

JMMC Updates 2024

JMMC TECH

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MFIR

F. Soulez, E. Thiébaud,
M. Tallon

Training/OLBIN publication

M. Benisty/A. Chelli

User Support

A. Matter
K. Perraut

AMHRA

Ar. Domiciano da
Sousa
G. Verbiese

+ External collaborators

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JMMC Services



VLT



CHARA

Real time astrophysical models

AMHRA

SearchCal

a2p2

Aspro2

Prepare Observations

SearchFTT

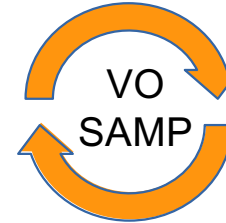
CDS Catalogs

Search Data

SearchCal

Results

OiDB



Reduce data

- amdlib
- pndrs

View Data

OIFits Explorer

Fit Models

LITpro

Reconstruct Images

OImaging



Reminder: JMMC 'Open' strategy (license):

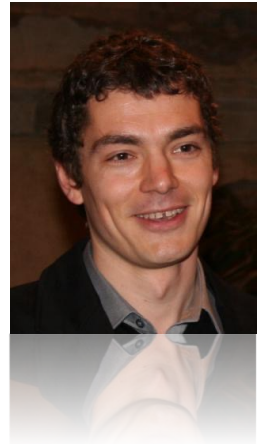
- Public money = public code (GPL)
- <https://github.com/JMMC-OpenDev>
- Open Data (FAIR)

Miscellaneous News

Outline

- News
- Update on some services
- 2025 roadmap and beyond

- Great VLT School in June 23 (Budapest), **next in Porquerolles Island (France), Sep 22-28 2024 ! (A. Matter)**
- Gaspard Duchêne joined in late 2023 to take the scientific leadership on OiDB & JMMC databases
- Myriam Benisty to leave => MPIA (July 2024)
- Human resources involved (2023)
 - 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/>



Preparing the **feasibility** of an observation

Real time astrophysical models



Kinematic Be disk
Model of the geometry (size and shape) and kinematics (rotation and ex circumstellar, flat, rotating disks, relevant to Be stars. It is suited to inter-ferometric data obtained on emission lines formed in the disk.



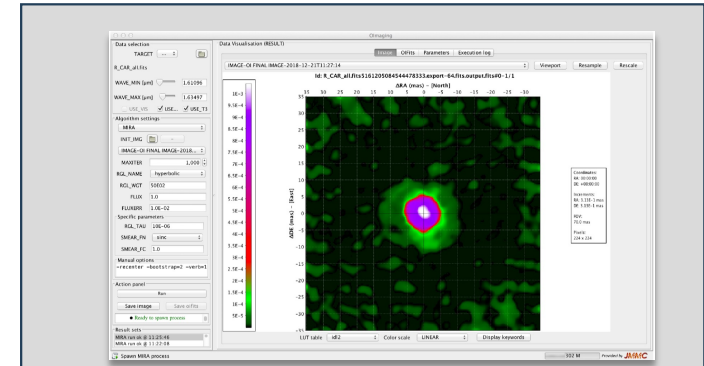
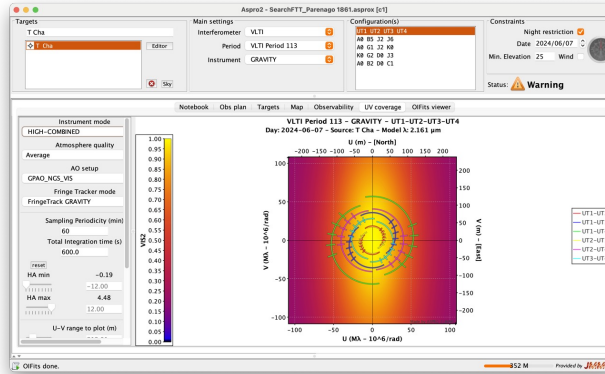
Disk and stellar continuum - DISCO
Model of the continuum emission from a star surrounded by a gaseous c free and bound-free), with partially ionized and geometrically thin disk w given by the viscous Keplerian decretion disk model. DISCO is well suited



Binary spiral model
Phenomenological model mimicking the shock caused by the collision bt massive stars (e.g. WR and OB stars) and that results in dusty spirals.



Analytical Limb-darkening Elliptical or Spherical - ALDES



Choosing model

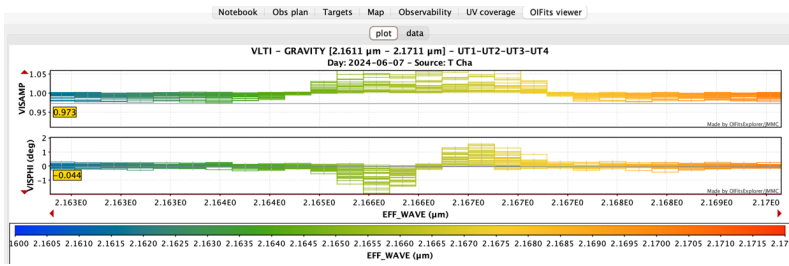
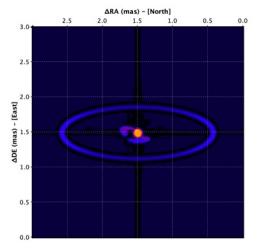
- Analytical model
- AMHRA
- User model

Aspro2: Observability

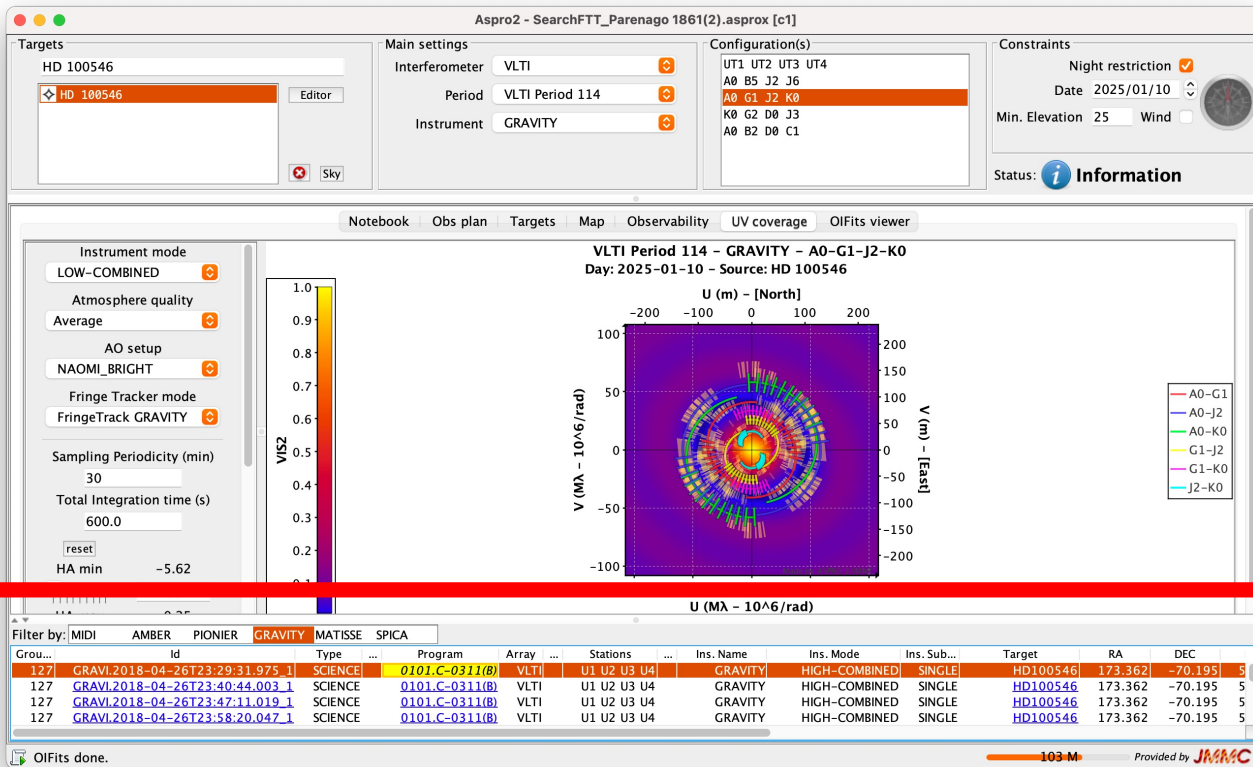
- VLT/Chara/custom interferometer
- Instrument model (Gravity, MATISSE, MIRC, MYSTIC)

Feasibility

- Model fitting (LITPro)
- Image reconstruction (OIImaging)
- Model fitting + image reconstruction
- Image reconstruction + model fitting



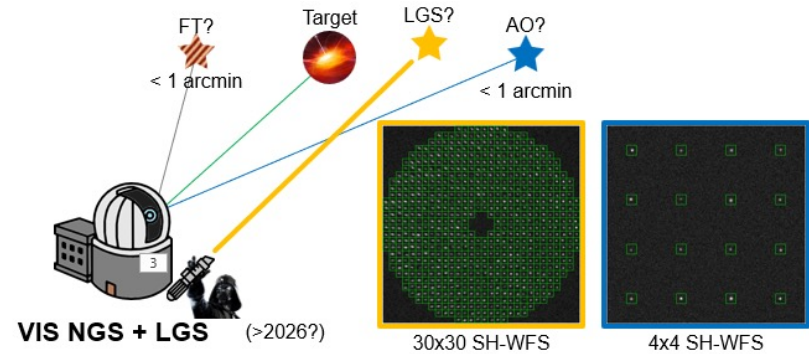
Preparing the feasibility of an observation



- **ObsPortal:** find other observations on same object
- **oitools:** command line access your observability computation

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 (strong help 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+

- Massive challenge
 - **SearchFTT**: new tool to search for proper FT and AO stars
 - Compute and filter hundreds of targets
 - By score or ranking position:

HD 156411	259.964	-48.549	HD 156411	HD 156411	0.72
CD-31_9113	173.862	-32.540	CD-31_9113	CD-31_9113	0.71
HAT-P-17	324.536	30.489	HAT-P-17	HAT-P-17	0.63

Showing 1 to 156 of 156 entries (filtered from 223 total entries)

Limit to: 0.3 3

[Get my ASPRO2 file](#) [Get as SearchFTT input file](#)

user_identifier	ra	dec	FT Identifier	AO Identifier	Score	Rank	ft_mag	scl_ft_dist	ao_mag	scl_ao_dist	ft_ao_dist	Catalog
HD 192310	303.822	-27.033	HD 192310	HD 192310	0.692	1	3.501	2.172	5.481	2.172	0	Gaia DR3
HD 156846	260.143	-19.334	HD 156846	HD 156846	0.724	1	5.149	0.124	6.376	0.124	0	Gaia DR3
HD 156846	260.143	-19.334	HD 156846B	HD 156846B	0.658	2	6.377	5.235	6.376	0.124	5.351	Gaia DR3
HD 156846	260.143	-19.334	HD 156846B	HD 156846B	0.441	3	5.149	0.124	12.212	5.235	5.351	Gaia DR3
HD 156846	260.143	-19.334	HD 156846B	HD 156846B	0.401	4	6.377	5.235	12.212	5.235	0	Gaia DR3
HD 86081	149.025	-3.808	HD 86081	HD 86081	0.703	1	7.299	0.002	8.599	0.002	0	Gaia DR3
HD 125595	215.347	-40.394	HD 125595	HD 125595	0.679	1	6.447	2.143	8.662	2.143	0	Gaia DR3
HD 125595	215.347	-40.394	Gaia DR3 6104435819513_98272		0.001	2	6.447	2.143	12.565	29.927	29.923	Gaia DR3

<https://searchfft.jmmc.fr>

From Aspro2 to ESO's P2

The image displays a sequence of software windows illustrating the transition from Aspro2 to ESO's P2. The 'Target Editor' window shows a hierarchical list of targets, with 'Parenago 1861' highlighted. The 'A2P2 v0.7.0 [c4]' window shows a table of project IDs and instruments. The 'Aspro2 - SearchFTT_Parenago 1861.aspro [c1]' window shows configuration settings for 'GRAVITY' and 'VLT Interferometer'. The 'Phase 2 v2.20.28' window shows a list of observing runs and a detailed configuration panel for 'GRAVITY_dual_onaxis_acq'.

Project ID	Instrument	Container type
> 60.A-9108(A)	GRAVITY	SM Run (IP 113.22)
> 60.A-9108(B)	GRAVITY	SM Run (IP 113.22)
> 60.A-9108(C)	MATISSE	SM Run (IP 113.18)
> 60.A-9108(D)	MATISSE	SM Run (IP 113.18)
> 60.A-9108(E)	PIONIER	SM Run (IP 113.18)
> 60.A-9108(F)	PIONIER	SM Run (IP 113.18)
> 60.A-9108(G)	GRAVITY	
> 60.A-9108(H)	GRAVITY	
> 60.A-9108(I)	MATISSE	
> 60.A-9108(J)	MATISSE	
> 60.A-9108(K)	PIONIER	
> 60.A-9108(L)	PIONIER	
> 109.23B9.001	GRAVITY	
> 109.23B9.002	GRAVITY	
> 109.23B9.003	GRAVITY	
> 109.23B9.004	MATISSE	
> 109.23B9.005	MATISSE	

Configuration(s)
UT1 UT2 UT3 UT4
A0 B5 J2 J6
A0 G1 J2 K0

Obs. Description	Target	Constraint Set	Time Intervals
GRAVITY_dual_onaxis_acq	V* V348 Ori		
#1 acquisition 2665712			
FringeTracker mode	AUTO		
Mode for Metrology Laser	ON		
SC object picking strategy	F		
FT object name	V* V348 Ori		
FT object K band magnitude	7.989		
FT object H band magnitude	8.45		
FT object diameter (mas)	0		
FT object expected visibility	1		
SC object name	Parenago 1861		
SC object K band magnitude	9.83		
SC object diameter (mas)	0		

JMMC short term (1yr) Roadmap

- **Aspro 2:**
 - Finalize integration of Gravity+ and GRAVITY for MATISSE (including LGS with A. Berdeu, J.B.Le Bouquin)
 - Provide analytical models with blackbody temperature
- **Aspro2/a2p2:**
 - Link between Aspro2 and Cosmic Debris (CHARA)
- **OIFitsExplorer:**
 - Better ergonomoy to deal with data units / files / granules
- **Oimaging:**
 - Propose a set of standard metrics to compare the quality of image reconstruction (E. Thiébaud)
 - 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 => what should be the role of JMMC on model fitting
- **BadCal:** enrichment + interrogation by other tools (e.g SearchCal, Aspro2)

- **OIDB:**
 - **help feeding the archive provide DOIs or permanent links for publications, collections & collaborative session**
 - **ESO/Expertise Centers Gravity service mode archive reduction**
- **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:** interface to observing block database

Contact US

- jmmc-user-support@jmmc.fr
- Face 2 face support
- Feedback:
<https://apps.jmmc.fr/feedback/>
- JMMC Issues on github
<https://github.com/JMMC-OpenDev/>

Communities meetings: a rich source of new ideas !

Priorities are open to discussion !