SITools2 comme fournisseur de services OV: exemple avec HESIOD.

Integrated Data Operation Center
Institut d'Astrophysique Spatiale

SITools 2

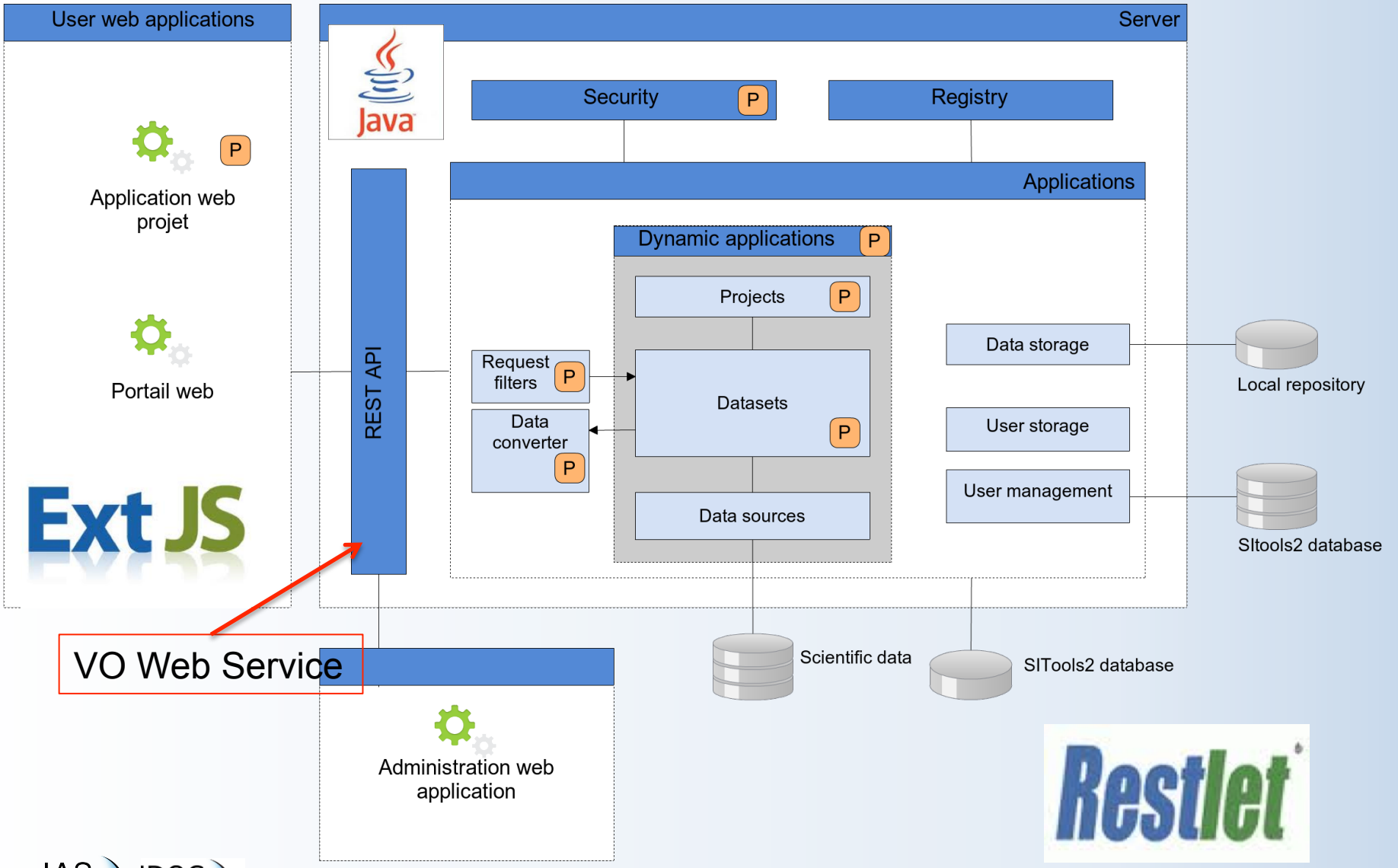
- Un outil générique du CNES issu d'une collaboration entre le CNES et plusieurs laboratoires spatiaux français.

- Il s'agit d'une application Client/Serveur sécurisée qui permet la gestion des droits utilisateurs et des données ainsi qu'un accès aux données à travers une interface Web 2.

- L'ajout de plugins permet d'ajouter des fonctionnalités aussi bien au niveau client qu'au niveau serveur (cas pour le web service VO).

- https://github.com/SITools2
- Contact: jean-christophe.malapert@cnes.fr

SITools2 General Architecture



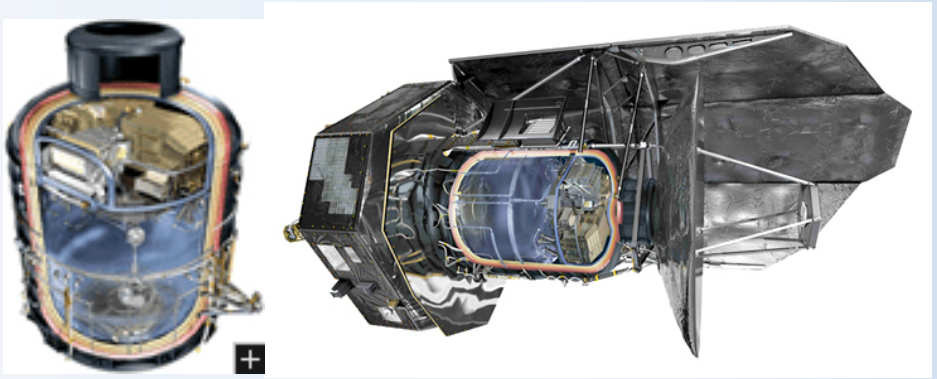
Herschel

- Le satellite Herschel est un observatoire de l'Agence Spatiale Européenne (2009 – 2013)

- **Objectifs**: Formation et évolution des proto-étoiles au sein des nuages moléculaires, formation et évolution des galaxies dans un passé lointain (redshift: 1 à 5).

- **PACS** (photomètre et spectro-imageur), dans la gamme 60-210 µm, **SPIRE** (photomètre et spectro-imageur), dans la gamme 200-650 µm, et HIFI spectomètre haute résolution dans des gammes choisies du submillimétrique.

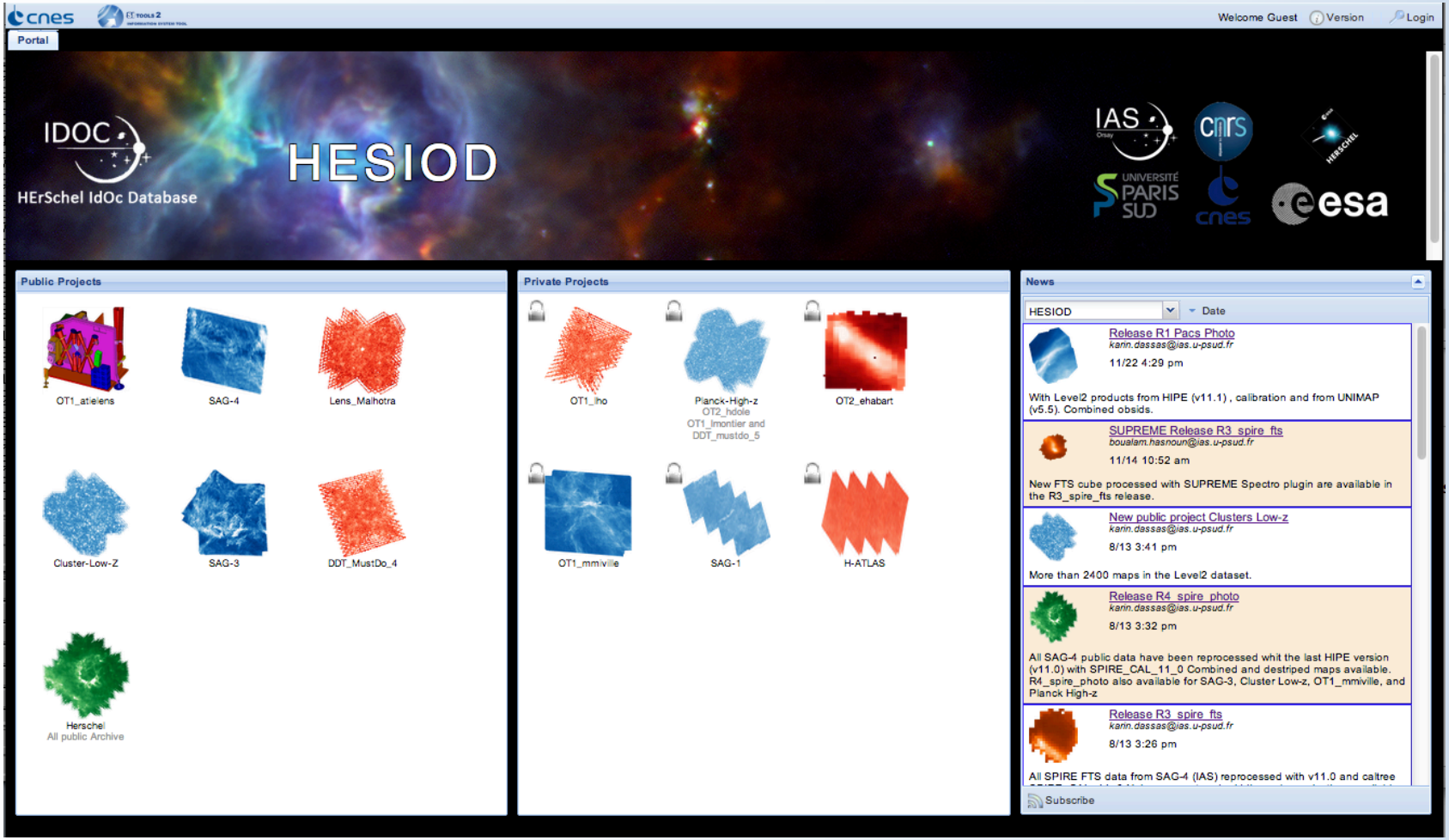
- http://www.herschel.fr/



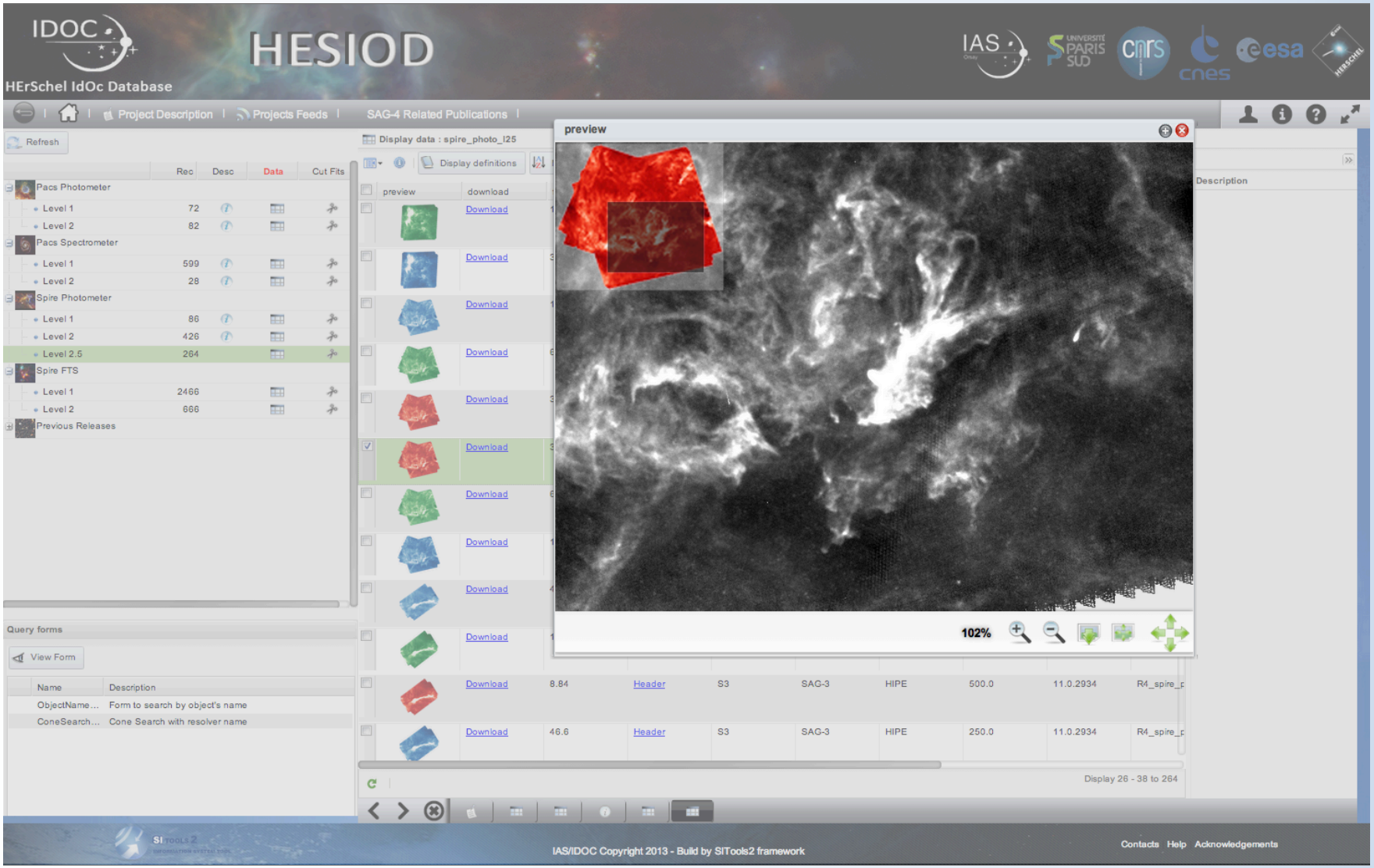
HESIOD (HErSchel IdOc Database) Portail

IDOC = Integrated Data and Operation Center

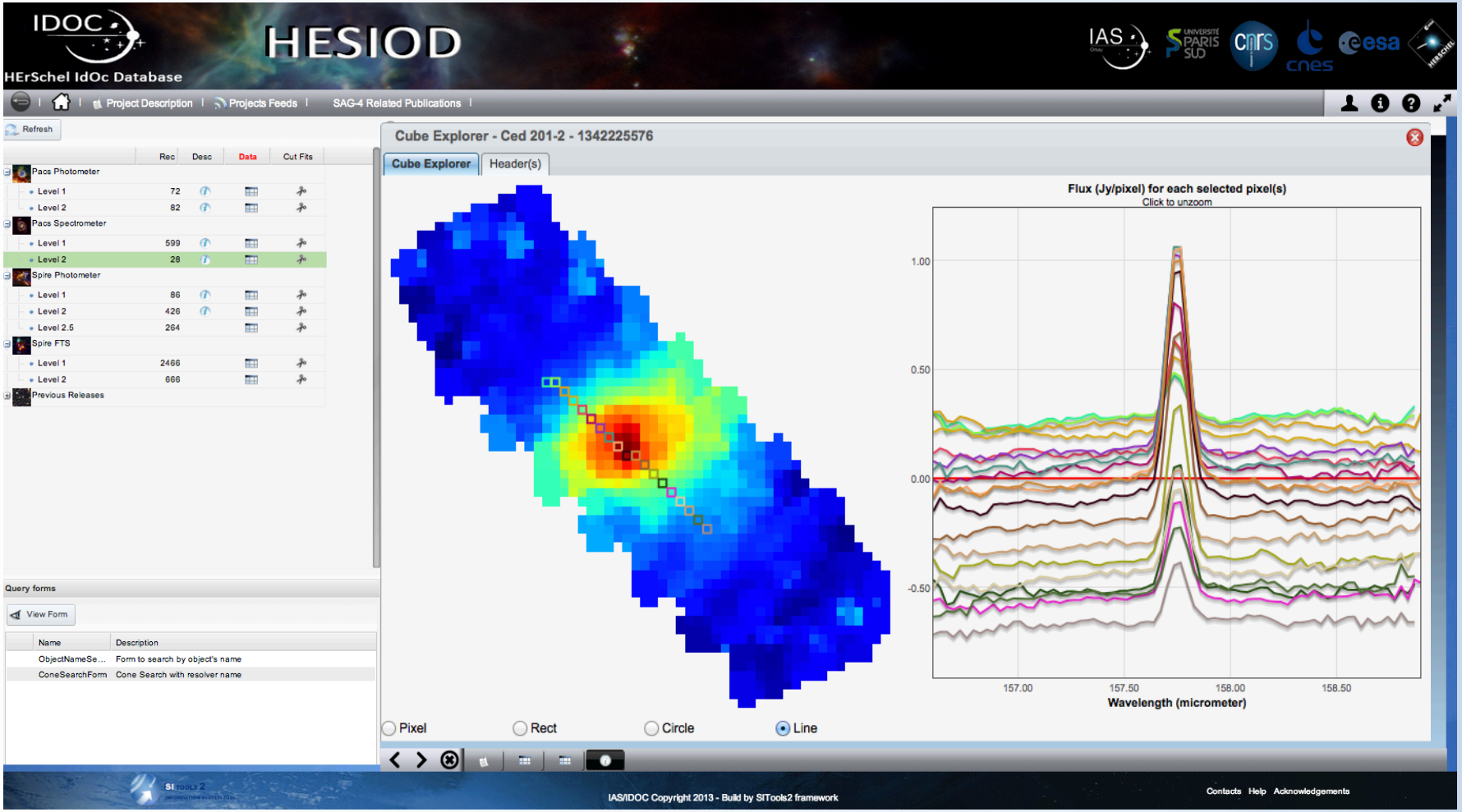
http://idoc-herschel.ias.u-psud.fr/



Temps Garanti Milieu Interstellaire (SAG-4) d'HESIOD
Photométrie

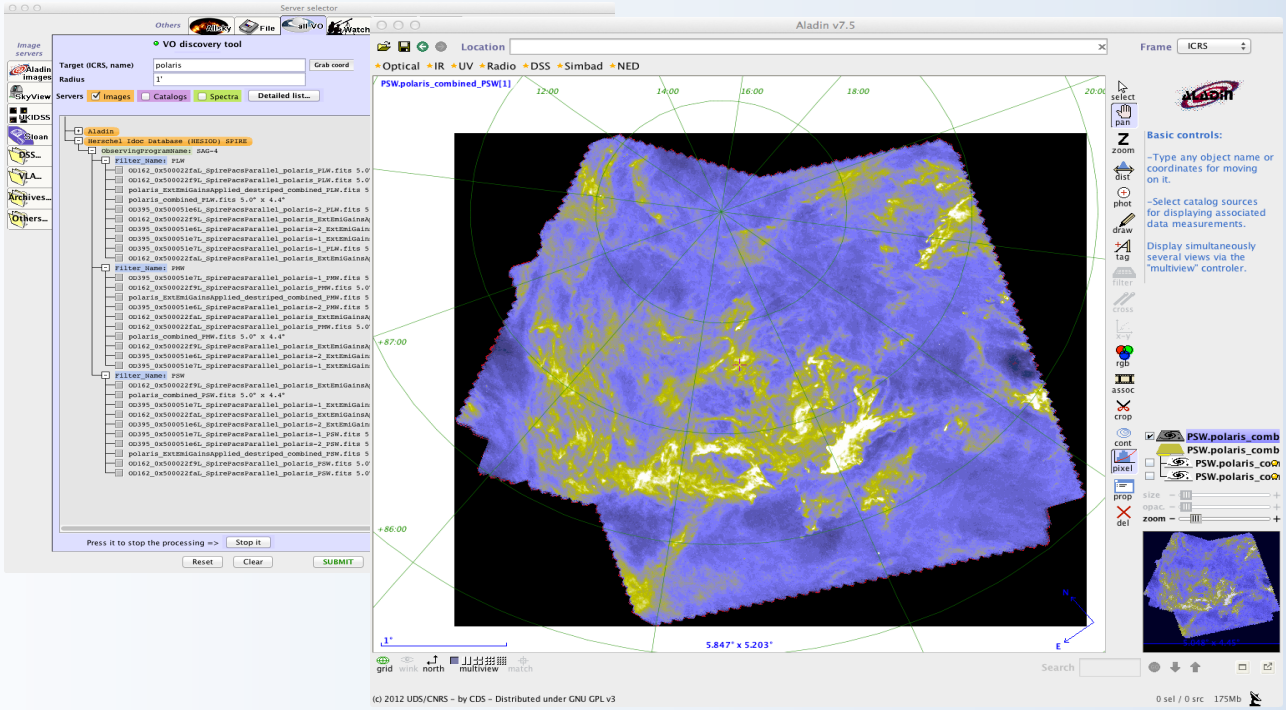


Temps Garanti Milieu Interstellaire (SAG-4) d'HESIOD
Spectrométrie



Temps Garanti Milieu Interstellaire (SAG-4) d'HESIOD interfacé avec le VO : photométrie

- L2.5 PACS (60 or 100 170 µm) et SPIRE (250, 350, 500 µm)
- Données retraitées à l'IAS avec la dernière version du pipeline de l'ESA ainsi qu'avec des pipelines maison (SANEPIC, SUPREME à venir), combinaison des obsids quand plusieurs obsids pour un même champ.



HESIOD Pipeline

PACS Photometer | SPIRE Photometer | PACS Spectrometer | SPIRE Spectrometer

Pipeline =>
Fits Multi extensions, spectrum 1D, cubes, cartes photo

Fichiers FITS

Extraction des metadata
Psycopg2 Pywcs pyfits

BDD METADATA

FITS

IDOC

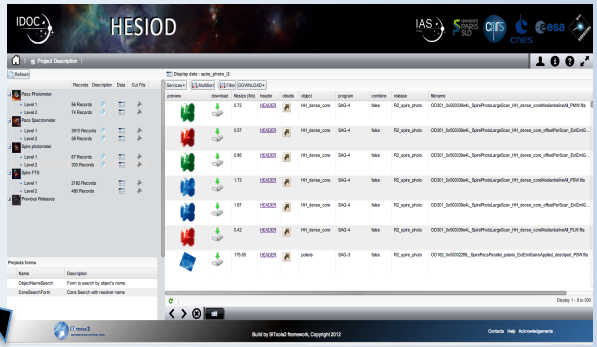
BDD indexation importante!

PgSphere

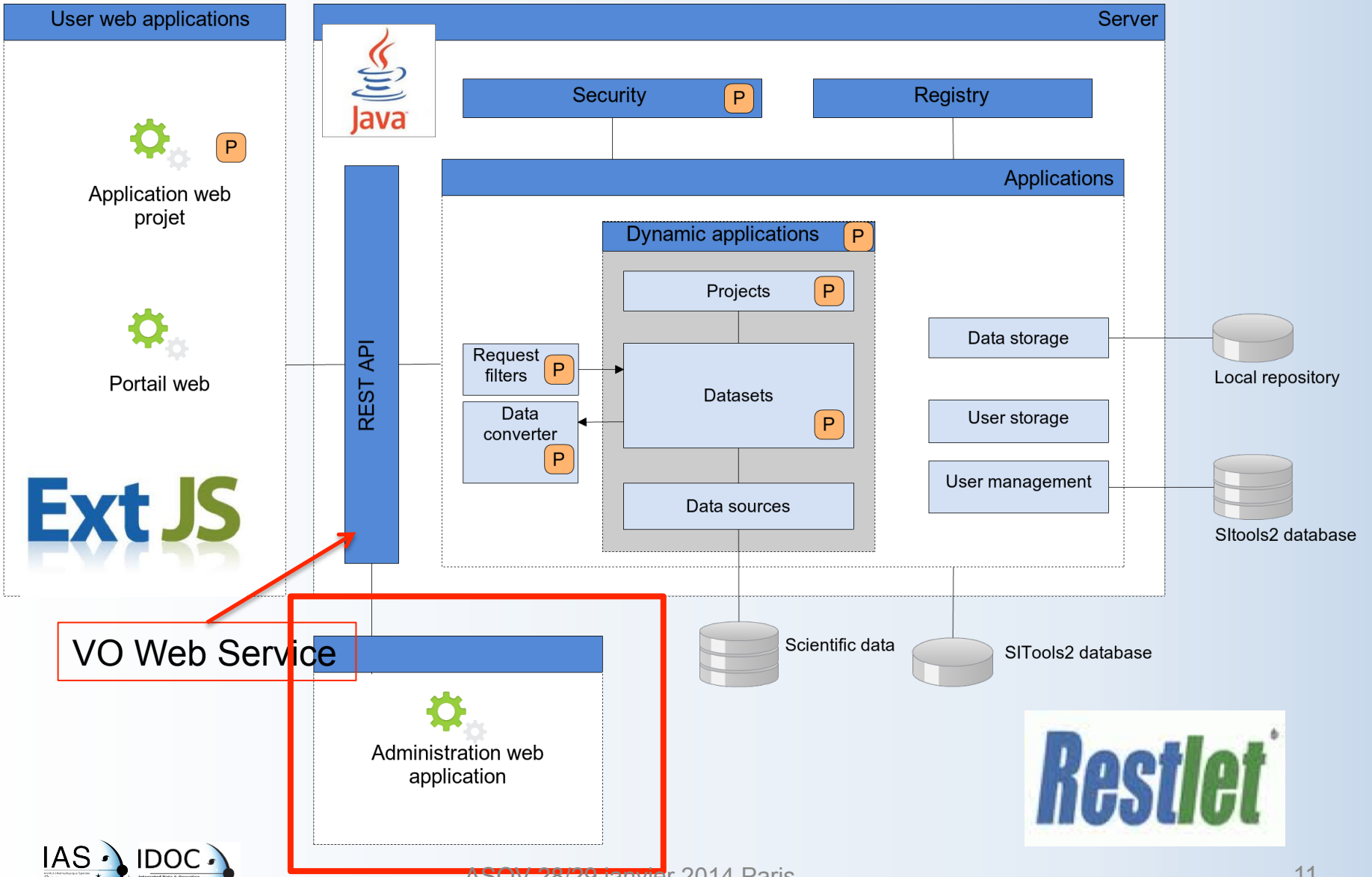
SI TOOLS 2
INFORMATION SYSTEM TOOL

VO

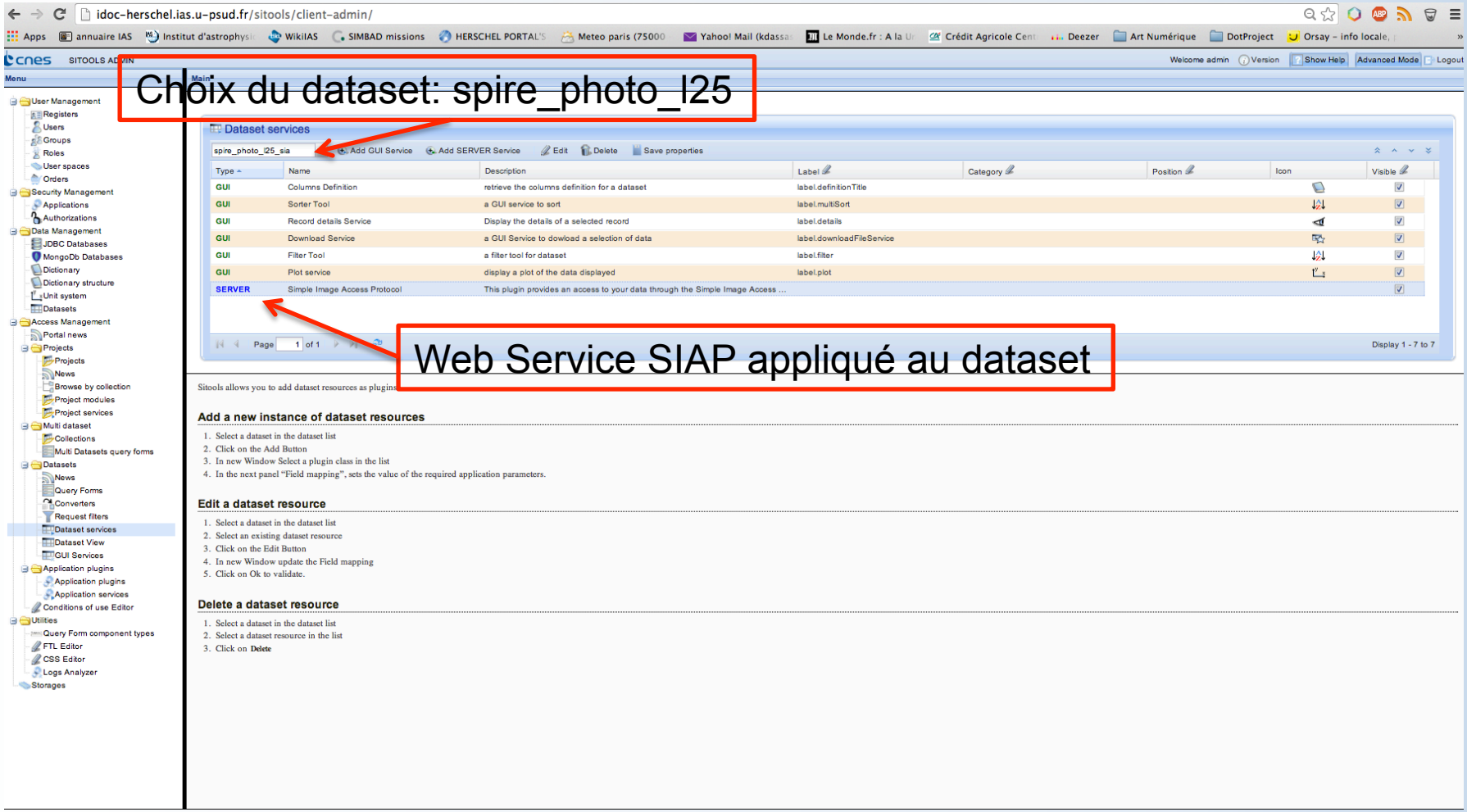
Portail Web 2.0



SITools2 General Architecture



SITools2 Dataset Services Admin



SITools2 SIA Module

SI TOOLS 2
INFORMATION SYSTEM TOOL

http://idoc-herschel.ias.u-psud.fr/ds/pub/spirephotol2/services/sia?
http://voparis-validator.obspm.fr

Edit service

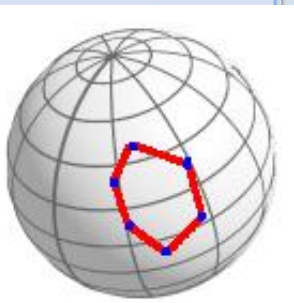
Field mapping

Name: Simple Image Access Protocol
Purpose:
Behavior: DISPLAY_IN_NEW_TAB

Parameters Mapping

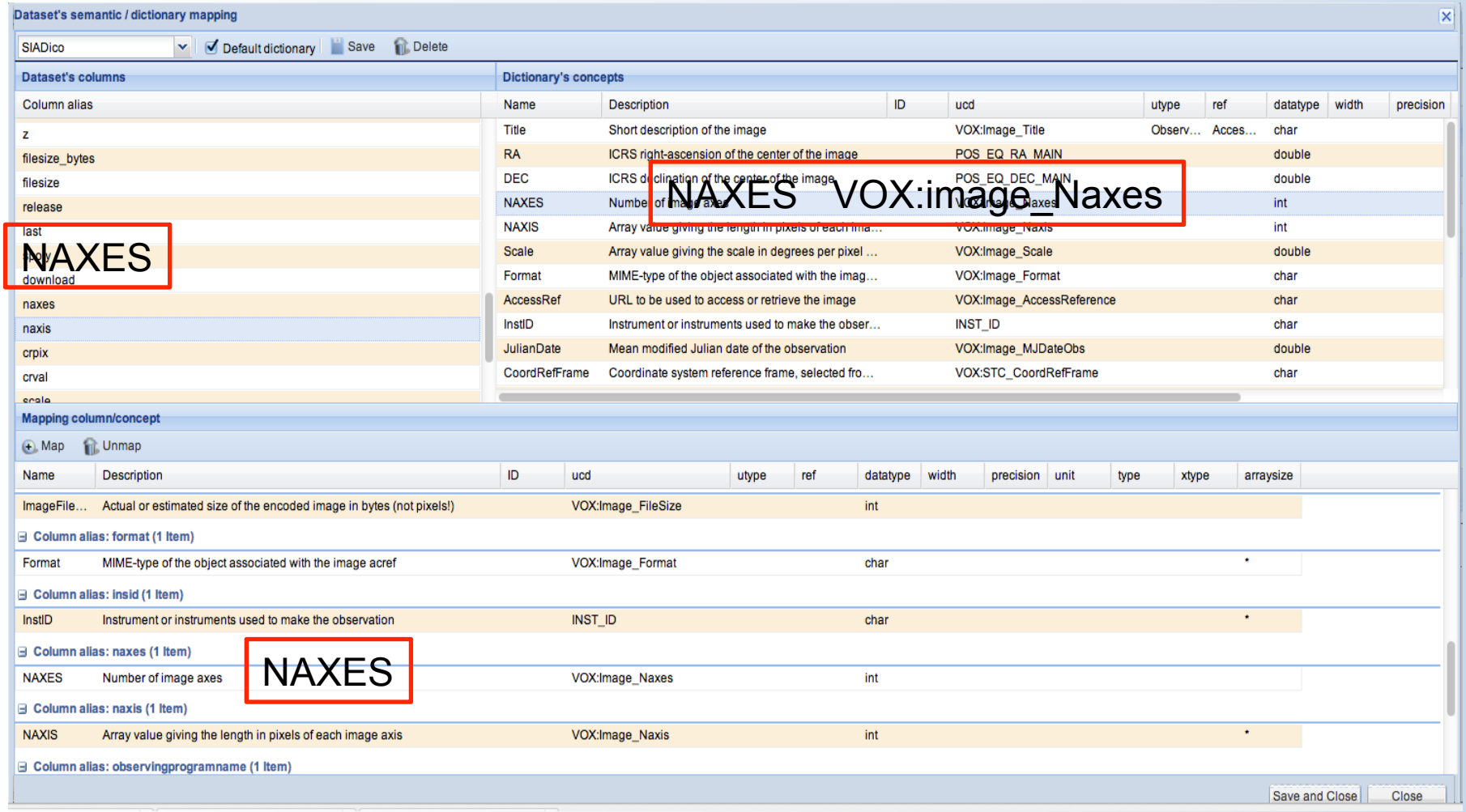
Name	Type	Value
url	PARAMETER_ATTACHMENT	/services/sia
methods	PARAMETER_INTERN	GET
fileName	PARAMETER_USER_INPUT	
image	PARAMETER_INTERN	
PARAM_Dictionary	PARAMETER_INTERN	SIADico
Description : Dictionary name that sets up the service		
INTERSECT	PARAMETER_INTERN	OVERLAPS
Description : how matched images should intersect the region of interest		
geoAttribut	PARAMETER_INTERN	spoly
Description : Geographical attribut for OVERLAPS mode. The geographical attribut must be spoly datatype from pgsphere		
VERB	PARAMETER_INTERN	1
Responsible party	PARAMETER_INTERN	
Image service	PARAMETER_INTERN	Pointed Image Archive
Description	PARAMETER_INTERN	Herschel Spire SIA protocol
Instrument	PARAMETER_INTERN	Spire
Waveband Coverage	PARAMETER_INTERN	infrared
Description : The waveband of the observations		
Spatial Coverage	PARAMETER_INTERN	
Temporal Coverage	PARAMETER_INTERN	
Max query size	PARAMETER_INTERN	64800

SIADico



OK Cancel

SITools2 SIA Module – dictionnary

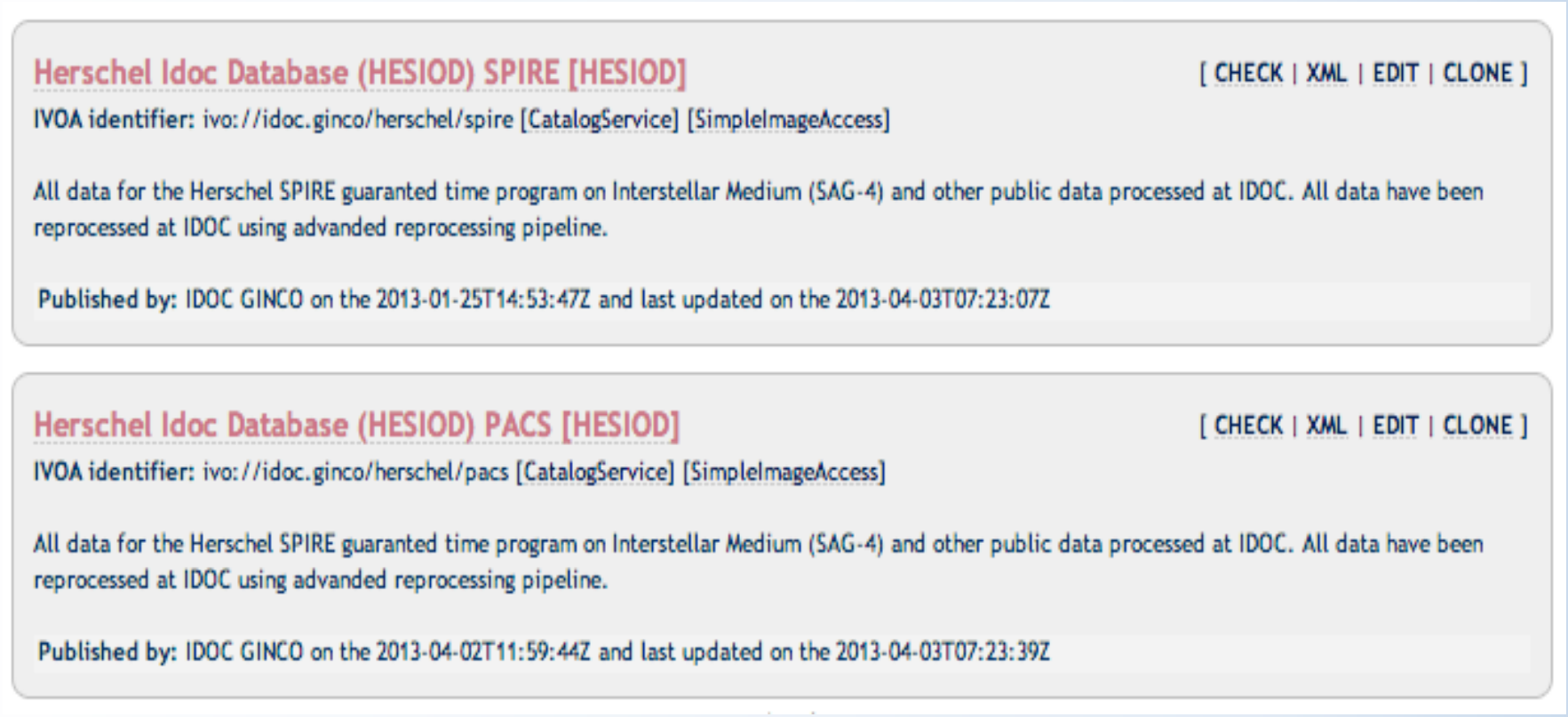


SITools2 SIA VOTable Résultat

http://idoc-herschel.ias.u-psud.fr/ds/pub/spirephotol2/services/sia?POS=177,-77&SIZE=10

Usage de VOX ?

SIA EuroVO registry



Herschel Idoc Database (HESIOD) SPIRE [HESIOD] [CHECK | XML | EDIT | CLONE]

IVOA identifier: ivo://idoc.ginco/herschel/spire [CatalogService] [SimpleImageAccess]

All data for the Herschel SPIRE guaranted time program on Interstellar Medium (SAG-4) and other public data processed at IDOC. All data have been reprocessed at IDOC using advanded reprocessing pipeline.

Published by: IDOC GINCO on the 2013-01-25T14:53:47Z and last updated on the 2013-04-03T07:23:07Z

Herschel Idoc Database (HESIOD) PACS [HESIOD] [CHECK | XML | EDIT | CLONE]

IVOA identifier: ivo://idoc.ginco/herschel/pacs [CatalogService] [SimpleImageAccess]

All data for the Herschel SPIRE guaranted time program on Interstellar Medium (SAG-4) and other public data processed at IDOC. All data have been reprocessed at IDOC using advanded reprocessing pipeline.

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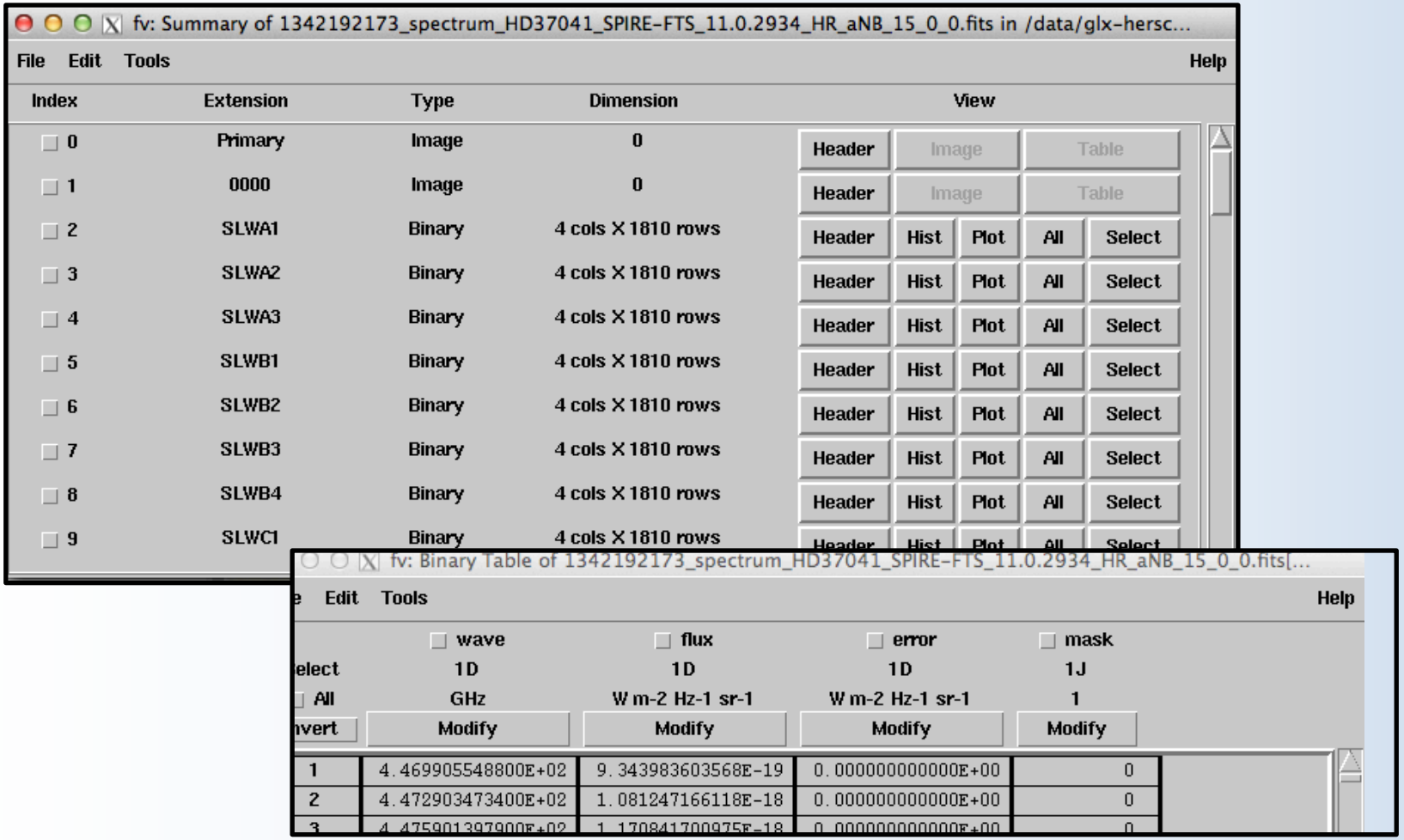
http://idoc-herschel.ias.u-psud.fr/ds/pub/spirephotol2/services/sia?

Sitools 2 VO: SCS, SIA to SSA

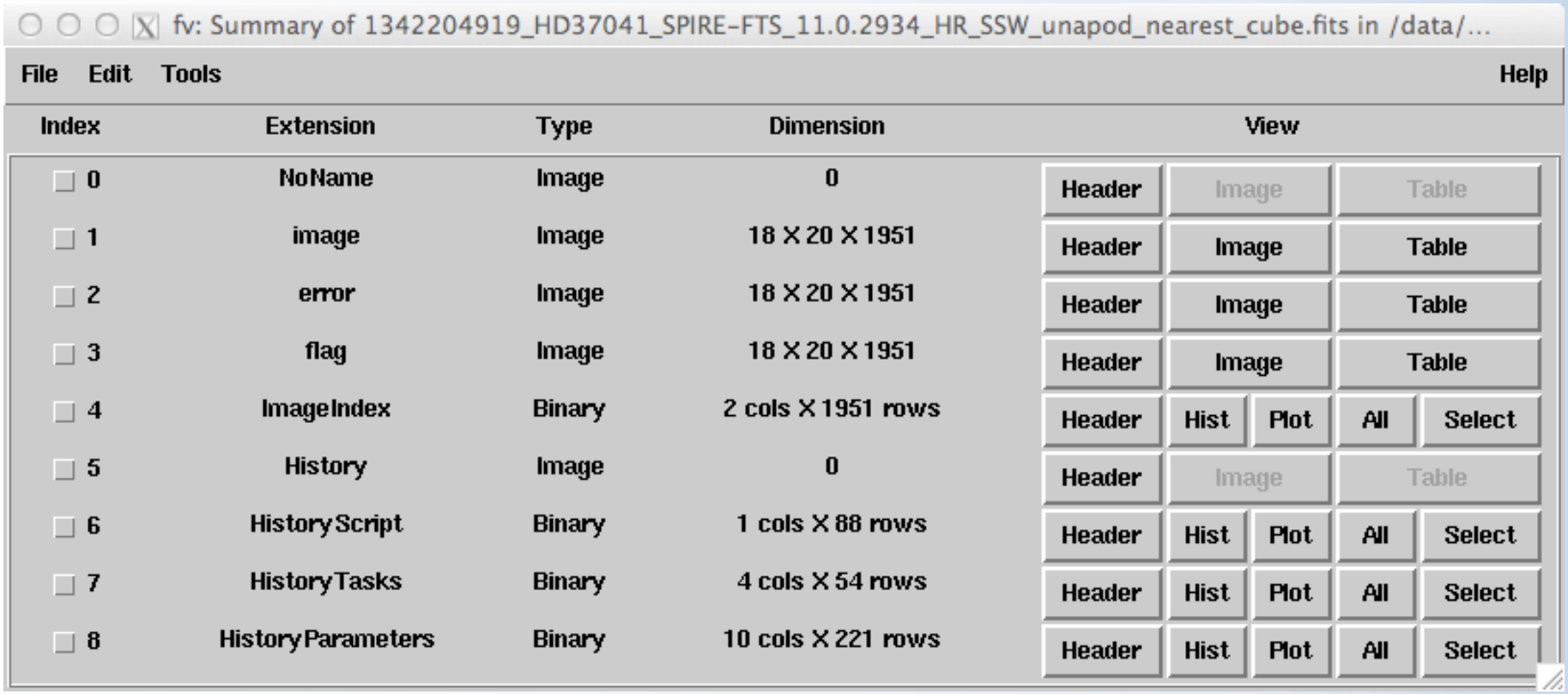
- Pour Sitools, création d'un DicoSSA, avec la liste des UCDs mandatory pour être « minimally compliant »

- Spectres 1D et cubes spectraux à générer avec les metadata correctes.

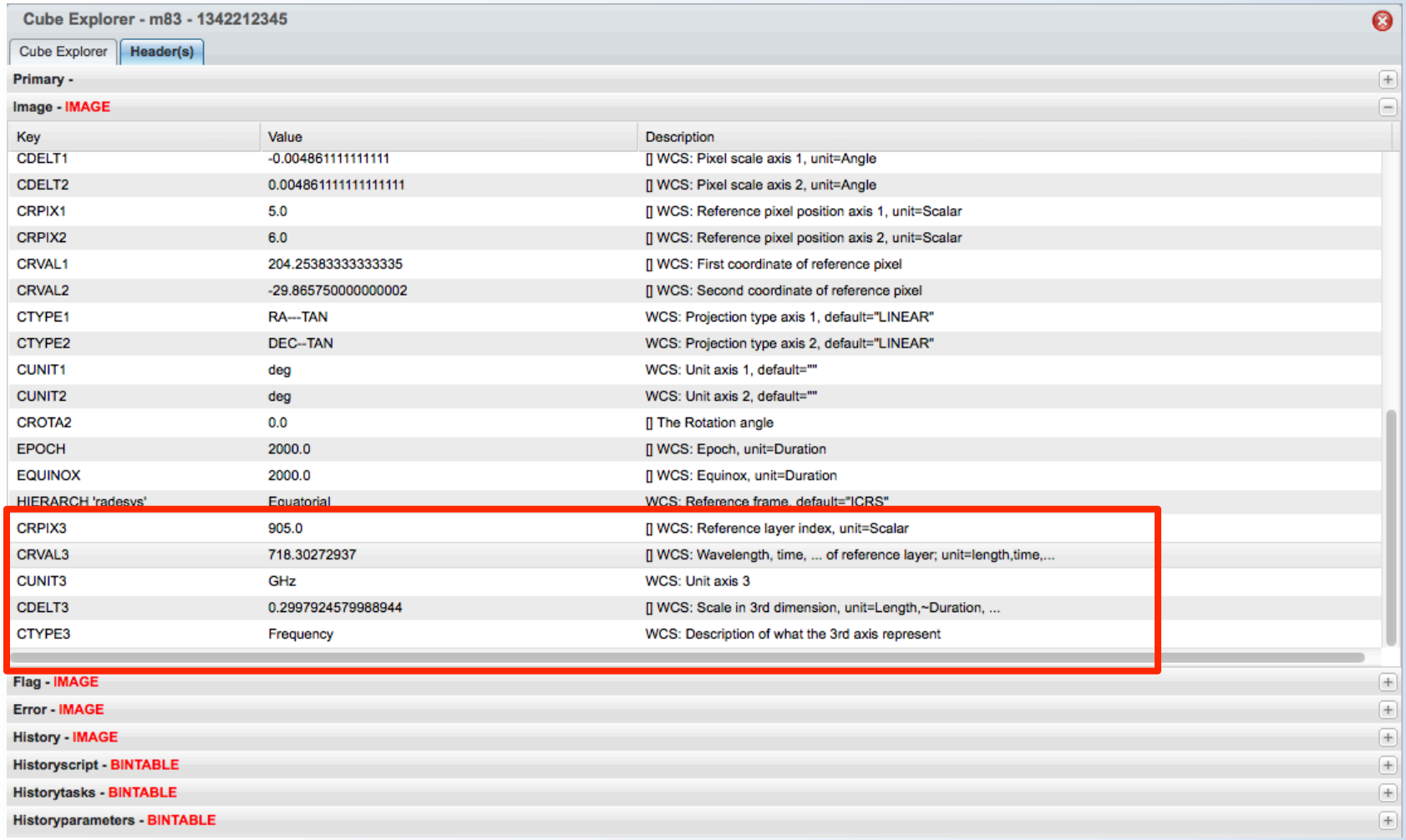
Collection de spectres 1D



Cubes spectraux 1/2
Exemple sans CRVAL3 CRPIX3



Cubes spectraux 2/2



VO SSA Input

Simple Spectral Access Protocol Version 1.1
IVOA Recommendation, February 10 2012

4.1.1 Mandatory Query Parameters

The following parameters **must** be implemented by a compliant service:

Parameter	*Sample value*	*Physical unit*	*Datatype*
POS	52,-27.8	degrees; defaults to ICRS	string
SIZE	0.05	degrees	double
BAND	2.7E-7/0.13	meters	string
TIME	1998-05-21/1999	ISO 8601 UTC	string
FORMAT	votable	-	string

Mais que POS et SIZE dans l'exemple: http://www.myvo.org/ssa?REQUEST=queryData&POS=22.438,-17.2&SIZE=0.02

VO SSP Output

- Liste des UCD obligatoires : PR-SpectralDM-2.0-20130425.pdf Annexe A ?
- http://voparis-validator.obspm.fr/
  - Version de Spectral Spectral Access 1.03
- Creation / Service Type: archival trop gros? spectralExtraction ou cutout (région ou bande spectrale) pour les cubes?
- Rajout des metadata dans les fits directement
- Exemple dans C.2.1 Basic Spectrum Instance: ok
- Exemple pour un cube?

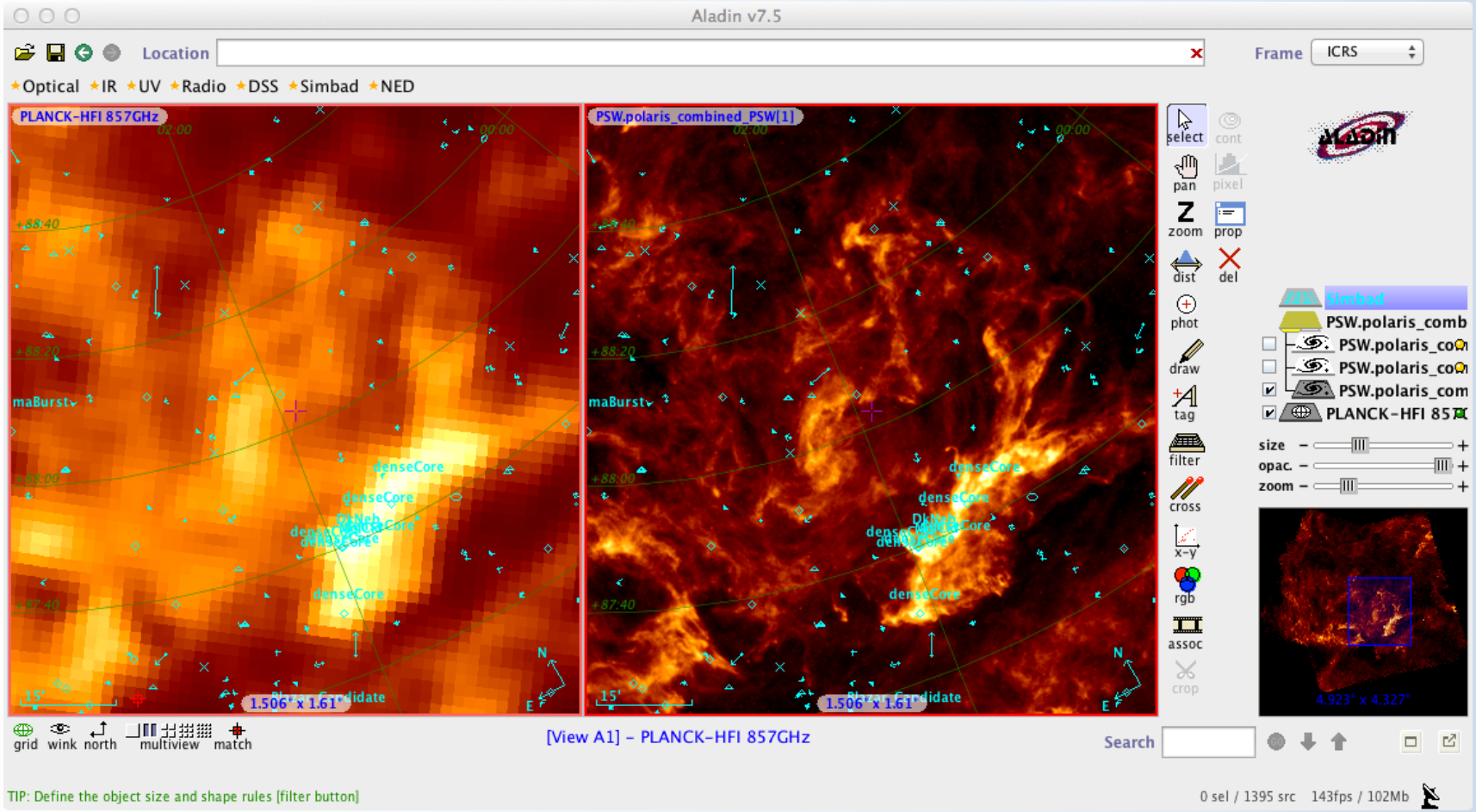
VO @ IDOC

- extension du SIAP aux autres programmes disponibles dans HESIOD.
- SIA Cutout Image Service en cours de développement
- mise en place et enregistrement du service Simple Cone Search pour la base SZ-Cluster actuelle et extension au futur catalogue de sources Herschel de la base HESIOD (en cours)
- réflexion sur l'utilisation du protocole TAP pour l'accès aux catalogues de sources, notamment pour SZ Cluster
- SSAP (cubes?)
- Contacts IDOC VO: scientifique alexandre.beelen@ias.u-psud.fr, ingénieur karin.dassas@ias.u-psud.fr

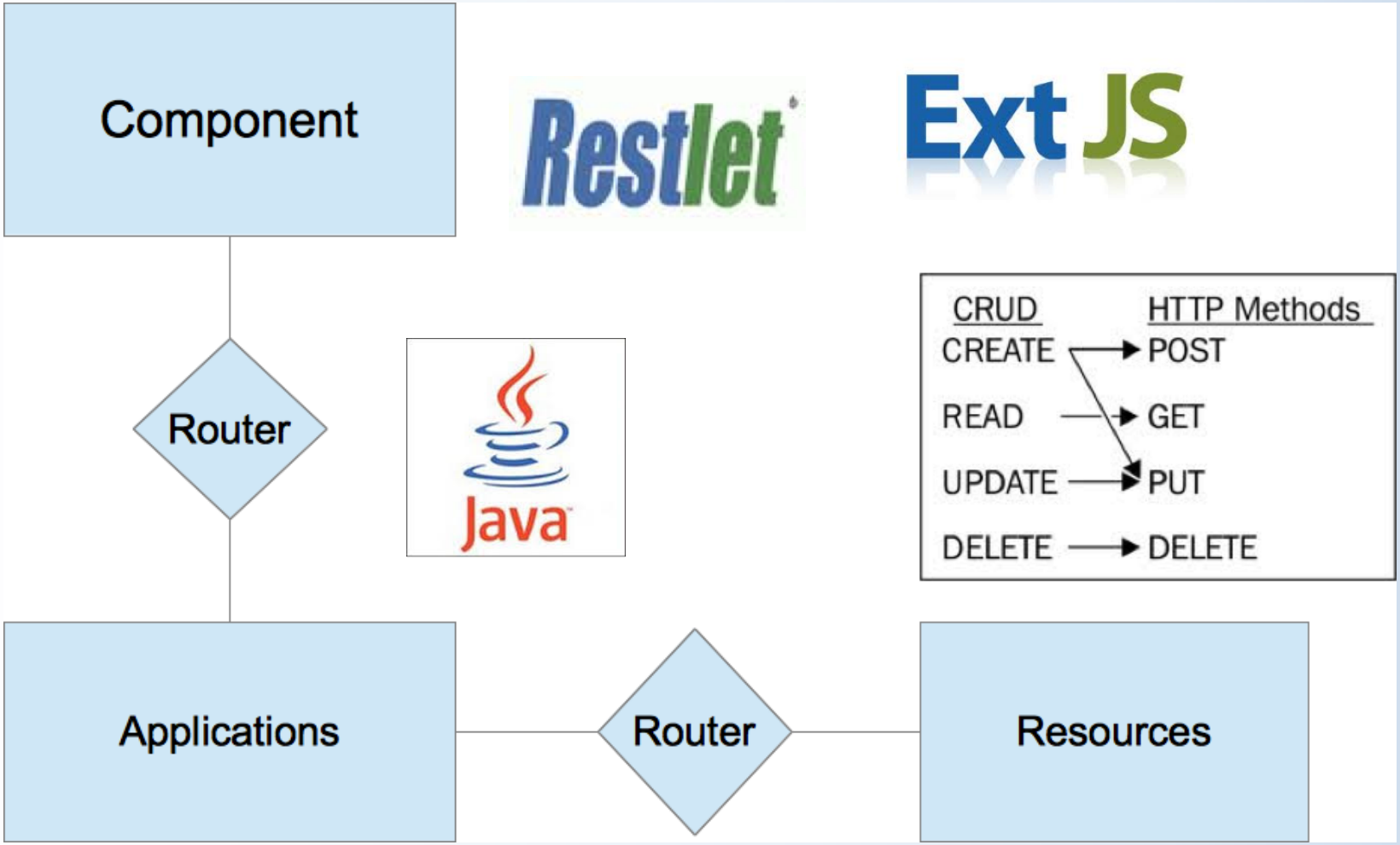
Merci de votre attention!

ANNEXES

HESIOD through Aladin



SITools2 General Architecture: REST



SITools2 SIA Module spoly

```
def calculateSpoly(filepath=""):
        hdulist=pyfits.open(filepath)
        try:
                Image = hdulist['Image']
                wcs = pywcs.WCS(Image.header)
                hdr1=hdulist[1].header
        except:
                try:
                        ###### for SCANAMORPHOS fits files
                        Image=hdulist['PrimaryImage']
                        PrimaryHeader=hdulist['Primary'].header
                        wcs = pywcs.WCS(PrimaryHeader)
                        hdr1=Image.header
                        print wcs
                        print hdr1
                except KeyError:
                        print "EE - No 'Image' extension in "+os.path.basename(inputImage)
                        return 2
        poly1=wcs.wcs_pix2sky([[0.5,0.5]],0)
        print poly1
        poly2=wcs.wcs_pix2sky([[0.5+hdr1['NAXIS1'],0.5]],0)
        print poly2
        poly3=wcs.wcs_pix2sky([[0.5+hdr1['NAXIS1'],0.5+hdr1['NAXIS2']]],0)
        print poly3
        poly4=wcs.wcs_pix2sky([[0.5,0.5+hdr1['NAXIS2']]],0)
        print poly4
         poly1="("+str(poly1[0,0])+"d,"+str(poly1[0,1])+"d)"
        poly2="("+str(poly2[0,0])+"d,"+str(poly2[0,1])+"d)"
        poly3="("+str(poly3[0,0])+"d,"+str(poly3[0,1])+"d)"
        poly4="("+str(poly4[0,0])+"d,"+str(poly4[0,1])+"d)"
        poly="{"+poly4+","+poly3+","+poly2+","+poly1+"}"
        #poly="("+poly1+","+poly3+")"
        return poly
```

SIA EuroVO registry

VO Integrated Data Operation Center [IDOC] [XML | EDIT | CLONE]

IVOA identifier: ivo://idoc [Authority]

This naming authority is the root of the naming of the resources from IDOC

Published by: IDOC on the 2013-01-25T09:21:30Z and last updated on the 2013-01-25T10:31:24Z

GINCO: Galaxy, INterstellar matter and Cosmology [GINCO] [XML | EDIT | CLONE]

IVOA identifier: ivo://idoc.ginco [Authority]

GINCO is a center for expertise for several space, balloon and ground mission. It has an important role in data processing, distribution and interpretation, for several astronomy missions at long wavelength. In this matter, GINCO : develops and maintains high level analysis pipelines develops and maintains data archives & access develops, maintains and distribute high level software for data analysis offers scientific expertise for mission using long wavelength detectors plays an important role in education and outreach to the general public

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HErSchel IdOc Database (HESIOD) [HESIOD] [XML | EDIT | CLONE]

IVOA identifier: ivo://idoc.ginco/herschel [Organisation]

HErSchel IdOc Database (HESIOD)

Published by: IDOC GINCO on the 2013-01-25T11:01:53Z and last updated on the 2013-03-29T10:57:43Z

SITools2 SIA Module – dataset columns