MARCE a Service for current & future optical interferometers

Jean-Marie Mariotti Center



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Mission

(+) JMMC encompasses two Services Nationaux d'Observation: Méthodes et Outils pour l'Interférométrie Optique (MOIO-ANO5) and Service aux Utilisateurs du VLTI (SUV-ANO3) The poster is also available at https://www.jmmc.fr/doc/approved/JMMC-POS-2100-0003.pdf

Since 2000, the "Pôle Thématique National" JMMC aims to coordinate the efforts of the French partner Observatories involved in optical interferometry (OI) to offer the best operational environment to all the potential users of OI facilities open to the community, i.e. the VLTI*/ESO and CHARA**/GSU instruments. Its mission is multiple and consists in:

· developing, producing, documenting and maintaining the software necessary for the exploitation of the current instruments,

providing a "Face to Face" User support for all the steps, from the preparation of the observations until the data archiving,

• participating actively to the academic formation of non specialists (e.g. by co-organizing VLTI schools or providing video courses and tutorials),

- providing and maintaining an interactive interferometry publication database, named OLBIN, gathering all refereed papers related to OI in ADS,
- participating to the prospective around new interferometric instruments or new instrumental configurations (e.g. by providing simulated data).

Aspro2 (

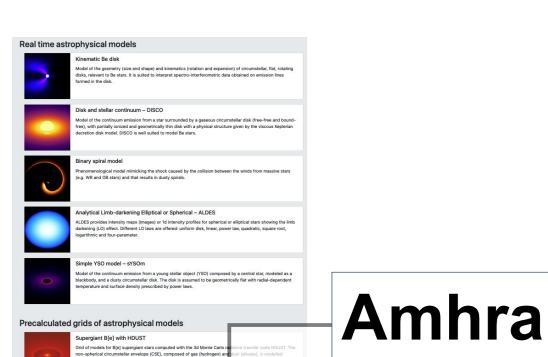
(*) VLTI: Very Large Telescope Interferometer, see https://www.eso.org/sci/facilities/paranal/telescopes/vlti.html (**) CHARA: Center for High Angular Resolution Astronomy, see https://www.chara.gsu.edu/

Main Activity

The main activity of JMMC, besides User supporting, training and prospective, is software oriented system analysis and software development, mainly using the Virtual Observatory standards and protocols. The whole range of services before and after acquiring interferometric data is covered. Main service features are summarized below, *in italics, the most recent or forthcoming functionalities*.

Detailed description of each software is accessible from its web page on the JMMC site, and for most of them available on github (https://github.com/JMMC-OpenDev/).

Software suite along the overall data lifetime



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https://amhra.oca.eu/

provides a library of astrophysical models, as a kinematic Be disk or a simple YSO model,
provides for each model either polychromatic images or pre-computed grids,
provides a tool to simulate data at the spatial frequencies of the real data. - provides multiple functionalities to easily schedule your observation, see its feasibility for a given configuration, prepare OB (linked to **a2p2)**,

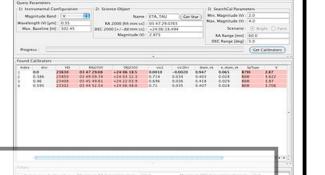
- simulates data, taking into account instrumental and atmospheric features, with an analytical modeling of your Science Target or from an intensity map you may provide, made with your own model or by using **Amhra**, *Makes GRAVITY*+ observations possible since it:

- manages Science, adaptive optics (AO) and fringe tracking (FT) targets potentially different,

- integrates a proper noise model of GPAO the off-axis AO and FT mode,

- integrates the FT jitter on the science instrument noise for GRA4MAT.





- allows to find and select your calibrators given instrument configuration and various filters,

- uses **JSDC2**, a catalogue of computed stellar angular diameters from Tycho & 2MASS catalogues, founded also on **JMDC**, the catalogue of published measured stellar apparent diameters,

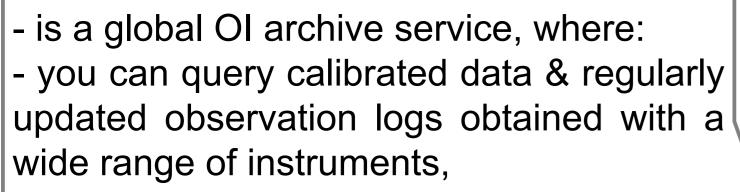
- *will be linked to BadCal*, which maintains an enrichable list of bad calibrators.

Soon: **JSDC3** after integration of GAIA DR3, midinfrared photometry and infrared excess information.





allows to find stars for the fringe tracker and the AO

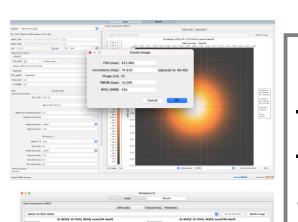


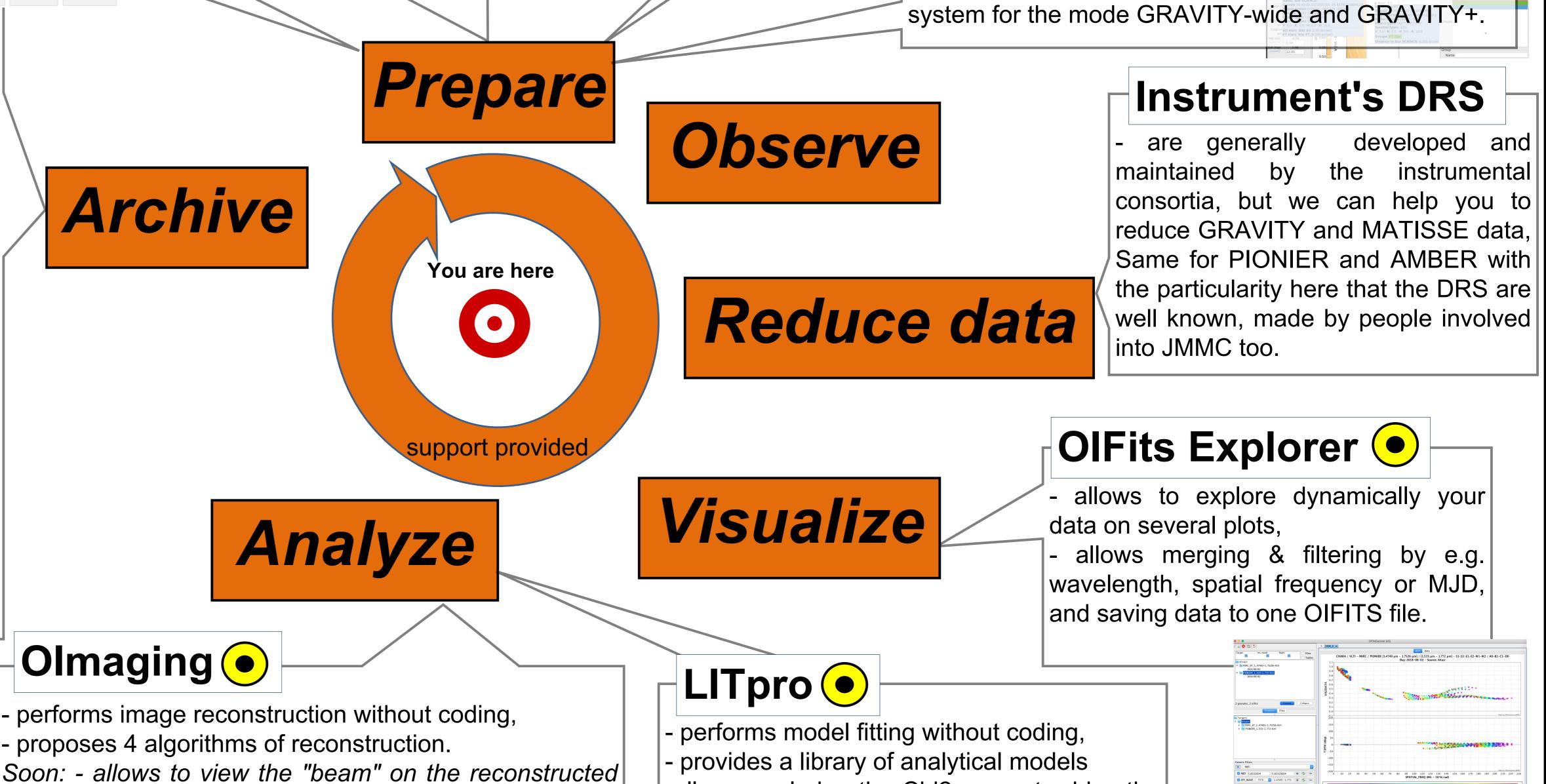
- you can archive your own data when published or in private collections during your data processing.

- In progress:
- ingest more existing data,
- *motivate and help the community to use OIDB,*
- improve the User interface and enrich the database content,
- enable private collections for active collaborations,
- help facilitate execution of surveys

Activities benefiting from current work carried out by:

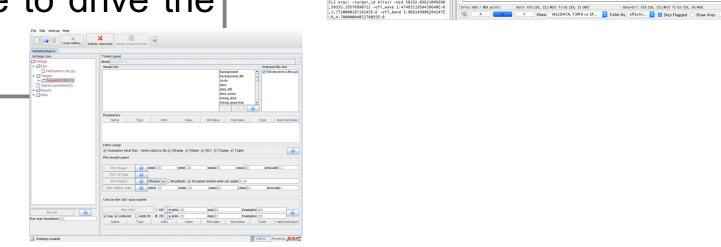
the SPICA-DB project (survey),
the curation of GRAVITY archive data (with ESO & Porto VLTI-expertise center)





The second seco

image if you wish, - a github page will provide metrics of comparison helping you to estimate the quality of your final image. -allows exploring the Chi2-space to drive the fitting process.



) indicates that the software or service uses interoperability under Virtual Observatory standards with other JMMC tools or other VO applications (SAMP)

Key numbers

 ~3.5 FTE: the mean human resources per year of the JMMC, including 1.6 FTE engineers, all people working at part-time. Unquantified but valuable: constructive exchanges and collaborations inside the OI community,

~70%: the percentage of the refereed papers in OI with astrophysical results making reference to JMMC tools or services, number relatively constant for the past ten years, as seen in Fig.1, as well as the percentage ~60% of OI publications with astrophysical results,
~100: the minimum number of distinct IP-access to Aspro2 per week, as seen in Fig.2 for the year 2023 (this number almost tripling during a VLTI-school). For other tools, this access number varies from a few units to a few dozen per week.

