

CHARA Community Workshop
2017/03/15 - Pasadena



Observation preparation & data analysis Tools

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PLAN

- Service overview
- Observation preparation
 - ASPRO 2
 - SearchCal / JSDC 2
- Data analysis
 - OIFits Explorer
 - LITpro
- OiDB portal
- Demo: now or this afternoon

Service overview



Prepare Observations

SearchCal

SearchCal

Found Calibrators

ID	RA	DEC	Mag	Filter	Mag	Filter	Mag	Filter	Mag	Filter		
1	0.0	28.00	0.47	28.00	+24.06	18.5	0.0010	-0.0020	0.947	0.065	R700	2.87
2	0.16	18.00	0.00	18.00	+24.03	32.0	0.714	0.014	-0.031	0.014	R800	3.02
3	0.46	23.00	0.41	23.00	+24.22	0.3	0.496	0.016	0.415	0.019	R800	3.87
4	0.55	23.00	0.42	23.00	+24.06	48.0	0.71	0.033	-0.037	0.028	R800	3.706

aspro

Reduce data

amdlib

pndrs

View Data

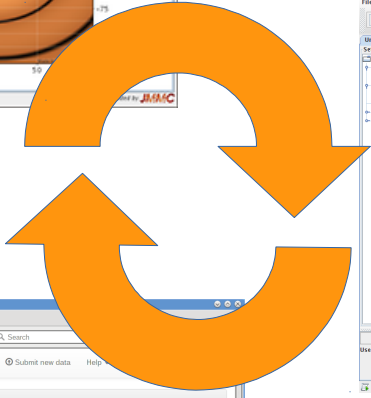
OIFits explorer

Fit Models

LITPro

CDS Catalogs

New!



OiDB

L0 to L3 DataBases

Results

SELECT ALL * FROM glob AS t WHERE (CONTAINS(POINT('ICRS', t.S, t.L, t.Bc), CIRCLE('ICRS', 219.98085, -66.83 (Edit query)

target_name	access_url	t_min	Instrument name	wlen_min
Alpha_Cen_B	PCN 2016-05-28T01:56:00.739_oiadbCalibrated.fits	2016-05-28T01:55:12	PIONER	1.51900030
Alpha_Cen_A	PCN 2016-05-28T02:15:37.104_oiadbCalibrated.fits	2016-05-28T02:15:21	PIONER	1.51900030

Reconstruct Images

New!

OImaging

+ Training

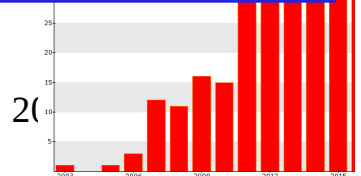
+ User Support

+ OLBIN forum And Publications

JSDC

JMDC

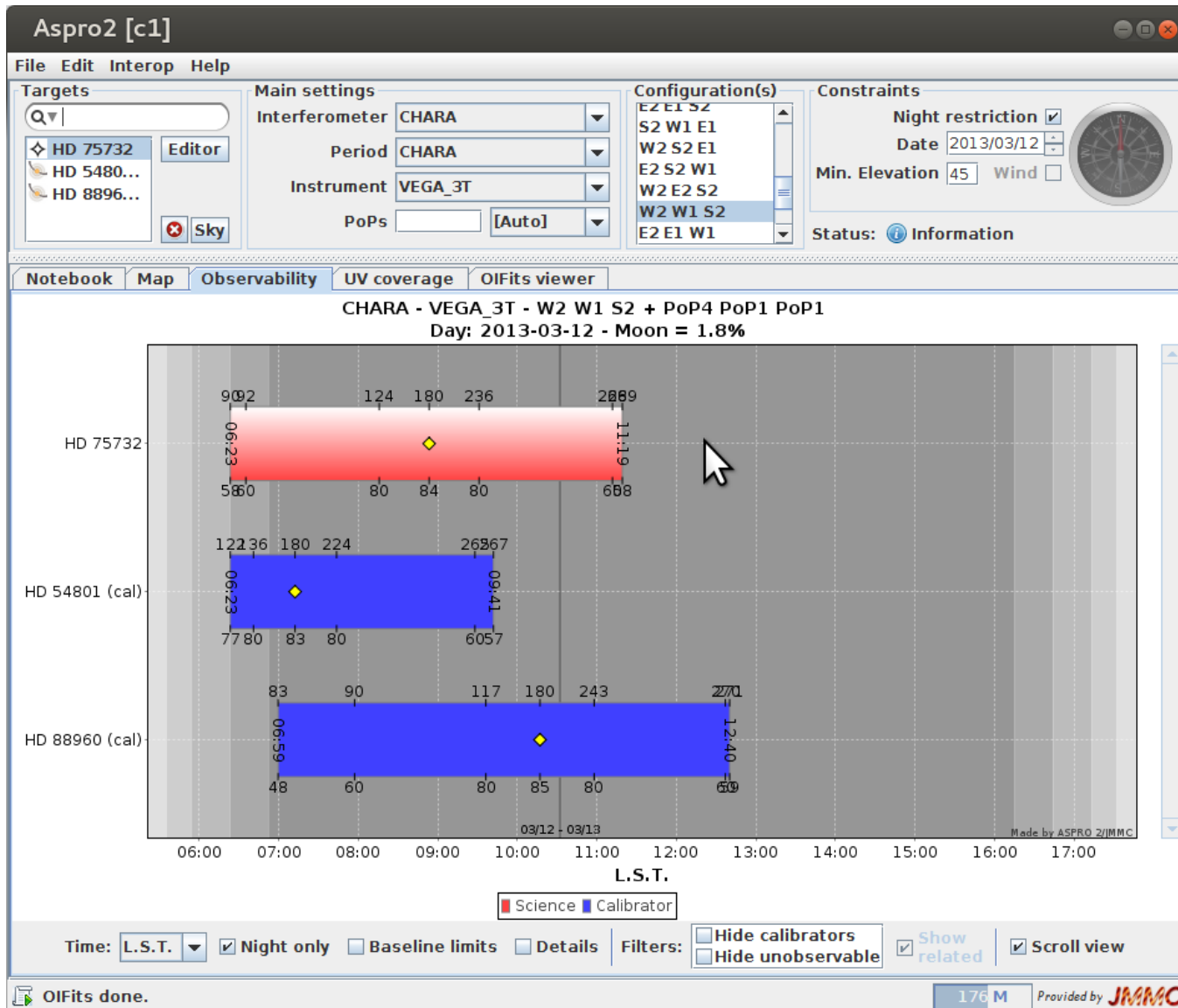
CHARA C



ASPRO 2: Feature overview

- [ASPRO 2](#) Page: download / doc
- Observation preparation = VLT / CHARA / NPOI
 - Target & calibrator list with their models (geom / FITS)
 - Target observability, UV coverage
 - Instrument modes + noise modeling => **OIFITS data**
Noise modeling & OIFits simulator: [see SPIE 2016](#)
- Interoperability :
 - SearchCal (calibrator search), Vizier / Simbad (flux)
 - OIFits Explorer, LITpro or Olmaging ...
 - Export OB (VLT, VEGA) to be generalized

ASPRO 2: Observability

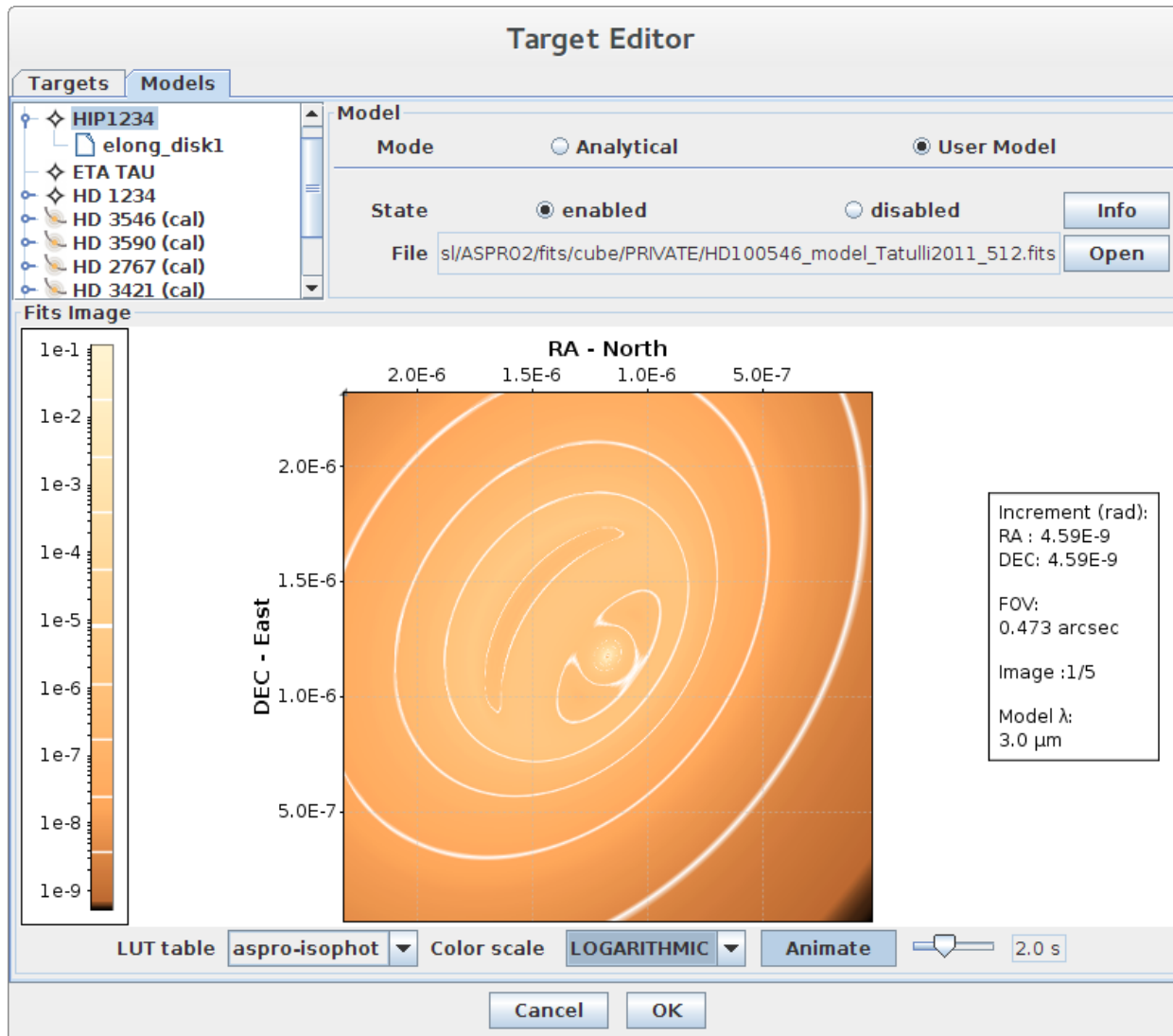


Observation =

Targets, array & instrument setup, baselines...

- SCI / CAL
- Horizon / DL / PoPs (best) constraints
- Configuration comparison
- Time markers (night mode)

ASPRO 2: Target Editor

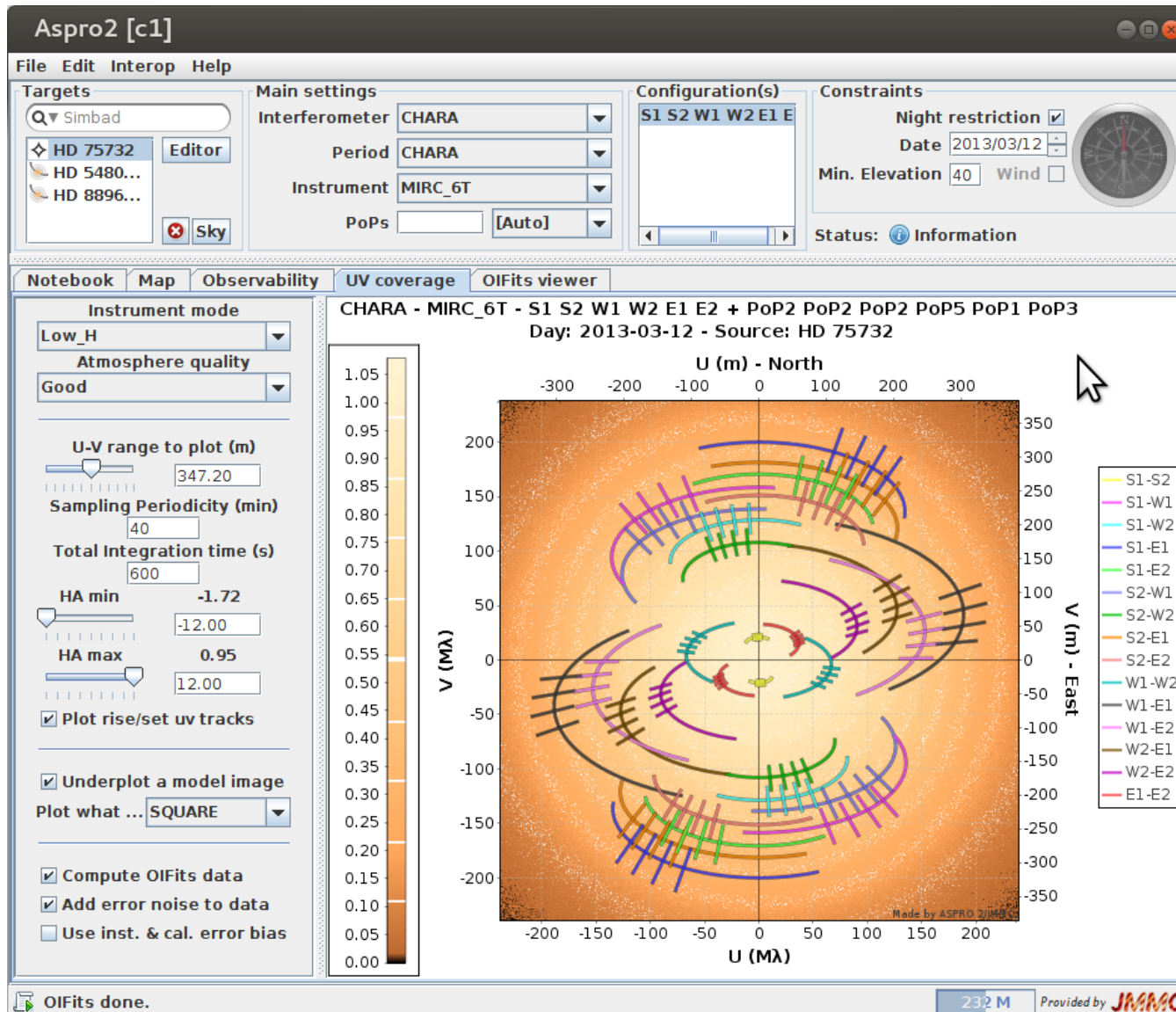


Target information:

- Fluxes (mag)
- Models
 - Analytical
 - User models:

Fits cubes for polychromatic models

ASPRO 2: UV Coverage



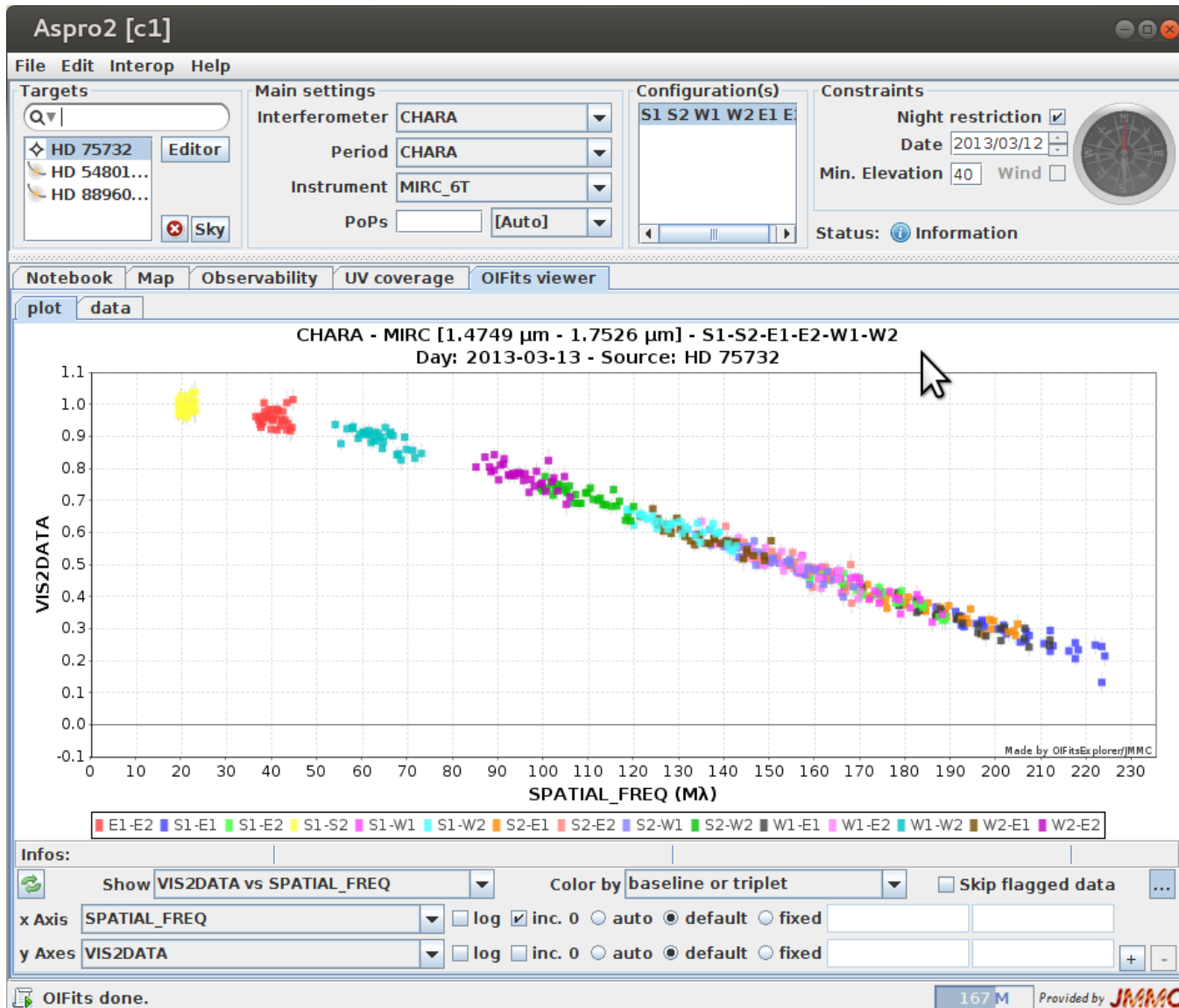
UV Plot for MIRC 6T
LOW_H mode with a
disk model

Instrument mode:

- Wavelength range / spectral channels
- Transmission, camera parameters
- Seeing (atm quality)
- Total integration time (s) on SCI

Select baselines adapted to your model (scaling)

ASPRO 2: OIFits simulator



Exact Fourier Transform from user model images

Click 'Skip flagged data' to hide data with low SNR

Noise modelling:

- Target photometry
- Atm. transmission
- Instrument parameters

CHARA / NPOI Instrument params to be refined !



SearchCal / JSDC 2

- **SearchCal** Page: download
 - Search Calibrators close to your target object and phot.
 - Filter results (SP type, luminosity, V2 ...)
 - Interoperability with ASPRO2, Aladin
- New JSDC 2: **Vizier II/346** ~400 000 stellar diameters
- Future:
 - New SearchCal 5.0 release coming soon:
 - use internally JSDC 2 to be faster and more accurate
 - Only JSDC scenario [BVIJHKLMN]



SearchCal

SearchCal

Query Parameters

1) Instrumental Configuration

Magnitude Band : V

Wavelength (V) [μm] : 0.6562

Max. Baseline [m] : 216.84477

2) Science Object

Name : QV HD 75732

RA 2000 [hh:mm:ss] : 08:52:35.811

DEC 2000 [+/-dd:mm:ss] : +28:19:50.951

Magnitude (V) : 5.95

3) SearchCal Parameters

Min. Magnitude (V) : 3.95

Max. Magnitude (V) : 7.95

Scenario : Bright Faint

RA Range [mn] : 240.0

DEC Range [deg] : 20.0

Progress :

Get Calibrators

Found Calibrators (949 sources, 736 filtered)

Index	HD	HIP	RAJ2000	DEJ2000	SpType	V	K	UD_V	UD_R	H	UD_K	vis2	vis2Err	diam_bv
180	87866	49677	10 08 27...	+24 18 3...	F0	7.784	7.262	0.12	0.121	6.966	0.124	0.903	0.013	0.157
181	88270	49882	10 11 08...	+20 41 4...	F2Vl	6.631	5.67	0.284	0.287	5.732	0.295	0.551	0.048	0.285
182	88460	50093	10 13 42...	+26 09 0...	A2	7.534	7.338	0.102	0.103	7.401	0.106	0.93	0.009	0.128
183	88560	50056	10 13 11...	+21 25 1...	F2	7.817	6.696	0.182	0.184	6.775	0.189	0.789	0.026	0.18
184	88672	50143	10 14 10...	+31 25 2...	F0	7.602	6.835	0.158	0.159	6.865	0.163	0.838	0.021	0.175
185	88924	50293	10 16 09...	+35 09 5...	A8 V	7.336	6.867	0.142	0.143	6.9	0.147	0.868	0.017	0.153
186	88960	50303	10 16 14...	+29 18 3...	A0Vn	5.485	5.387	0.244	0.246	5.413	0.251	0.654	0.04	0.268
187	89055	50355	10 16 56...	+25 51 3...	G0V	7.574	6.083	0.255	0.258	6.137	0.266	0.617	0.043	0.257
188	89086	50364	10 17 00...	+21 54 4...	F5 III	7.611	6.536	0.193	0.195	6.619	0.201	0.762	0.029	0.211
189	89239	50459	10 18 10...	+27 24 5...	A0V	6.525	6.604	0.126	0.127	6.599	0.13	0.896	0.014	0.15
190	89363	50508	10 18 57...	+17 42 2...	A0	6.842	6.723	0.132	0.133	6.731	0.136	0.886	0.015	0.149
191	89865	50823	10 22 38...	+24 35 4...	F5	7.809	6.644	0.188	0.19	6.681	0.195	0.776	0.028	0.184
192	89892	50857	10 23 05...	+35 13 0...	A8 III	7.103	6.579	0.164	0.166	6.615	0.171	0.824	0.022	0.179
193	89904	50860	10 23 06...	+33 54 2...	A6V	5.885	5.506	0.257	0.261	5.568	0.268	0.614	0.043	0.288
194	90164	50997	10 25 01...	+30 22 1...	F8V	7.892	6.494	0.216	0.218	6.592	0.224	0.712	0.034	0.211
195	90681	51312	10 28 51...	+34 53 0...	G0	7.822	6.42	0.215	0.218	6.451	0.224	0.712	0.034	0.241
196	90878	51406	10 29 58...	+27 49 3...	F8	7.802	6.603	0.192	0.194	6.666	0.199	0.766	0.029	0.191
197	91148	51550	10 31 45...	+24 04 5...	G8V	7.918	6.297	0.232	0.235	6.386	0.243	0.666	0.039	0.252
198	91163	51574	10 32 01...	+29 43 5...	G2V	7.868	6.404	0.218	0.221	6.463	0.228	0.703	0.035	0.221
199	91204	51579	10 32 05...	+17 59 2...	G0	7.816	6.348	0.223	0.226	6.398	0.234	0.69	0.037	0.261
200	91365	51685	10 33 30...	+34 59 1...	A2Vn	5.571	5.348	0.262	0.265	5.413	0.271	0.608	0.044	0.263
201	91455	51701	10 33 50...	+20 18 1...	F 8 V	7.289	6.063	0.248	0.251	6.114	0.258	0.636	0.041	0.277
202	91546	51770	10 34 43...	+26 09 3...	F5	7.83	6.677	0.185	0.187	6.727	0.191	0.783	0.027	0.192

Filters

Reject stars farther than : Maximum RA Separation (mn) : 10.0 Maximum DEC Separation (degree) : 10.0

Reject stars with magnitude : below : 0.0 and above : 10.0

Reject Spectral Types (and unknowns) : O B A F G K M

Reject Luminosity Classes (and unknowns) : I II III IV V VI

Reject Visibility below : vis2 : 0.5

Reject Visibility Accuracy above (or unknown) : vis2Err/vis2 (%) : 2.0

Reject Variability

Reject Multiplicity

Status : Sending data through SAMP ... done.

Provided by JMMC

OIFits Explorer

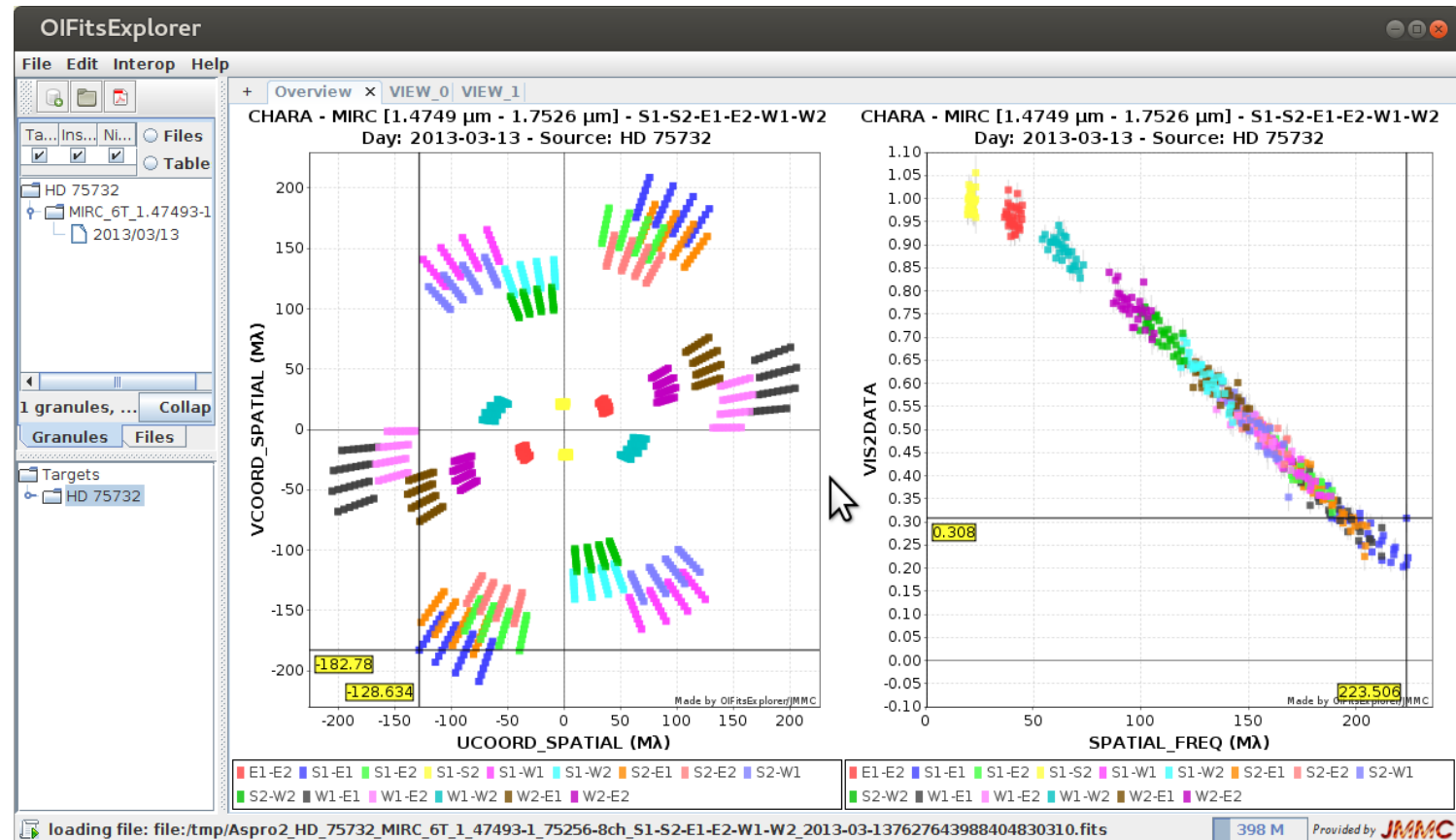
OIFits Explorer Page: download

Visualization:

- Load OIFits files
- Plots:
 - UV plan
 - V2, T3, VIS...
 - Extra quantities:
 - HA, PA, SNR...

Future:

- Editor: flag data & export (merged) OIFits files
- Better data selection graphically or by using filters



LITpro model fitting

[LITpro GUI](#) Page: download / doc / tutorials

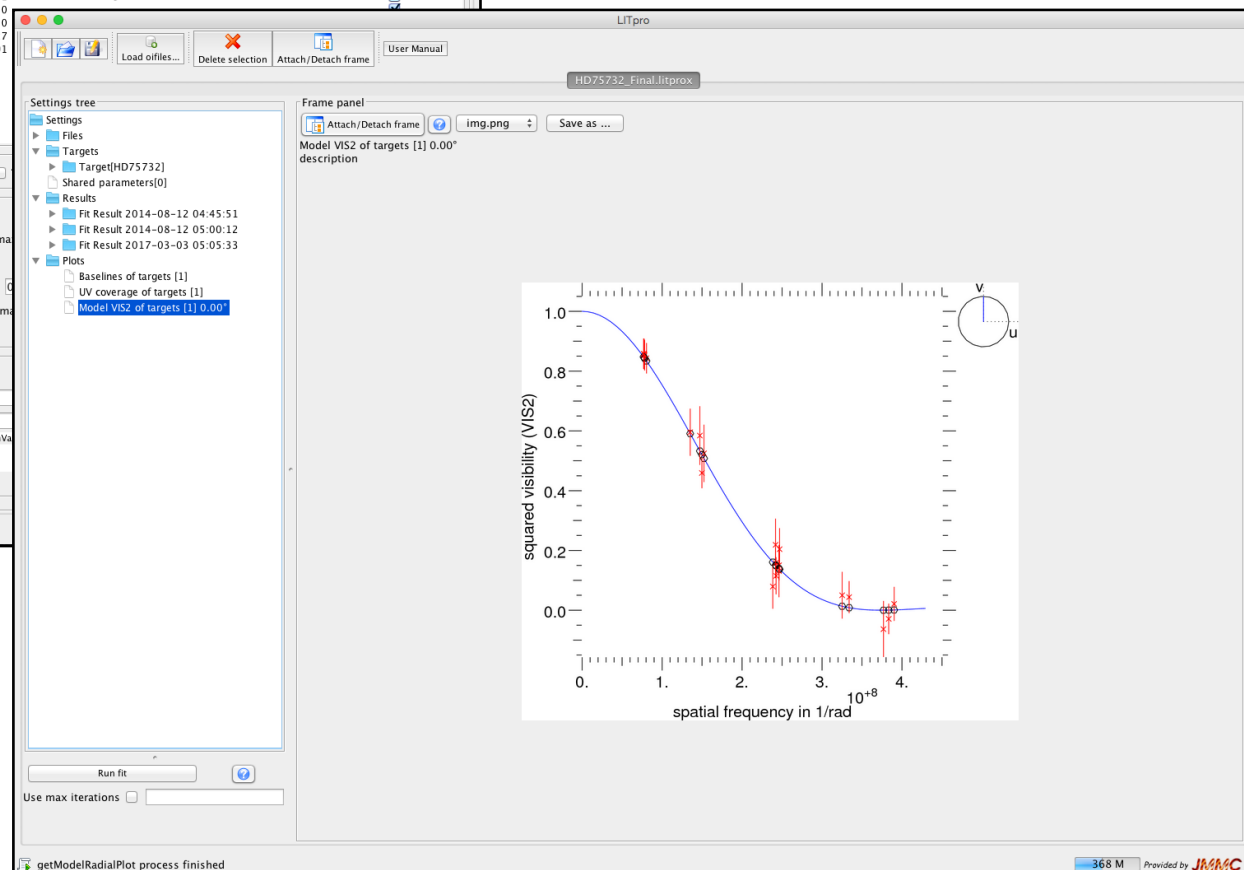
- (Gray) Analytical models (fixed / shared parameters)
- Use Chi2 map to guess initial parameter values
- Run Fit
 - Results: parameters + error bars + chi2
 - Plots (residuals)
- Future:
 - New “global” Fitter coming (gutsy & genetic fitters)
 - User model functions (yorick) to expand existing model functions
 - => astro-physical and polychromatic models

LITpro model fitting

The screenshot shows the LITpro software interface with the following components:

- Settings tree:** A hierarchical view on the left showing 'Settings', 'Files', 'Targets' (with 'Target[HD75732]' selected), 'Shared parameters[0]', 'Results', and 'Plots'.
- Target panel:** Displays 'Ident: HD75732' and a 'Model list' containing 'limb_linear', 'background', 'background_BB', 'circle', 'disk', 'disk_BB', 'disk_polar', 'elong_disk', and 'elong_gaussian'. A 'Selected file list' on the right contains several FITS files.
- Parameters table:** A table with columns: Name, Type, Units, Value, MinValue, MaxValue, Scale, HasFixedValue.

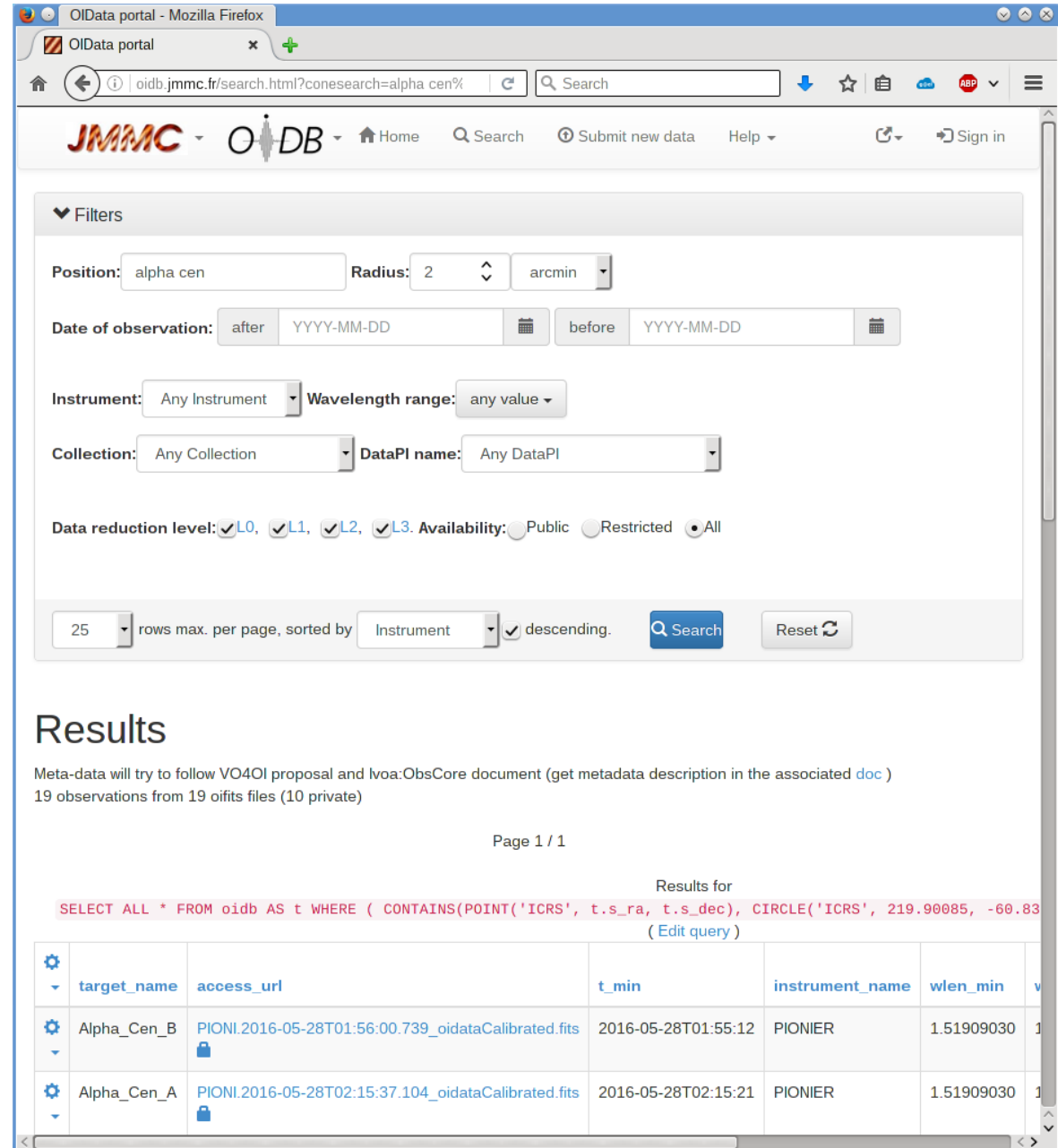
Name	Type	Units	Value	MinValue	MaxValue	Scale	HasFixedValue
limb_linear1.flux_weight1	flux_weight		1		0		<input checked="" type="checkbox"/>
limb_linear1.x1	x	mas	0	0			<input type="checkbox"/>
limb_linear1.y1	y	mas	0	0			<input type="checkbox"/>
limb_linear1.diameter1	diameter	mas	0.727				<input type="checkbox"/>
limb_linear1.a1_coeff1	a1_coeff	mas	0.591				<input type="checkbox"/>
- Plot model panel:** Includes buttons for 'Plot image', 'Plot UV Map', 'Plot Radial', and 'Plot sniffer map', along with input fields for 'xmin' and 'ymin'.
- Plots:** A section with checkboxes for 'Baselines of targets [1]', 'UV coverage of targets [1]', and 'Model VIS2 of targets [1] 0.00*'. The 'Model VIS2' option is selected.



Roxanne Ligi (2016)

OiDB portal:

- Query & download OI data (OIFITS)
- L0 Observation logs
 - CHARA: Classic, Climb, Vega only
 - ESO / VLTI soon
- OIFits files
 - L2 PIONIER
 - L3 Published data
- Future:
 - All CHARA data ?



OIData portal - Mozilla Firefox

OIData portal

oidb.jmmc.fr/search.html?conesearch=alpha cen%

JMMC - OiDB - Home Search Submit new data Help Sign in

Filters

Position: alpha cen Radius: 2 arcmin

Date of observation: after YYYY-MM-DD before YYYY-MM-DD

Instrument: Any Instrument Wavelength range: any value

Collection: Any Collection DataPI name: Any DataPI

Data reduction level: L0, L1, L2, L3. Availability: Public Restricted All

25 rows max. per page, sorted by Instrument descending. Search Reset

Results

Meta-data will try to follow VO4OI proposal and Ivoa.ObsCore document (get metadata description in the associated doc)
19 observations from 19 oifits files (10 private)

Page 1 / 1

Results for

```
SELECT ALL * FROM oidb AS t WHERE ( CONTAINS(POINT('ICRS', t.s_ra, t.s_dec), CIRCLE('ICRS', 219.90085, -60.83
```

(Edit query)

	target_name	access_url	t_min	instrument_name	wlen_min	wlen_max
	Alpha_Cen_B	PIONI.2016-05-28T01:56:00.739_oidataCalibrated.fits	2016-05-28T01:55:12	PIONIER	1.51909030	1.51909030
	Alpha_Cen_A	PIONI.2016-05-28T02:15:37.104_oidataCalibrated.fits	2016-05-28T02:15:21	PIONIER	1.51909030	1.51909030

Last word...

- Visit jmmc.fr
- Feedback is welcome:
 - Bug reports
 - Enhancement requests
 - User support

Thank you for your attention