

OU-VIS: Status

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and the OU-VIS team

What is OU-VIS for ?

- From raw **VIS data**, create the algorithms and software to produce **calibrated images suitable for cosmic shear measurement**
- **Implications:**
 - We need to fully characterise the instrument
 - We need generate the instrument calibration models
 - We need to test algorithms for the data reductions, and write software to apply these algorithms
 - We need to to be able decide **to first order** if the data coming out of the pipeline meets the requirements.

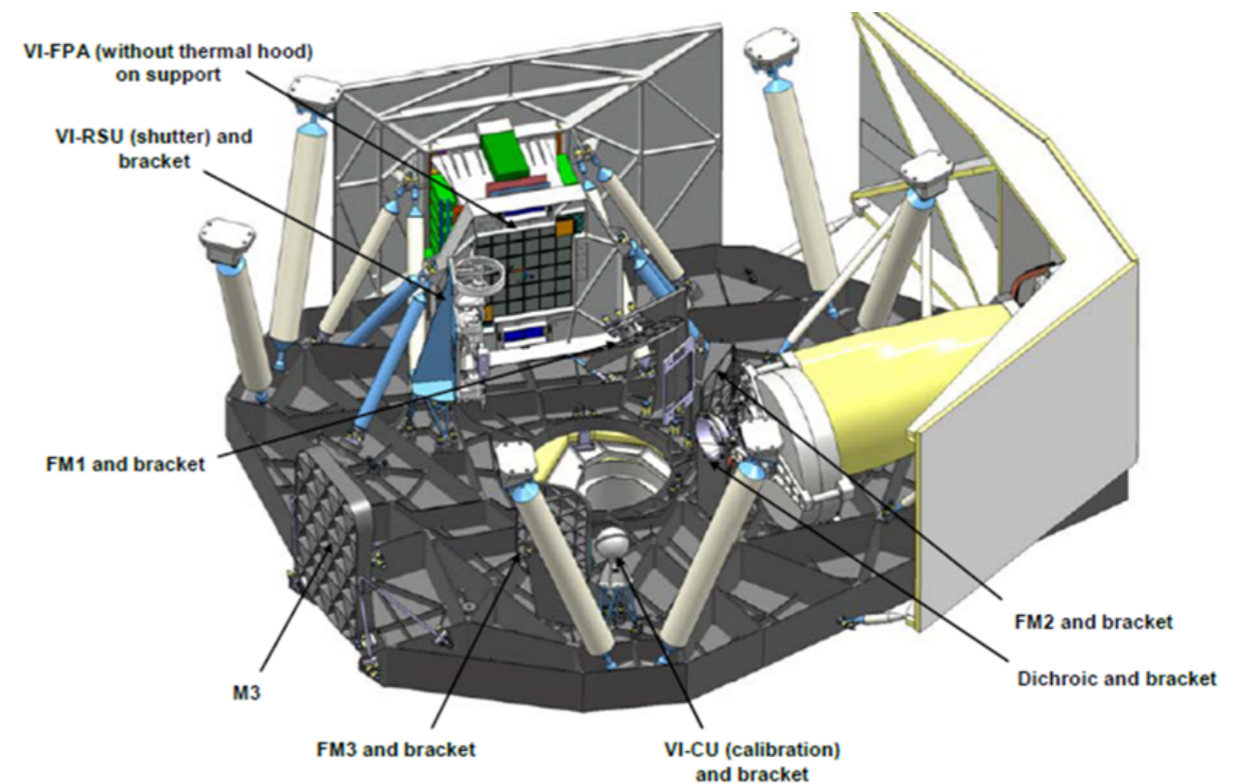


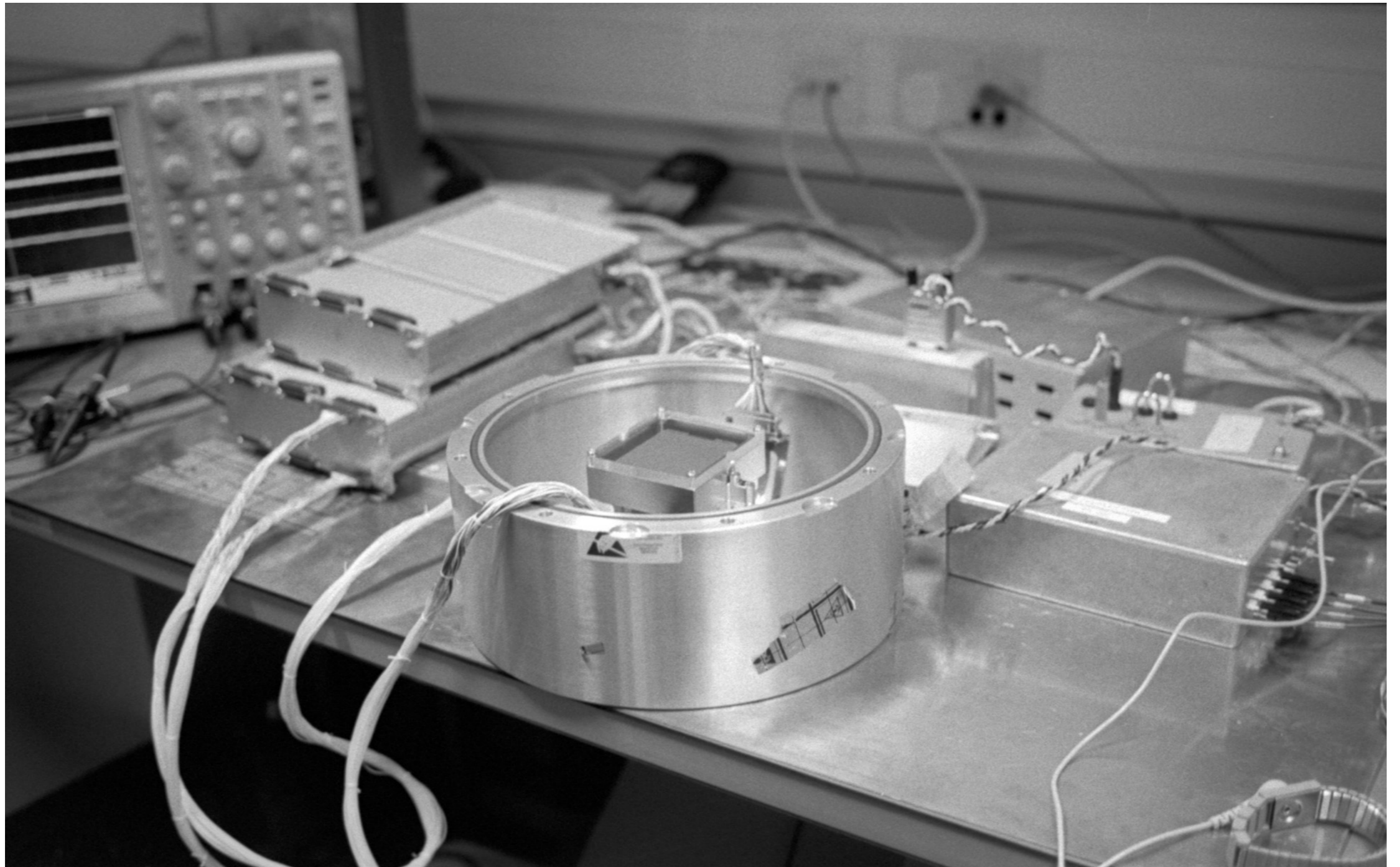
The OU-VIS team at MSSL, UK, September 2015

VIS Instrument

- Simple as possible so maintain high stability of PSF: focal plane instrument with no optics
- Single broad-band filter (to maximise number of galaxies)
- Will cover 35 % of the sky at HST resolution

- Limiting magnitude = 24.5AB, 10σ
- Pixel size: 0.1"/pixel, FOV 0.8 deg²
- VIS images will be a fantastic legacy resource: HST-quality imaging over SDSS size areas



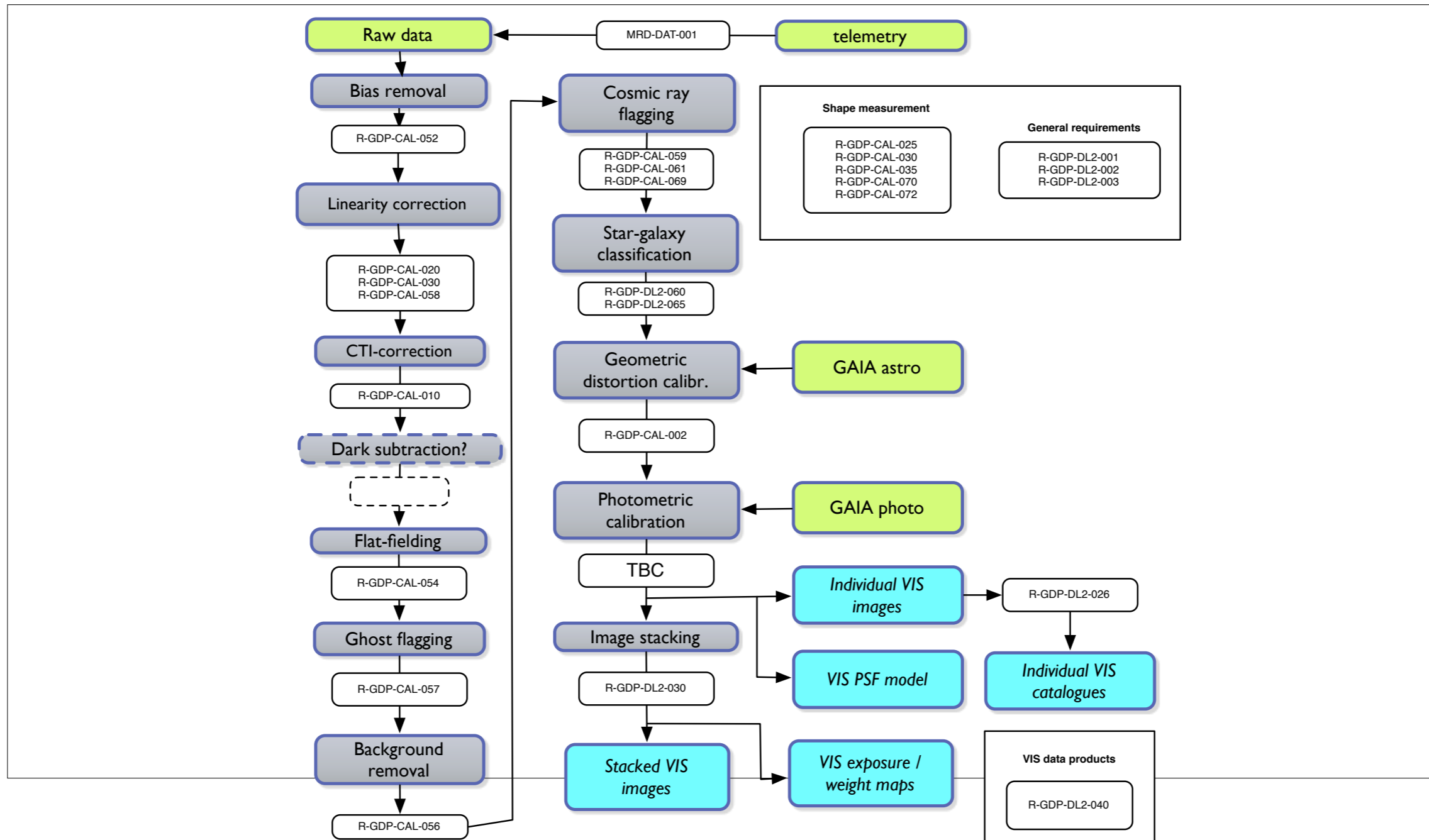


Euclid CCD on the test bench at MSSL (in silver halides!)

Do we (really) know the requirements?

- **Until now** VIS simulations have been for made for single quadrants for monochromatic sources
 - No full FPA sims have been made with Besancon model and a realistic mix of stellar SEDs
 - Chromatic effects need to be considered for many VIS requirements (PSF, astrometry)
 - Need to test requirements with more data and at a wider range of galactic latitudes (=stellar densities)
- Can't do this properly without adding all the processing steps together
- So, in order to properly validate the requirements we will need a complete prototype pipeline

GDPRD and OU-VIS



The SGS should also be requirement-driven

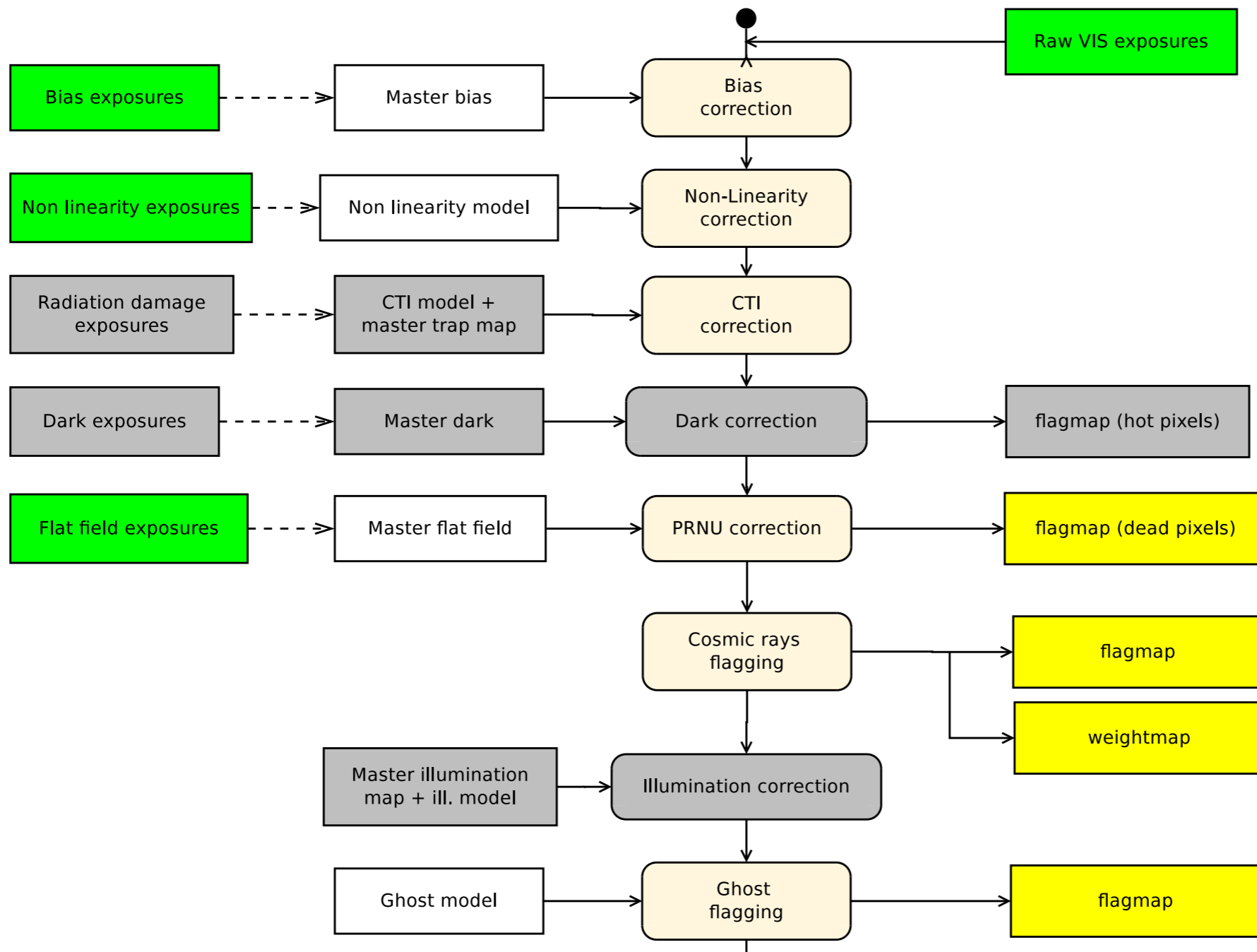
- In order to decide what to include at each step the in the pipeline **we need to decide what to do in order to carry out validation**
 - **We must decide now** what scientific tests we want to do in order to validate the requirements in the GDPRD
 - In a complicated pipeline like EC-SGS this is probably the only way to proceed.
 - We need to carefully assess the effects of **residuals** on each of the corrections
- **We will need:**
 - Realistic simulations
 - Prototype code

We will need to characterise all instrumental effects

- Some hard ones:
 - Charge transfer inefficiency
 - Brighter / fatter effect (PSF changes with flux because of charge repulsion in the CCD lattice)
 - Chromatic effects in the PSF and the wavelength dependence of the instrumental flat field. Do we need (for example) to select the flat field we need based on the galaxy SED?
 - Effect of CCD stitch-blocks on the galaxy shapes
 - **And some other stuff we haven't thought about yet**

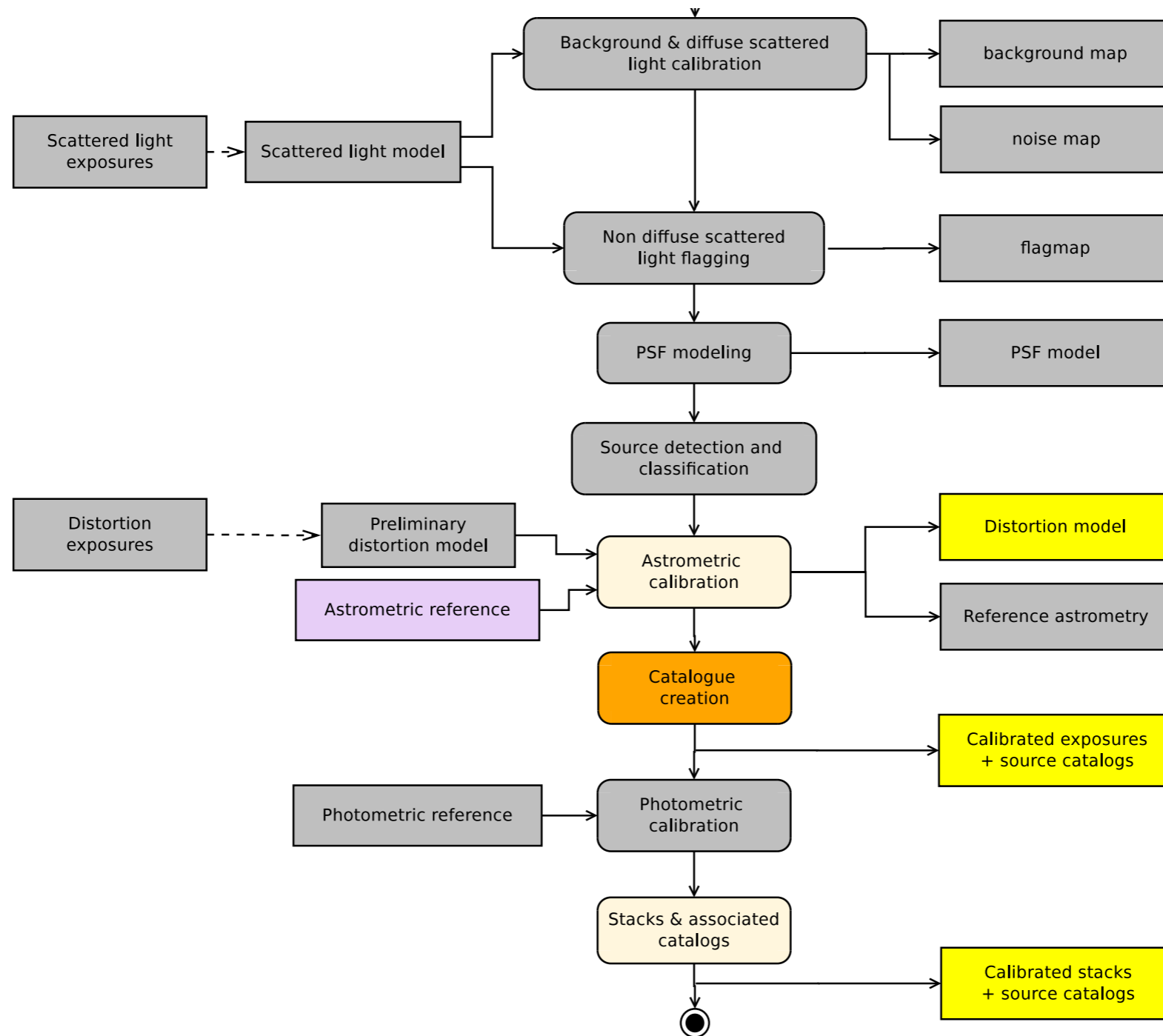
OU-VIS 2015-2016 roadmap

- With OU-SIM, develop realistic VIS image simulations and produce simulated data
- Create and run (at CC / Lyon) a prototype VIS processing pipeline which will be eventually used for SC2 challenge and TK1
 - Note that our pipeline is **extremely** hacked-up. Almost no coding standards, no API, no data model. Object is just to get something up and running. Will see later what the correct framework to apply is, etc, etc
- Test and validate prototype pipeline output to confirm that production pipeline will meet the OU-VIS requirements and overall Euclid GDPRD requirements.



Key

- (Activity)
- Input data product
- Output data product
- Auxiliary data
- Intermediate data
- - - ➤ Master/model production
- Not implemented in v0
- In v0 only





SEX PISTOLS

SEX 1-6

ANARCHY

IN THE

UK-SDC FR

OU-VIS status

- Created “custom” OU-VIS simulations and found lots of bugs in the simulator !
 - At least seven different iterations were required. Great flexibility in being able to run everything at CC.
- **V0 prototype pipeline is complete and functional at CC (December 2015)**
 - **Can process “raw data” and produce raw data corrected for all instrumental effects**
- We will now start applying validation tests on this output.
- Infra at CC not set up to offer “volume” SC2 environment?!!!