

SUMMARY OF THE NATURE OF NAUGHTY (BLINKING) PIXELS IN AisaOWL

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1. A study with four 400 frames long datasets shows:
 - a. Datasets have 6.51% - 6.94% naughty of all image area pixels.
 - b. Pixels that are naughty in all four lines are 5.3%
 - c. Pixels that are naughty in three of four lines are 0.87%
 - d. two of four are 0.84%
 - e. one of four are 1.27%
 - f. Pixels that are naughty in at least one of the four are 8.27%

Based on all above, 64% of naughties remain naughties in all datasets and 36% are different from dataset to another. It should be kept in mind that 400 frames at 100 fps correspond to four seconds time interval only. Then only blinkers whose interval is less than 4s are cached here. Also statistics in this study was bad as only four lines were taken but it gives the idea of the variability of naughty pixels.

2. Blinkers respond to light properly but have two or more different offsets (i.e. "naughty" pixels) that change in unpredictable times.
3. Based on discussions with detector manufacturers the reason of blinking is not clear but it has something to do with material (Mercury-Cadmium-Telluride) and focal plane array structure itself.
4. Frequency of changing offset is not constant and it is very different from a blinker to another.
5. There are several ways to find and handle blinking pixels from the data:
 - a. Find outlying standard deviation when looking at constant target.
 - b. Find sudden changes in single pixel signal value.
 - c. Data filtering techniques.

Currently option a is used in OWL pre-processing because option b (which has been used by SPECIM as well) has shown to be unpredictable. Option c is currently being studied by some of SPECIM partners but studies are not ready at the moment and there is also a risk of losing or mixing data when using filtering techniques.