A global Database for Optical Interferometry

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Why expose your data ?

- Re-use of published data, combine OI datasets with other datasets: long-term multi-instrument studies

  « A publication based on a data set is just one expression of the potential of the data set » (Henneken et al. 2011)

- + significant amount of unpublished data (~50% at VLTI and VLT)

- Capitalise on the work to obtain science-ready data
- Increase the scientific return of OI instruments/facilities.
- OI datasets for non-OI specialist —> broadening the community

Why expose your data ?

- Additional incentive: sharing data increases the citation of your papers (+20%, Henneken et al. 2011, arXiv:1111.3618)
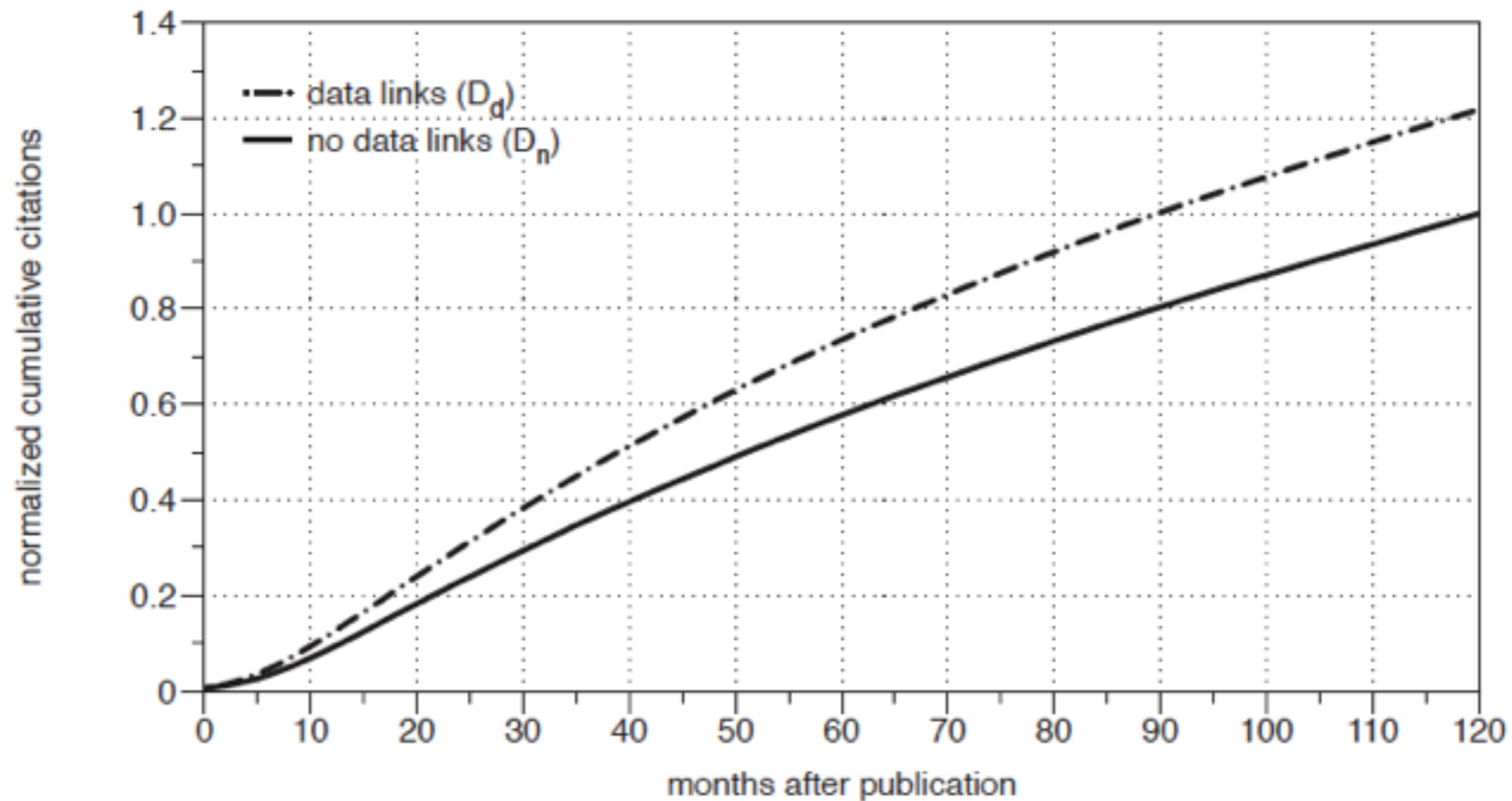
# Diffusion of OI data

Creation of a global database:

- Promote, preserve OI data and centralise its access
- Easy to use for non specialists
- Improve operability within the Virtual Observatory philosophy
- Dynamise collaborations, boost data analysis

+ a public web portal:

- Access to calibrated science-ready data
- Browse weekly updated observation logs

The content of the database

Observations

↓

[L0] Raw data

↓ Reduction

[L1] OIFITS

↓ Calibration

[L2,L3] OIFITS
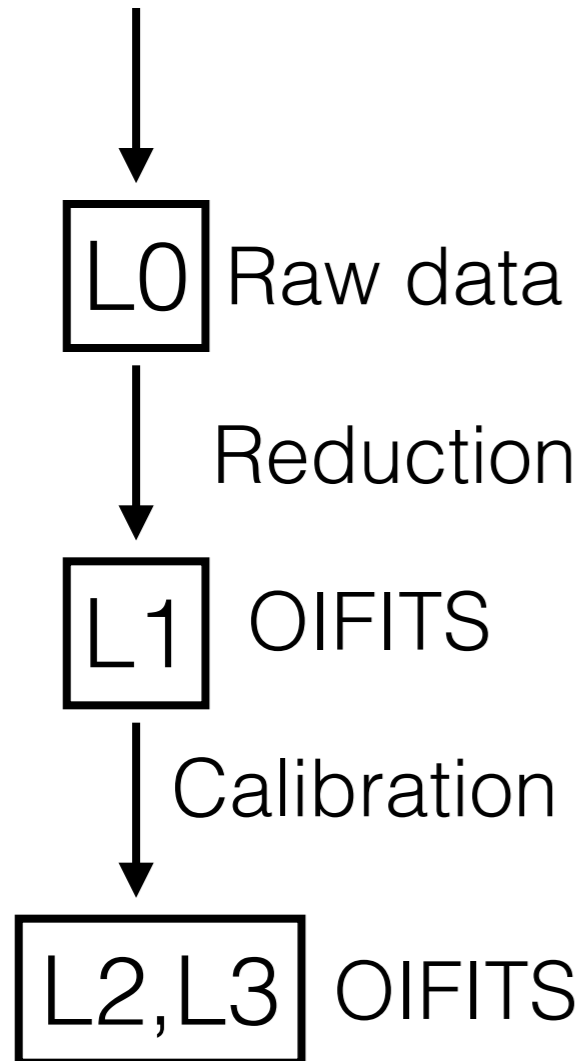
- L0 metadata (observation logs)

- L2,L3 : REDUCED science-ready OIFITS
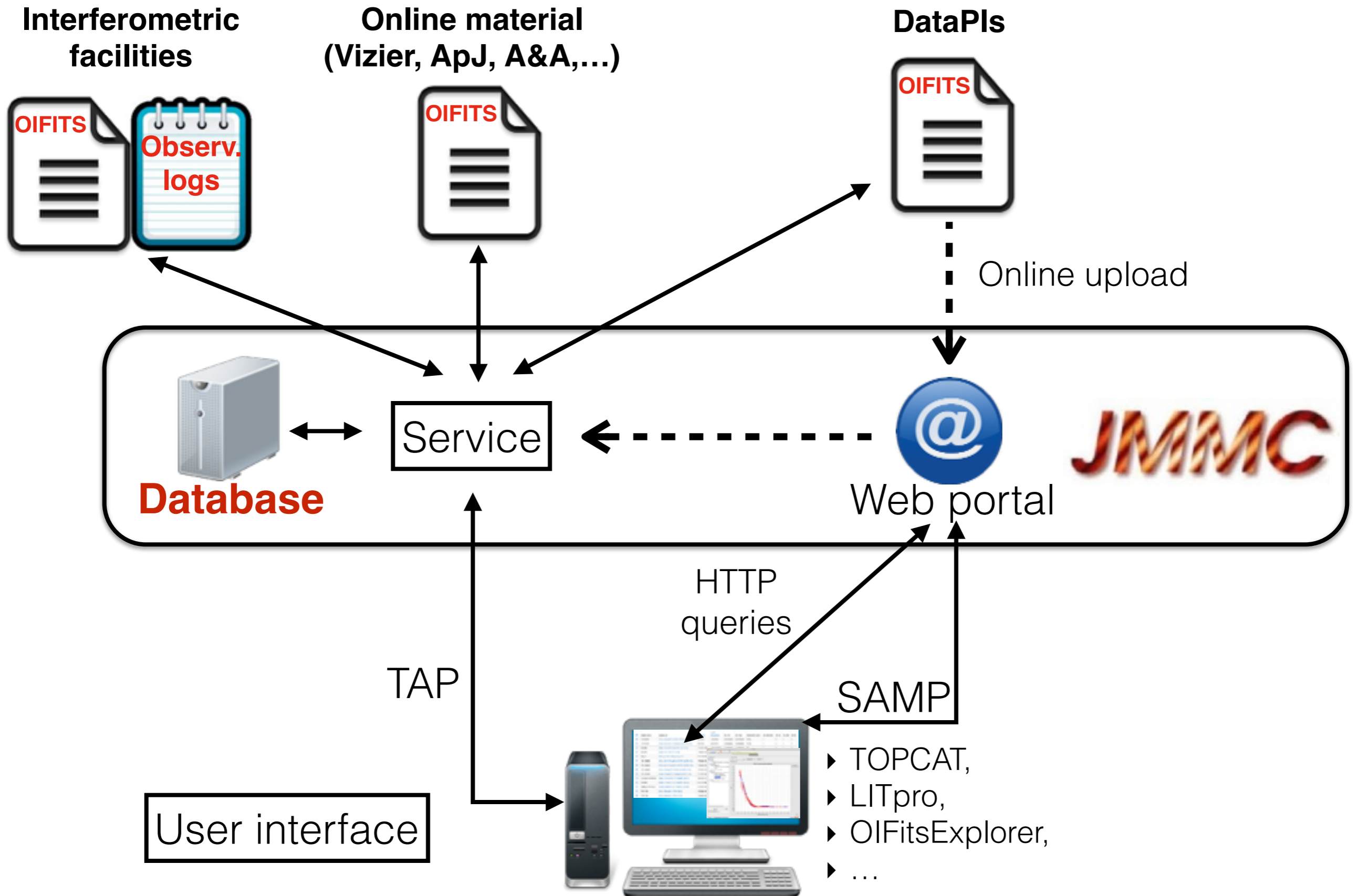
The OIDB service

- 1st rule: We don't touch datafiles

- <u>2nd rule</u>: WE DON'T TOUCH DATAFILES !

- Server that hosts/links to data files
- Quick-look plots, Web 2.0
- **Interoperability** tools within the VO

- Statistics of the downloads
- Curation: manage the data along its evolution
- Act as a bridge between data users and data providers (dataPIs)

Realisation began in December 2013: prototype **in development**

Architecture

Interferometric facilities

OIFITS

Observ. logs

Online material (Vizier, ApJ, A&A,…)

OIFITS

DataPIs

OIFITS

Online upload

Database

Service

Web portal

JMMC

TAP

HTTP queries

SAMP

User interface

▸ TOPCAT,
▸ LITpro,
▸ OIFitsExplorer,
▸ …

VO tools in the OIDB

Protocols:

- **TAP** protocols on top of an eXist-db server

- We use **SAMP** for communication with other VO tools

Datamodel:

- Basis: **ObsCore** data model (standard set of metadata to describe astronomical observations)

- Additionnal columns: nb_channels, nb_vis, nb_vis2,nb_t3, subdate, quality_flag, telescope_config, instrument_mode, astronomical_keywords, comments

Granularity
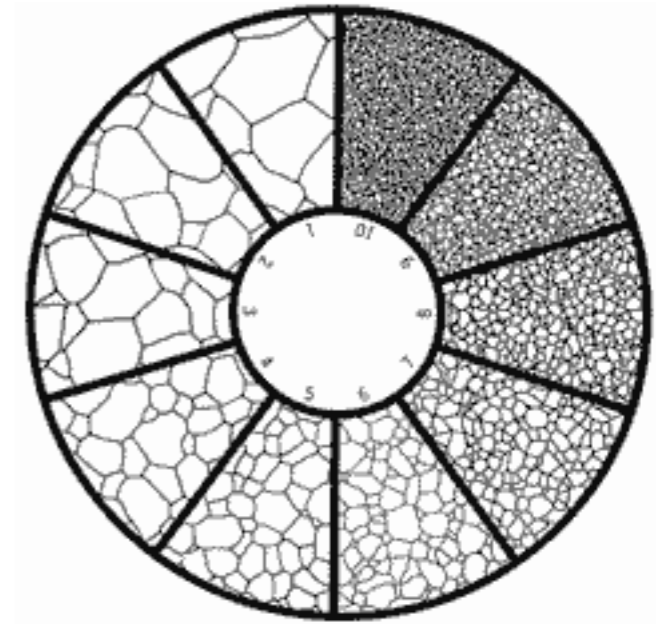
- OIFITS = « Container format », not scientifically meaningful per se

- 1 granule = 1 target / 1 night / 1 instrument mode / 1 OIFITS

- 1 OIFITS is split in granules to see the content better

The web portal: oidb.jmmc.fr

Query form

- Query form -> ADQL query
- Underlying TAP interface

Observation logs (L0 metadata)

PI contact

	target_name meta.id;src	obs_creator_name meta.id	access_url meta.ref.url	t_min time.start;obs.exposure	em_min em.wl;stat.min	em_max em.wl;stat.max	instrument_name meta.id;instr
⚙ ▾	HD176232	Karine Perraut	- 🔒	2011-07-24T06:23:02	0.70000000	0.70000000	VEGA
⚙ ▾	HD170878	Karine Perraut	- 🔒	2011-07-27T06:23:02	0.70000000	0.70000000	VEGA
⚙ ▾	HD176232	Karine Perraut	- 🔒	2011-07-27T06:50:24	0.70000000	0.70000000	VEGA
⚙ ▾	HD197950	Karine Perraut	- 🔒	2011-07-29T07:26:23	0.65600000	0.65600000	VEGA
⚙ ▾	HD197950	Karine Perraut	- 🔒	2011-07-29T08:03:50	0.65600000	0.65600000	VEGA
⚙ ▾	HD200775	Karine Perraut	- 🔒	2011-07-29T07:35:02	0.65600000	0.65600000	VEGA
⚙ ▾	HD197950	Karine Perraut	- 🔒	2011-07-28T09:07:11	0.65600000	0.65600000	VEGA

- Updated on a weekly basis
- CHARA instruments: VEGA for the moment, for CLIMB and CLASSIC soo
- Next: your instrument ?

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L2/L3 OIFITS

|	target_name meta.id;src	obs_creator_name meta.id	access_url meta.ref.url	em_min em.wl;stat.min	em_max em.wl;stat.max	instrument_name meta.id;instr	nb
⚙ ▾	TWA_5	Jean-Baptiste Le Bouquin	2012-03-05_SCI_TWA_5_oiDataCalib.fits	1.68108000	1.68108000	PIONIER	1
⚙ ▾	DELTA_CAP	Jean-Baptiste Le Bouquin	2010-10-26_SCI_DELTA_CAP_oiDataCalib.fits	1.59942000	1.76275000	PIONIER	5
⚙ ▾	MWC158	Jean-Baptiste Le Bouquin	2010-10-26_SCI_MWC158_oiDataCalib.fits	1.59942000	1.76275000	PIONIER	5
⚙ ▾	SS_LEP	Jean-Baptiste Le Bouquin	2010-10-27_SCI_SS_LEP_oiDataCalib.fits	1.59942000	1.80358000	PIONIER	6
⚙ ▾	ALF_HYI	Jean-Baptiste Le Bouquin	2010-10-28_SCI_ALF_HYI_oiDataCalib.fits	1.59942000	1.80358000	PIONIER	6

- Details of granules, links to ADS, SIMBAD, export the results in VO Tables,…

- Interoperability (SAMP) —> TOPCAT, JMMC apps: OIFitsExplorer, LITpro…

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Interoperability
with LITpro (Tallon-Bosc et al. 2008)
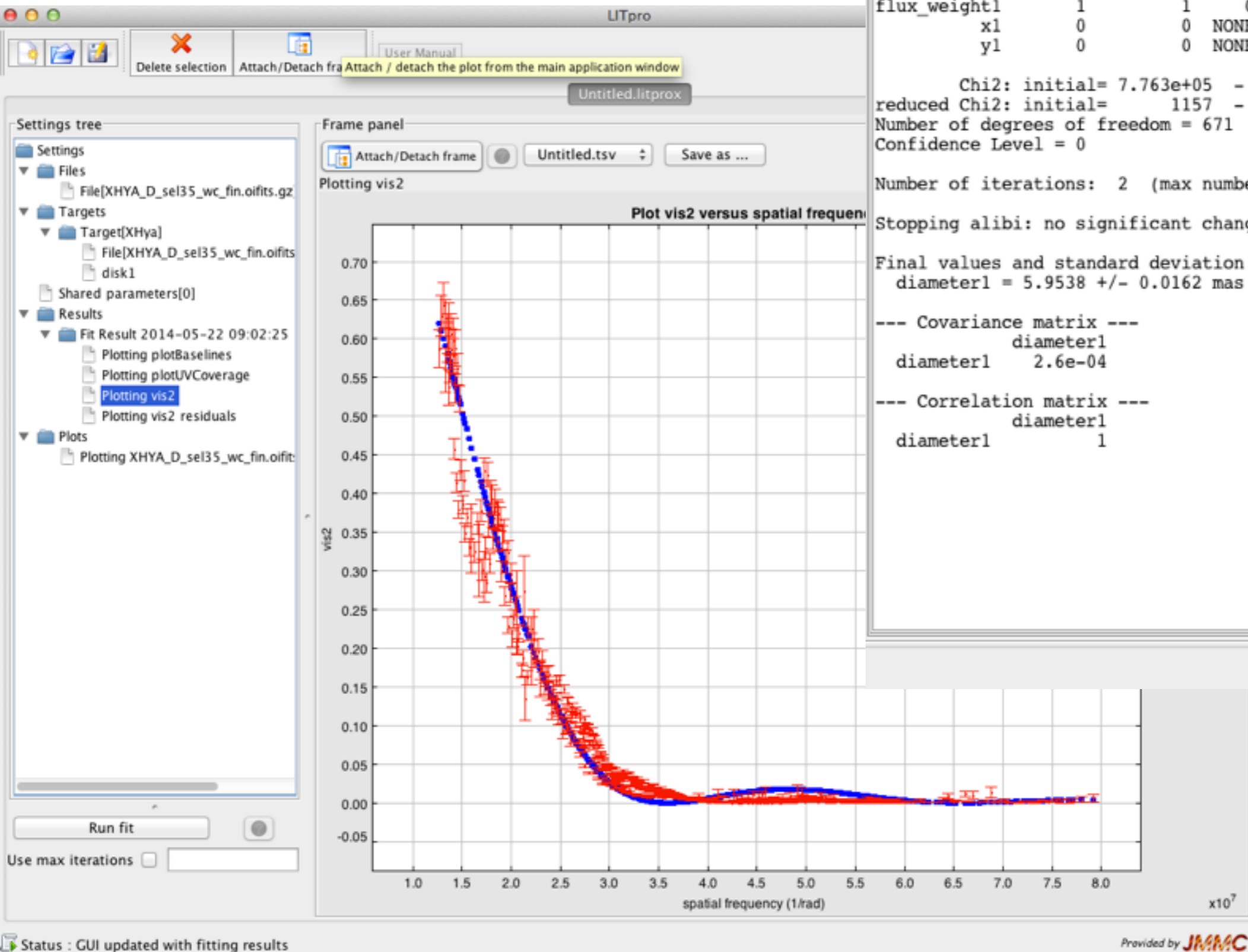
Conclusion

Status:

- Everything is almost ready, we are entering a test period.

- <u>OIDB Version 1.0 delivered ~ end 2014</u>

Perspectives:

- L1 data for specialists (nomenclature ?)

- Tutorial for OI newcomers

- Ingest OIFITS files from more instruments / hosting

- Coordination with local databases

- Definition of a new standard (OIFITS2) is ongoing
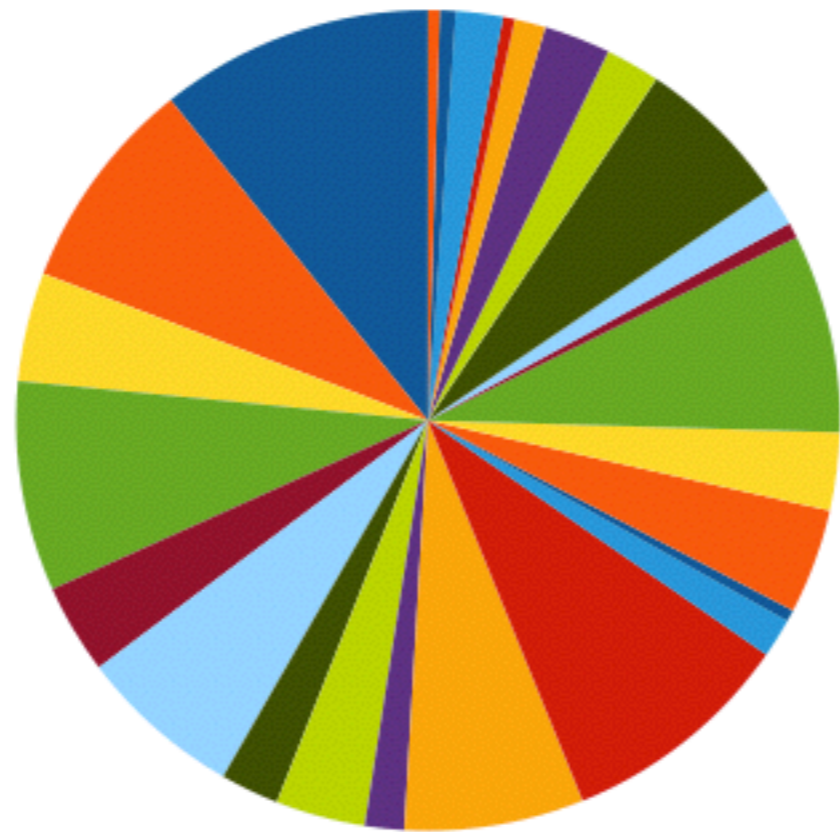
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mailing list: olbin.vo

Fill out the survey!

We require your help to get some user input on the setup of this portal.

Fill out now

Discussion at the IAU 54 commission forum on Saturday, Univ. of Montreal

OI Papers

Pie chart legend:

- Mira variables
- Cepheid variables
- Rapidly rotating stars
- Dust shells of late type stars
- Subgiant stars
- Supergiants
- Galactic Center
- Debris disks
- Low-mass stars
- Exoplanets
- Young massive stars
- R CrB stars
- Asteroids
- Herbig Ae/Be stars
- Be stars
- T Tauri Stars, FU Orionis stars
- Active Galactic Nuclei
- Giant stars
- Novae
- AGB and Post-AGB stars
- Dwarf stars
- Wolf-Rayet stars
- B[e] stars
- Luminous Blue Variables
- Carbon stars
- Exozodiacal Dust

Bar chart legend:
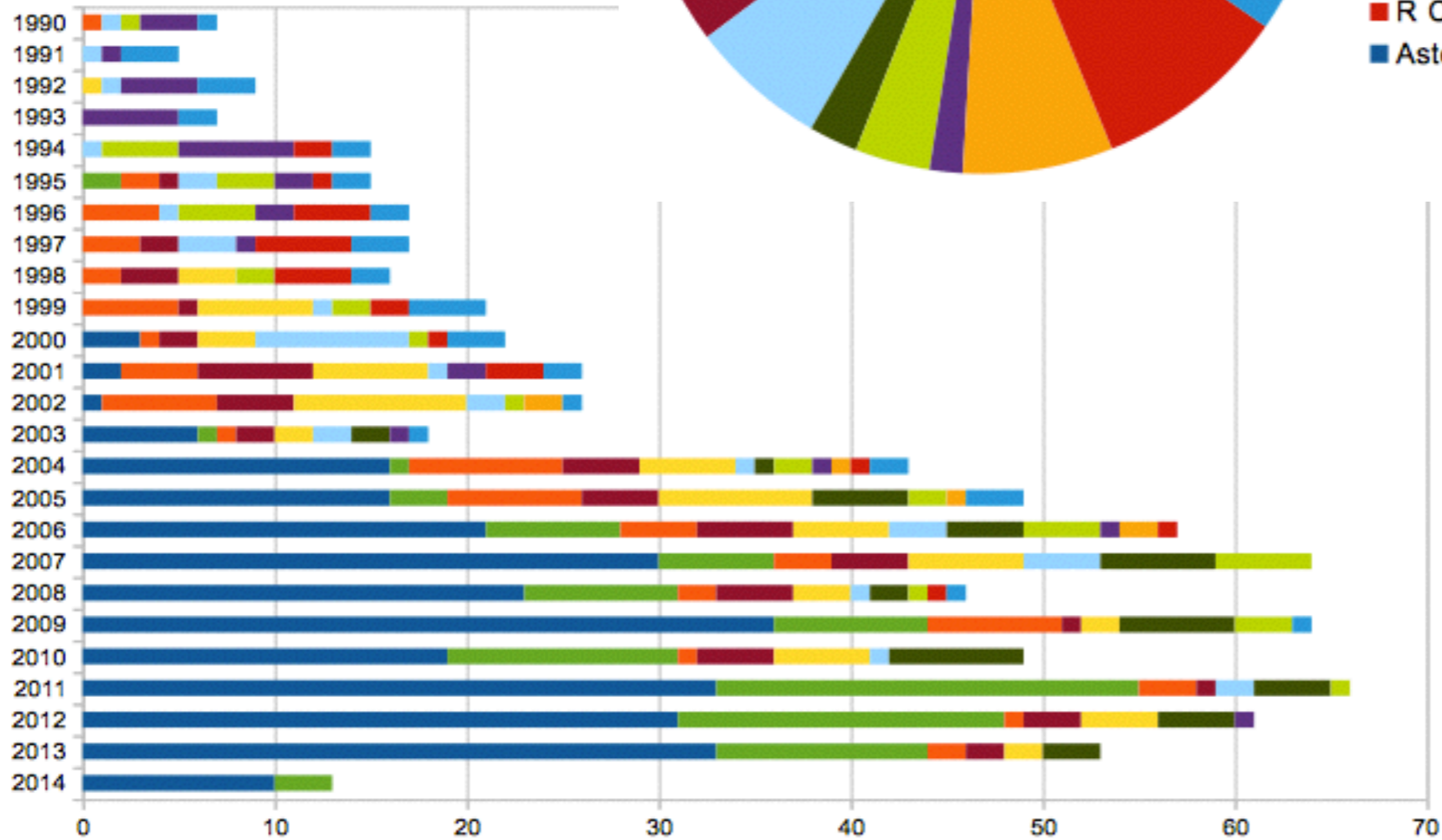
- COAST
- GI2T
- LBTI
- Mark III
- SUSI
- Keck
- ISI
- PTI
- NPOI
- IOTA
- CHARA
- VLTI

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