



# The VLT Data Flow System

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# High Level VLT Requirements

## ESO aims to :

- maximise the scientific return of the VLT
- ensure quality and long-term usefulness of data
- ensure the performance of instruments

## Therefore ESO must :

- make it possible to use the resources of the VLT flexibly, responsively, intelligently and easily
- calibrate, monitor and simulate the VLT instruments





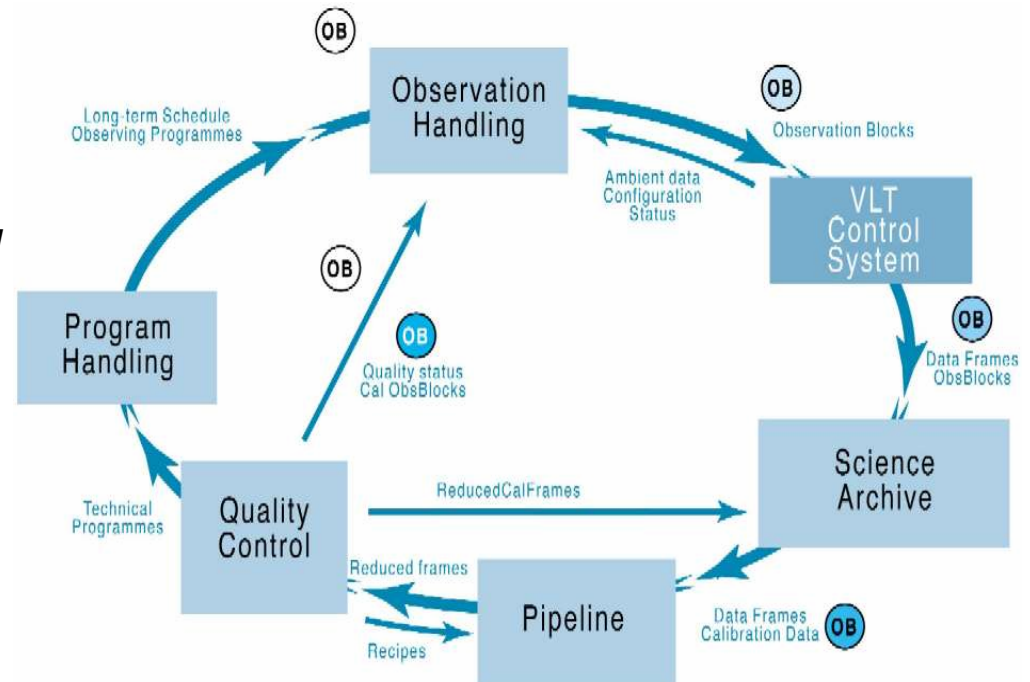
## To achieve these goals the VLT must have:

- a unified, simple interface to telescope and instruments
- processing on-the-fly
- flexible scheduling
- calibration plans for all instruments
- automatic monitoring of instrument performance
- detailed instrument models



# DFS Mission

- The **Data Flow System** is composed of a collection of software components for preparation and scheduling of observations, archiving of data, pipeline data reduction and quality control
- Our customers are:
  - Visiting Astronomers Section
  - User Support Department
  - Data Flow Operations Department
  - Paranal-La Silla Science Operations
  - ESO Community





# DFS Front-End Tools - ETC

Optical Spectroscopy Mode **Version 2.4.1** [Description](#) [F.R.Q](#) [Performance](#)

**Input Flux Distribution**

**Uniform (constant with wavelength)**

**Blackbody:** T =  Kelvin

**Template Spectra:**  Redshift Z =

**Object Magnitude:**  **Band:**

Magnitudes are given per square arcsec for extended sources. Note that some [template spectra](#) are defined over a limited wavelength range and may not allow calculations for all instrument configurations.

**Spatial Distribution:**  [Point Source](#)  [Extended Source](#)

**Sky Conditions**

**Days From New Moon:**  **Airmass:**  **Seeing:**  arcsec

The sky brightness is determined by the moon phase and the instrument efficiency according to [this table](#).

**Instrumental Setup**

**Mirrors (2 aluminium coated mirrors):** 80% at 670 nm

**Resolution:**  Standard  High

**Detector read mode:**  slow

**Grism:**

**Slit:**  From list:  arcsec

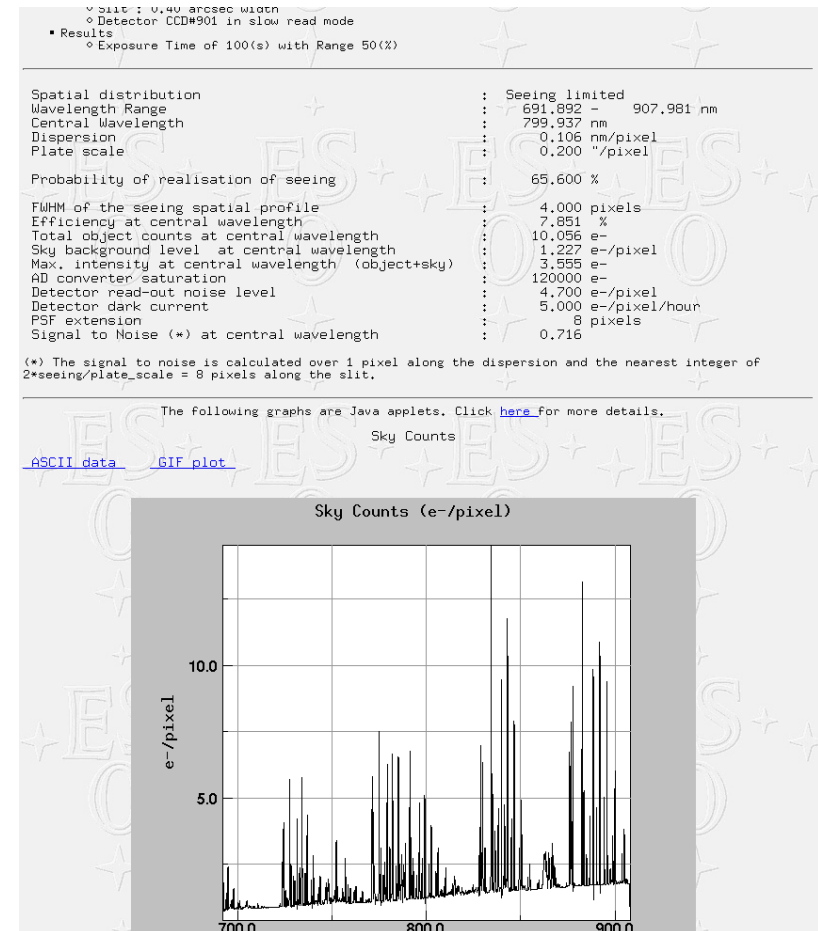
**Polarimetry Mode:**  No polarimetry  Linear or circular polarisation

**Results**

**Exposure Time (s):** Value  Plotting range  %

On submission the model can generate the following graphs:

- [Object Spectrum](#)
- [Sky Spectrum](#)
- [Input spectrum in physical units](#)
- [Signal-to-noise](#)
- [Total Efficiency and Wavelength Range](#)





# DFS Front-End Tools -P2PP

The screenshot displays the P2PP V.dev software interface. The main window shows a star field image with a grid overlay. The image is titled "71\_B-3053(B)" and includes the text "Zoccali" and "Bulgel\_P2Q1". The software window title is "P2PP V.dev 60.A-9252(J)/SM/VIMOS". The interface includes a menu bar (File, Finding Charts, Edit, Folder, Reports, Synchronise), a toolbar with icons for New, Duplicate, Verify, and View, and a "Folders" list on the left. The "Folders" list contains the following entries:

- 60.A-9252(B)/SM/SUSI2
- 60.A-9252(C)/SM/SOFI
- 60.A-9252(D)/SM/FORS1
- 60.A-9252(E)/SM/ISAAC
- 60.A-9252(F)/SM/FORS2
- 60.A-9252(G)/SM/UVES
- 60.A-9252(H)/SM/NACO
- 60.A-9252(I)/SM/FLAMES
- 60.A-9252(J)/SM/VIMOS**
- 60.A-9252(K)/SM/WFI
- 60.A-9253(A)/SM/CES3.6
- 60.A-9253(B)/SM/EFOSC2
- 60.A-9253(C)/SM/TIMMI2
- 60.A-9253(D)/SM/EMMI

The "Summaries" table is visible, showing the following data:

ObsBlock	CalBlock	Name	Dbaseld	Status	Target	OD	CS	Acquisition	FindingCharts
VIMOS T...	0	(P)arti...	No Name	No Name	No Name	No Name	VIMOS i...	(1) 71...	
VIMOS T...	0	(P)arti...	No Name	No Name	No Name	No Name	VIMOS i...	(4) 072...	

The bottom of the window shows a taskbar with various applications open, including Java - Eclipse, Document1, Document2, xterm, RHAT: Summa, [Bug 3131] Ad..., P2PP V.dev, GIMP, and latfc - Paint. The system clock shows 17:46.



# VLT/MLTI Instrument Pipelines

## The main missions of the instrument pipelines are:

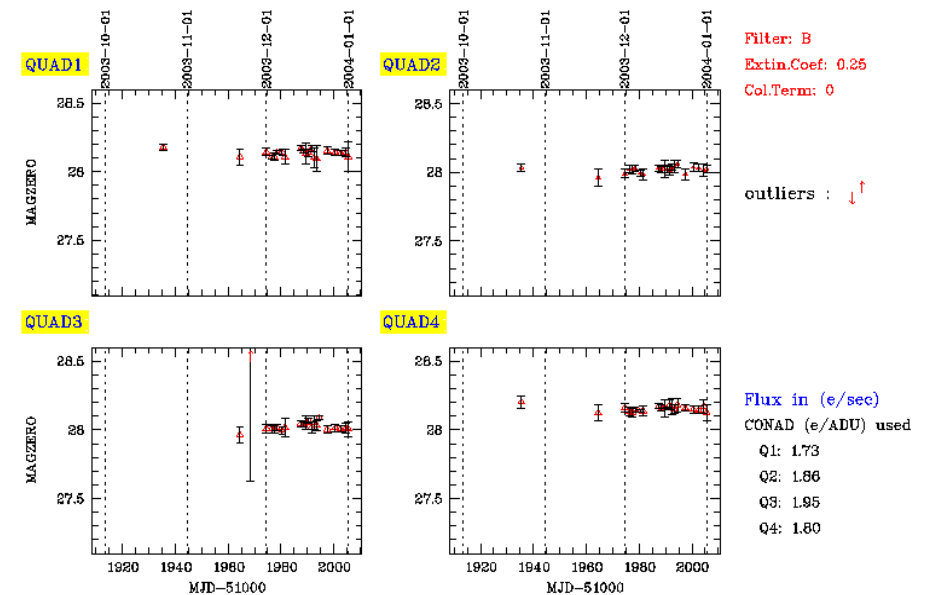
- Process raw calibration frames into master calibration
- Produce QC parameters for monitoring telescope, instrument and detector performance
- Process raw science frames into science data products

## The quality of the products is limited by :

- Quality of input data (raw +calibration)
- Set of standard parameters (on-line)
- Quality of the algorithms

VIMOS trend analysis: ZERO\_POINTS-B (OCT-DEC2003)

Last date: 2004-01-01





# VLT/VLTI Instrument Pipelines

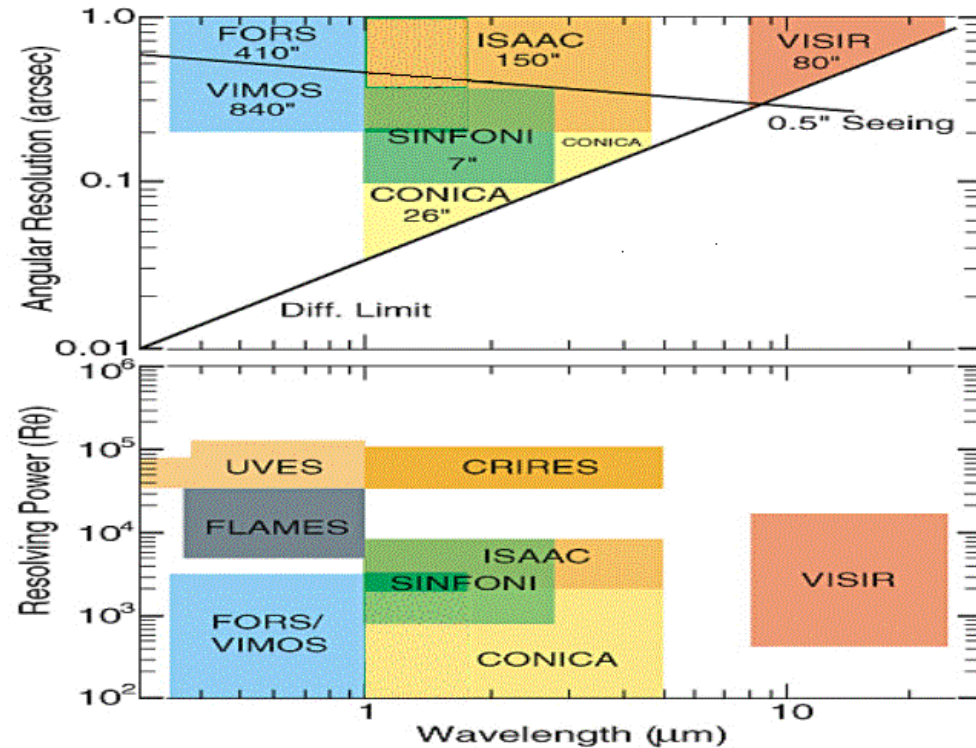
## An instrument pipeline is:

- Set of data processing executables called **Pipeline Recipes** built on top of the Common Pipeline Library

## An Instrument pipeline runs in the following environments:

- On-line (Paranal), in an automatic manner with default settings
- Off-line (Data Flow Operations), in an automatic manner
- On the Desktop, interactively

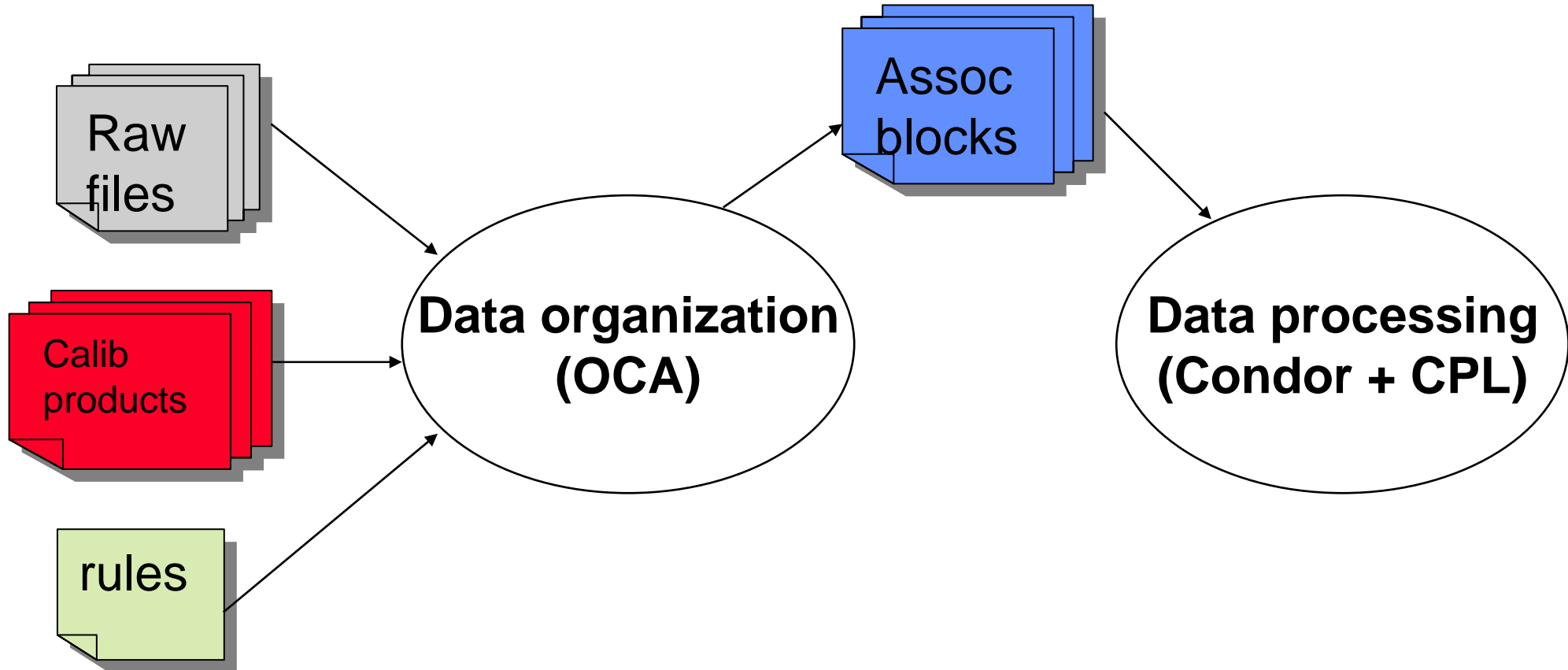
Coverage of VLT instruments





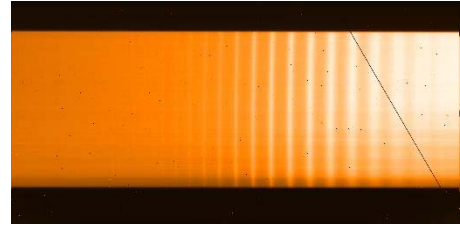


# On-Line-DFO Environment

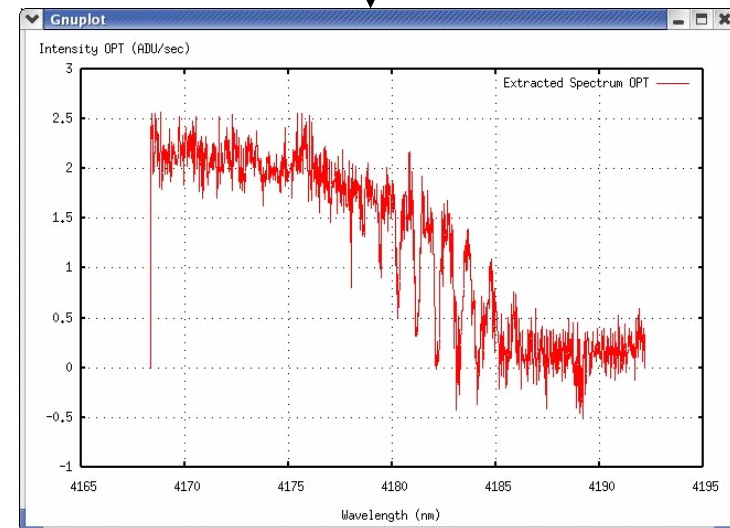
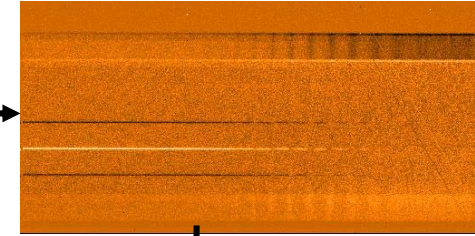




# Pipeline Desktop environments-EsoRex



CRIRES Pipeline



- EsoRex supports the execution of pipeline recipes from the command line.
- Recipe name, input files and parameters must be provided on the command line
- Pipelines and tools can be downloaded:  
[www.eso.org/pipelines](http://www.eso.org/pipelines)



# Pipeline Desktop environments-Gasgano

**File**

File	CLASSIFICATION...	INS. MODE	INS. FLT3. NA...	INS. GRIS3. N...
200135363 F02P063				
OCS.CON.QUAD = 3				
VIMOS.2003-12-26T01:05:06.233.fits	MOS_SCIENCE	MOS	05-red	LR_red
VIMOS.2003-12-26T01:26:00.251.fits	MOS_SCIENCE	MOS	05-red	LR_red
VIMOS.2003-12-26T01:47:04.050.fits	MOS_SCIENCE	MOS	05-red	LR_red
60.A-9031(A)				
200125078				
OCS.CON.QUAD = 1				
OCS.CON.QUAD = 2				
OCS.CON.QUAD = 3				
OCS.CON.QUAD = 4				
Unknown Observation				
60.A-9050(A) VIMOS 55555555				

**Keyword**

Keyword	Value
SIMPLE	T
BITPIX	16
NAXIS	2
NAXIS1	2148
NAXIS2	4096
ORIGIN	ESO
DATE	2004-01-08T23:22:51.2
MJD-OBS	5299.04521101
DATE-OBS	2003-12-26T01:05:06.2
EXPTIME	1200.0060
TELESCOP	ESO-VLT-U3
RA	02:26:53.4
DEC	-04:09:43.78
EQUINOX	2000.

**Parameters**

Name	Value	Default	Range
vimos.Parameters.bias_removing_met...	Zmaster	Zmaster	
vimos.Parameters.extraction.fuzz	5	5	
vimos.Parameters.lamp_frames.validate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
vimos.Parameters.ids.refine	<input type="checkbox"/>	<input type="checkbox"/>	
vimos.Parameters.extraction.window	-1	-1	
vimos.Parameters.flat.apply	<input type="checkbox"/>	<input type="checkbox"/>	

**Input Frames**

Include	Filename	Classification	Display
<input checked="" type="checkbox"/>	master_bias4.fits	MASTER_BIAS	Display
<input checked="" type="checkbox"/>	mos_combined_screen_flat1.fits	MOS_COMBINED_SC...	Display
<input checked="" type="checkbox"/>	mos_master_screen_flat1.fits	MOS_MASTER_SCRE...	Display
<input checked="" type="checkbox"/>	grs_LR_red_3.tfits	GRISM_TABLE	Display
<input checked="" type="checkbox"/>	lcat_LR_red_3.tfits	LINE_CATALOG	Display
<input checked="" type="checkbox"/>	VIMOS.2003-12-26T04:53:47.415.fits	MOS_ARC_SPECTRUM	Display

**Output Frames**

Filename	Classification	Display
extract_table6.fits	EXTRACT_TABLE	Display
mos_arc_spectrum_extracted6.fits	MOS_ARC_SPECTRUM_EXTRACTED	Display
MOS_wavecal_LR_red_36.cmf	PAF	Display
extract_table7.fits	EXTRACT_TABLE	Display

**Log Messages**

```

/home/pipeline/gasgano_products/mos_arc_spectrum_extracted8.fits
/home/pipeline/gasgano_products/MOS_wavecal_LR_red_38.cmf
Completion status: SUCCESS
  
```

- VLT interactive data organisation tool
- FITS file browsing
- Grouping
- Classification

- Interactive front-end
- Interface to CPL plugins
- Interface to visualisation tools

- Next Generation tool : Reflex (next presentation)



# Observation Preparation Tools

## - Support for surveys

- Surveys will involve many OBs per run (~1,000 per semester?)
- They will require observations of large fields (many pointings)
- They will require repeated observations over a time span, with a given frequency
- They will require sets of observations to be performed over a short interval (near-simultaneity)
- They will require a sequencing of the observations so as to maximize the scientific value of intermediate release products



# Support of new structures in P2PP

- Groups contain internal scores driving the scheduling of their components
- Time links and concatenations are defined in a straightforward way
- Grouping in containers facilitates the overall view and organization of the survey
- The implementation of containers will also be valuable for operations at VLT, VLTI, La Silla

The screenshot shows the P2PP V.2.10.4 software interface. The left pane displays a tree view of folders under the path 60.A-9281(A)/SM/VIRCAM. The right pane shows a table of observation blocks with columns for name, Type, delay, tolerance, Contr. ..., and User p... The table contains the following data:

name	Type	delay	tolerance	Contr. ...	User p...
60.A-9281(A)/SM/VIRCAM	Folder			0	0
60.A-9281(A)/SM/VIRCAM Folder	Folder			0	0
My first OB Group	Group...			0	0
Group OB 1	Group OB			0	1
Group OB 2	Group OB			0	1
Group OB 3	Group OB			0	1
Group OB 4	Group OB			0	1
New Concatenation	Conca...			0	0
Chained OB 1	Concat			0	1
Chained OB 2	Concat			0	1



**Read the Call for Proposals**

**Submit an observing proposal**

**Find out the status of the OPC review**

**Prepare and submit OBs (SM only)**

**Specify where the resulting data are to be sent (SM only)**

**Request (supporting) data from the Archive**

USD-based applications, OPC-related applications, ESO-internal applications

**Phase 1/2 Interactions**



# User Portal - Current Situation

## Proposal to Receipt of Data

Download the ESOFORM package.

**Find web page, and download.**

Upload the finished proposal.

**Find WASP web page and upload.**

Review the webletter report.

**Find another web page, and login (ID?).**

(If successful) use P2PP to prepare OBs, Finding Charts, and README file.

**Download P2PP (where?), login (ID?), and receive notice of submission.**

(If OBs are executed) receive the SM data.

**But I'm on sabbatical, ...**



# User Portal - Current Situation

## Archive Data Request

Look through the Archive for the data

**Use the new Archive web search interface**

Login (authenticate).

**Username? Password? Not the P2PP ...**

Receive the data.

**But I'm on sabbatical!**





Wouldn't it be better if...

links for the whole flow were in one place  
each person has their own...  
usernames...  
And...  
each...  
the...



# 100 USER PORTAL

ESO User Portal - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://ga012705.ads.eso.org:8080/UserPortal/authenticatedArea/changeInstitute.eso

ESO IT Web ERP System

Site Map Home News Search  Go! Contact Help Español

**Here you can change your profile.**

**Actions**

- Check my runs
- Check the web letters
- Submit a proposal
- Administrative Options
- Edit Account
- Manage Profiles
- Logout

**General Information**

\*Title: Prof.

\*Profile Category: ESO-Garching user

\*First name: Isaac

\*Last name: Newton

\*e-mail address: inewton@eso.org

**Proposal Information**

\*Country/Organisation Code: Germany

\*Institute: European Southern Observatory

**Shipping Information**

\*Institute: European Southern Observatory

\*Street: Karl-Schwarzschild-Str. 2

\*City: Garching

\*Post code: 85748

\*Country: Germany

\*State: -

\*Phone number: 6566

Mobile number: 234

\*Media Type: LAN

\*These fields are mandatory

[Send comments to userportal@eso.org](mailto:userportal@eso.org)

Find: grab Find Next Find Previous Highlight Match case Phrase not found

Done

# User Portal - Account Manager