



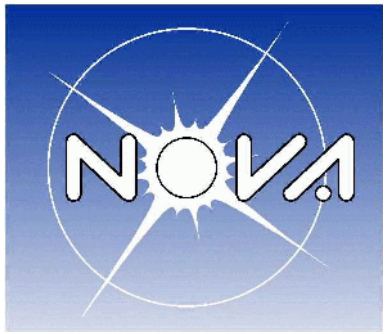

ASTRO-WISE

ASTRO-WISE pre-kickoff

21 November Leiden pre-kick-off meeting

Issue: Version 1.11 of OmegaCAM doc's

Date: 18 Nov 2001

Prepared by: Edwin A. Valentijn

www.astro-wise.org

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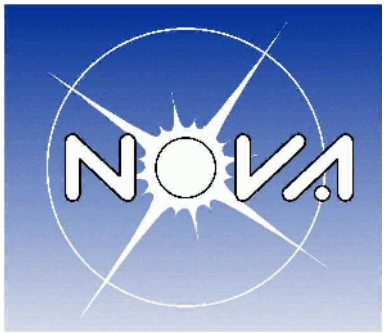


ASTRO-WISE This Meeting

- **NOVA - director**
- **this group - pre-kickoff**
  - → **kickoff-meeting Feb/March 2002**
  - → **design review T0 + Q1**
- **ASTRO-WISE status**
- **latest news**



ASTRO-WISE This Meeting - today

- purpose of meeting
  - identify tasks and persons for workpackages
  - profiles NNs
  - prepare design review T0+Q1

Agenda

General introduction





ASTRO-WISE AIMS

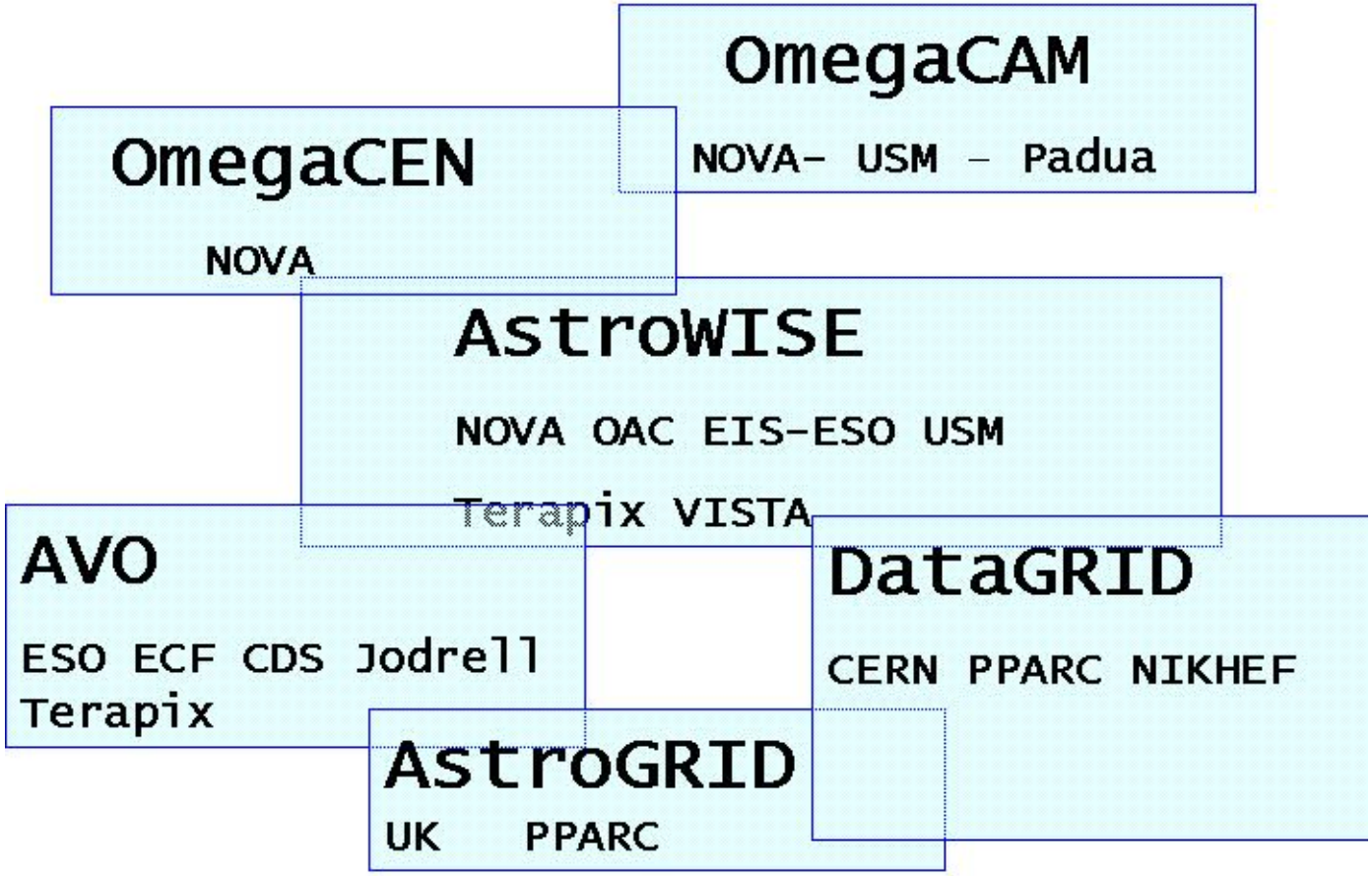
Participants: NOVA, ESO, OAC, Terapix, USM and VISTA / Co-ordinated by NOVA – Valentijn – Kapteyn Institute

A RTD programme EC Research Directorates "Enhancing access to Research Infrastructures"

- **to provide a European astronomical SURVEY SYSTEM, consolidating European wide field imaging expertise, joining the efforts of several National WFI data centres + ESO, OmegaCAM + VISTA survey system**
- **facilitating astronomical research, data reduction, and data mining**
- **establish through common standards, a European wide shared computing infrastructure.**
- **coordinates the development of software tools**
- **produce VLT targets, Survey products, products for AVO**

- **TOOLS: procedures, classes, and federated databases**
- **EXPERTISE: the first step towards GRID, ASTRO-GRID, AVO**

The GRID of GRIDs





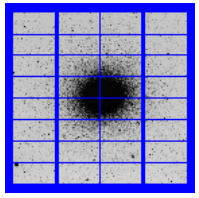
ASTRO-WISE - NATIONAL DATA CENTERS- TASKS

- **Hardware** -
  - Beowulf parallel processors (32) - WP4
  - Terabyte storage - RAID disks (dozens) WP5
- **Front-end processing**: Pipeline - (re-)processing WP1
  - error evaluation/ reliability
  - stacking/ differencing of science images etc.
- **Back-end processing**: Analysis - WP2
  - source extraction - User tunable, e.g. sExtractor
  - search engine (query and associate Tbyte source lists)
  - tell me *everything* about this sky position



ASTRO-WISE - NATIONAL DATA CENTERS- Implementation

- **STANDARDS - WP6**
  - - OmegaCAM procedurizing of all observations URD, CAI Plan, DFS
  - - liaison VISTA
  - - external: AVO, ASTROGRID, DATAGRID
- **FEDERATIONS- WP3**
  - oo database:
    - source lists
    - source code
    - pipeline administration, calibration and image data WP3
- **Python scripting WP1, WP2 WP3**



PROCEDURIZING CALIBRATIONS - Photometry

The baseline requirement for the photometric calibration of the broad band

- **accuracy** of better than 5% on the photometric scale in 'instrumental magnitudes' as assigned to the units of the resultant output image of the "image pipeline".
- The accuracy of the **colour transformation** terms of instrumental to standard systems should be better than 10% on the photometric scale.

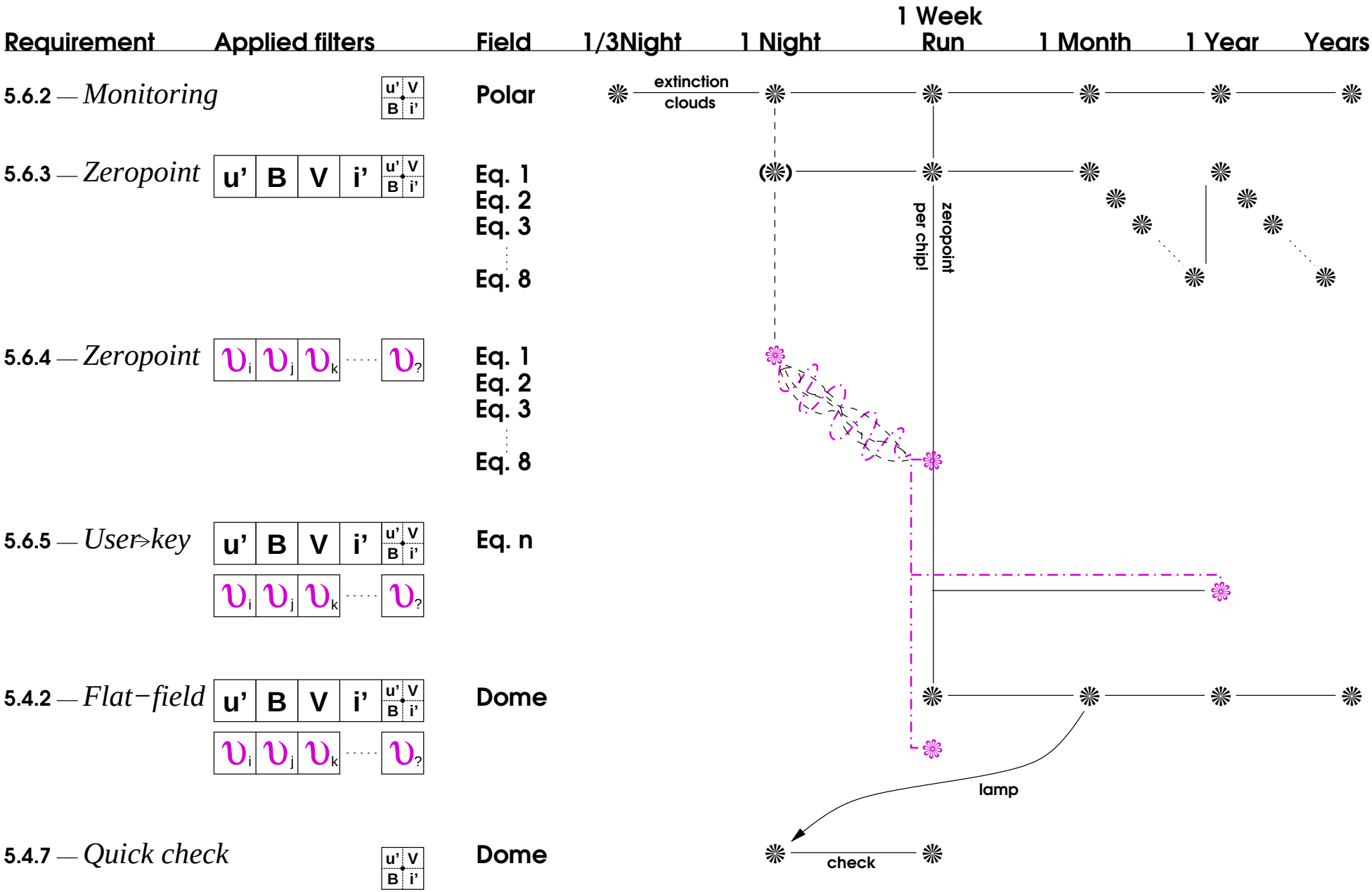
OmegaCAM specific concepts:

- **maintain instrument continously** over years of operation
- **key passbands** (X = B, V, R and I or u',B,V,i') – **overriding programme / FREQ**
- **two lens correctors** (near Zenith, the baseline, key configuration) and an **atmospheric dispersion corrector -ADC** for operations in User mode at larger Zenith angles.
- a **composite key filter** (X = B,V, R and I in each quadrant) 

,
- a standard **polar field/FREQ** , observable throughout the year
- **8 equatorial fields/FREQ**, containing both primary and secondary standard stars (Landolt fields)
- a **dome lamp** and screen equipped with a stabilized power supply,
- **32 CCD's** are operated simultaneously, with the exception of the composite filter which 'feeds' 8 CCDs simultaneously in one pass band.
- data rates should stay within limits that allow processing and storing of the data with the currently anticipated technology.
- A **standard atmospheric extinction curve** is adopted and all atmospheric extinction in various pass bands is a taken as a scaling of this curve.
- procedures data-taking, calibration pipeline (**timestamping**)

$$g_0 \times g(t)$$

Monitoring the Photometric Calibration



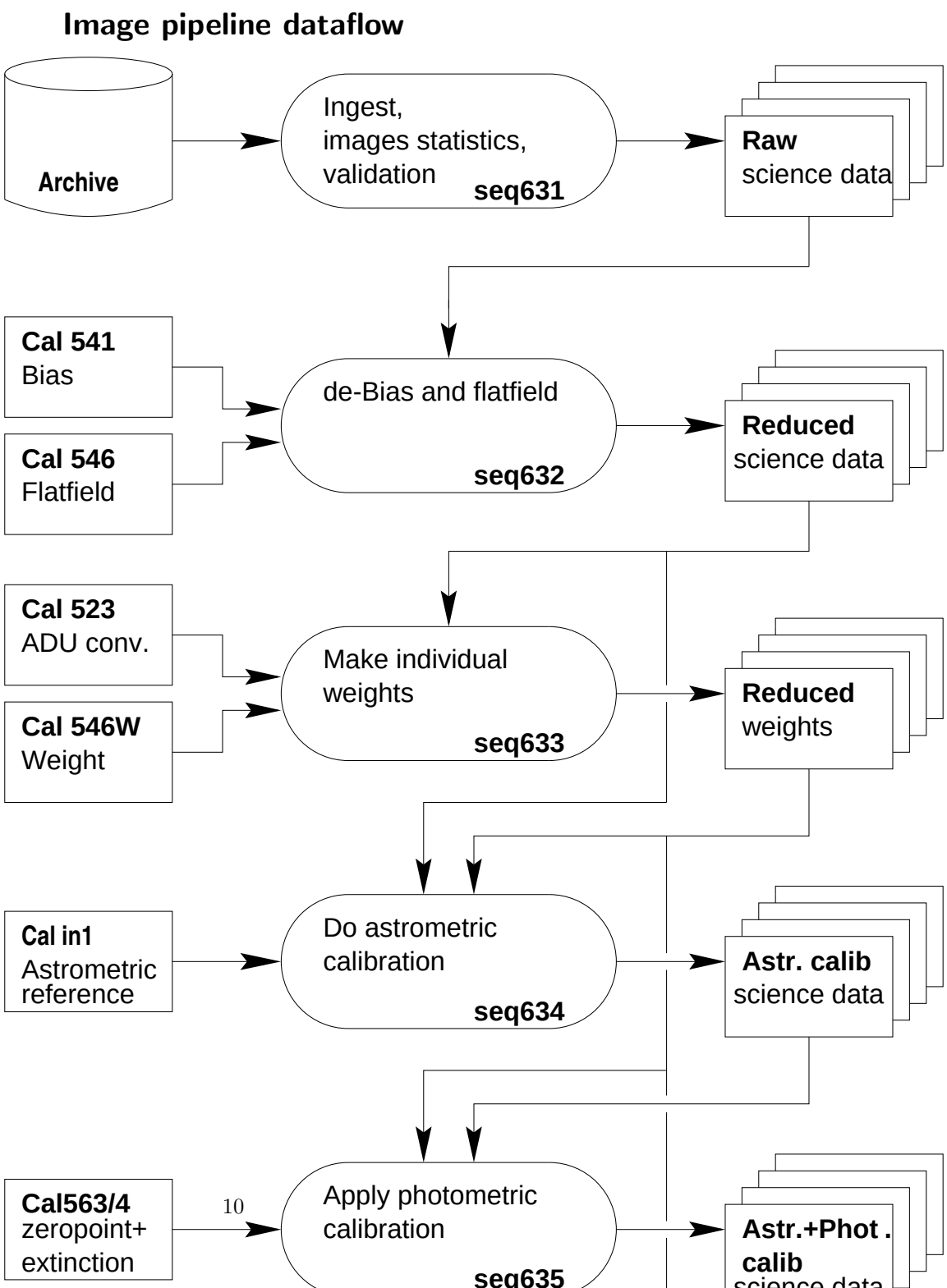


Image pipeline dataflow
Archive
Ingest,
images statistics,
validation
seq631
Raw
science data
Cal 541
Bias
Cal 546
Flatfield
de-Bias and flatfield
seq632
Reduced
science data
Cal 523
ADU conv.
Cal 546W
Weight
Make individual
weights
seq633
Reduced
weights
Cal in1
Astrometric
reference
Do astrometric
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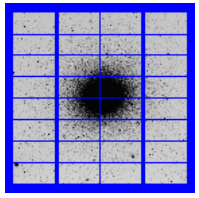
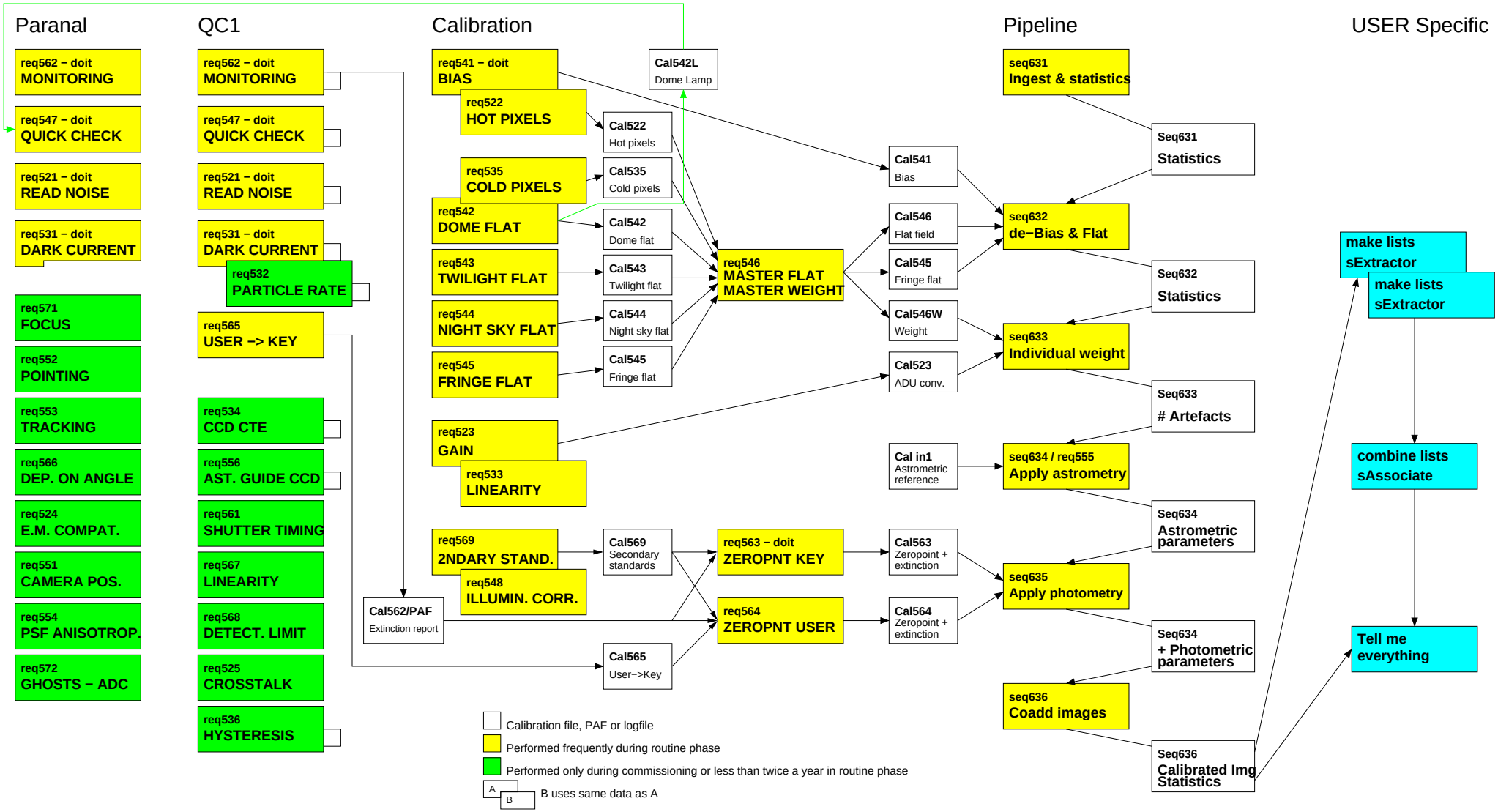


THE GEOGRAPHICAL PIPELINE –HIGHLIGHTS

- **design pipeline** both for ESO-HQ and the National data centers
  - Pipeline ESO DFS pipeline infrastructure compliant
  - pipelines operated at ESO HQ- but copied to NATIONAL centers
  - export of all image and calibration pipeline code to National centers
  - export of administration and calibration files to National centers
- **parallel processing– Beowulf 32 parallel Linux Gigabit Pc's**
- **design datamining by users**
  - **source extraction** at National centers
  - **re-processing with full access to calibration and administration data**
- **tools - object oriented, but specific for OmegaCAM**
  - **Python** scripting language - **import libraries, expertise, re-cycle existing code!**
  - Object oriented data base – **Objectivity/db Oracle 9i**

    federated db, all pipeline administration, VIRTUAL OBSERVATORY
  - both has prooven **fast development** is possible, low maintenance


Paranal
QC1
Calibration
Pipeline
USER Specific
req562 – doit MONITORING
req547 – doit QUICK CHECK
req521 – doit READ NOISE
req531 – doit DARK CURRENT
req571 FOCUS
req552 POINTING
req553 TRACKING
req566 DEP. ON ANGLE
req524 E.M. COMPAT.
req551 CAMERA POS.
req554 PSF ANISOTROP.
req572 GHOSTS – ADC
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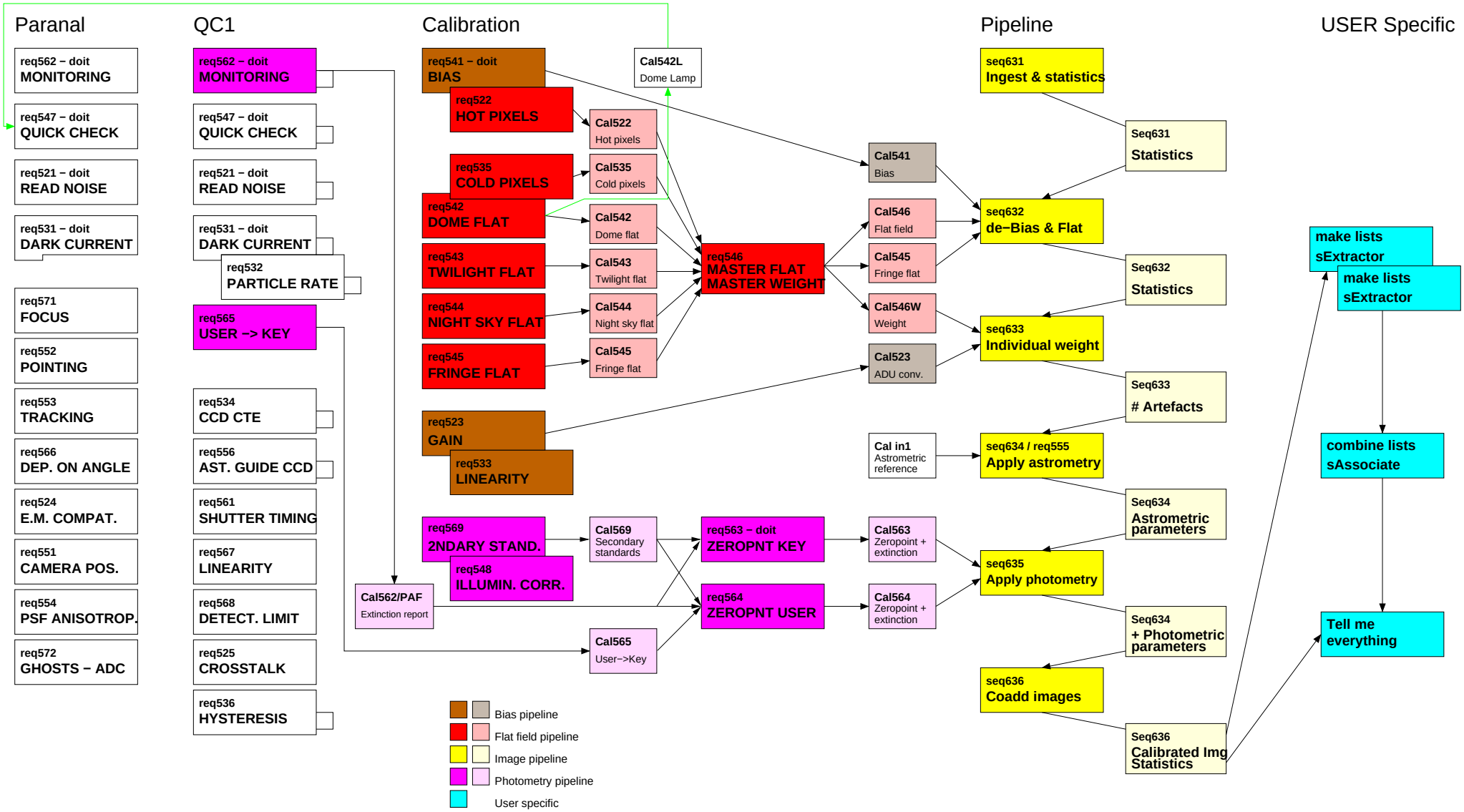
req565 USER –> KEY
req534 CCD CTE
req556 AST. GUIDE CCD
req561 SHUTTER TIMING
req567 LINEARITY
req568 DETECT. LIMIT
req525 CROSSTALK
req536 HYSTERESIS
req541 – doit BIAS
req522 HOT PIXELS
req535 COLD PIXELS
req542 DOME FLAT
req543 TWILIGHT FLAT
req544 NIGHT SKY FLAT
req545 FRINGE FLAT
req523 GAIN
req533 LINEARITY
req569 2NDARY STAND.
req548 ILLUMIN. CORR.
Cal542L Dome Lamp
Cal522 Hot pixels
Cal535 Cold pixels
Cal542 Dome flat
Cal543 Twilight flat
Cal544 Night sky flat
Cal545 Fringe flat
Cal562/PAF Extinction report
Cal565 User–>Key
Cal569 Secondary standards
req546 MASTER FLAT MASTER WEIGHT
req563 – doit ZEROPNT KEY
req564 ZEROPNT USER
Cal541 Bias
Cal546 Flat field
Cal545 Fringe flat
Cal546W Weight
Cal523 ADU conv.
Cal in1 Astrometric reference
Cal563 Zeropoint + extinction
Cal564 Zeropoint + extinction
seq631 Ingest & statistics
seq632 de–Bias & Flat
seq633 Individual weight
seq634 / req555 Apply astrometry
seq635 Apply photometry
seq636 Coadd images
Seq631 Statistics
Seq632 Statistics
Seq633 # Artefacts
Seq634 Astrometric parameters
Seq634 + Photometric parameters
Seq636 Calibrated Img Statistics
make lists sExtractor
make lists sExtractor
combine lists sAssociate
Tell me everything
Calibration file, PAF or logfile
Performed frequently during routine phase
Performed only during commissioning or less than twice a year in routine phase
A
B
B uses same data as A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