

Data Products in the ESO Science Archive

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Archive Science Group (ASG)

Data Management and Operations Division

European Southern Observatory


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Data Products in the ESO Science Archive


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ESO Science Archive Facility (SAF)


<http://archive.eso.org>



European Southern Observatory



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01 Aug 2013

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Welcome to the ESO Science Archive Facility

The ESO Science Archive Facility contains data from ESO telescopes at La Silla Paranal Observatory, including the APEX submillimeter telescope on Llano de Chajnantor. In addition, the raw UKIDSS/WFCAM data obtained at the UK Infrared Telescope facility in Hawaii are available.

The Principal Investigators of successful proposals for time on ESO telescopes have exclusive access to their scientific data for the duration of a proprietary period, normally of one year, after which the data becomes available to the community at large. Please read the [ESO Data Access Policy](#) statement for more information, along with the [relevant FAQs](#).

Browsing the archive does not require authentication, but to request and download data you have to log in to the [ESO User Portal](#). Please [acknowledge the use of archive data](#) in any publication.

Latest News and Updates

- [First Data Release from the MATISSE/OCA-ESO Project \(AMBRE\)](#) (15 Jul 2013)
- [Deep HAWK-I J and Ks imaging of the X-ray luminous galaxy cluster XMMU J2235.3-2557](#) (12 Jul 2013)
- [First Release of VST Public Survey KIDS Imaging Data](#) (12 Jul 2013)

[More news ...](#)

To browse the archive

Currently, **raw data** and various types of **data products** can be reached via different interfaces:

Category	Query Forms	Data collection	Data Type	Instruments
LPO Raw Data	Raw data query form (all instruments) Instrument specific query forms Direct retrieval of raw data by file name	All ESO raw data	Various	Many La Silla Paranal instruments
LPO Data Products	Phase 3 main query form Phase 3 imaging query form Phase 3 instrument specific query form	Phase 3 Data Products (ESO Public Surveys)	Currently, Imaging	Currently, VISTA/VIRCAM
	Catalogue Facility query interface	Phase 3 Catalogues [ESO User Portal authentication required also when browsing]	Catalogues	Currently, VISTA/VIRCAM
	Advanced Data Products query form	GOODS (C.Cesarsky)	Imaging, Spectroscopy	FORS2/ISAAC/VIMOS
		zCOSMOS (S.Lilly)	Spectroscopy	VIMOS
		Observation of Corot astrophysically-selected HD stars (E.Poretti)	Spectroscopy (time series)	FEROS
		UVES reprocessed	Spectroscopy	UVES
		Time-domain survey of NGC 2547 (S.Aigrain)	Imaging	FEROS
	FEROS/HARPS pipeline processed data query form	FEROS/HARPS pipeline processed data	Spectroscopy	FEROS, HARPS
	Science Verification, Commissioning, EIS, etc.	Full list of available data packages	Various	Many
APEX Quick Look Products	APEX query form	APEX	Heterodyne, Bolometer	APEX-2A, LABOCA, SABOCA, SHeFI
ALMA Data	ALMA Science Archive	All ALMA data	Cube	ALMA

ESO Archive Contents

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Total volume: >300 TB
predominantly raw data (rate in: 3.6TB/month)

ESO Archive Contents

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Data Products

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Phase 3 data represent the largest collection of data products in the ESO archive:

In total: 13 TB, >230k files, and growing..

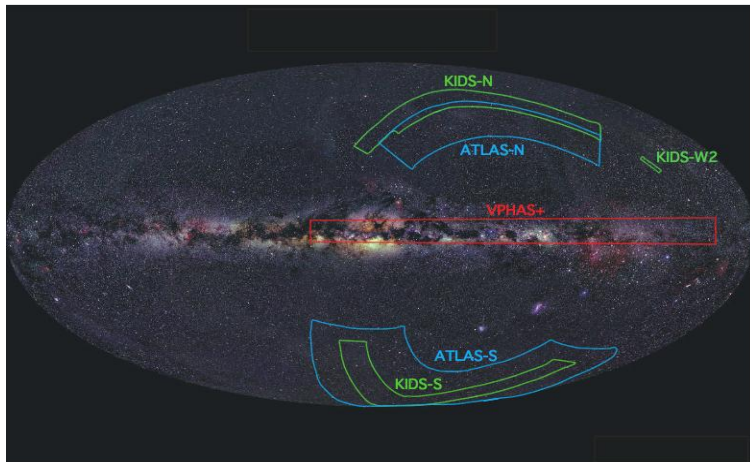
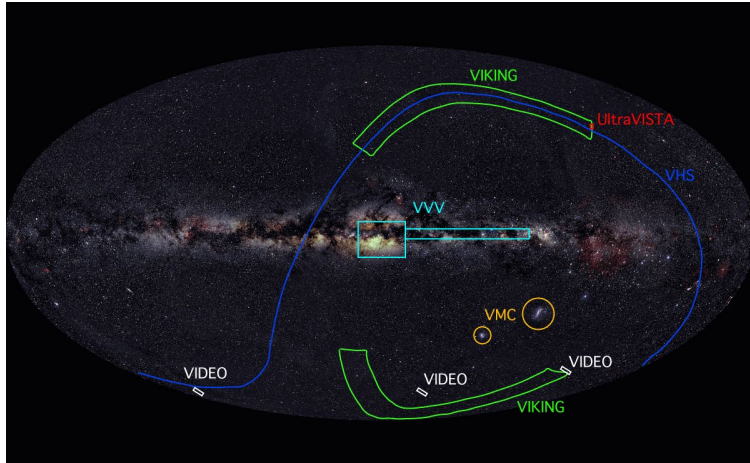
Science Data Products – Characteristics and Requirements

- Science-grade data, i.e. “ready” for scientific exploitation– to enable the users to do what they want.
- Instrumental signatures to be removed/corrected for;
- Data calibrated to physical units;
- Data uncertainties/errors quantified.
- Must adhere to the **ESO Science Data Product Standard** regarding data and metadata format (ie. required keywords)
 - Uniformity of products across the ESO/SAF in terms of data format, level of characterization, search capabilities, and data documentation.

ESO Archive Data Products

PHASE 3 OPERATIONS

ESO Public Surveys



VISTA: 6 surveys started Apr 2010 (P85)

- VHS - 20000 deg² YJHKs (K_s<20 AB)
- VIKING - 1500 deg² ZYJHKs (K_s<21.2 AB)
- VIDEO - 3 Deep Extragalactic Fields
- Ultra-VISTA - Ultra-deep ZYJHKs + NB118 in the COSMOS field
- VVV - Variability study of 520 deg² in bulge +plane plus multi-color map
- VMC - Magellanic Survey

VLT Survey Telescope: 3 surveys, started 15 Oct 2011 (P88)

- VST-Atlas - 4500 deg² UVRIZ, like SDSS
- KIDS - 1500 deg² UVRI, 2.5 mag deeper than SDSS
- VPHAS+ 1800 deg² UVHaRI in the Southern Galactic Plane

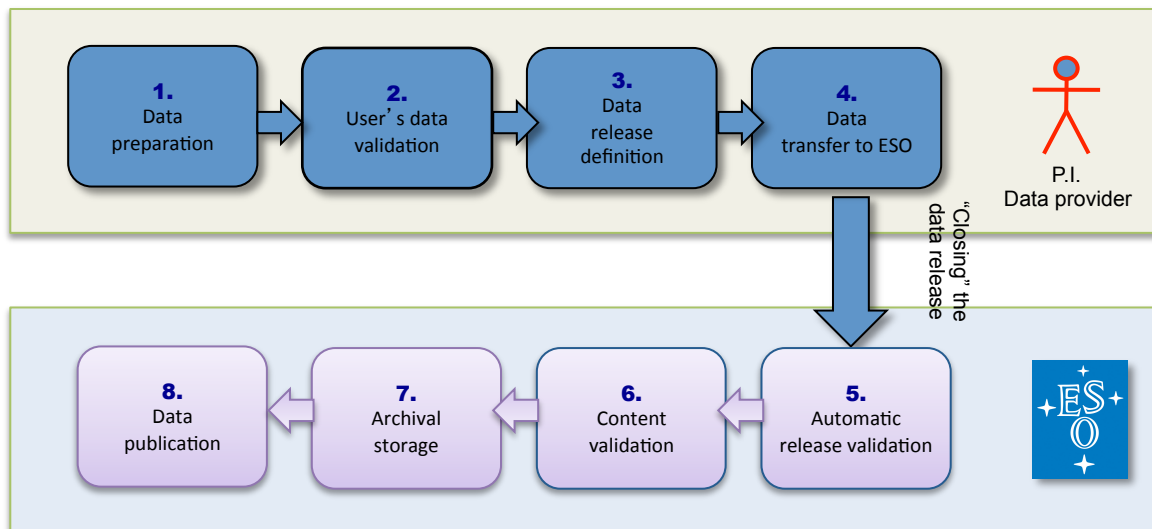
Spectroscopic Surveys: started 1 Jan 2012

- PESSTO: 30+60n on NTT (SOFI+EFOSC)
- Gaia-ESO: 30+30n on VLT-UT2 (FLAMES)

The Phase 3 process has been setup in 2011 to implement ESO's policies for public surveys.

Phase 3 Process & Responsibilities

Phase 3 denotes the process of **preparation**, **submission**, **validation** and **ingestion** of science data products for storage in the ESO Science Archive Facility, and subsequent data **publication** to the scientific community.



ESO defines the required data format, provides dedicated tools, user documentation and direct support for Phase 3 data providers.


The data provider ie. survey P.I. is responsible for the **quality** of the reduced data products and the **associated data release documentation**.

Content validation: audit of submitted data, including checks of

- consistency of data content against documentation,
- format of data and metadata,
- completeness and quality of the metadata (keywords).

<http://www.eso.org/sci/observing/phase3.html>

ESO Science Data Products Standard



European Organisation
for Astronomical
Research in the
Southern Hemisphere

Organisation Européenne
pour des Recherches
Astronomiques
dans l'Hémisphère Austral

Europäische Organisation
für astronomische
Forschung in der
südlichen Hemisphäre

Data Management and Operations Division

Phase 3 User Documentation
**ESO Science Data Products
Standard**

Doc. No.: GEN-SPE-ESO-33000-5335

Issue: 5

Date: 11/01/2013

Prepared: J. Retzlaff, N. Delmotte		
Name	Date	Signature
Approved: M. Amaboldi		
Name	Date	Signature
Released: M. Romaniello		
Name	Date	Signature

ESO, Karl-Schwarzschild-Str. 2, 85748 Garching bei München, Germany

Identifies **product types**, their **data and metadata formats** depending on instrument/mode.

Defines relevant keywords for data characterization, quality, processing provenance (history) etc.

- Supports archive operations, setup of query forms, data request etc.
- To minimize (meta)data curation during archive ingestion.
- **Current Issue: #5, Date 11/01/2013 covers all PS data products: imaging & spectroscopy**

<http://www.eso.org/sci/observing/phase3/p3sdpstd.pdf>

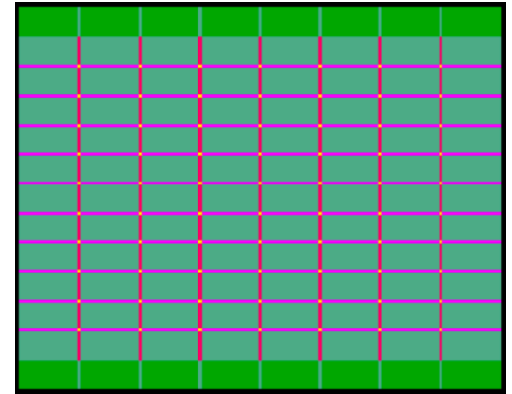
Types of Data Products

Survey Tile Image

- Astrometrically & photometrically calibrated FITS image with associated confidence/weight map;
- Quality params. (limiting magnitude, PSF size, etc.)
- Generally: processing provenance (keyword PROVi) to trace back to the original (raw) data.

1-dim. extracted wavelength-calibrated spectrum^{*}

- FITS binary table format (compliant to IVOA Spectral DM, v1)
- Support for 2d spectral frames as ancillary files



Exposure map of the VISTA survey tile.

Survey Source List

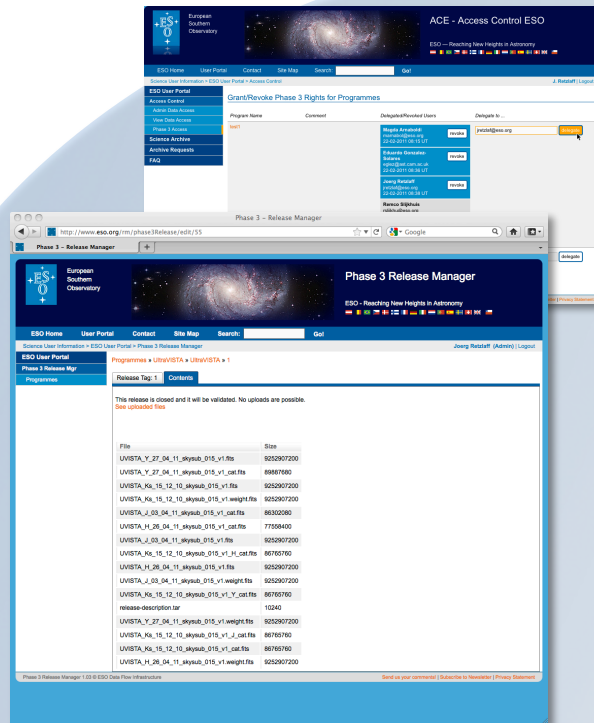
- Single-band source catalogues directly extracted from the (tile) image –associated to its originating image (provenance keyword PROVi)
- Based on nightly calibrations, degenerate w.r.t. physical sources

Science Catalogues

- Homogeneous merged multi-band catalogue for each survey (possibly per region)
- Global astrometry/photometry; cross-calibrated using overlapping tiles and across bands
- Multiple detections merged, i.e. unique entries (ultimately)
- Uniform tabular structure including content descriptors (employing UCDs)
- Supports variability surveys: multi-epoch photometric catalogues (i.e. light curves)
- Tile-by-tile scheme supported for data delivery
- Dedicated query interface: [ESO Catalogue Facility](#)

Phase 3 System Components

The **Phase 3 Validator** is a command-line application that verifies the data's compliance with the format standard and the validity of the FITS header keywords against predefined rules.



Start of operations:
March 2011

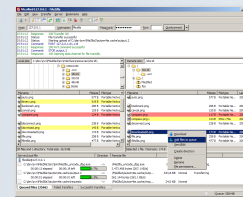
The **Phase 3 Release Manager** is a web application that allows the P.I. to define data collections and releases and to manage the Phase 3 delegation to co-investigators.
<http://www.eso.org/rm>

```
phase3@vistas1:~/jrl/VNC1/data — ssh — 98x34
Starting up validation tool.
Performing validation. Please wait...
INIT    PARSE HEADERS  CHECK CONSISTENCY  VERIFY FITS    DONE
[.....]

Release summary and content written on file: /disk/home/phase3/jrl/VNC1/data/validator.toc
Release error(s) are being written on file: /disk/home/phase3/jrl/VNC1/data/validator.error
Log file: /disk/home/phase3/jrl/VNC1/data/validator.log

FILES
-----
Science          92
Calib             0
Ancillary        42
Other             0
ASSOCIATIONS
-----
Dataset          42
Provenance       20
ERRORS
-----
Fits validation  1173
MDS check        0
Missing CHECKSUM/DATASUM  0
Invalid category  0
Missing category  0
Meta-data        0
Outlier          1
Missing from disk 1164
Invalid provenance 0
Duplication       0
Inconsistency     0
Other            0

ERROR - PLEASE FIX THE ERRORS BEFORE UPLOADING THE RELEASE.
[phase3@vistas1:~/jrl/VNC1/data]$
```



Any FTP client like lftp, filezilla etc.
Note: the requirement for SSL/TLS was dropped (Jun 2012).

The P.I. or a delegate transfers the data via standard **FTP** to the dedicated staging area at ESO headquarters.

ESO - Phase 3

http://www.eso.org/sci/observing/phase3.html

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Observing with ESO Telescopes

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Science Users Information > Observing with ESO Telescopes > Phase 3 01 Jun 2011

Phase 3

In a nutshell, Phase 3 denotes the process in which principal investigators of ESO observing programmes return their reduced data products to ESO for storage in the ESO archive and subsequent data publication to the scientific community. ESO's policies governing Phase 3 are specific to the type of observing programme. Phase 3 is mandatory for ESO Public Surveys and for ESO Large Programmes since period 75. For other ESO programmes there is no obligation but PIs are invited to take advantage of the Phase 3.

To ensure the successful integration of External Data Products (EDPs) into the archive, ESO supports the users in carrying out the Phase 3 process by defining ESO/EDP data standards, by devising procedures and providing the infrastructure for the delivery of EDPs, and by supplying tools for the data preparation.

The description of the policies, the data standard and the procedure for the submission of reduced data products applicable to the ESO Phase 3 process given here is intended to provide the information for the preparation and successful completion of the ESO Phase 3 process. The target audience consists of the principal investigators and their collaborators who return reduced data products resulting from ESO observations for public release to the astronomical community through the ESO archive.

Instructions and Documentation

- Overview of the Phase 3 process
- Phase 3 Policies for ESO Public Surveys
- ESO External Data Products standard [PDF]
- Phase 3 User Guide to the Data Submission [PDF]

Phase 3 Infrastructure and Software Tools

- Phase 3 Release Manager
- Release Validator
- FTP upload (phase3ftp.eso.org)

Further Information

- Questions & Answers
- Public Surveys Phase 3 Workshop, Garching, 30.11.2010

In March 2011, Phase 3 operations have started to support the validation, transfer and publication of the first data products from ESO public surveys. Other ESO observing programmes will be handled through the Phase 3 system as soon as the underlying data products standard and infrastructure have been extended to cover the respective instruments and data product types.

Contact the Phase 3 Helpdesk

For any questions regarding Phase 3, its policies, the data content and format, or the submission process of data products to the ESO Archive, please feel free to contact the EDP group via email at

usd-help@eso.org, subject: Phase 3

Phase 3 Quick Links

- Phase 3 Main Level
- ESO EDP standard [PDF]
- Phase 3 User Guide [PDF]
- Phase 3 Release Manager
- Release Validator
- Phase 3 FTP upload
- Get a template for the data release description
- Contact the Phase 3 Helpdesk

Workshops for Phase 3 users

Documentation

Phase 3 Tools

Helpdesk

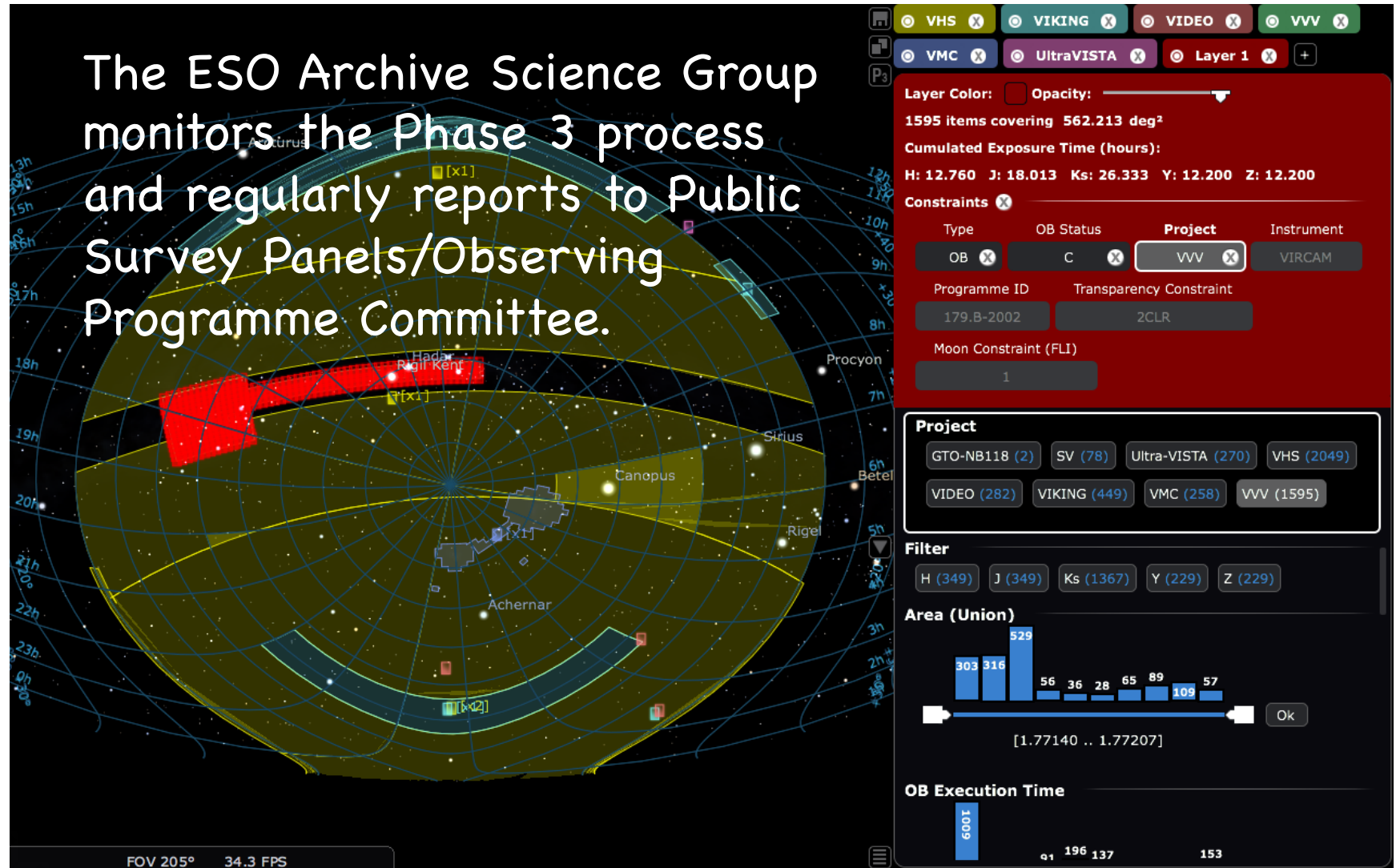
Phase 3 User Support

Send us your comments | Subscribe to Newsletter | Privacy Statement

http://www.eso.org/sci/observing/phase3.html

Monitoring the Phase 3 Progress

The ESO Archive Science Group monitors the Phase 3 process and regularly reports to Public Survey Panels/Observing Programme Committee.



ESO Public Survey Data Products

PHASE 3 DATA RELEASES

Status of Phase 3 Data Releases

http://www.eso.org/sci/observing/data_releases.html

Data Release	Data Type	Release Type	Release Date
VVV: VISTA Variables in the Via Lactea Survey - Data Release 1	Image	obsolete	25.07.2011
VIDEO: VISTA Deep Extragalactic Observations Survey - Data Release 1	Image	latest	25.07.2011
VMC: VISTA Magellanic Survey - Data Release 1	Image	obsolete	25.09.2011
VHS: VISTA Hemisphere Survey - Data Release 1	Image	obsolete	17.10.2011
Ultra-VISTA: an Ultra Deep Survey with VISTA - Data Release 1	Image	latest	15.02.2012
Ultra-VISTA Catalogue - Data Release 1	Catalogue	latest	24.09.2012
VVV: VISTA Variables in the Via Lactea Survey - Data Release 2	Image	latest	28.06.2013
VHS: VISTA Hemisphere Survey - Data Release 2 (*)	Image	latest	28.06.2013
VIKING: VISTA Kilo-degree Infrared Galaxy Survey - Data Release 1	Image	latest	28.06.2013
VMC: VISTA Magellanic Survey - Data Release 2	Image	latest	28.06.2013
KIDS: the Kilo Degree Survey - Data Release 1	Image	latest	11.07.2013
60.A-9284H: XMMU_J2235_JK_imaging - Data Release 1	Image	latest	11.07.2013
MATISSE/OCA-ESO Project (AMBRE) - Data Release 1	Catalogue	latest	15.07.2013
VPHAS+: VST Photometric Ha Survey of the Southern Galactic Plane and Bulge - Data Release 1	Image	latest	20.08.2013

(*) Note: Phase 3 supports *incremental* and *superseding* data releases.

Link to the associated data documentation

Link to the data

ESO Phase 3 – Data Release Documentation

Example: Ultra-VISTA

ESO – UltraVISTA Survey Data Release 1

Science Users Information > Observing with ESO Telescopes > Phase 3 > Data Releases > UltraVISTA Survey Data Release 1

22 Apr 2012

UltraVISTA Survey Data Release 1

Provided by: Jim Dunlop

Release Date: 15/02/2012

Abstract

The UltraVISTA program aims to provide extremely deep near-infrared YJHKs and narrow-band NB118 photometry on the COSMOS field. The survey is divided into two components, the "deep" component which covers a 1.5×1.2 deg contiguous region in the COSMOS field, and the "ultra-deep" component which covers 4 ultra-deep stripes in the field (cf. Figs. 1a,b). This first data release comprises part of the "deep" component and contains stacked, sky-subtracted images in Y,J,H,Ks and NB118 from the first year of data-taking. Single band and multi-band aperture matched catalogues are also provided.

Overview / Layout of observations

All the stacks released here cover part of the COSMOS field. Figure 1a shows the field layout on the COSMOS CFHT i-band image. The area of the green box is $\sim 1.5 \text{ deg}^2$. The green box corresponds to the coverage in the broad-band images (i.e. to the contiguous region); it has corners 9:57:13.02:48:00 (NW) and 10:03:00.01:37:00 (SE). Note that in the actual stacks, some data is missing in the bottom south-east corner due a bad detector on VIRCAM. Figure 1b shows schematically the deep and ultra-deep components of the UltraVISTA survey, in addition to the area covered by ACS/HST. Figure 1c shows the 5 images.

Figure 1a. Location of the UltraVISTA deep data (green box) superimposed on the COSMOS i-band data from CFHT. North is up and west (note!) is to the left in this figure.

Figure 1b. UltraVISTA Ultra-deep and deep surveys and ACS coverage. North is up and east is to the left.

Figure 1c. The 5 stacks, top: Y, J, H, bottom: Ks, NB118. The images have been displayed using intensity out to -5.15 "ADU" (cf. the colour bar), with the "ADU" in these images corresponding to a zero point of 30.0 in AB magnitude. North is up and east is to the left, and the layout corresponds to Fig. 1b.

Release description

- Provide short broad overview of the program, with an overview/layout of the observations

Essential input for data content validation.

Release content -

- Extended listing for each sky position, filters, exposure times, seeing

Release notes –

- Reduction method used, calibration procedures, data quality

Data format –

- Description of files in this data release, associated files, and naming conventions

Acknowledgements –

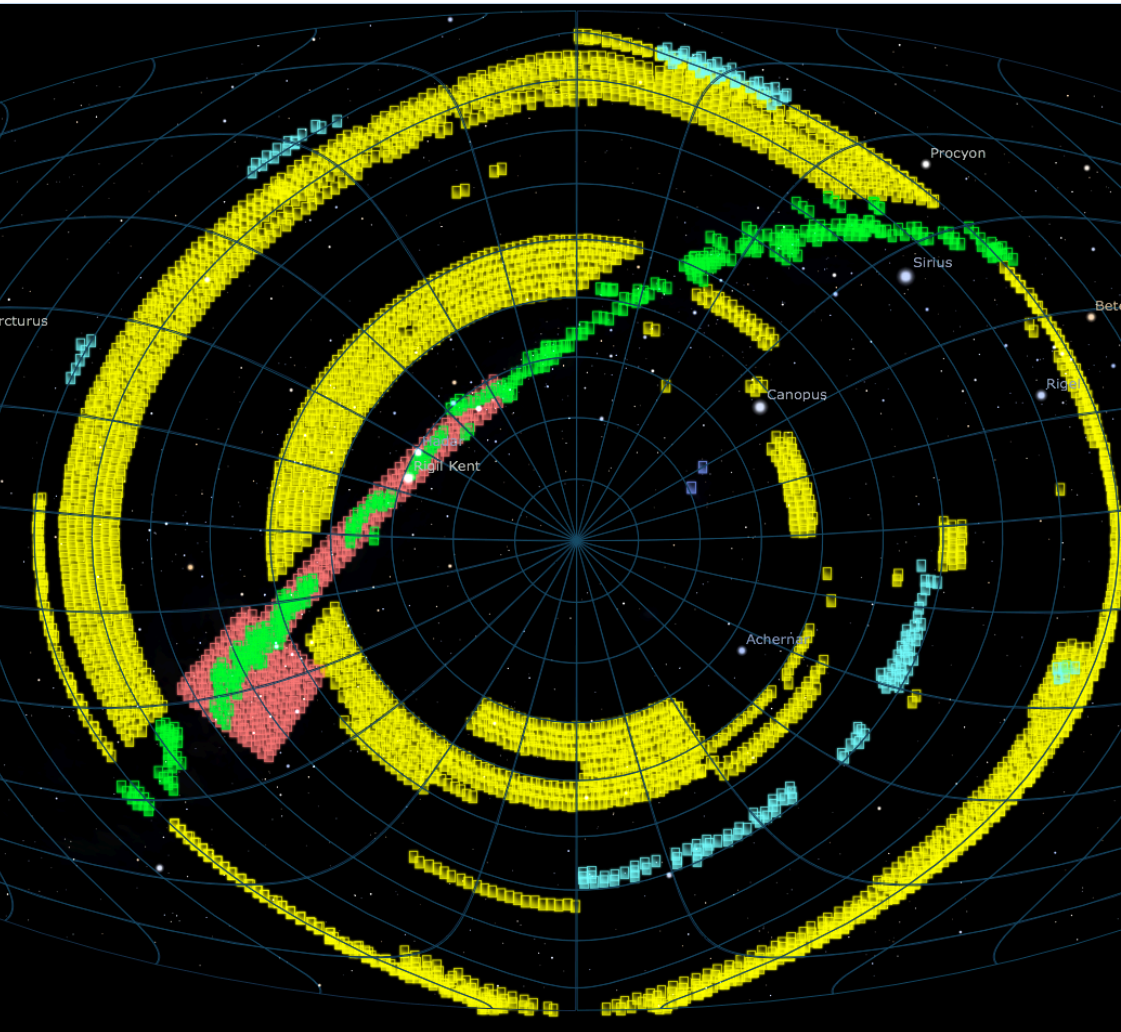
- Bibliographic reference to be included when using these data.

Data Releases from Public Imaging Surveys (Aug. 2013)

Survey	Submission Date	Date of Observations	Release Content	Pass-bands	Sky coverage (sq.deg)	Type of Data Products	Total volume	Total number of files	VISTA tile images	Pub. date
VVV	06.05.2013	Feb 2010 – Oct 2012	Contiguous patch of bulge and disk region including multi-epoch data in Ks	ZYJHKs	~520 (348 tiles)	Tiles, single-band source lists	2.8 TB	~16000	5327	28.06.2013
VIDEO	03.05.2011	Nov 2009 – Feb 2010	XMM-LSS field	YJHKs	1.5	Tiles, single-band source lists	24 GB	291	97	25.07.2011
VMC	03.06.2013	Nov 2009 – Nov 2010	2 pointings in the LMC: one overlapping the 30 Doradus and the other the South Ecliptic Pole region	YJKs	3.5	Stacked tiles, single-OB tiles and pawprints, single-band source lists	27 GB	252	50	28.06.2013
VHS	25.02.2013	Nov 2009 – Sep 2011	VHS DES: 120 secs in JHK VHS ATLAS: 60 secs in YJHK VHS GPS: 60 secs in JK	YJHKs	~3800	Tiles, pawprints, single-band source lists	8.3 TB	200000	10000	28.06.2013
UltraVISTA	06.10.2011 – 30.01.2012	Dec 2009 – Apr 2010	Deep imaging of the COSMOS field	YJHKs, NB118	1.5	Stacked images, SExtractor catalogues including Ks-selected multi-band catalogue	87 GB	19	5	15.02.2012
VIKING	20.05.2013	Nov 2009– Feb 2011	Sub-areas overlapping with the GAMA09/12/14, SGP stripe and CFHTLS-W1 regions	ZYJHKs	226	Tiles, single-band source lists	288 GB	7000	151	28.06.2013

Survey	Submission Date	Date of Observations	Release Content	Pass-bands	Sky coverage (sq.deg)	Type of Data Products	Total volume	Total number of files	VST tile images	Pub. date
KiDS	28.06.2013	Oct 2011– Sep 2012	Non-contiguous area in KiDS South and North	u, g, r, i	50	Tiles, weight maps and mask images, single-band source lists	700 GB	800	200	11.07.2013
VPHAS+	16.05.2013	Dec 2011 – Sep 2012	Bulge and disk of the MW	u, g, r, i H α	334	Pawprints, single-band source lists	750 GB	291	3489	20.08.2013

Status of ESO Survey Imaging Products



ESO Public Survey data products released up to Aug'13 cover about 4900 square degrees in total.

- VHS (yellow) 4210 sq.deg.
- VIKING (cyan) 235 sq.deg.
- VVV (red) 563 sq.deg.
- VMC (blue) 3.6 sq.deg
- VIDEO (light green) 1.8 sq.deg.
- VPHAS+ (green) 240 sq.deg.

UltraVISTA, KIDS not shown.

Total data volume: ~13 TB,
230k+ files

Accessing Phase 3 Data: Query Forms

Imaging observing programme

☒ **Programme**..... : Any
VVV
VIDEO
VMC
VHS
☒ **Collection**... : Any
VVV
VIDEO_XMM3
VMC
VHS
☒ **Release version**... : default: latest

☒ **Run/Program ID**..... : PPP.C-NNNN(R) (eg 179.B-2003)
 ☐ **Phase3 user**..... :

Target Information

Target name..... : SIMBAD name

Coordinate System..... : Equatorial (FK5) **RA** **DEC** RA: sexagesimal/hours, decimal/degrees

Search Box..... : **Equatorial Output Format** Sexagesimal

Input Target List..... : no file selected

Observation Parameters

☒ **Telescope**... : Any
ESO-VISTA
ESO-VLT-U4
ESO-VST
☒ **Instrument**... : Any
VIRCAM
HAWKI
OMEGACAM
☒ **OBSTECH**... : Any
IMAGE,JITTER
IMAGE
IMAGE,DITHER
☒ **Filter**... : Any
Z
Y
J
H

☐ **DATE OBS**..... : UT in YYYY-MM-DD HH:MM:SS format

☒ **MJD OBS**..... : Modified Julian Date

☒ **EXPTIME**..... : Total integration time per pixel [sec]

☒ **TEXPTIME**..... : Total Exposure Time [sec]

☐ **MULTI EPOCH**..... : Any

☐ **MULTI OB**..... : Any

Data Product Properties

☒ **PRODCATG**..... : Any
SCIENCE.IMAGE
SCIENCE.SRCTBL
SCIENCE.MEFIMAGE Data Product Format

☒ **Sky Coverage**..... : sky solid angle [deg^2] e.g. 0.6..1.8

☐ **ISAMP**..... : Any Sky Sampling

☐ **PIXELSCALE**..... : Spatial Sampling [arcsec]

☒ **ABMAGLIM**..... : Limiting Depth [mag] e.g. 20..22.5

☐ **ABMAGSAT**..... : Saturation Limit [mag] e.g. 13.5..15

☒ **PSF_FWHM**..... : Spatial Resolution [arcsec] (e.g. 0.9..1.1)

☐ **ORIGFILE**..... : Original File Name

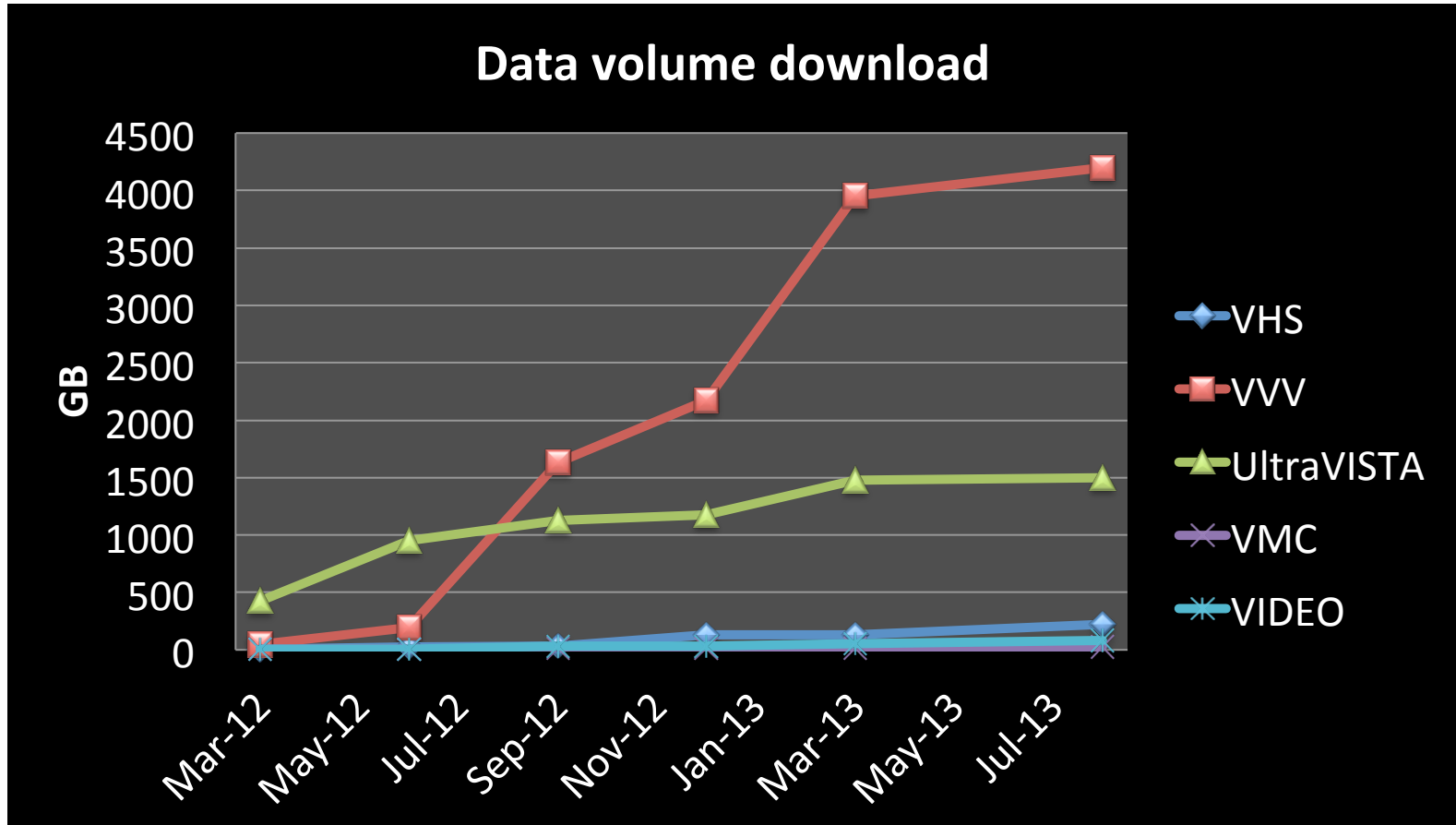
☒ **ARCFILE**..... : Archive File ID

- Supports queries by high-level quality parameters:
 - MAGLIM
 - PSF_FWHM
- For spectra (2013Q4):
 - By wavelength (range),
 - RP, SNR etc.

http://archive.eso.org/wdb/wdb/adp/phase3_main/form

ESO SAF

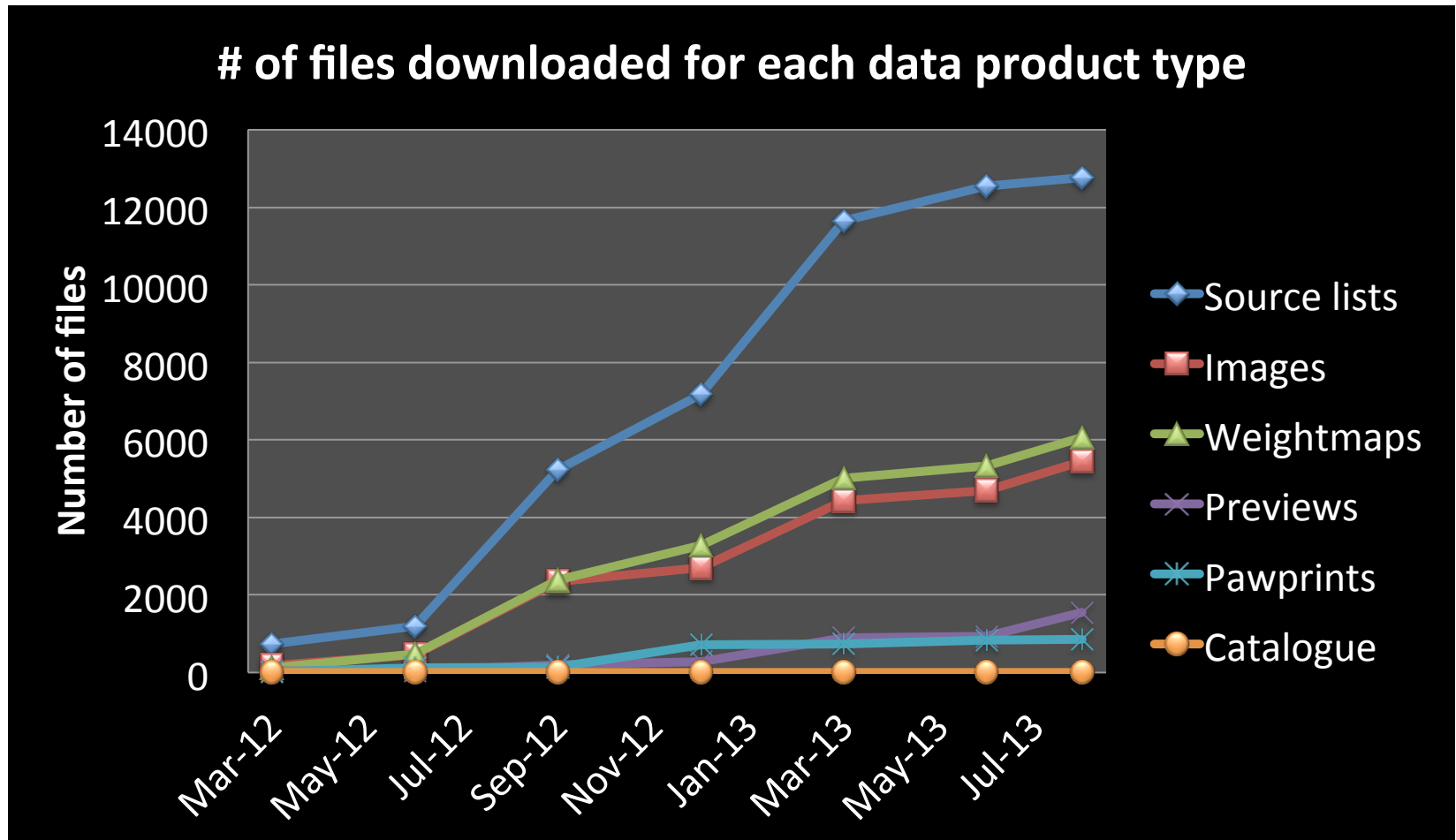
Data Access Statistics (1)



Courtesy: M. Arnaboldi/ESO Survey Team/ASG

6.8 TB of data products and more than 27000 files downloaded from the ESO SAF since December 2011

Data Access Statistics (2)



- High popularity of high-level products (source lists = single-band tile-based catalogues)

New data resulting from the **MATISSE/OCA-ESO Project (AMBRE)** released on 15.07.2013

- In collaboration between the Observatoire de la Côte d'Azur (OCA, Nice) and ESO, stellar radial velocities, atmospheric parameters including effective temperature, surface gravity, mean metallicity and enrichment in alpha-elements have been obtained by analyzing 21551 FEROS spectra from the ESO data archive with the MATISSE parametrization algorithm
- Available through the [ESO/SAF Catalogue Facility](#) query interface

Catalogue Facility Query Interface

Go to the URL <http://www.eso.org/qi>

Load an input file containing the list of target names or tab-separated target coordinate pairs (J2000).

Click on the catalogue title to display detailed information

Click to inspect the kind of content

1. Main Catalogue Facility page

2. Catalogue query form

3. Query results page

4. Query results page (detailed view)

5. Query results page (detailed view)

6. Query results page (detailed view)

Examples:
 >10
 >99
 <1.5
 <=5
 10 - 20
 abc%

Constraint qualification using the ASU syntax

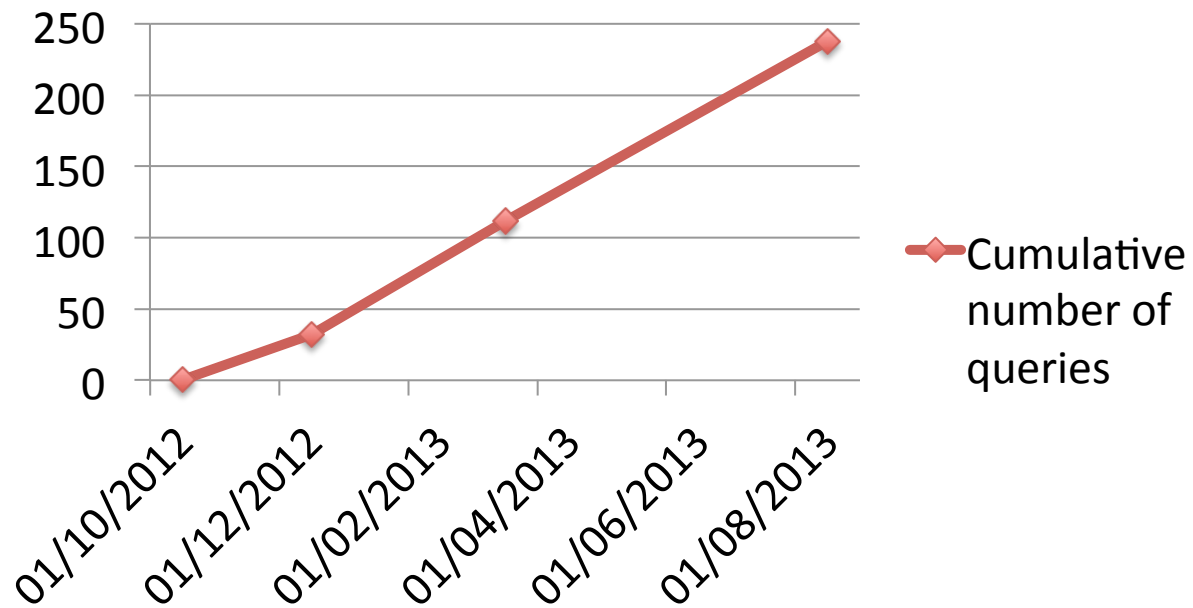
Click to sort the result set

Download for further scientific data analysis on the user's local computer.

- Serves science catalogue data
- Flexible: source catalogues, photometric light curves, redshift catalogues, stellar parameters,...
- Integrated with the ESO Phase 3 system (process, responsibilities, data standard)
- Scalability: supports large data volumes as resulting from large-area surveys.
- Deployed in 2012. Example for the further development of ESO/SAF services.

See also: poster #26

Evolution of CF User Queries



Current Status of Phase 3 Data Submissions

- ✧ VST-ATLAS: 3 TB submitted– Phase 3 content validation on-going
- ✧ VMC: updated band-merged **catalogue** data submitted
- ✧ VIKING: 14.5+ million sources band-merged **catalogue** data revised
- ✧ VIDEO: feedback on content validation provided
- ✧ VVV: band-merged **catalogue** data submission revised (11/09/2013), in content validation phase

Upcoming: Internal Data Products (IDPs)

- **Why?** The Users Committee recommended [UC36.R.3]: The ESO data archive should contain calibrated data where at least instrumental signatures are removed to increase the value of the archive for the ESO users.
- **Plan:** Science-grade DPs being produced by ESO in-house and integrated in Phase 3-compliant fashion for seamless access of internal and external data products through the ESO archive user interfaces.
- To enable IDP publication the existing Phase 3 system has been extended:
 - Concept of the *Phase 3 Data Stream* added: content grows over time; publication on file-by-file basis; supports proprietary data (according to ESO's data access policy)
- Development started in April '13. Phase 3 System to be upgraded on 16 Sep.
- The ESO/SDP Standard plays a pivotal role! Output format of ESO data reduction pipelines must comply (or conversion must be done).
- Operations: Data are being processed by the ESO/Quality Control group as part of the data flow operations.
- First IDPs to be integrated: UVES/Echelle data archive (ca. 91,000 spectra) + the current data stream; see also Poster #11 by R. Hanuschik / ESO

Internal Data Products (cont'd)

ESO Data Products Spectral Query Form

Other data products query forms: [Archive Facility \(MCM\)](#) [ESO \(MCM\)](#) [INCO](#) [EAO](#)

This form provides access to **reduced spectra** that were produced externally by PIs of ESO programmes, or internally at ESO (using ESO calibration pipelines with the best available calibration data). These data were then integrated into the ESO [Science Archive Facility](#) through the [Phase 3 process](#). Each available data set is fully described; please see the [list of data releases](#) of type "Spectrum". To search for other ESO phase 3 data products, please use the [Generic Data Products query form](#), the [Imaging query form](#), or the [VISTA Data Products](#). Other spectral data not yet migrated to the Phase 3 infrastructure are available via different user interfaces; please check the [archive home page](#).

Save Reset Output preferences: html table Return max 200 rows. All Fields Syntax Help

Spectral Observing Programme

Programme: Any VFTST Collection: ☒ Release version: ☒ default: latest

Run/Program ID: PPP.C-NNNN(R) (eg 179.B-2003) Phase 3 user:

Data product origins: Any

Target Information

Target name: SIMBAD name:

Coordinate System: Equatorial (FK5): RA DEC RA: sexagesimal-hours,decimal-degrees

Search Box:

Input Target List: Choose File no file selected

Equatorial Output Format: Decimal Display: ☒ RA ☒ DEC ☐ Gal long ☐ Gal lat

Observation Parameters

Telescope: Any ESO-36 ESO-VLT-U2 Instrument: ☒ HARPS ☐ UVES ☐ OBSTECHECHELLE

DATE_OBS: YYYY-MM-DD[Thh:mm:ss] (Thh:mm:ss is optional)

MJD_OBS: Modified Julian Date

EXPTIME: Total integration time per pixel [s]

MULTI_EPOCH: Any

MULTI_OBJ: Any

Spectrum Characteristics

Wavelength special syntax (mouse-hovering to know more)

Example	Mnemonics
656	Contained
393 AND 657	Both contained
393..657	Partial range overlap
<656	Min A smaller than
>656	Max A greater than
656 or (393 and 397)	Complex example

Wavelength coverage: Any [nm]

R (A/Å): e.g. > 10000 or < 3000 or 3000..10000

Spectral bin: [nm]

SNR: Any

Flux calibration: Any

Aperture (Slit width or fiber diameter): [arcsec]

Dispersive element: Any

Extended object: Any

Normalised: Any

Total flux: Any

Data Product Properties

Release Date:

Publication Date:

Processing Level: Any

ORIGFILE: Original File Name

ARCFILE: Archive File ID

Other

REFERENCE: ADS Bibcode

Sort results by: None (Faster)

The Phase 3 upgrade includes **query forms**, one dedicated to spectra, to support both, the upcoming spectroscopic PS data and IDPs.

Further planning:

- To extend the production of IDPs to more (existing) instruments and modes;
- To ensure that upcoming instrument pipelines are "IDP ready"

Next steps (preliminary):

- UVES slicer: processing to start once batch processing of UVES/Echelle point-like data is completed.
- GIRAFFE-MEDUSA: data products of science quality appropriate for archive publishing exist for 2004-04 until 2011-10. Pipeline upgrade planned.
- X-Shooter/Echelle: pipeline upgrade to be compliant to SDP standard planned for next year.
- HARPS: specification for the data conversion into SDP standards-compliant form currently on-going.
- HAWK-I and VIMOS imaging: delivery of compliant data products in October 2014 by the UK in-kind team.
- FORS2 and VIMOS spectroscopy: SDP-compliant pipeline planned. Processing of backlog and stream thereafter.
- In parallel: extension of the ESO/SDP standard to data cubes to support IFU data (KMOS, MUSE, as well as GIRAFFE-Argus); and the extension to interferometric data

Conclusions

- ❑ Transition of the ESO archive is currently taking place: from a repository of predominantly raw data into a scientific resource of immediately utilizable data products.
- ❑ The ESO Science Archive Facility is being populated with science data products including calibrated images, spectra, and catalogues
- ❑ Currently, predominantly resulting from ESO Public Surveys; complemented by other programmes
- ❑ Regular production and publication of science data products for selected instrument modes is about to start (with UVES/Echelle data first)
- ❑ Next: VST-Atlas DR1, Spectroscopic Public Surveys, VISTA band-merged catalogues (VMC, VIKING, VVV, VHS), VISTA DR3, LPs, VIMOS SPSs, more IDPs.