WFCAM

UKIRT

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CHANGE RECORD

Issue	Date	Section affected	Change Description

1 DETECTOR CHARACTERISATION TESTS

1.1 DETECTOR TRANSIMPEDANCE (COPLANARITY CRYOSTAT)

Calculate from shot noise vs signal curve.

Ensure that this number is the same across the array for different outputs and different regions - other detectors have seen capacitance change in different regions thus affecting system sensitivity.

1.2 FULL WELL CAPACITY (COPLANARITY CRYOSTAT)

Determined from point at which output becomes strongly non-linear.

Look at variation with reset voltage, and determine best operating point.

1.3 READ NOISE MEASURE (COPLANARITY & FINAL CRYOSTAT)

Spatial, Temporal and Allen Variance all measured.

Also requires visual inspection of images for structure (eg. interference)

1.4 LINEARITY (COPLANARITY CRYOSTAT)

Determine this by varying the number of illuminating LED pulses.

Calculate for Low Level 0 - 1000 ADU, and High Level 1000 - 65k ADU

1.5 DARK GENERATION PIXEL MAP (COPLANARITY CRYOSTAT)

The mean dark signal will be very difficult to measure because it is so small.

Of most relevance here is the number of pixels with high dark current – ie. the high dark current tail in the distribution. This will vary with detector temperature and reset voltage.

1.6 THERMAL CYCLING EFFECTS ON OPERABILITY (COPLANARITY CRYOSTAT)

This will be determined by careful comparison of images before and after thermal cycling. Things to lok for are

- Changes in Hot/cold pixel distribution
- Changes in QE Defects such as bad pixels

1.7 PERSISTENCE MEASUREMENTS (COPLANARITY CRYOSTAT)

This will be tested by saturating a small portion of the detector, and taking repeated exposures at 5 second intervals to determine the decay time.

1.8 INTER READOUT CROSS TALK MEASUREMENTS (COPLANARITY & FINAL CRYOSTAT)

- Measure 8x8 crosstalk matrix per quadrant using hot pixels
- Measure stability of crosstalk matrix over hours and days.

- check for inter-quadrant crosstalk

1.9 D.C. DRIFT/GAIN VARIATION WITH TEMPERATURE (COPLANARITY CRYOSTAT)

Measure changes in DC signal, bias structure and gain as a function of array temperature.

1.10 DEPENDENCE OF QE ON ARRAY TEMPERATURE (COPLANARITY CRYOSTAT)

This may be very difficult to do since it is a small effect, unless 1.9 shows negligible drifts with temperature.

1.11 RESET ANOMALY STABILITY (DARK AND ILLUMINATED)

This will be done by taking identical dark and illuminated frames, and comparing. Timescales from hours to days to be examined.

1.12 FLATFIELD STABILITY

This will be done by taking identical dark and illuminated frames, and comparing. Timescales from hours to days to be examined.

1.13 QE AT Z AND Y RELATIVE TO JHK (FINAL CRYOSTAT)

This can be done on all four detectors during throughput tests with the calibrated blackbody source by measuring throughput in different filters.