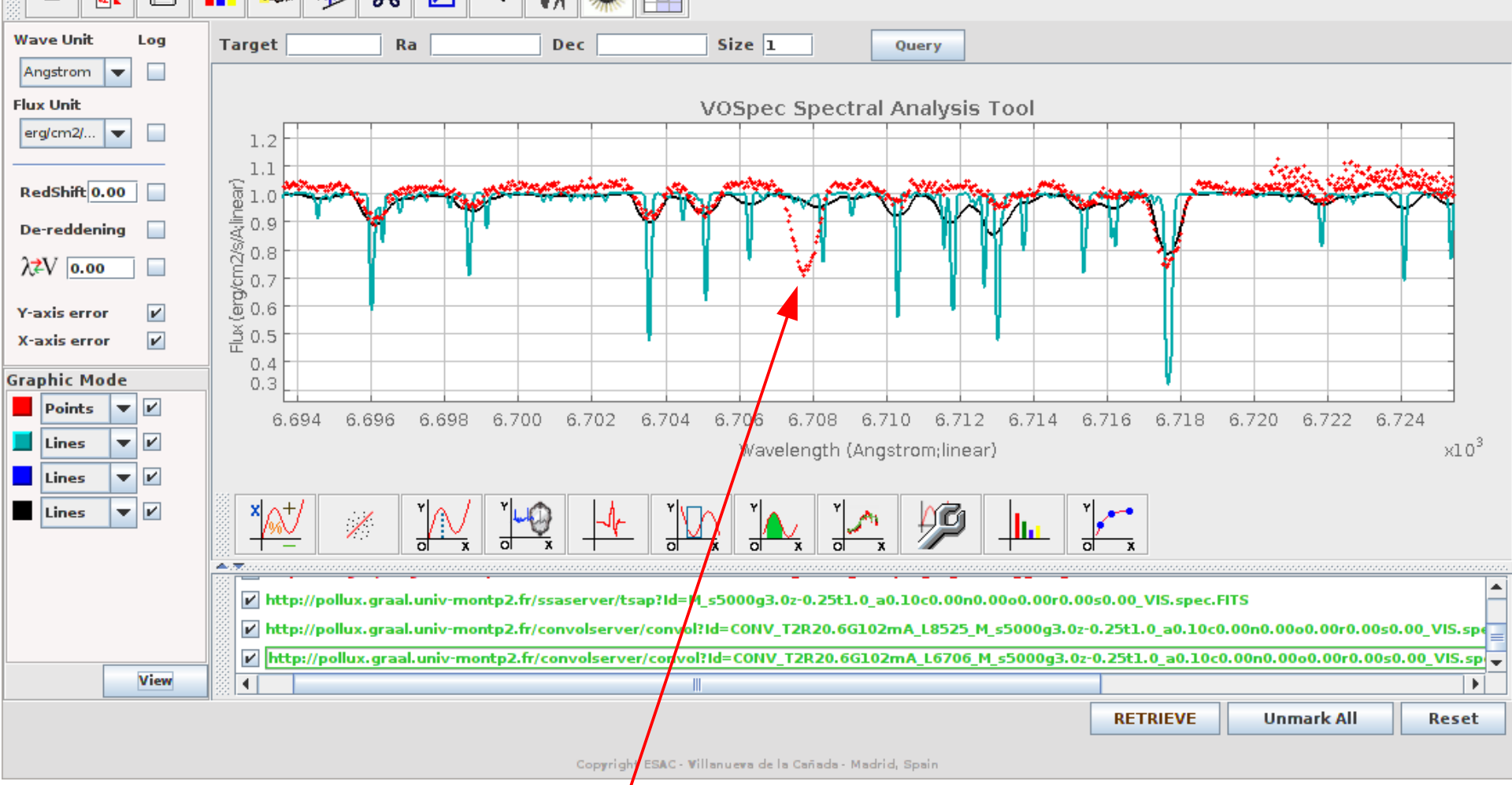

VOSpec
VOSpec
esa
VO
Virtual Observatory
File Edit View Operations Plastic SAMP Help
Wave Unit
Log
Angstrom
Flux Unit
erg/cm2/...
RedShift 0.00
De-reddening
0.00
Y-axis error
X-axis error
Graphic Mode
Points
Points
Points
View
Target
Ra
Dec
Size 1
Query
VOSpec Spectral Analysis Tool
Flux (erg/cm2/s/A;linear)
1.2
1.0
0.8
0.6
0.4
0.2
8.525
8.530
8.535
8.540
8.545
8.550
8.555
8.560
Wavelength (Angstrom;linear)
x10^3
Spectra List
Local Data
RETRIEVE
Unmark All
Reset
Copyright ESAC - Villanueva de la Cañada - Madrid, Spain
Active star
Observation
Theoretical spectrum
Convolved spectrum



Lithium -rich star

Exemples d'utilisation en spectro stellaire :

Outil d'accompagnement des observations spectroscopiques (à disposition des observateurs et opérateurs de télescope)
par ex. pour vérification du pointage du bon objet

En amont, pour une simulation d'observation envisagée
(+ bruit ?)

En aval, pour

produire des contraintes (grossières) sur les paramètres stellaires (vsini, Teff, log g, métallicité ...),
permettre de dégrossir une analyse,
identifier rapidement la présence/absence d'une signature spectrale.

Développements/actions complémentaires :

Optimisation de la moyenne des paramètres stellaires (exclusion *des bad values*)

Correction en vitesse radiale

Format de sortie des spectres convolués (VOTable, ...) et possibilité de *download*

Exportation des données sous applications graphiques OV (VOplot, splatVO, ...)

Enregistrement du service et ouverture à la communauté pour utilisation scientifique via l'OV-GSO

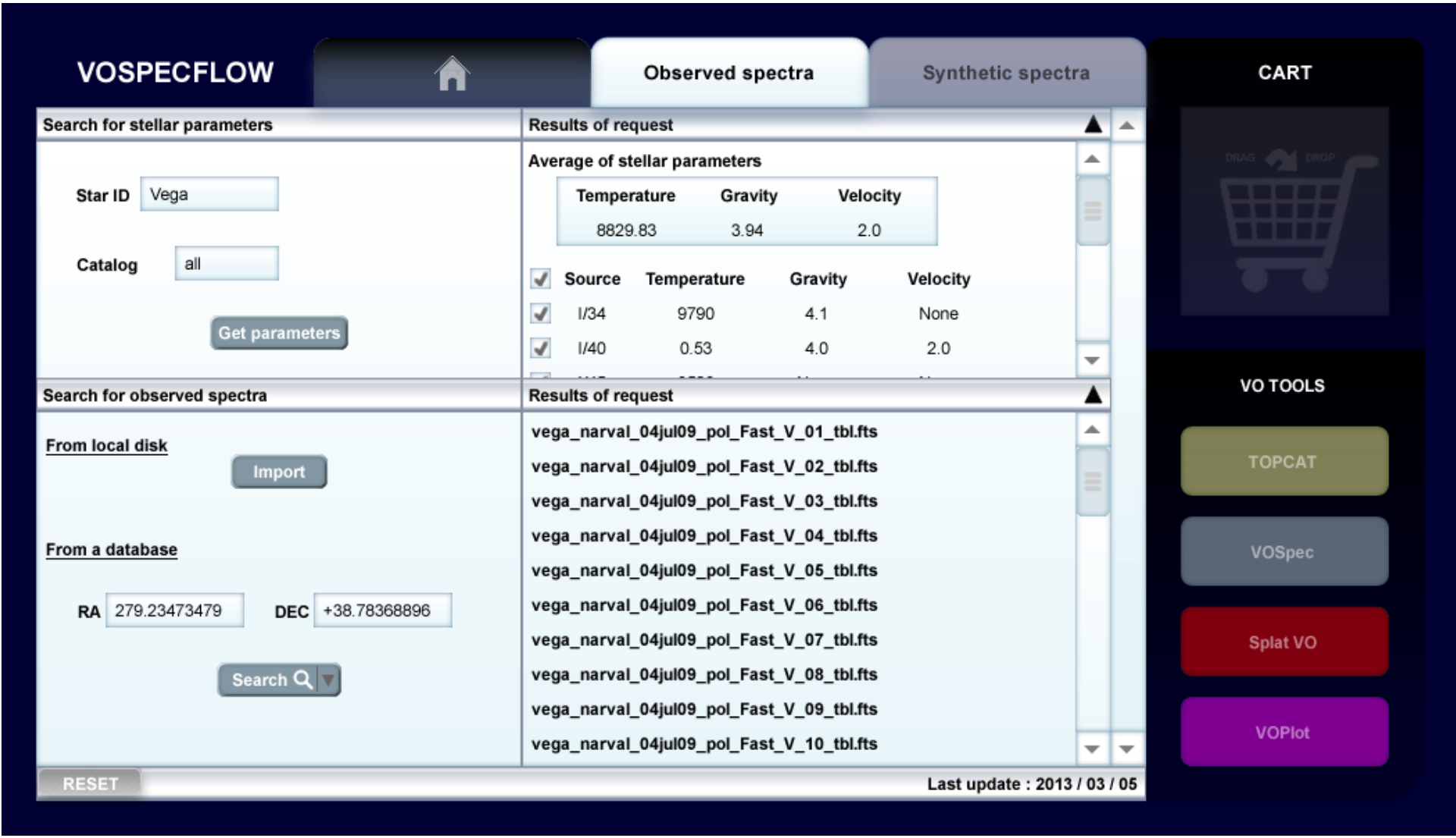
Ajout d'autres services OV (Archives de télescope - Bases de spectres calculés)

Utilisation dans le cadre de PolarBase service SO5 nouvellement labélisé.

Nouvelle ergonomie à l'étude pour distribution de l'application

Design : Aurélien Emeras – stagiaire info

Nouvelle ergonomie à l'étude pour distribution de l'application



Design : Aurélien Emeras – stagiaire info

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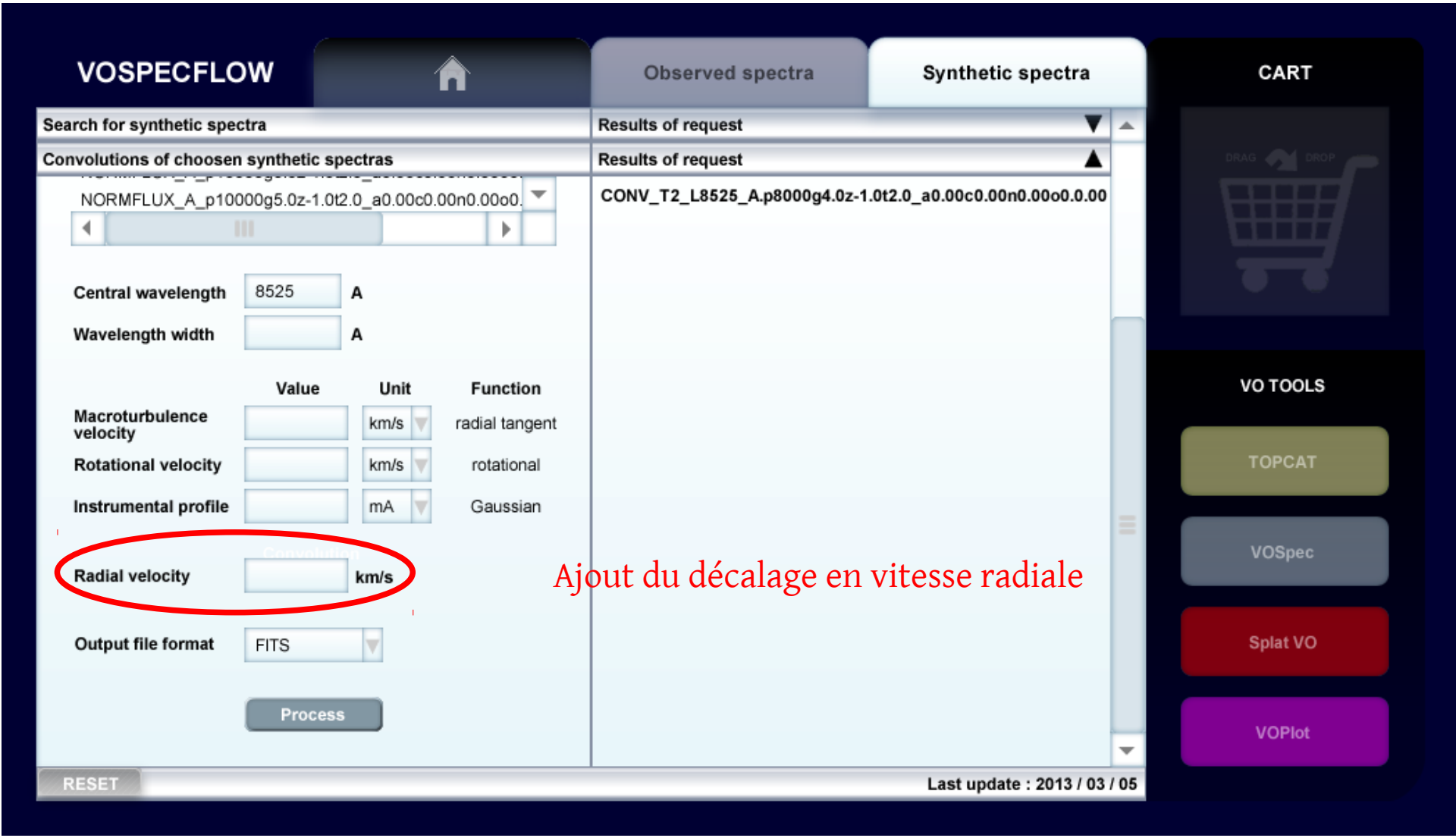

Ajout du décalage en vitesse radiale

Design : Aurélien Emeras – stagiaire info

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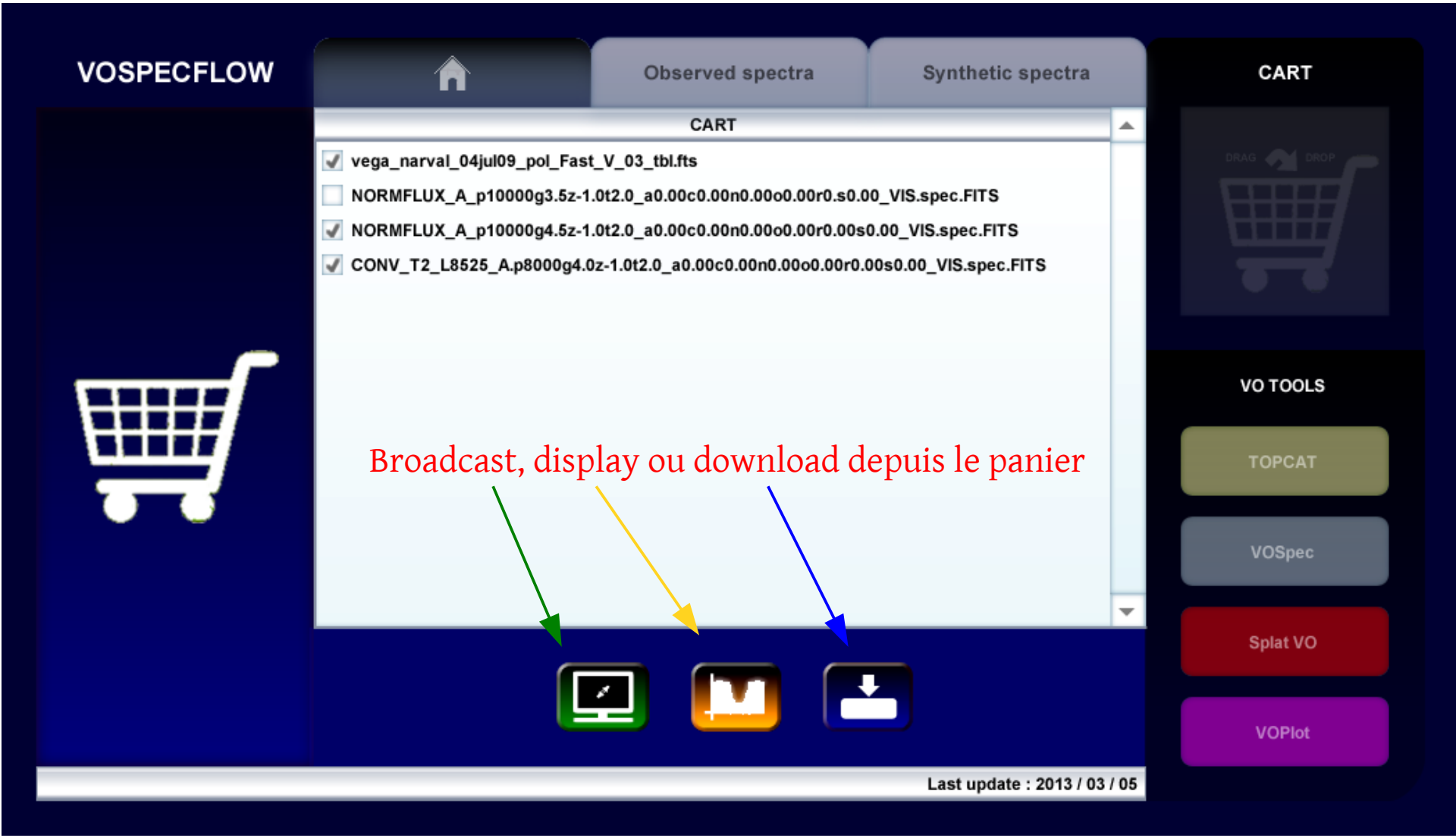

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