

Req 5.3.4

Title:

CCD Charge Transfer Efficiency

Objective:

Characterize horizontal and vertical transfer efficiency (CTE) per single transfer (in units of the fraction of the charge actually transferred).

Taken from WFI@2.2m: Ten flatfields are taken with 50 vertical and 50 horizontal overscan pixels and a mean exposure level of about 20000 ADU's. The mean is computed and corrected for the bias. Average signal levels are determined in the two overscan regions as well in the light sensitive pixels just preceding the respective overscan pixels. Any signal found in the overscan pixels was due to non-unity CTE lost from the neighbouring light-sensitive pixels. The fractional charge still remaining in the light-sensitive pixels is the CTE.

Note added after analysing Bias behaviour in overscan regions on OmegaCAM CCDs (see test report Notes on OmegaCAM bias level- Nov 2003): The test report shows that there is significant reminiscence in the detector/amplifier chain with typical time scale of about a second. Therefore both the vertical and the horizontal overscan regions are affected by this reminiscent signal (only the upper 50 rows of the Y-overscan region are free from this signal). Thus the above described method for WFI is not expected to deliver very useful information on CTE.

Alternative: it might be more practical and informative to inspect the tails in X and Y of very bright stars.

Fulfilling or fulfilled by:

selfstanding but related to masks for **req. 541** *Bias - doit*, **req. 522** *Hot pixels* and **req. 535** *CCD Cold Pixels*.

When performed/frequency:

daytime- Commissioning, in RP once half year *alternative* additional data reduction of **req. 525** *Cross talk*

Sources, observations, instrument configurations:

Dome flat field- lamp. Use r' filter.

Alternative none- use **req. 525** *crosstalk*.

Inputs:

CalFile– **541** *Master Bias frame*

Outputs:

CalFile– 534 *charge transfer efficiency factors*

Required accuracy, constraints:

CTE > 0.999995 per parallel or serial shift.

Note, that a small fraction of the **OmegaCAM**CCDs will have a CTE slightly below these values.

Estimated time needed:

30 min.

Priority:

desirable

TSF:

Mode– Stare N=10

(**TSF– OCAM_img_cal_domeflat**, N=10)

= **TSF– OCAM_img_cal_cte**

CA:

The originally proposed method to determine CTE will give very limited info due to significant reminiscence.

Original text: Ten flat fields are taken with 50 vertical and 50 horizontal overscan pixels and a mean exposure level of about 20000 ADU's. The mean is computed and corrected for the bias. Average signal levels are determined in the two overscan regions as well as in the light sensitive pixels just preceding the respective overscan pixels. Any signal found in the overscan pixels was due to non-unity CTE lost from the neighbouring light-sensitive pixels. The fractional charge still remaining in the light-sensitive pixels is the CTE.

An alternative method, inspecting the tails of very bright stars in X and Y direction can be done on RTD and does not need a special recipe.