Curation of the VISTA Science Archive

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Overview

- ✳ Data Transfer and Ingest
  - � Flat File Access
- ✳ Recalibration
- ✳ Post-nightly pipeline data products:
  - ◦ Deep Stacks
  - ◦ Deep Tiles
  - ◦ Difference Images
- ✳ Provenance
- ✳ Quality Control & QC Flags
- ✳ Source Merging & Reseaming
- ✳ Neighbour Table Creation
  - ➤ Release Database

Data Transfer & Ingest

* Data transfer from [CASU logo] to [WFAU logo] via UKLight
  [2.5-5h per observing night; run monthly]
* Compressed Images (JPEGs) for each detector
  [~2.5-5h per observing night]
* Extraction, process & ingest of multiframe metadata
  [~1-2h per observing night]

➔ Flat File Access (images, confidence maps, single band catalogues)!
  [1-2 weeks after CASU releases data]

* Extraction, process & ingest of catalogue data
  [2-4h per observing night]

➔ Parallelised processing, run-time mainly determined by ingest.

Monitor Page

http://surveys.roe.ac.uk/vsa/index.html

Shows progress of ingest procedure. If one of the tickmarks ✅ 🟡 ✅ is present, flat file access is available, but all JPEGs may not be created yet.

Post-nightly pipeline Data Products

* Recalibration (if necessary)

* Difference images (eg. in WSA: GPS)

* Deep stacks (eg. in WSA: DXS)

* Deep tiles (eg. Mosaics in WSA: UDS)

* Catalogues for these image products

* Quality control by checking correct magnitude limits

* Synoptic data products

* …

Provenance & Quality Control

✳ *Provenance:* Information about file provenance

✳ *Quality Control of detections:* done by archive scientists, some files marked as deprecated, e.g.:
- 0 = good data
- 60-70 = eyeball check deprecation
- >127 = frame superceded by reprocessing

✳ Update of *Quality Error Bit Flags* (ppErrBits): deblended sources, bad pixel, boundary sources, saturated sources, cross-talk artefacts, etc.

Source Merging & Reseaming

On detections that passed Quality Control:

* *Source merging:* creation of multi-colour source lists from individual passband detections.

* *Reseaming:* flagging of duplicate objects as primaries or secondaries (relies on quality error bit flag).

Neighbour Tables

* Neighbour tables between sources and detections to quickly generate light curves and look for variable objects

* Neighbour tables with external catalogues to specifications:
  * SDSS, DENIS, MGC (Millennium Galaxy Catalogue), NVSS (NRAO VLA Sky Survey), 2XMM, 2MASS, ROSAT, IRAS, FIRST, GLIMPSE, SSA, UKIDSS Releases ...

Release

* Creation of the Release Database
  - Created in individual file-groups for faster access

* Copying to Public Catalogue Server
  - Update of VSA Browser pages to reflect changes

➔ http://surveys.roe.ac.uk/vsa/www/vsa_browser.html

Timeline

		UKIDSS DR3
Transfer	7h per observation night	50d (~7d after last pipeline proc.)
JPEGs	2h calc. + 0.3h ingest per observation night	~7d calc. (parallel) + 2d ingest
Metadata	0.2h calc. + 0.2h ingest per observation night	~1d calc. (parallel) + 1.5d ingest
Catalogue data	1h calc. + 1h ingest per observation night	4d calc. (parallel) + 7d ingest
Recalibration		4d
GPS diff. images		1.5d
UDS stacks		1d
DXS mosaics		3d
Provenance		1d
Quality Control	depending on PI input	28d
Error bit flags		2d
Source merging	UDS+DXS: 0.5h; GCS: 1d; LAS: 2d; [GPS: 3d]	3d
Reseaming	UDS+DXS: 2h; GCS: 2d; LAS: 0.5d; [GPS: ~14d]	2.5d
Neighbour tables	UDS+DXS: 1h; GCS: 1h; LAS: 4d	4d
Release database	15h creation; 7h copying	1d
Total Computational Time		~90d

VSA Releases

* VISTA surveys are released independently
  - Smaller surveys don't have to wait until processing has finished on larger ones.

* Quality Control of detections is mainly the PI's responsibility
  - Quick but thorough QC leads to earlier releases.

* ESO's release policy
  - Major data releases with uniform photometric and astrometric calibrations at least once per year.
  - First delivery expected no later than **18** months after beginning of the observations.

VSA Browser
Your portal to VSA data products!
http://surveys.roe.ac.uk/vsa/index.html

VSA - VISTA Science Archive

The VISTA Science Archive (VSA) holds the image and catalogue data products generated by VIRCAM on the Visible and Infrared Survey Telescope for Astronomy (VISTA) . The primary contents of the archive wi... science-ready catalogue data will be released in phases, while standard flat-file data products (both images and derived single passband catalogues) become available continually after routine observation an... archive releases can be found on the surveys page

The history of archive releases, updates and bug fixes is recorded under the release history page. Users wishing to receive email announcements of such entries should subscribe to the VSA_Announcelist (c...

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Picture: Sky coverage of VISTA surveys, overlaid on a 2MASS image of the whole sky.
Credit: VISTA

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VSA Browser: Access

Fill in your login details and your database
is ready for querying!

VSA Browser: Schema Browser

Schemas, Tables, Attributes and more...

Questions

* ✳ Requests/wishes for post-nightly pipeline data products

* ✳ Requests for specific external (stable) catalogues

* ✳ Proprietary rights on Flat File Access:
  * ➢ **12** month to individual survey groups?

* ✳ Proprietary rights on Catalogue Database Releases:
  * ➢ Immediate world wide access?
* ✳ Transfer of flat file products into ESO's SAF?

For questions & feedback please contact
vsa-support@roe.ac.uk