"We interfere construtively"

JMMC Updates 2024

Laurent Bourgès on behalf of the JMMC extended team

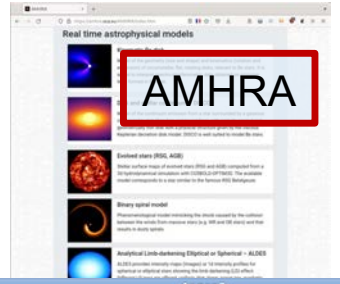
Guillaume Mella, Gaspard Duchêne

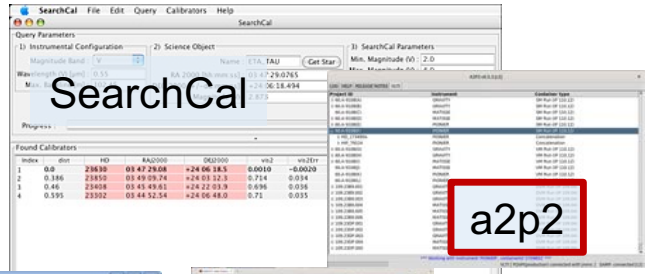
Jean-Philippe Berger, Alexis Matter & Isabelle Tallon-Bosc

2024.03.13 @ Tucson, arizona

JMMC Services

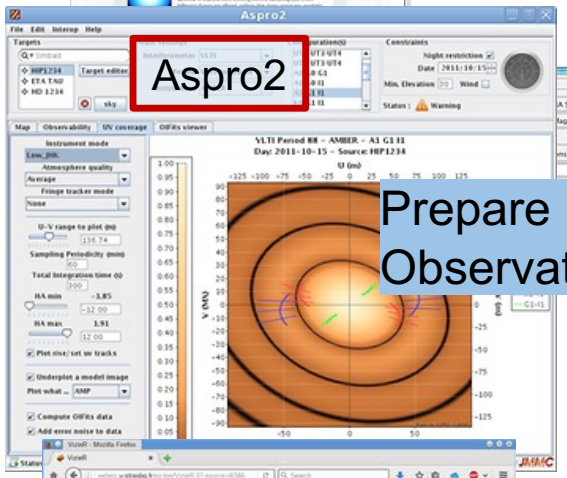
+ Expertise Center
  User Support
+ Training
+ OLBIN publications

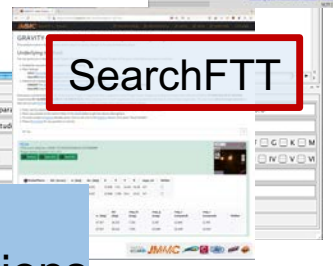




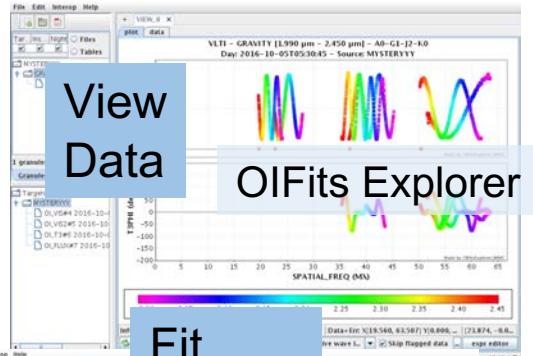
Reduce data

- amdlib
- pndrs

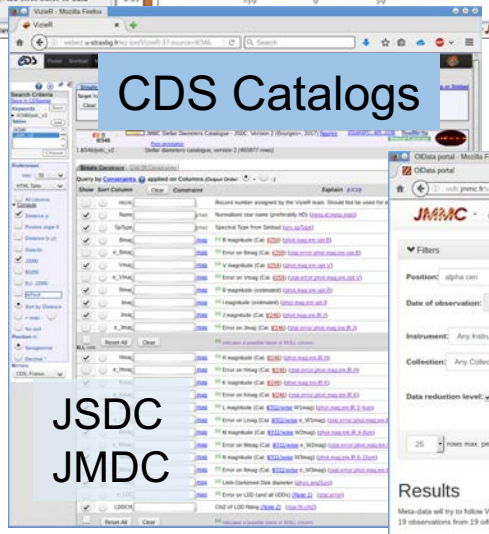


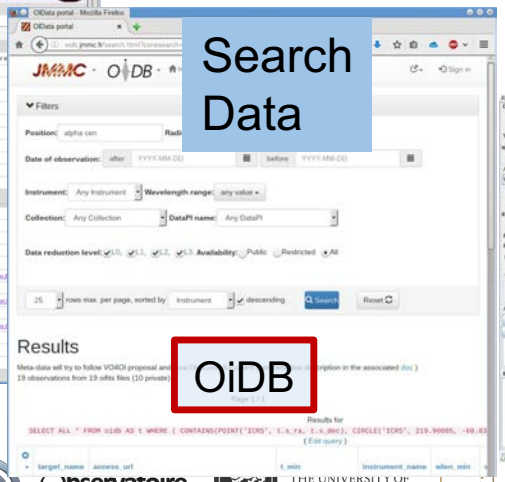


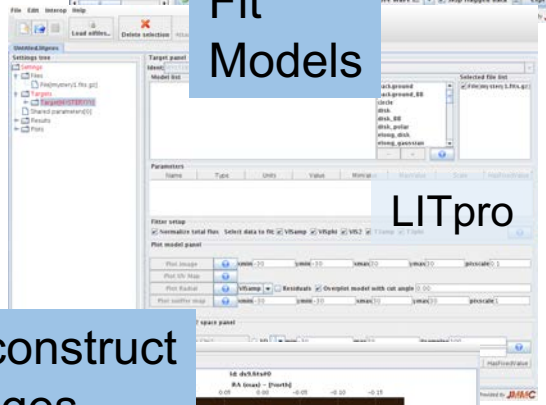
Prepare Observations

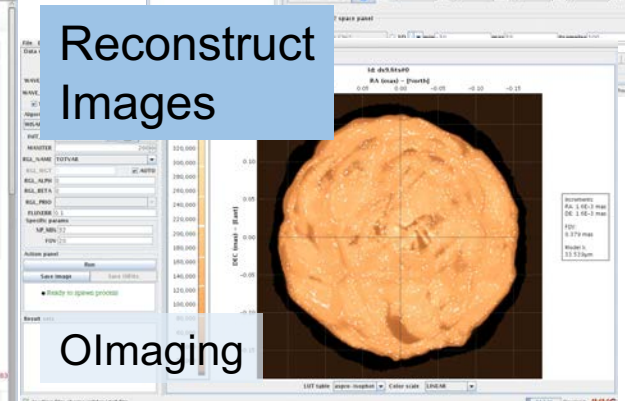


VO SAMP









Georgia State University · NSF · NOIR Lab · l'Observatoire de Paris – LESIA · University of Michigan · Observatoire de la Côte d'Azur · The University of Sydney · Australian National University · Kyoto Sangyo University · University of Exeter

News

- Great VLTI School in June 23 (Budapest), ***next in Porquerolles Island (France), Sep 22-28 2024 !***

- Gaspard Duchêne joined in late 2023 to take the scientific leadership on OiDB & JMMC databases

- Human resources involved: (small team but wonderfull)
  - Engineers: 1.3 FTE
  - JMMC Services & User support: 1.2 & 0.7 FTE

- New tutorials (Myriam Benisty):
  - https://www.jmmc.fr/english/training/tools-tutorials/

- Release page:
  - https://releases.jmmc.fr/

Outline

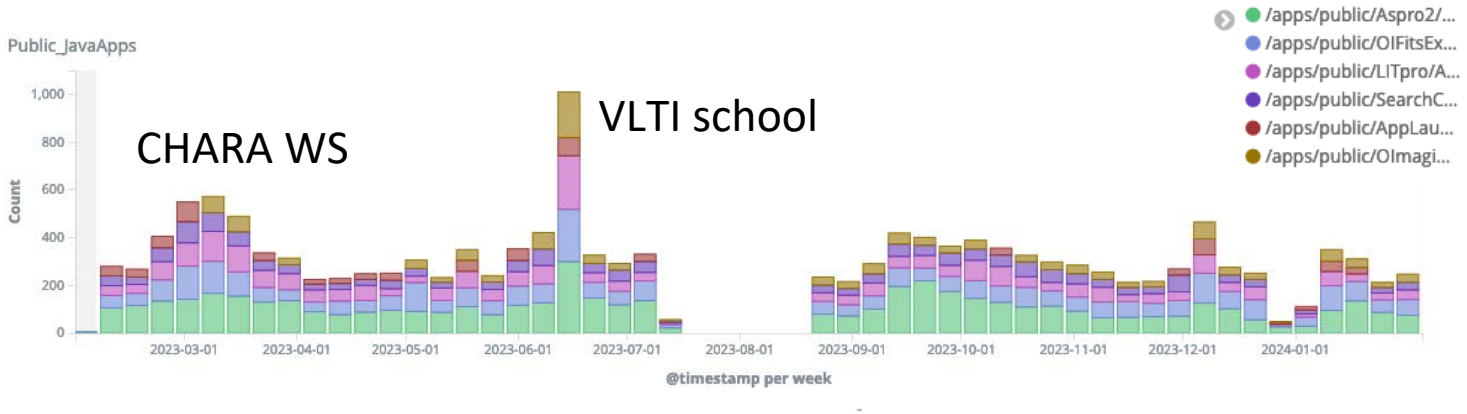
- Major service Updates
- JMMC Roadmap for 2024
- CHARA support actions & longer-term perspectives

Reminder: JMMC 'Open' strategy (license):

- Public money = public code (GPL)
  - https://github.com/JMMC-OpenDev
- Open Data (FAIR)

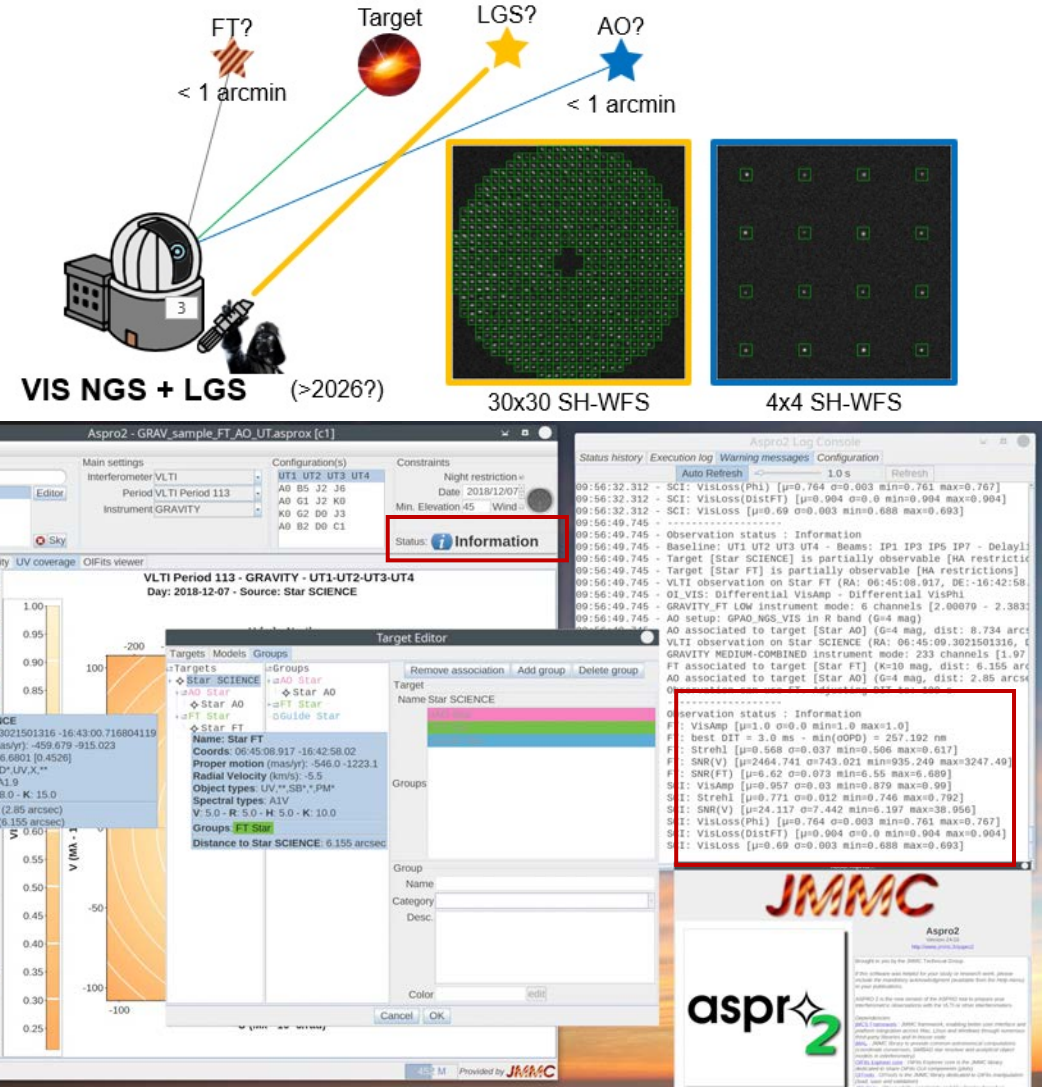
"We interfere construtively"

- Statistics still high:

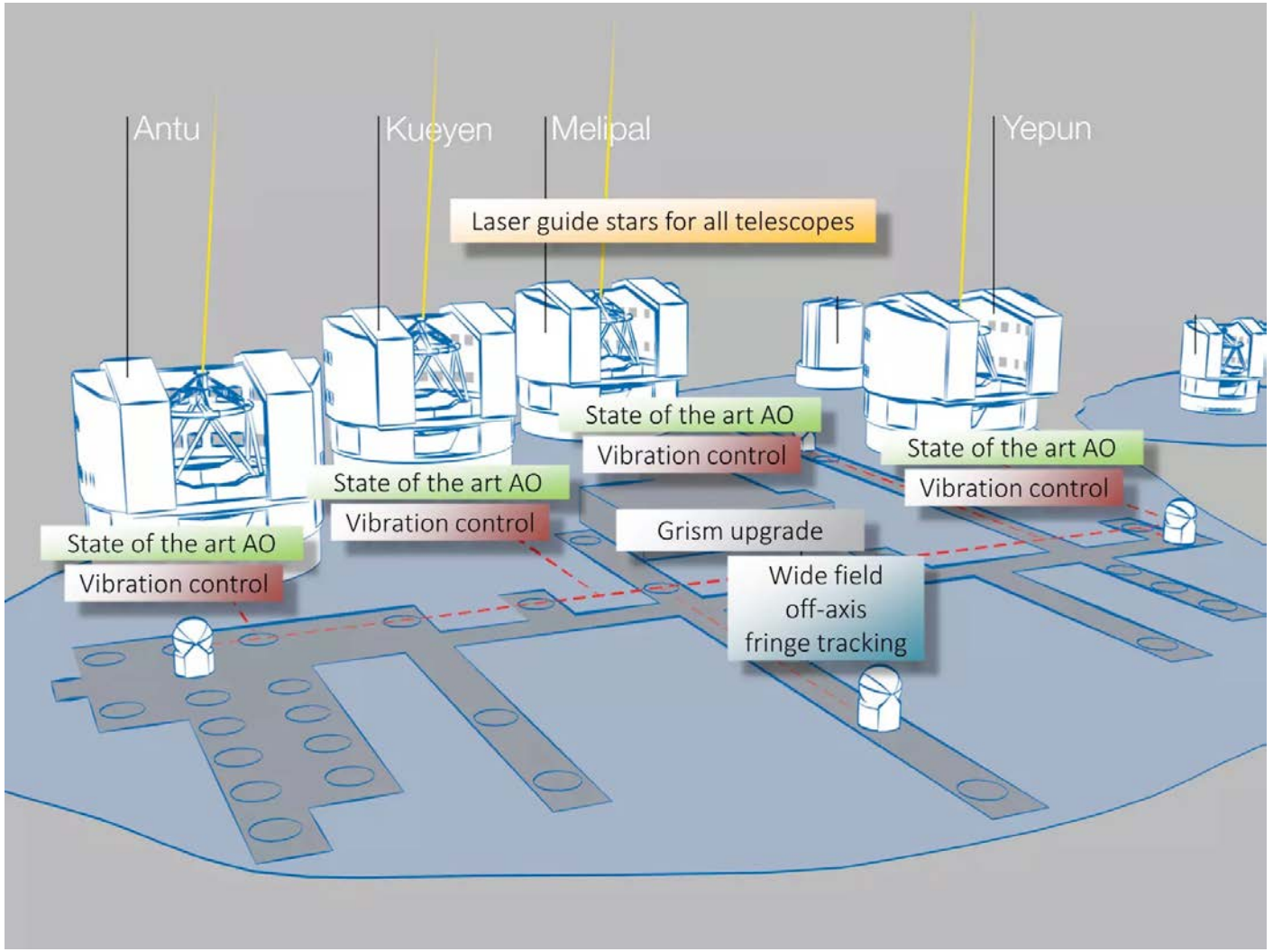


Preparing for GRAVITY+

- Massive challenge
  - **Aspro2:** allow the user to handle science, adaptive optics and fringe tracking targets potentially different
  - **Aspro2:** integrate a proper noise model of GPAO the off-axis adaptive optics and fringe tracking mode (inputs from T. Shimizu, A. Berdeu, J-B. Le Bouquin)
  - **Aspro2:** integrate the fringe tracking jitter on the science instrument noise for GRAVITY & MATISSE (GRA4MAT)



Preparing for GRAVITY+



GPAO (UTs):

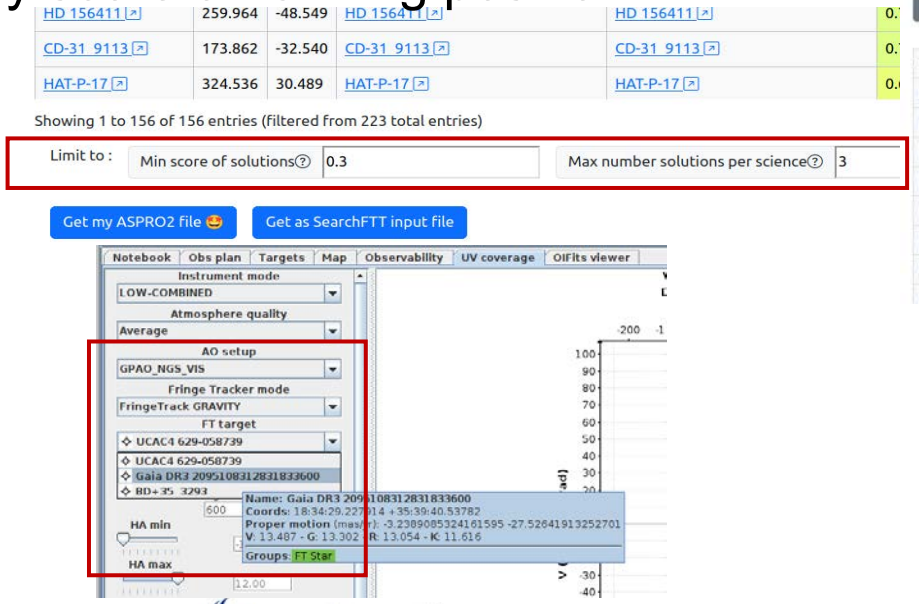
- NGS VIS in 24.08
  - R band, 1300 act.
- LGS in 2026:
  - 4 Laser guide stars
  - Fast AO + low Tip-tilt correction

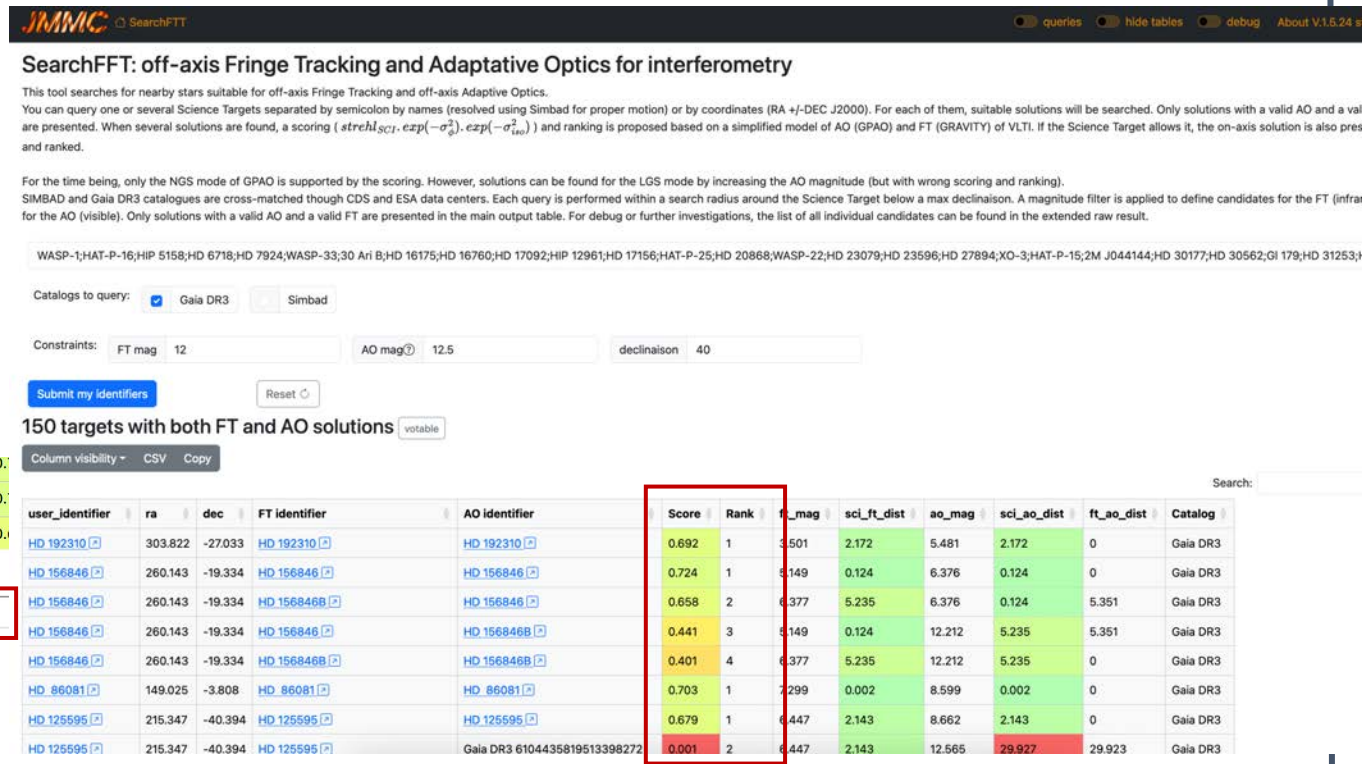
Preparing for GRAVITY+

- Massive challenge
  - **SearchFTT:** new tool to search

for proper FT and AO stars

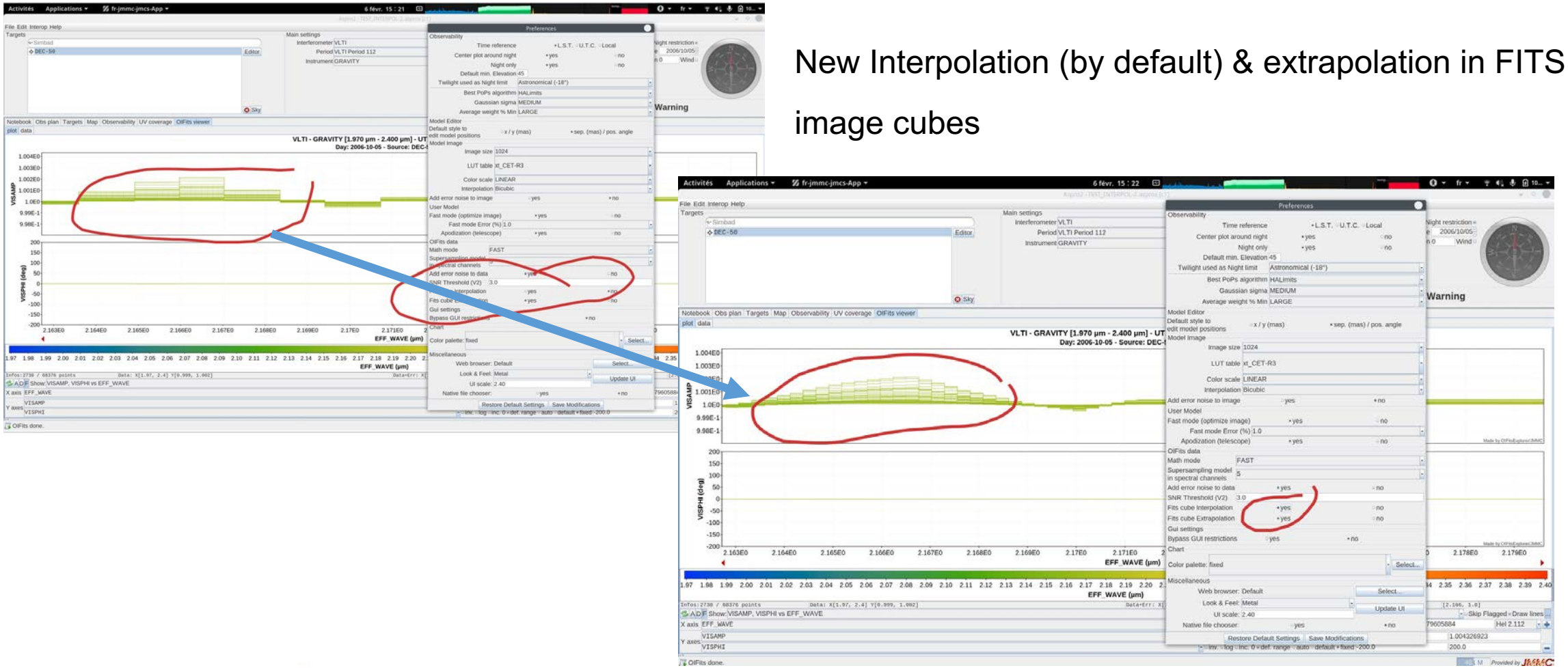
  - Compute and filter hundreds of targets
  - By score or ranking position:





https://searchftt.jmmc.fr

Aspro2: a better handling of spectral resolution

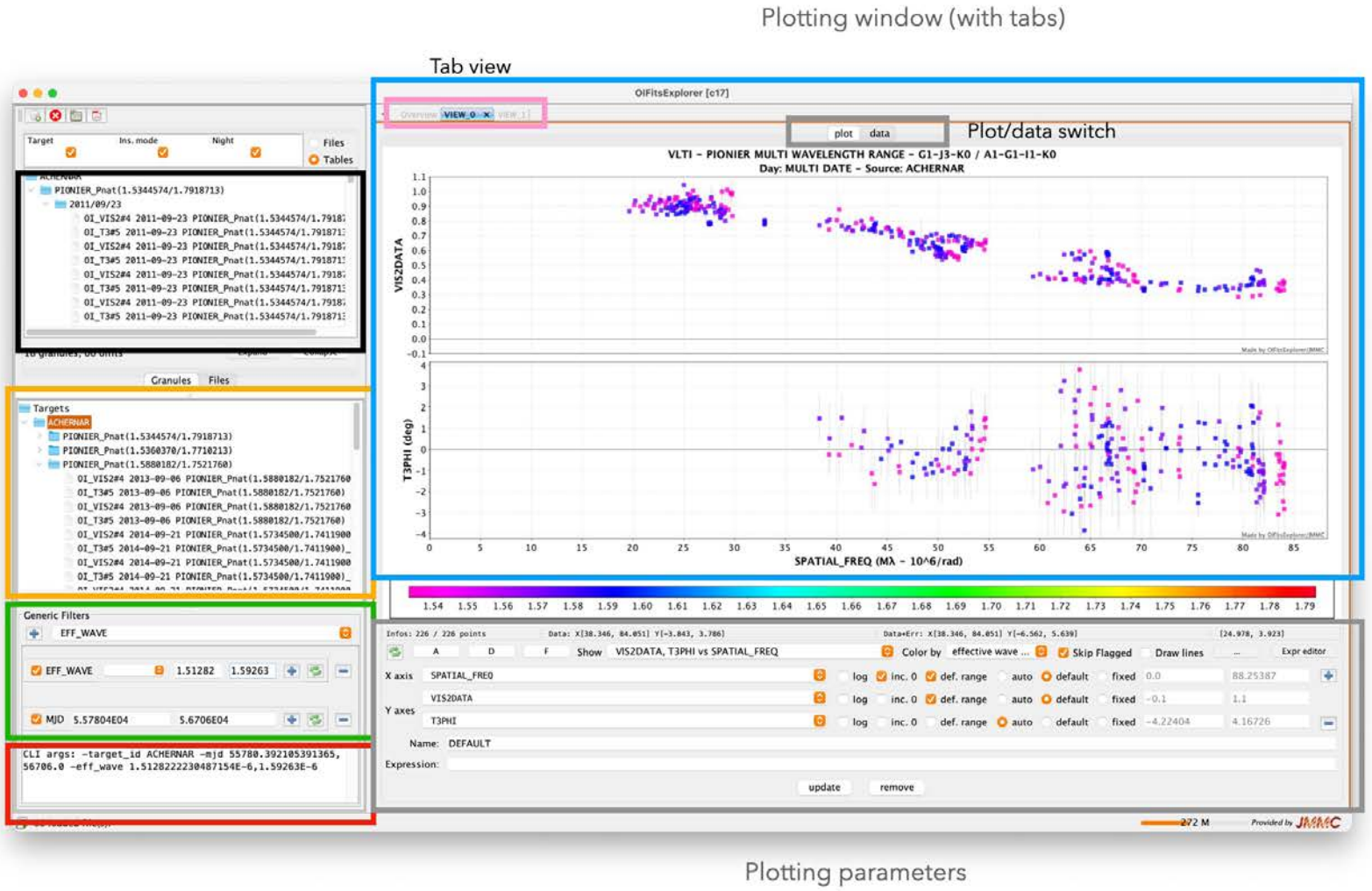


New Interpolation (by default) & extrapolation in FITS image cubes

OIFits Explorer

- No major change in 2023

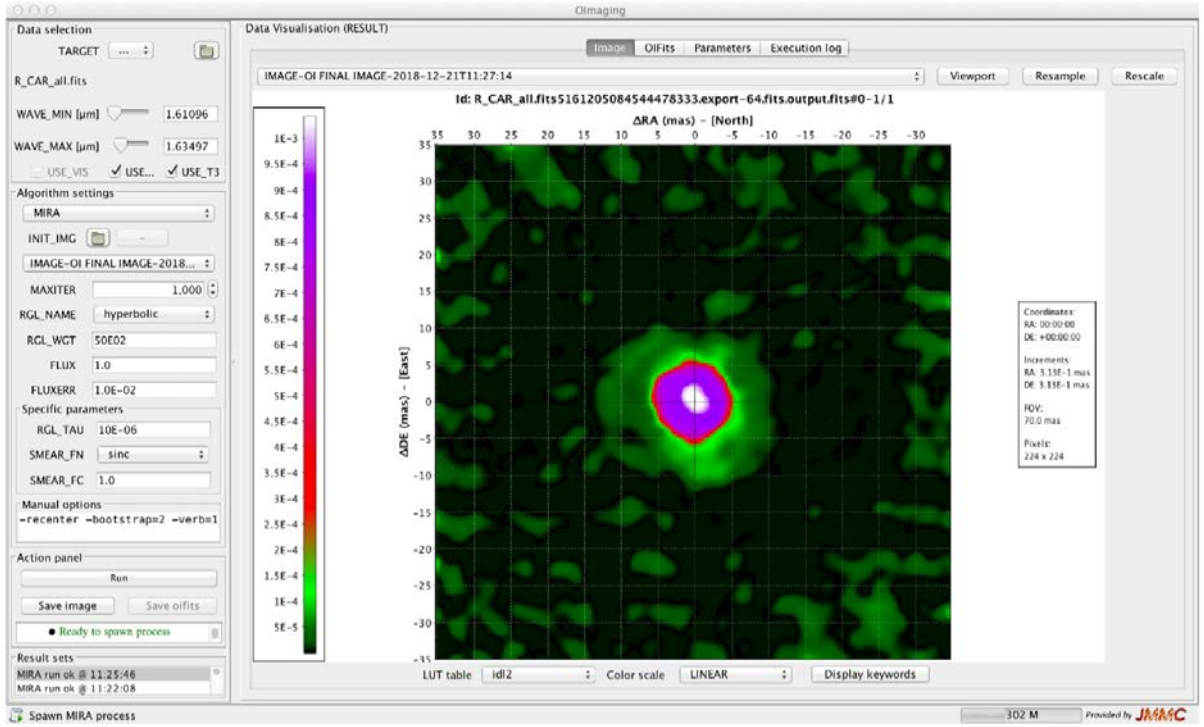
Fixed U-V plot orientation !



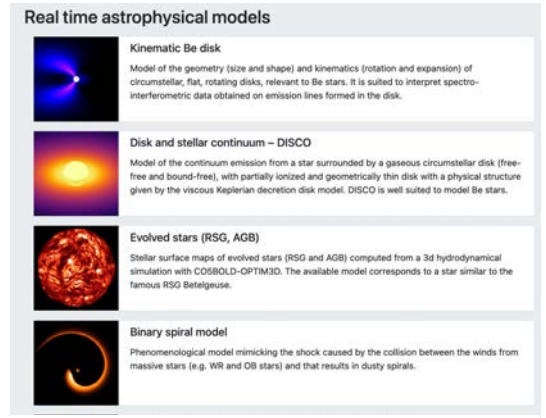
OImaging

- No developments in 2023
- Little community feedback

=> need to understand use and limitations to prioritize next steps



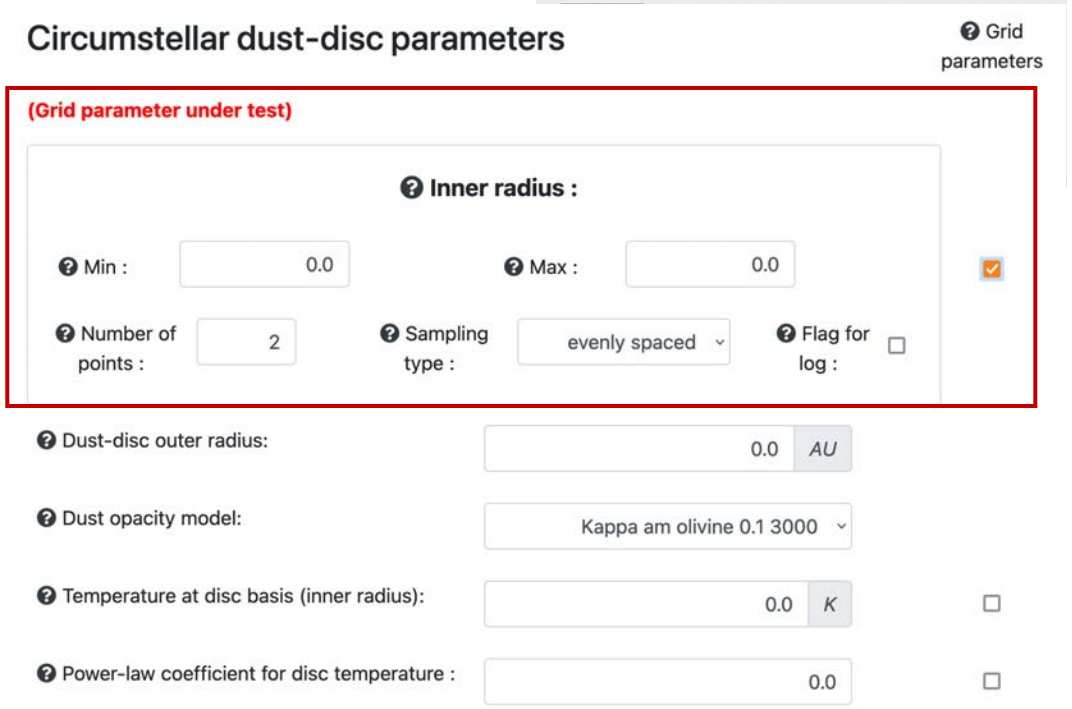
AMHRA



- Generate (semi)-parametric astrophysical model images (grid) and send them to Aspro2 → OiFitsExplorer → Oimaging

- New YSO disk model with temperature profile:
  - Possibility to explore grid parameters and generate a cube of images
  - Batch mode offered

- Open to new models suggestions !



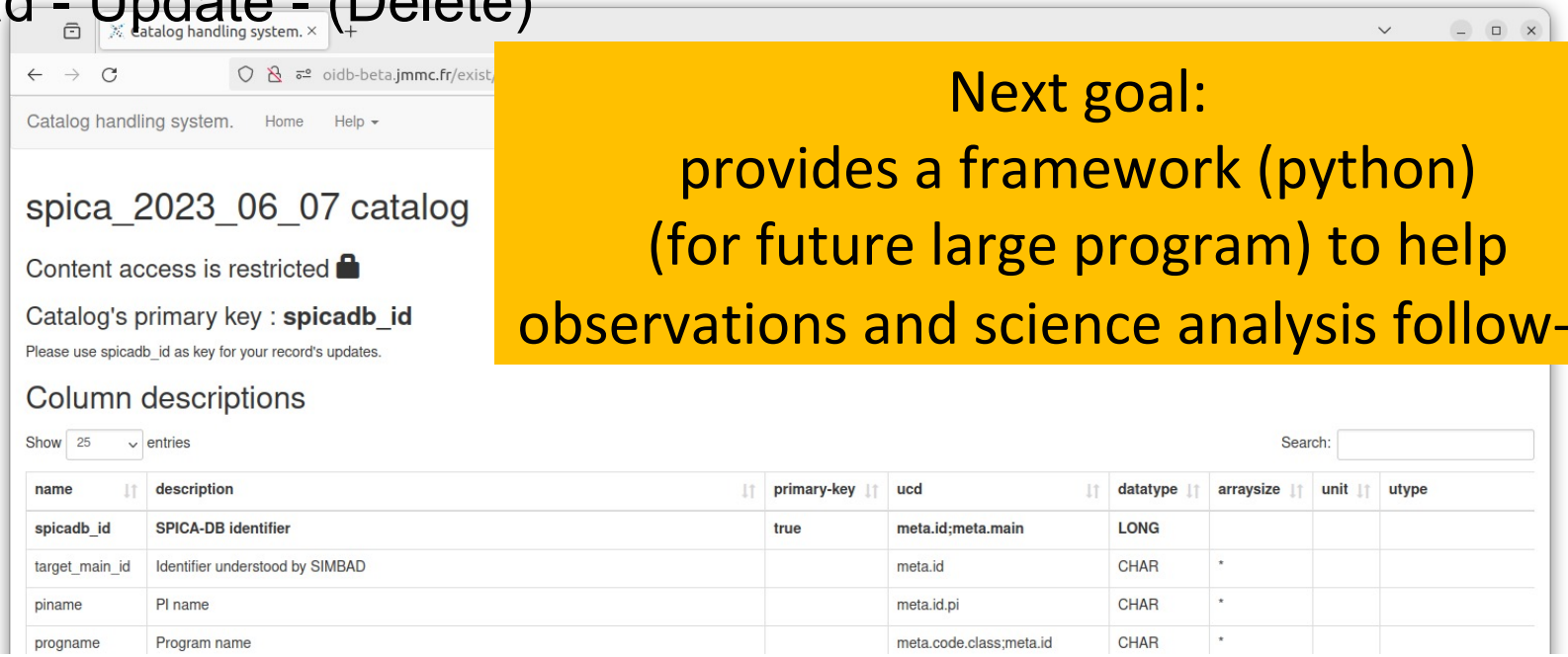
SPICA-DB in a nutshell

Adapt, develop missing building blocks for a synergistic solution

- Enhance data interchange between systems for a better interoperability (VO spirit)
- Offer collaborative catalogs and provide APIs for distributed content management: CRU(D) : Create - Read - Update - (Delete)

Involved JMMC services:

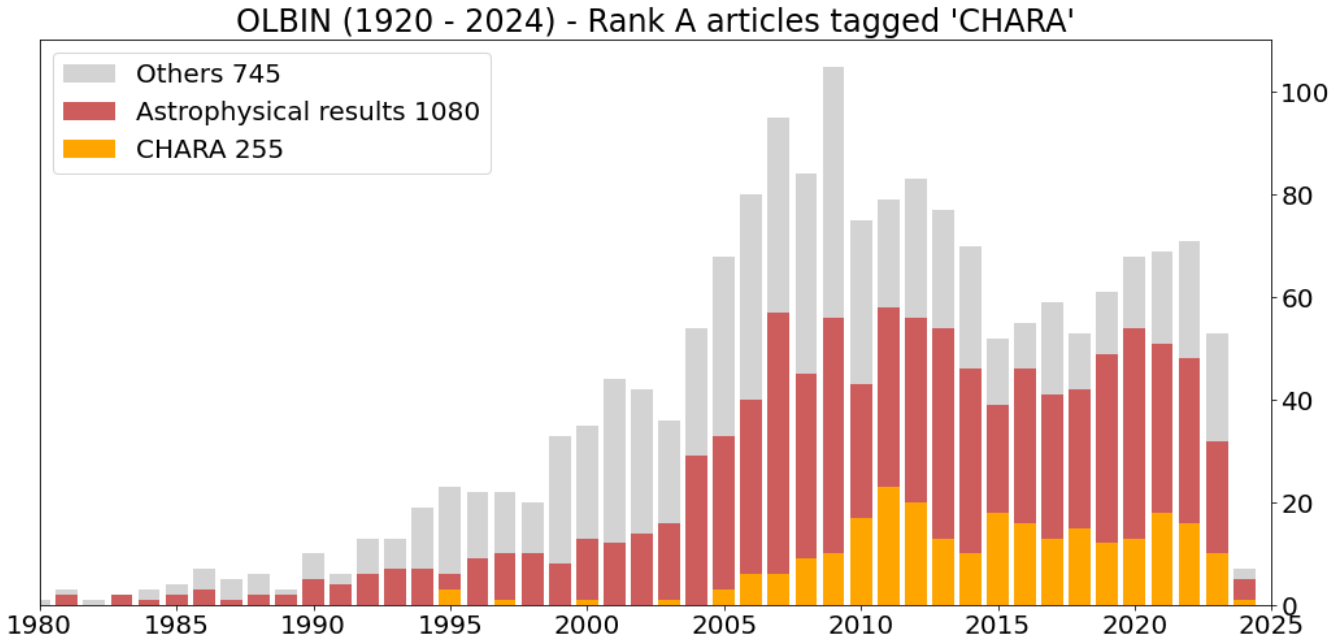
- Catalog API (spica-db, calibrators) delegation support
- ObsPortal (obs log)
- OiDB (remote public/under embargo L1 L2, TF, quality plots...)
- BadCal
- JMDC, JSDC 2 / 3 (coming)
- a2p2 → SPICA server (python REST server)
- ASPRO2 interoperability (SAMP)



Next goal:
provides a framework (python)
(for future large program) to help observations and science analysis follow-up

Publications.OLBIN.org

- Curation/tagging on a monthly basis
- 1800+ refereed ADS articles
  - new interferometric results
  - Observational, theoretical, experimental or technically related to Interferometry
  - Direct, Heterodyne, Intensity, Nulling and **Aperture Masking Interferometry (new)**
- Useful for paper reviews ?
- Minor UI changes :
  - Search for publications related to a your targets
  - Export or explore form results in ADS



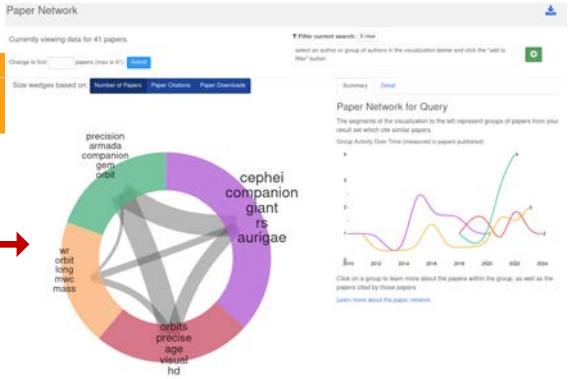
Tags used to search into the publication database : **CHARA** and **Binary and multiple stars**

Query of the publication database search : **Schaefer**

41 matching articles (view on ADS)

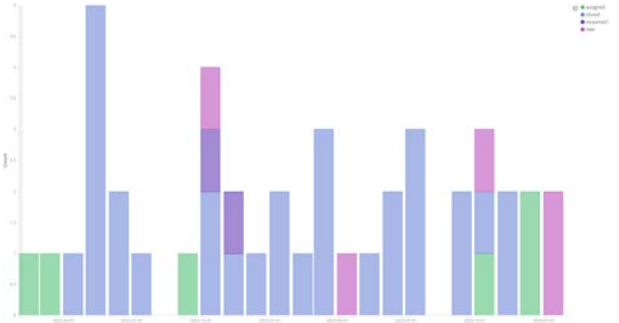
Astrophysical results (41)

YEAR 2024



JMMC User Support

- Historically 1 mailing list: jmmc-user-support@jmmc.fr
- Feedback form: https://apps.jmmc.fr/feedback/
- VLTI (French) Expertise Center:
  - See https://www.jmmc.fr/english/user-support/expertise-center/
  - preparation of observing proposals and observations
  - GRAVITY and MATISSE data reduction => new OIDB datasets
  - data analysis using model fitting and image reconstruction software



Support requests (22-now)

Since early 2024 all support requests & bug reports are supervised by the JMMC SUV service to improve response time & deal with all incoming requests.

JMMC short term (1yr) Roadmap

- **Aspro 2:**
  - Finalize integration of Gravity+ and GRAVITY for MATISSE (including LGS with A. Berdeu, J.B.Le Bouquin)
  - Integrate LITpro analytical models with blackbody temperature
- **Aspro2/a2p2:**
  - Link between Aspro2 and Cosmic Debris (CHARA)
- **OIFitsExplorer:**
  - Better ergonomy to deal with data units / files / granules
- **Oimaging:**
  - Propose a set of standard metrics to compare the quality of image reconstruction (E. Thiébaut)
  - Integrate a standard beam estimation (F. Soulez)
- **JSDC 3 / SearchCal**
  - Integration of mid-infrared photometry and infrared excess information (Pierre Cruzalèbes)
- **AMHRA**:
  - generalize to all models the possibility to generate model grids
  - New models ?
- **LITpro:** development frozen
- **BadCal**: enrichment + interrogation by other tools (e.g SearchCal, Aspro2)

JMMC & CHARA "Backlog"

- Aspro2 → a2p2 → Cosmic Debris integration
- Proper modeling of the instruments (including AO)
- Taking into account fringe tracking
- Automatic optimization of POPs
- Providing a POP-free sky coverage (overall coverage)
- Specific needs for 7T operation ?
- Checking the JMDC data base with CHARA diameters
- Continue to feed BadCal & OiDB

We need CHARA inputs & define priorities (best-effort) !

JMMC & community longer term roadmap

- **OIDB:** help feeding the archive (see Gaspard's talk), provide DOIs or permanent links for publications, collections & collaborative session
- **ASPRO2:**
  - Allow multiple instrument management
  - New ASGARD suite instruments (including NOTT nuller)
  - Model "blocs" in Aspro2
  - Enable large program management (inspired by SPICA)
- **Diameters / JSDC:**
  - JSDC4: precision stellar diameters (SPICA & GAIA) ?
- **AMHRA:** enrichment of models astrophysical ?
- Standard SCI-CAL calibration tool
- Diameter estimation from user-provided photometry
- Data reduction, model fitting, precision interferometry workshop: harmonization of approaches ?

CHARA meetings: a rich source of new ideas !
Priorities are open to discussion !

Contact US

- JMMC Issues on github https://github.com/JMMC-OpenDev/
- Email: jmmc-user-support@jmmc.fr

Thanks for your attention!