CHARA Community Workshop
2017/03/15 - Pasadena

Observation preparation & data analysis Tools

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REF: JMMC-PRE-0000-0024

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

aspro

Reduce data

amdlib

pndrs

View Data

OIFits explorer

Fit Models

LITPro

New!

CDS Catalogs

+ Training

+ User Support

+ OLBIN forum And Publications

JSDC

JMDC

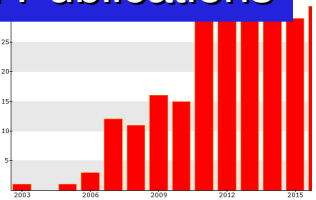
OiDB

L0 to L3 DataBases

New!

Reconstruct Images

OImaging



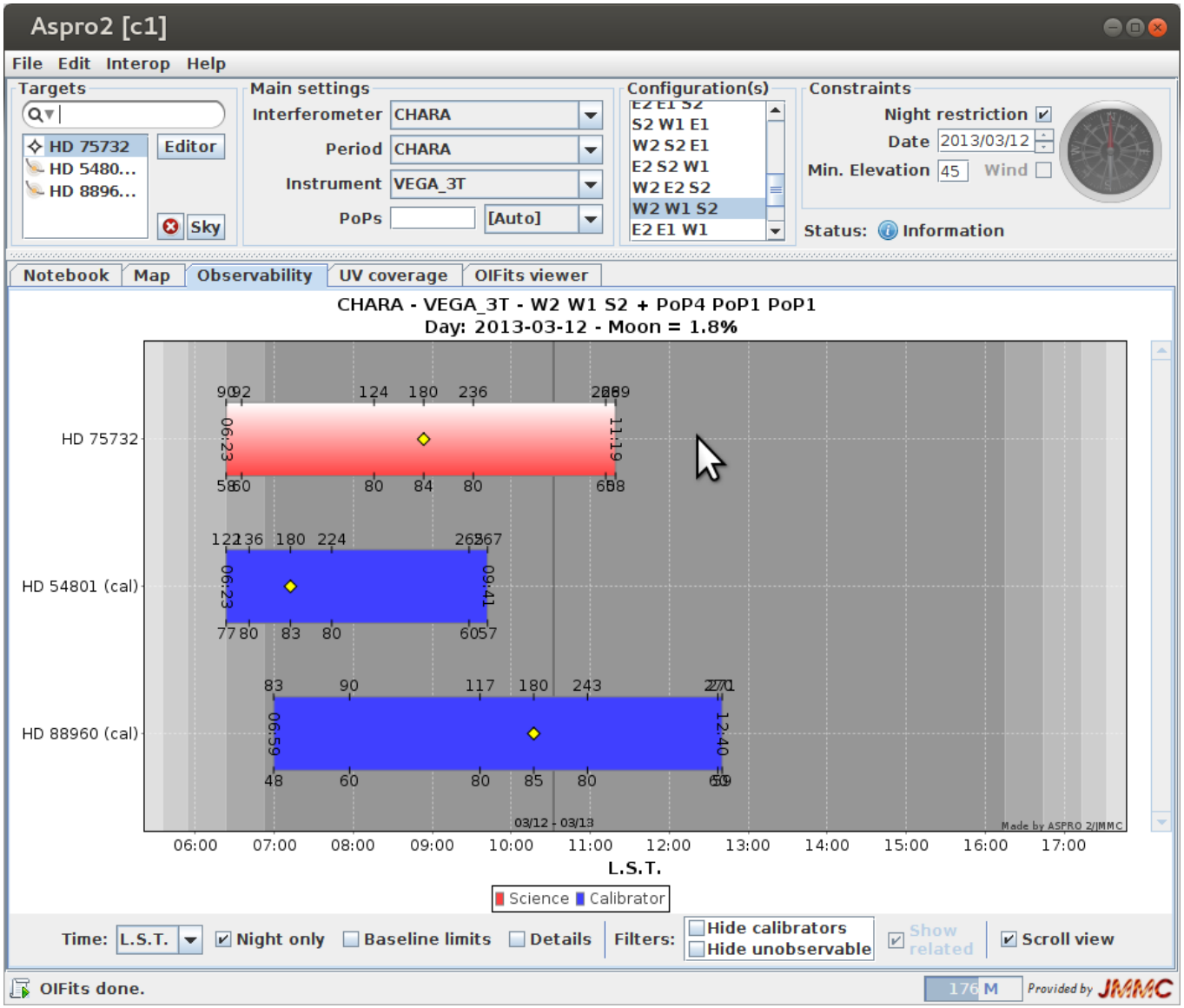
2(CHARA C

ASPRO 2: Feature overview

- ASPRO 2 Page: download / doc
- Observation preparation = VLTI / 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 OImaging …
  - Export OB (VLTI, VEGA) to be generalized

ASPRO 2: Observability

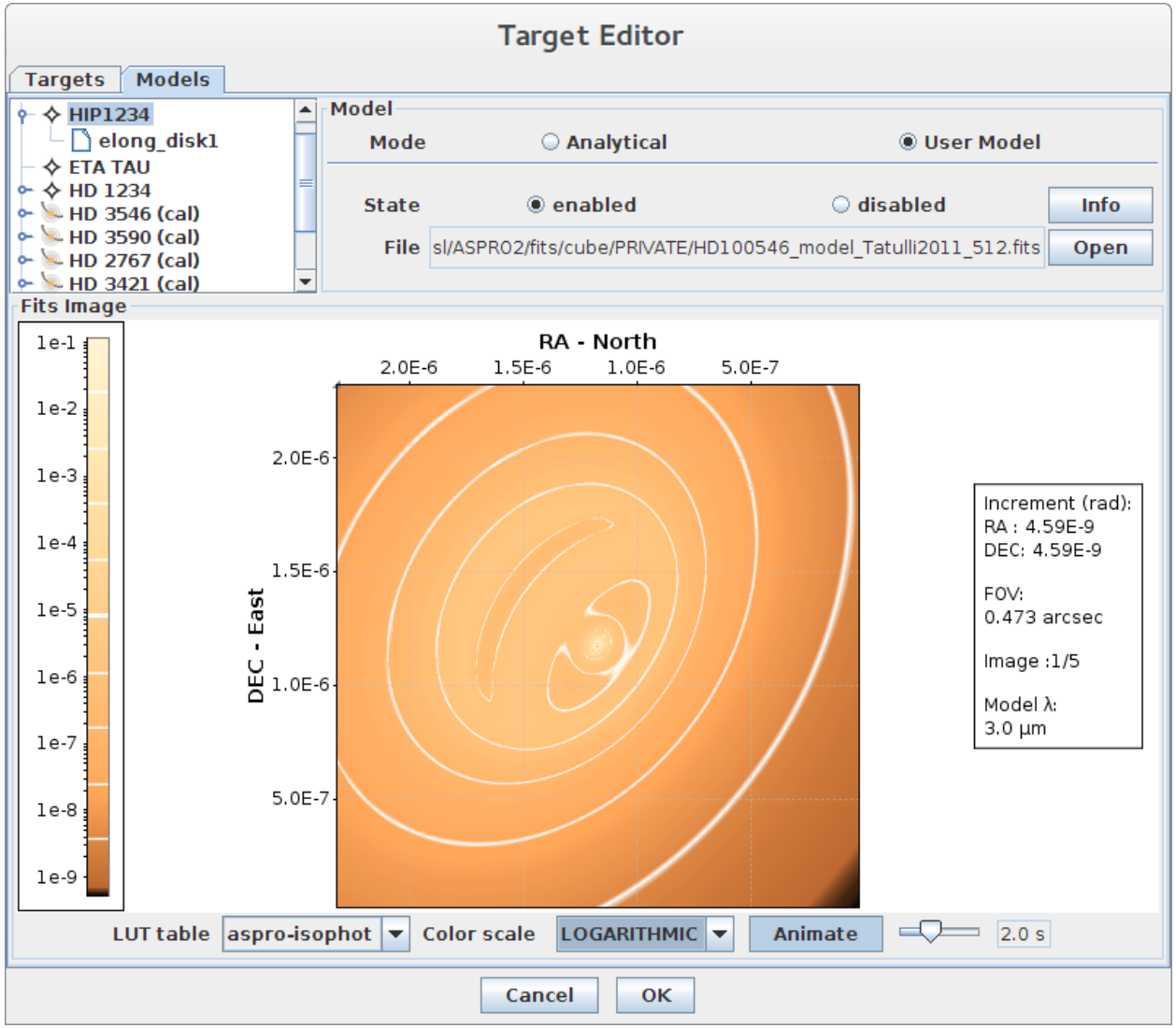


Observation =

Targets, array & instrument setup, baselines...

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

ASPRO 2: Target Editor

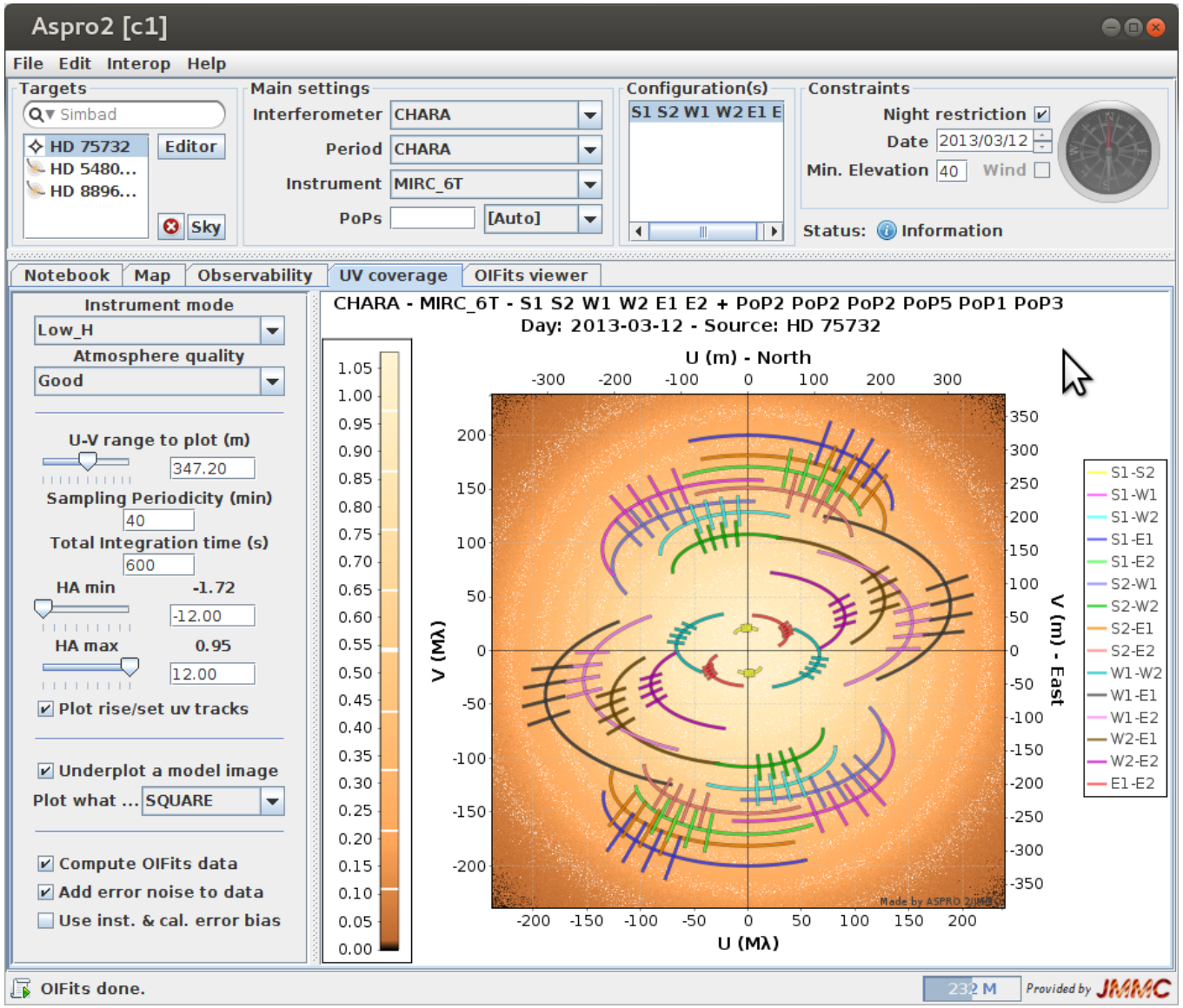


Target information:

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

Fits cubes for polychromatic models

ASPRO 2: UV Coverage



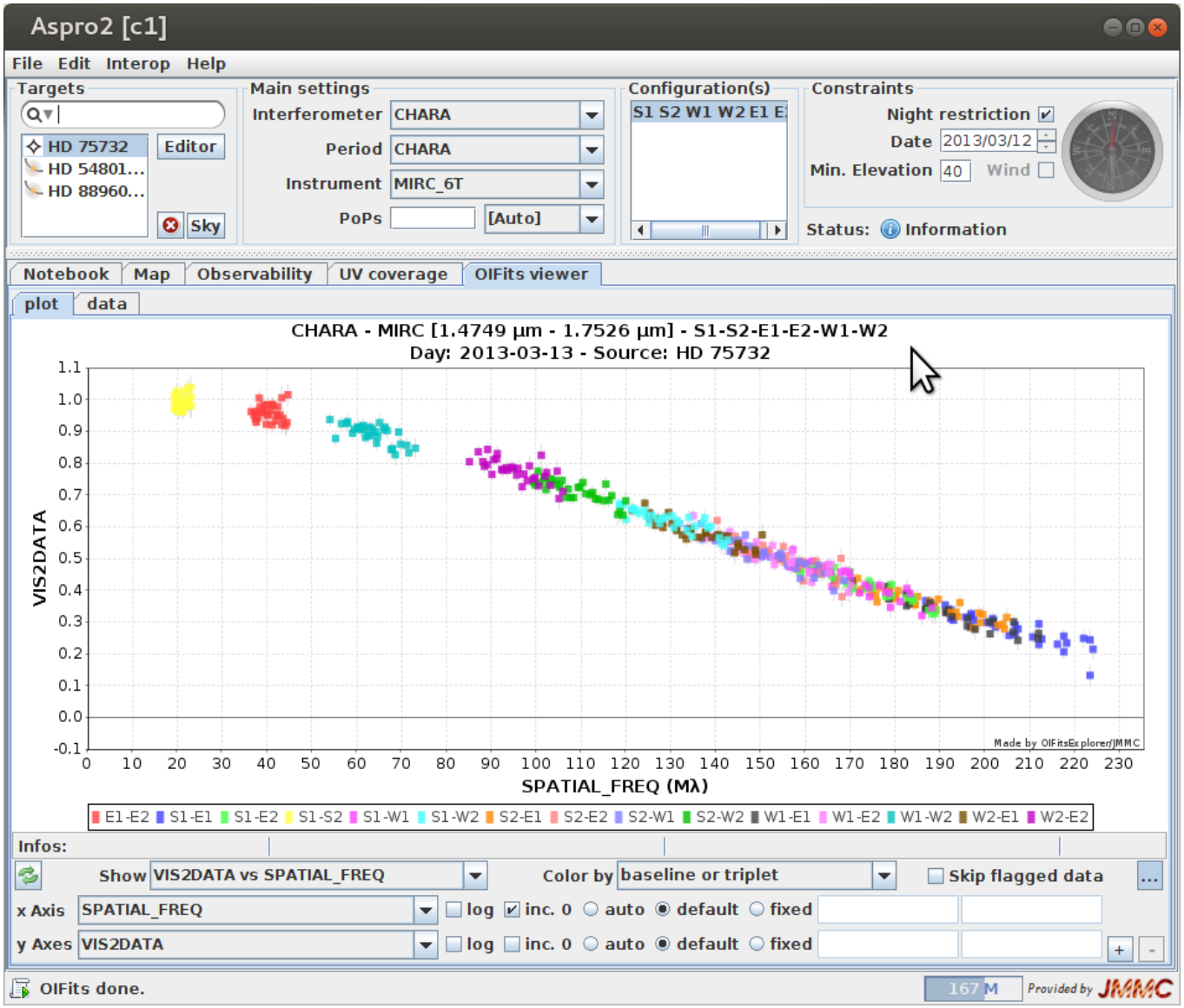
UV Plot for MIRC 6T LOW_H mode with a disk model

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:

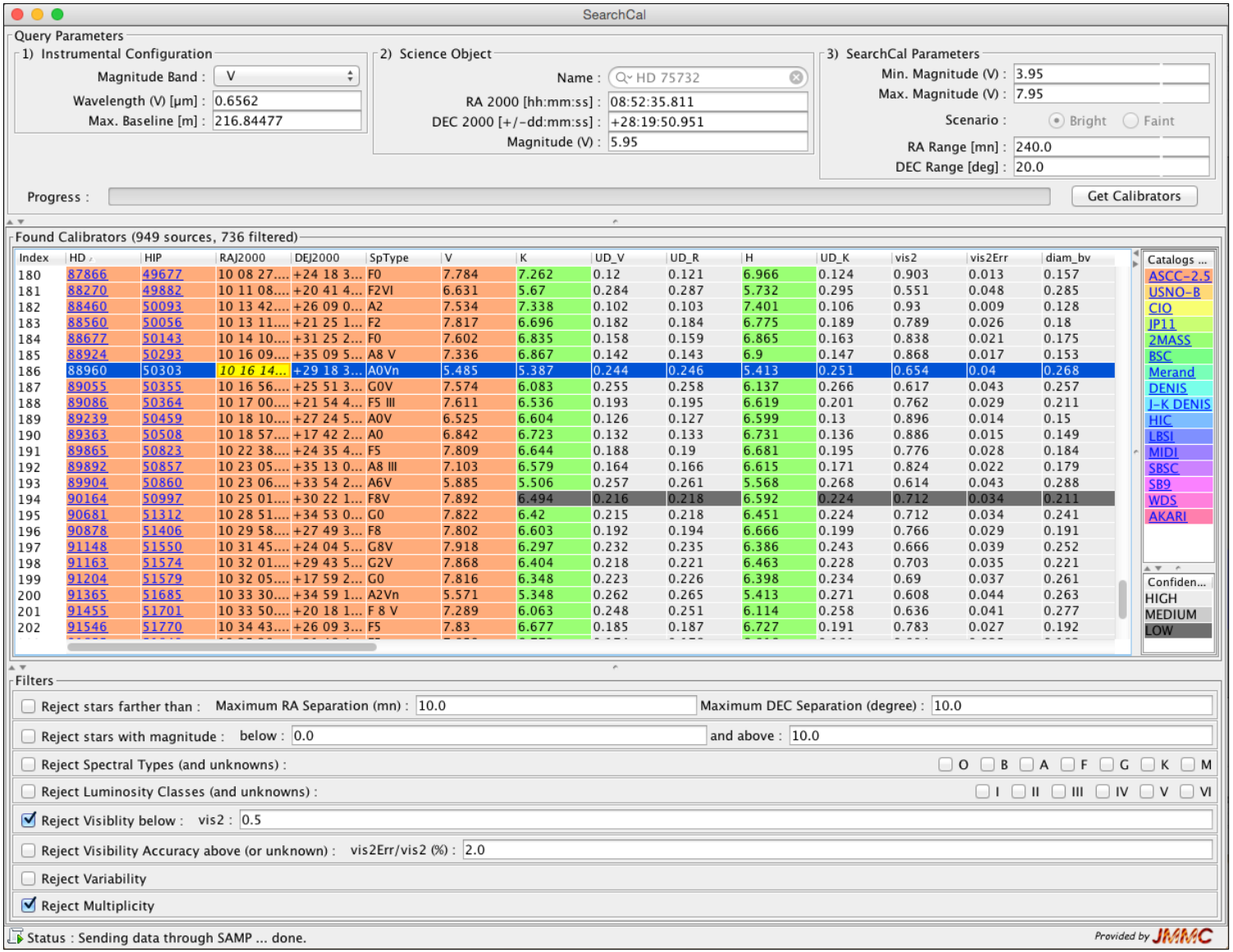
- Target photometry
- Atm. transmission
- Instrument parameters

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

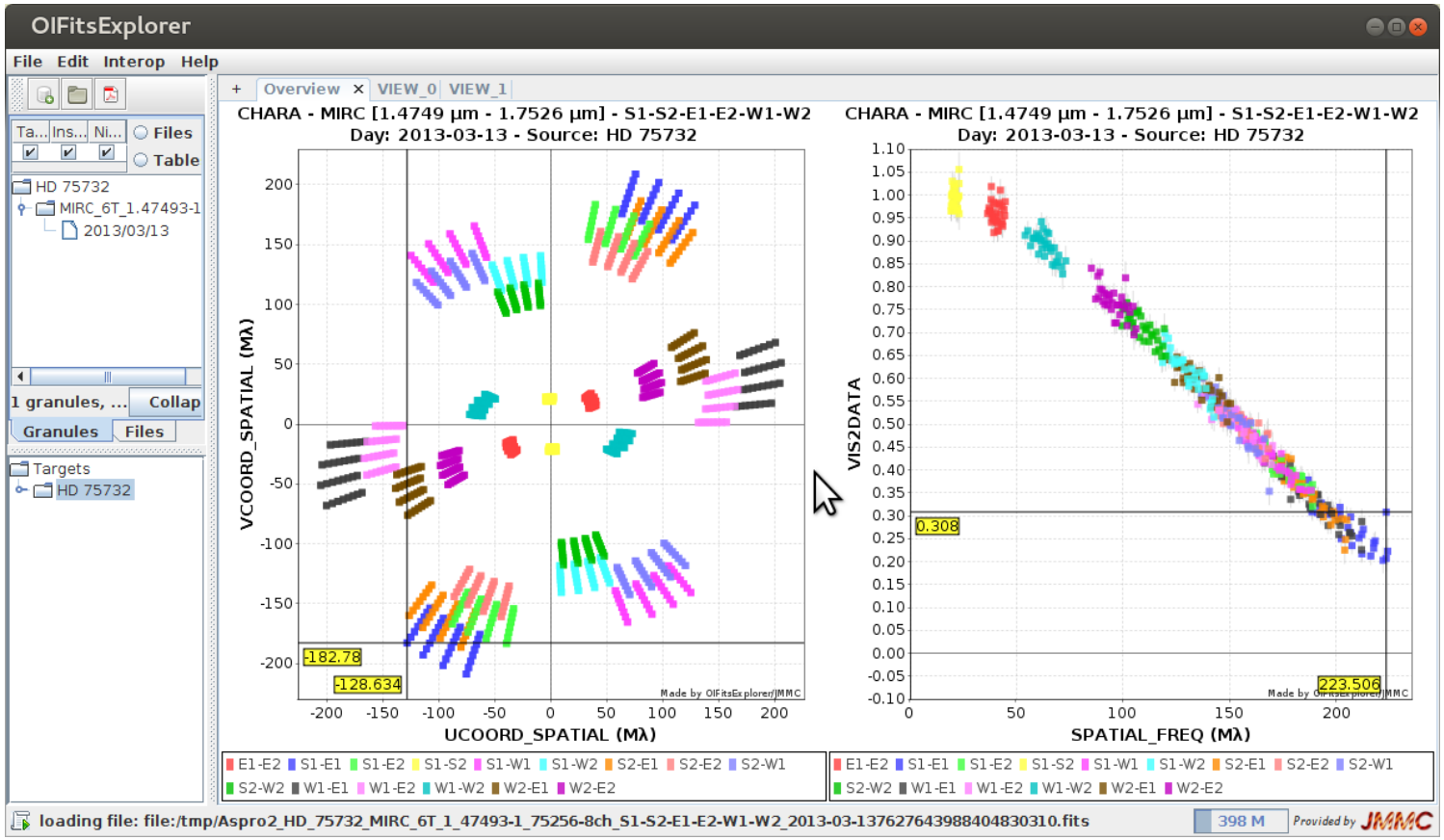

SearchCal
Query Parameters
1) Instrumental Configuration
Magnitude Band : V
Wavelength (V) [µm] : 0.6562
Max. Baseline [m] : 216.84477
2) Science Object
Name : HD 75732
RA 2000 [hh:mm:ss] : 08:52:35.811
DEC 2000 [+/-dd:mm:ss] : +28:19:50.951
Magnitude (V) : 5.95
3) SearchCal Parameters
Min. Magnitude (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... F2VI 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 88677 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
Catalogs ...
ASCC-2.5
USNO-B
CIO
JP11
2MASS
BSC
Merand
DENIS
J-K DENIS
HIC
LBSI
MIDI
SBSC
SB9
WDS
AKARI
Confiden...
HIGH
MEDIUM
LOW
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 Visiblity 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

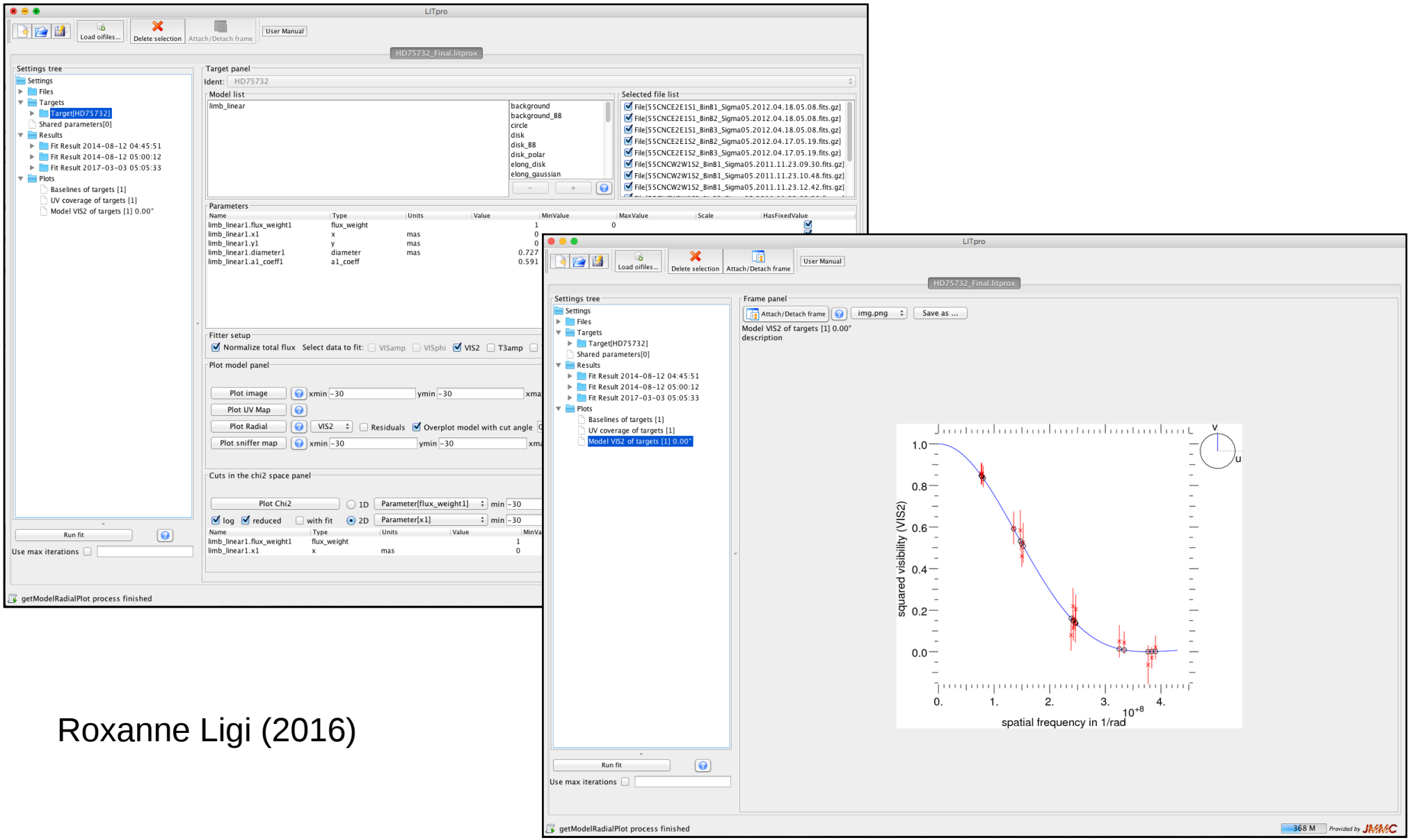
LITpro GUI Page: download / doc / tutorials

- (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

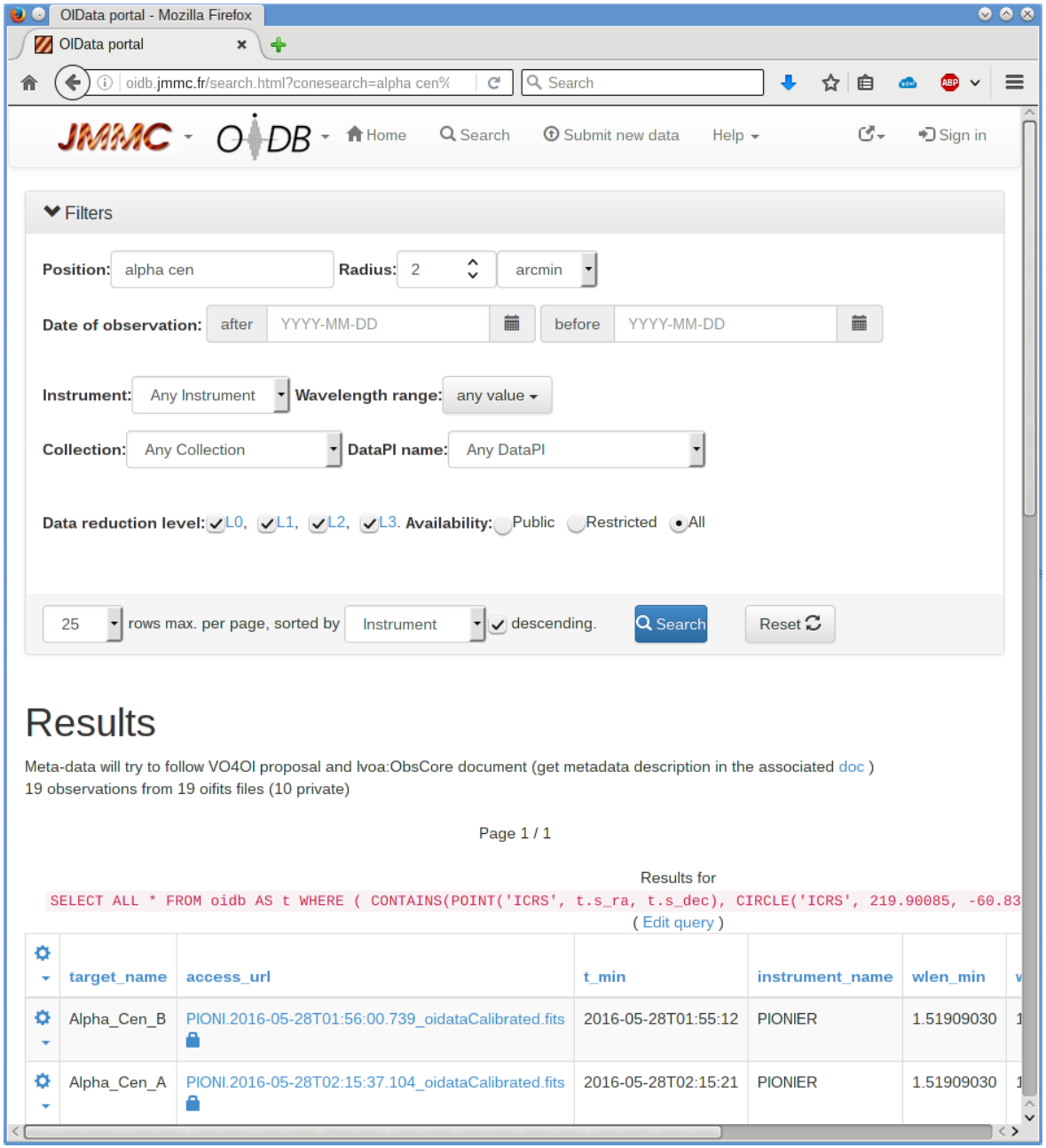
LITpro model fitting



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 ?



Last word...

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

Thank you for your attention