

Le Centre Jean-Marie Mariotti / Jean-Marie Mariotti Center

JMMC (<http://mariotti.ujf-grenoble.fr>)

- Created in 2000 by INSU/CNRS
 - Mission: **Optimize use of Interf. Facil. (VLT)**
 - Software (ASPRO, SearchCal, MIDI)
 - Training (Les Houches, 2002, 2006)
 - Prospective (Next generation Interf. Facilities)
- (Optimize= use and show your expertise!)

The Very Large Telescope Interferometer (VLT)

- Telescopes: 4 AT (1.8m) + 4 UT (8m)
- Delay lines: 6 -> 8
- Max baseline: 200m → few mas resolution
- MIDI: 2 beams (10 μ m) → 2004
- AMBER: 3 beams (2 μ m) → 2005
- PRIMA: dual field instrument → \geq 2005
- Limiting magnitudes: 12 (K), 5 (N)

Structure

A Network of 11 French Laboratories:

- CRAL, LAOG, LESIA, OCA, UNSA, ONERA, IAS, OBX, IRCOM, LISE, OPM...
 - Science, Experts
 - Propose «software instruments»
- Coordination Center at LAOG
 - Projects management,
 - Software structuration, documentation, [coding],
 - User support

Processus Evolutif...

- Service d'observation (2001)
 - Delfosse, Berger, Chadid, Duchene, Kervella
- GdR JMMC (2003)
- Maitre d'oeuvre du Logiciel Interferometrique Europeen (2004)

Manpower / Budget

➤ Manpower

- Ingenieurs: 4 (eq. Full time)
- Investigators: 3/4 (eq. Full time)

➤ Budget

- 50K€/year (CNRS)
- 50K€/year (Europe)

Jean-Marie Mariotti Center

Scientific Council

Director
Alain Chelli

Executive Board

Quality Insurance

Training
*Fabien Malbet
Guy Perrin
Bruno Lopez*

Coordination Center (LAOG)

Technical Director : Gilles Duvert

Project Manager : Gérard Zins

Ingenieers : Laurence Gluck, Sylvain Lafrasse, Gillaume Mella

Secretary: Sandrine Vignon

Research & Development Groups

Preparation of Observations
*Gilles Duvert
(LAOG)*

Calibrators
*Daniel Bonneau
Coll. CDS
(OCA)*

Model-fitting
*Isabelle Tallon-Bosc
(CRAL)*

Image Reconstruction
*Eric Thiébaud
(CRAL/ONERA)*

DARWIN
*CRAL/LUAN/IAS
Alcatel Space*

Euro-Interferometry Initiative
FP6

Services

- **Training**

Houches 2002 , Houches 2006,
Michelson Schools in Europe (coll. MSC) (?)

- **Proposal/Observation Preparation**

Aspro

SearchCalib

- **Data Reduction**

Amber DRS

MIDI DRS

- **User Support**

- **Common tools & services for JMMC**

The ASPRO Observing preparation Software

- <http://mariotti.fr/aspro.htm>
- **ASPRO is a Virtual Interferometer (VLT, ...)**
 - Input/Output Fits Tables
 - Interferometer configuration
 - Science Object Models
 - User Interface adapted to ESO's CFP [76]
 - Exposure Time Calculator (ETC)
 - Model Fitting
 - -> **Calibrator Search** (SearchCalib)

Example of ASPRO panel

The screenshot displays the ASPRO software interface, which is a Java applet running in a Mozilla browser window. The main window is titled "Java Applet Window" and contains a configuration panel for "UV COVERAGE". The configuration panel includes fields for Telescope #1 Name (U1), Telescope #2 Name (U2), and Telescope #3 Name (U3). It also has a "RESET FRAME (start a new plot)" checkbox, which is checked. Other parameters include Hour Angle Start (-12.0), Hour Angle End (12.0), Min. Elev. to Plot (20.0), Max. Elev. to Plot (90.0), U-V range to plot (200.0), and U-V Integration Time (5). There are also options for "Plot Aperture size on UV Plane" and "Name of the output PSF UV Table" (oipt_psf). A section for "Underplot a model image?" is checked, with the filename "oipt_lastmodel.gdf" and "Plot what..." set to "AMP". A "DISPLAY PSF" button is located at the bottom of the configuration panel.

Below the configuration panel, a "GREG" window displays a visualization of the UV coverage. The plot shows a 2D distribution of UV coverage in the U-V plane, with U (meters) on the x-axis and V (meters) on the y-axis, both ranging from -200 to 200. The plot shows a central bright region with a complex, multi-lobed structure. To the right of the main plot, there is a smaller plot showing a distribution of points. The text "U1-U2-U3, DL set @ 91.4400" is visible at the bottom right of the plot area.

The browser window shows a welcome message: "Welcome on the Web interface of the Aspro Software. ASPRO on the Web uses a Java2 applet." Below this, it says: "Wait a few seconds for the applet to start displaying a MENU BAR. To close the session close the MENU BAR Applet." There is also a note: "es (normally, only source catalogs and fits files) to the mariotti server using the panel below. on the server for a few days, and are useable/visible from all the ASPRO sessions."

Search Calib(rators)

Interferometric observations need to be externally calibrated by observing a *calibrator star* that must have properties close to those of the scientific target :

close sky location and apparent magnitude to observe with same instrument configuration,

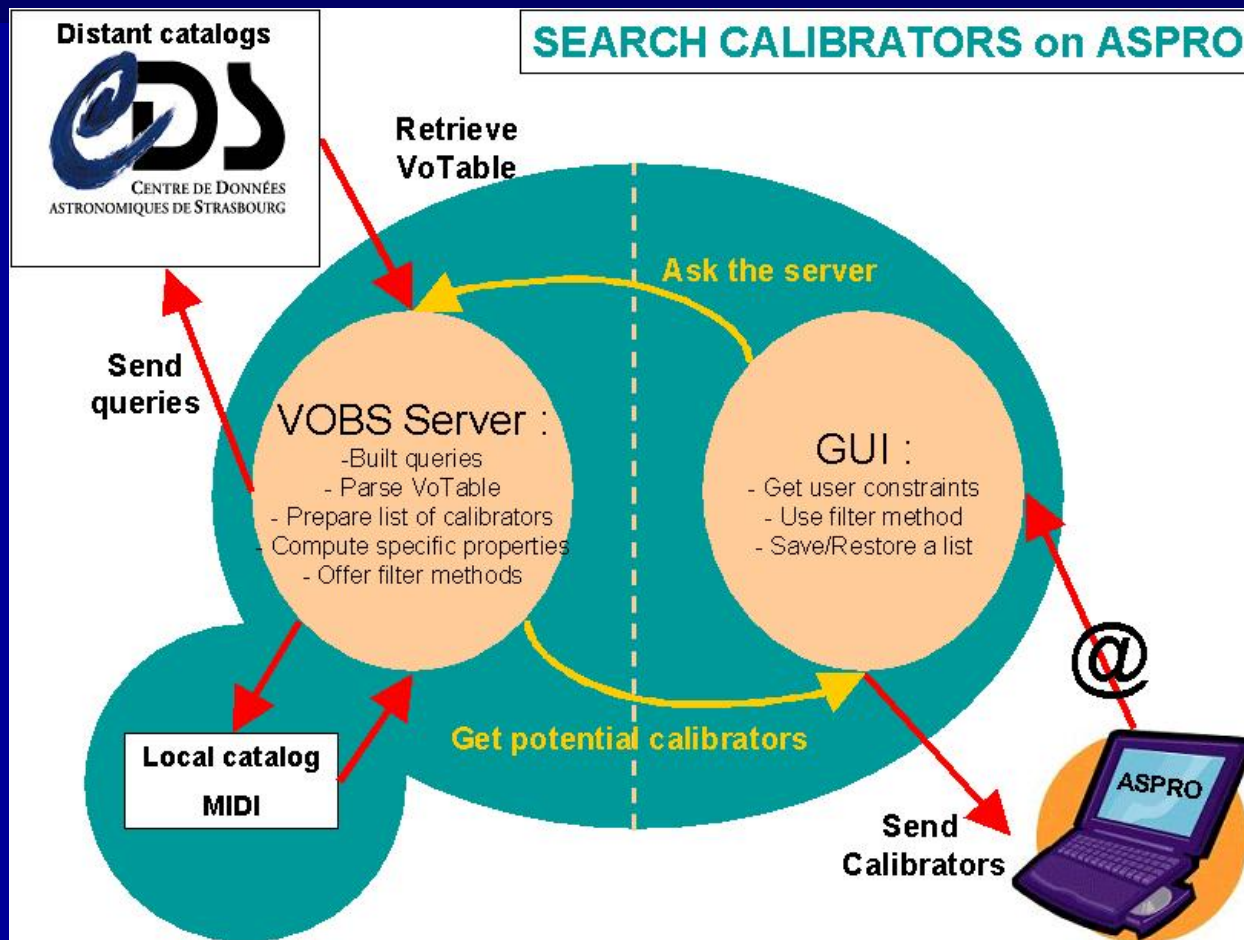
similar magnitude if used by AO

similar color (spectral type) in case of interferometric observation in large band to limit the chromatic effect.

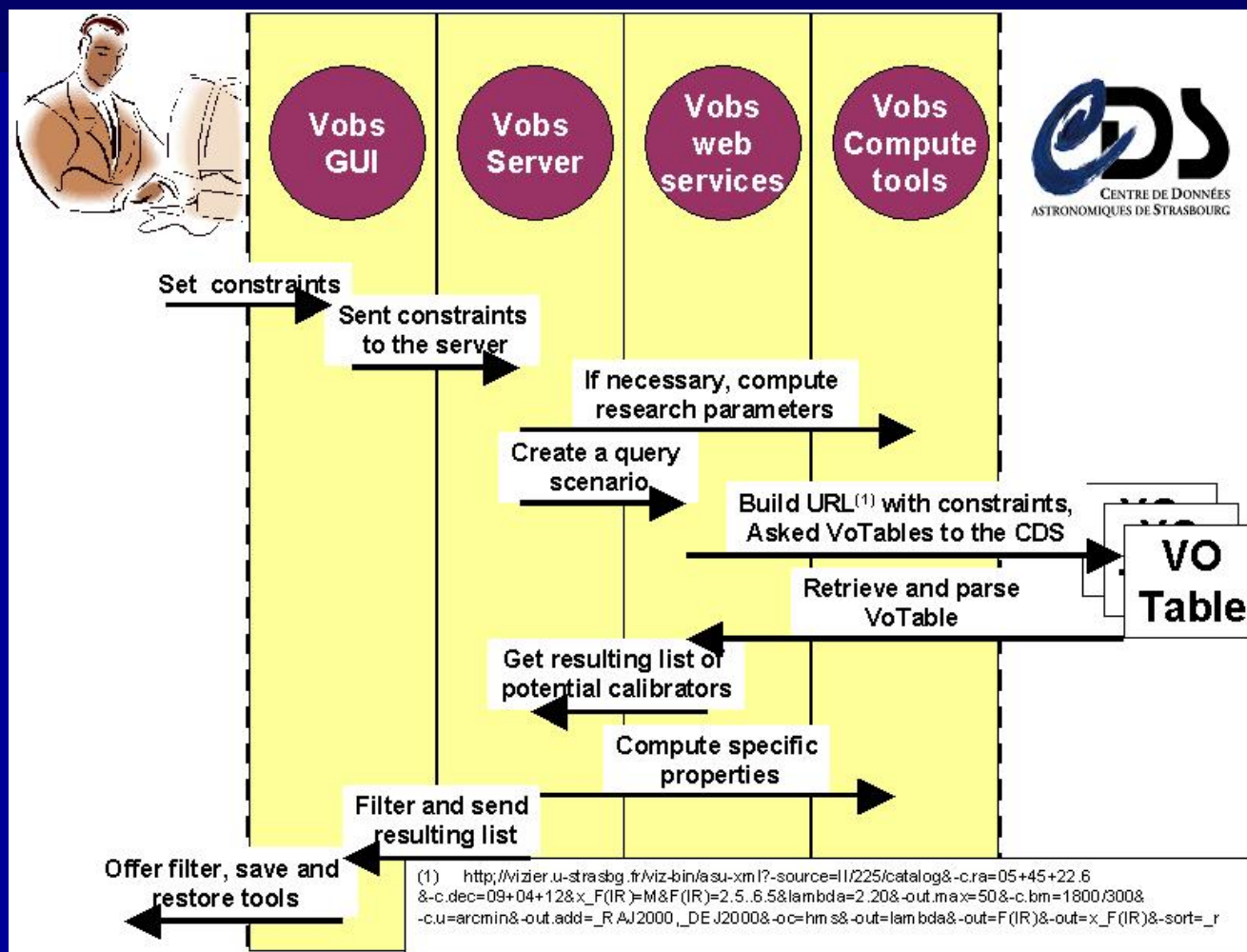
Known angular size (unresolved if possible)

- **JMMC Web Service SearchCalib:**
 - Input: Astrophysical requirements (source+telescope)
 - Output: list of possible calibrators.
- Requests to CDS or JMMC catalogs
- Multiple Scenarios

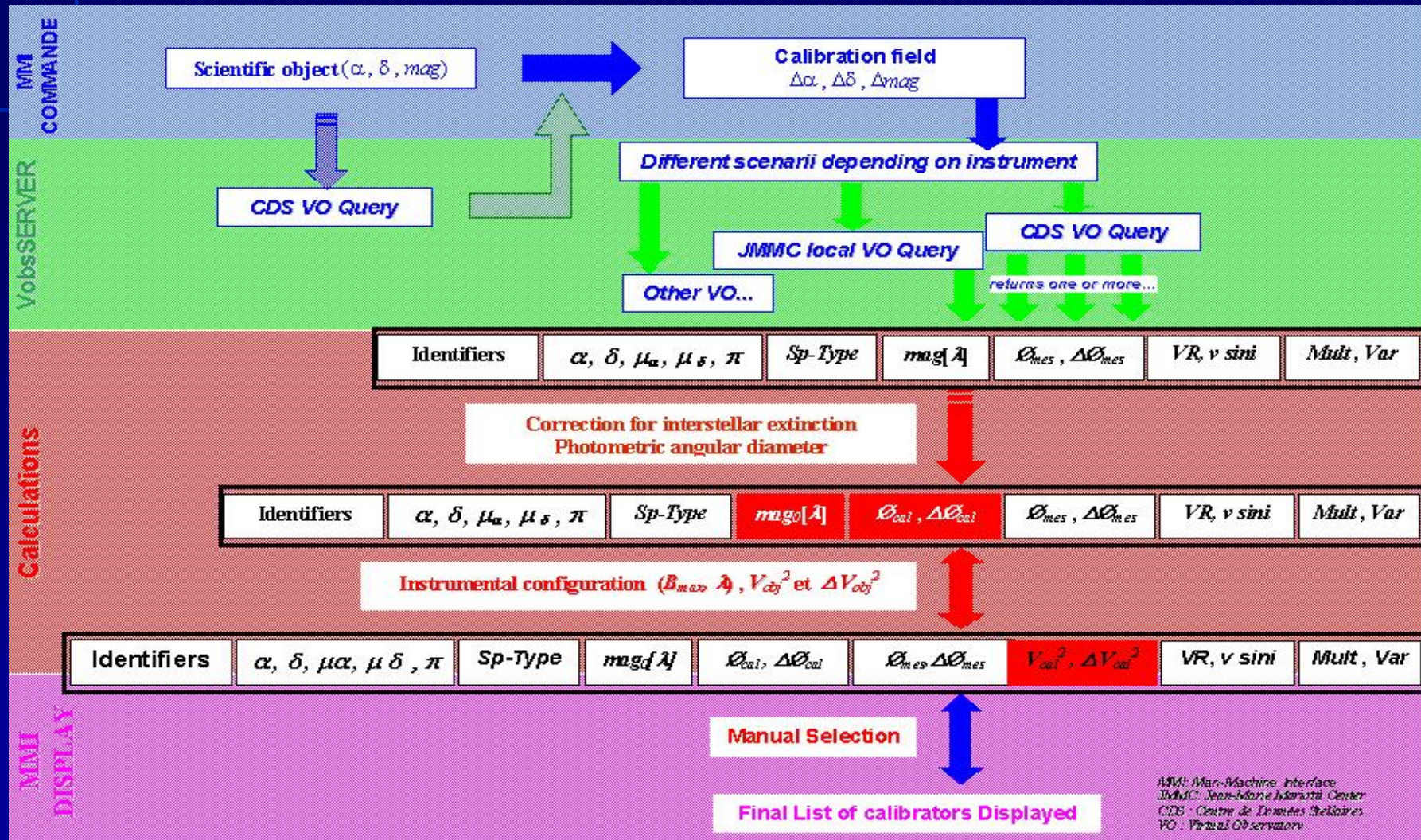
SearchCalib as a Web Service (1)



SearchCalib as a Web Service (2)



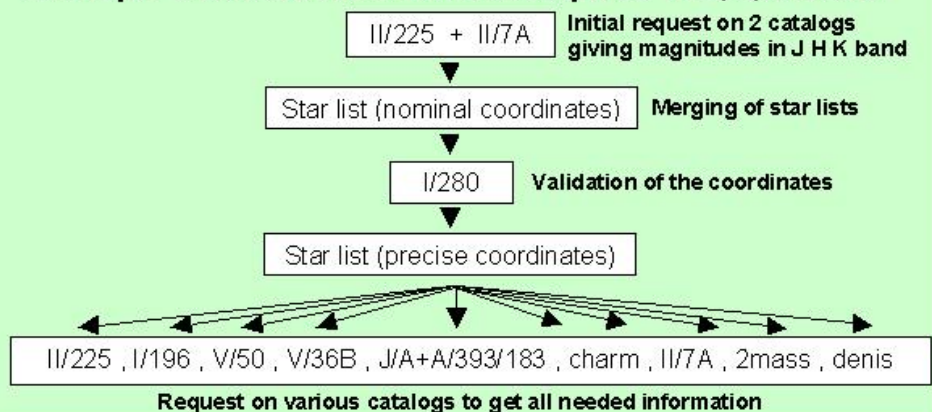
SearchCalib Block Diagram



MMI: Man-Machine Interface
 JMMC: Jean-Marie Aurière Center
 CDS: Centre de Données Stellaires
 VO: Virtual Observers

SearchCalib & Catalogs

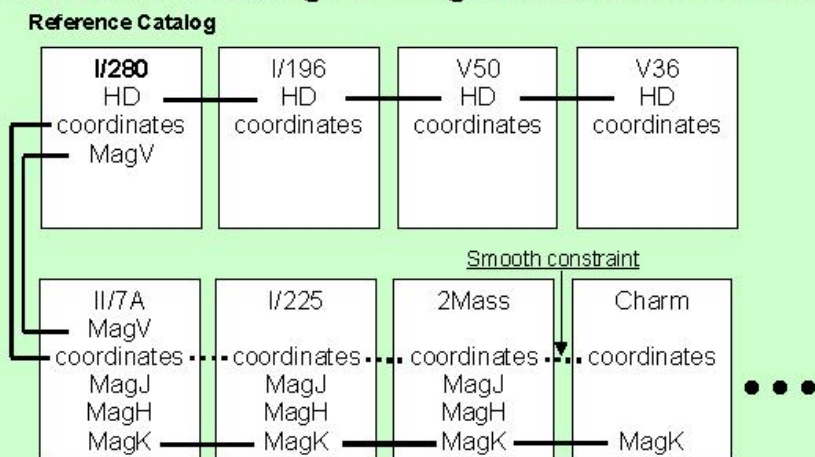
Exemple Scenario for Database request in J,H,K Band



Requested catalogs for bright calibrators search ($K \leq 5$)

- I/280 : All-sky Compiled Catalog of 2.5 million stars
- II/7A : UBVRIJKLMNH Photoelectric Catalog
- II/225 : Catalog of Infrared Observations, Edition 5
- II/246/out : The 2MASS all-sky survey Catalog of
- Point Sources
- J/A+A/386/492/charm : Catalog of High Angular
- Resolution Measurements
- J/A+A/393/183 : Catalog of calibrator stars for LBSI
- I/196/main: Hipparcos Input Catalogue, Version 2
- V/50 : Bright Star Catalog, 5th Revised Ed.
- V/36B : Supplement to the Bright Star Catalog
- II/246/2mass: The Two Micron All Sky Survey
- B/denis/denis : DENIS data base

Links between catalogs to merge the results in one file



SearchCalib result panel

JMMC Calibrator Group 3.1

Close Help

SHOW ALL RESULTS RESET SHOW DETAILS HIDE DETAILS

Science star

NAME	RAJ2000	DEJ2000	MagK	Base-max	Lambda	DiamVK
bet_Dor	05:33:37.52	-62:29:23.4	1.83	89.4427	2.1	1.921

Results

Number of stars: 16 found, 9 with coherent diameter and 5 without variability and multiplicity

Number	HD	RAJ2000	DEJ2000	vis2	vis2Err	diam_vk	e_diam_vk	SpType	Vo	Jo	Ho	Ko
1	39014	05 44 46.38	-65 44 07.9	0.950	0.007	0.698	0.048	A7V	4.303	3.841	3.744	3.706
2	27256	04 14 25.48	-62 28 25.9	0.454	0.053	2.648	0.183	G7III	3.313	1.882	1.396	1.318
3	27442	04 16 29.03	-59 18 07.8	0.675	0.014	2.044	0.141	K2IV	4.424	2.372	1.813	1.969
4	57623	07 16 49.82	-67 57 25.7	0.765	0.029	1.578	0.109	F6II	3.805	2.706	2.393	2.321
5	63744	07 48 20.16	-47 04 39.8	0.751	0.007	1.732	0.119	K0III	4.594	2.901	2.407	2.299

Catalog Origin: I/280 I/225 I/7A I/246 W50 charm B/denis I/196

Confidence Index: Low Medium High

Sort above list... SELECT CALIBRATORS

Delete Star DELETE

Load File LOAD

Save File SAVE

Export File EXPORT

Euro-Interferometry

Initiative (<http://www.strw.leidenuniv.nl/~eurinterf>)

- Project initiated in 2002 by the 3 European Interferometry centers:
 - FRINGE (D) – JMMC (F) – NEVEC (N)

- Objectives
 - Maintain & reinforce european interferometry
 - Generate a long term european vision
 - Integrate new countries
 - Formation/exchange of students/investigators
 - **Make the VLTI an end-to-end service instrument**

Joint Research Activity#4

<http://eii-jra4.ujf-grenoble.fr>

- Period: 2004-2008
- Coordinator: Alain Chelli
- Budget: 1.06 M€
 - WP1: 2nd Generation VLTI Instruments: 500 K€
 - WP2: Off-line data interpretation software: 500 K€
 - France: 260 K€
 - OCA: 26 K€
 - ONERA: 65 K€
 - LAOG: 169 K€

Off-line Data Reduction Software

PI: Gilles Duvert / SPM Gérard Zins (JMMC/LAOG)

→ **WP1.1: Management** (Programming rules, Data Format, Interfaces, Design)
Team: JMMC/LAOG

→ **WP2.2: Integration**
Team: JMMC/LAOG Technical team

WP2.6: European Helpdesk
Duchêne/Kervella (JMMC/LAOG/LESIA)

→ **WP2.3: Model-fitting** (Model Interferometric Observables with (a)chromatic Models)
PI: Tallon-Bosc (JMMC/LAOG)

→ **WP2.4: Astrometry** (Orbit fitting, Parallax, Proper motion)
PI: Quirrenbach (NEVEC/Leiden), Queloz (Unige)

→ **WP2.5: Image Reconstruction**
Teams: JMMC/CRAL – FINGE/MPIA/MPfR

**WP2.3: Model Fitting → V01:
2006**