Fake clusters based on noise simulation

Preliminary

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Objective of this analysis

- Measurement of fake clusters for one year of data taking

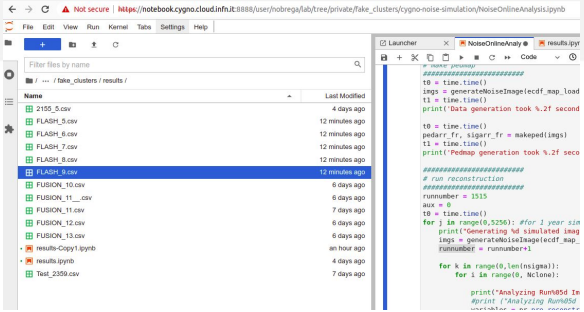
  (1 image per minute)

  For '4' different sensors (BSI_{CMS}, BSI_{HDR}, FLASH, FUSION)

Summary

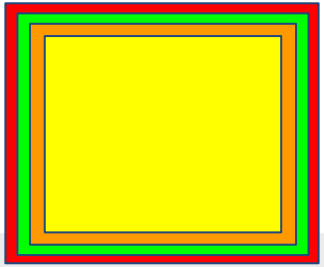
- Strategy
- Preliminary results *(only for FLASH and FUSION)*
- Conclusions

Strategy

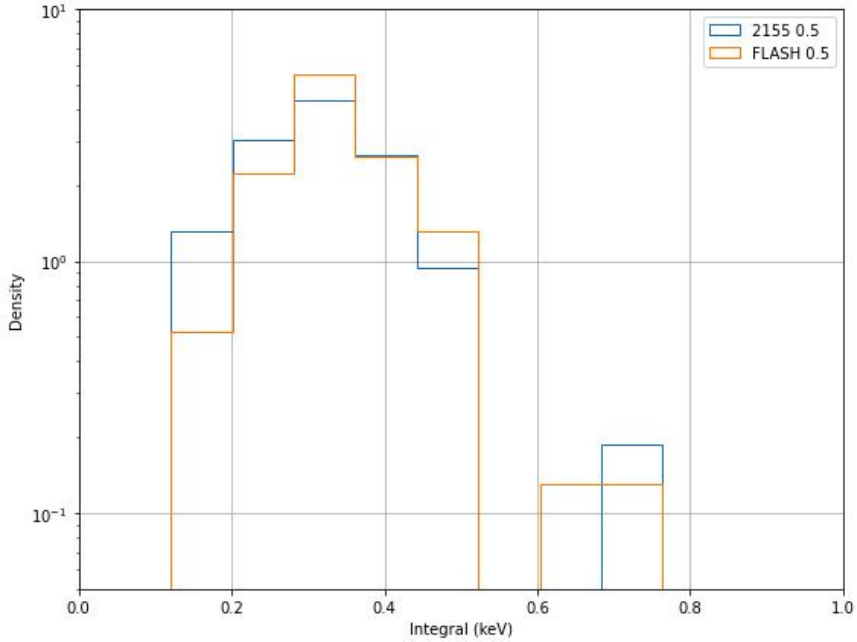


- ❑ Build ECDF from pedestal run
- ❑ Run simulation *(using the INFN cloud system thanks to Giovanni)*
  - ❑ First 100 images used to build *pedmap* (mean, std)
  - ❑ Run reconstruction for different threshold values
  - ❑ Generate results with different border cuts (0, 100, 200 and 300 pixels)

Sensor



Testing Simulation vs. real data test (Run02155 - only 100 events)



Sensor	Number of clusters
FLASH 0.5	233510
FLASH 0.6	16600
FLASH 0.7	2854
FLASH 0.8	264
FLASH 0.9	20

149k images

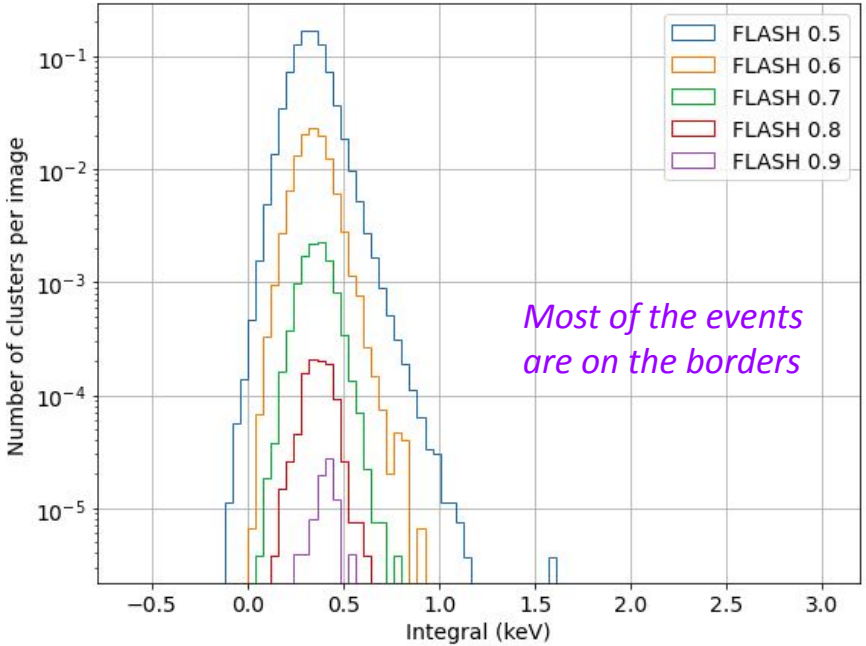
FUSION 1.0	94353
FUSION 1.1	3042
FUSION 1.2	94
FUSION 1.3	1

81k images

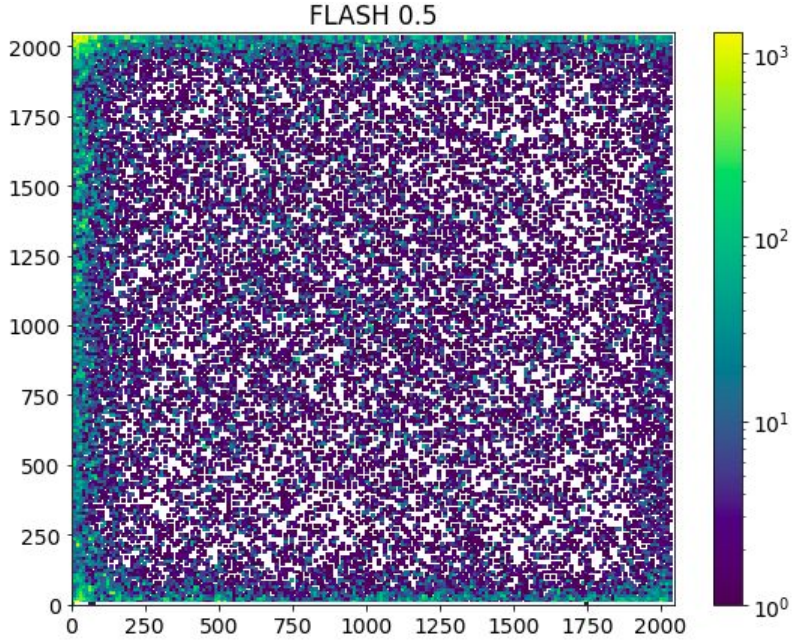
FUSION has less statistics by now

FLASH fake clusters Preliminary results

Energy distribution

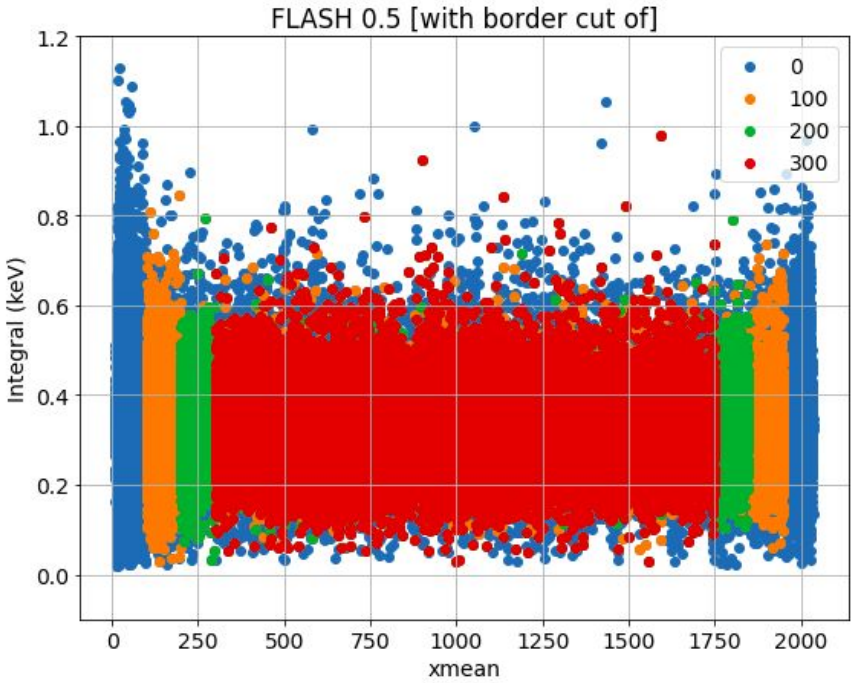


Positions in the sensor

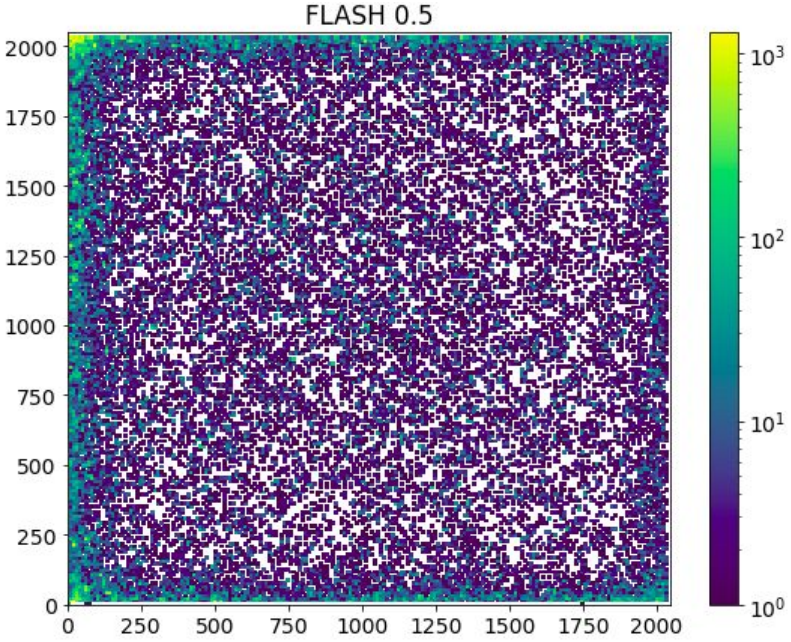


FLASH fake clusters Preliminary results

Energy vs. x position *(different border cuts)*

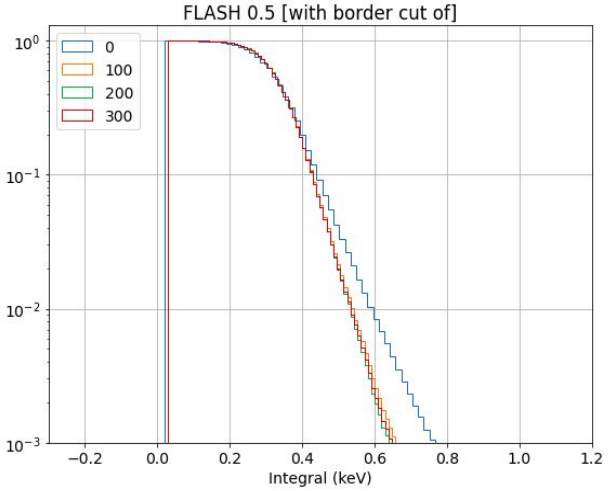


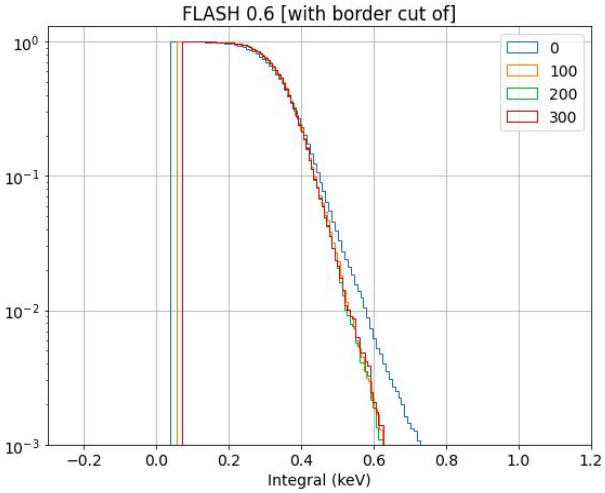
Positions in the sensor

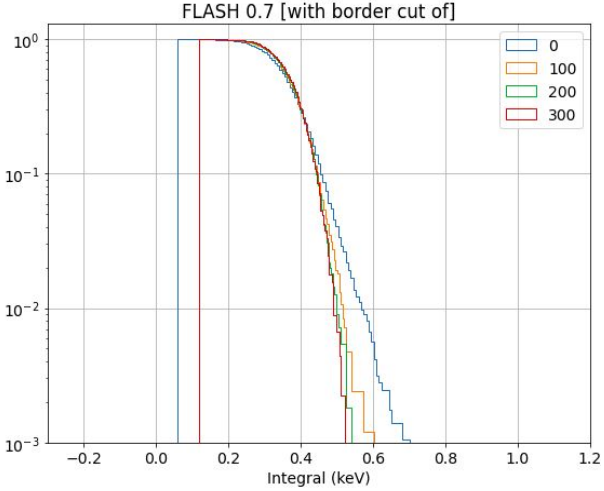


FLASH fake clusters Preliminary results

Energy inverse CDF *(different border cuts and different threshold values)*





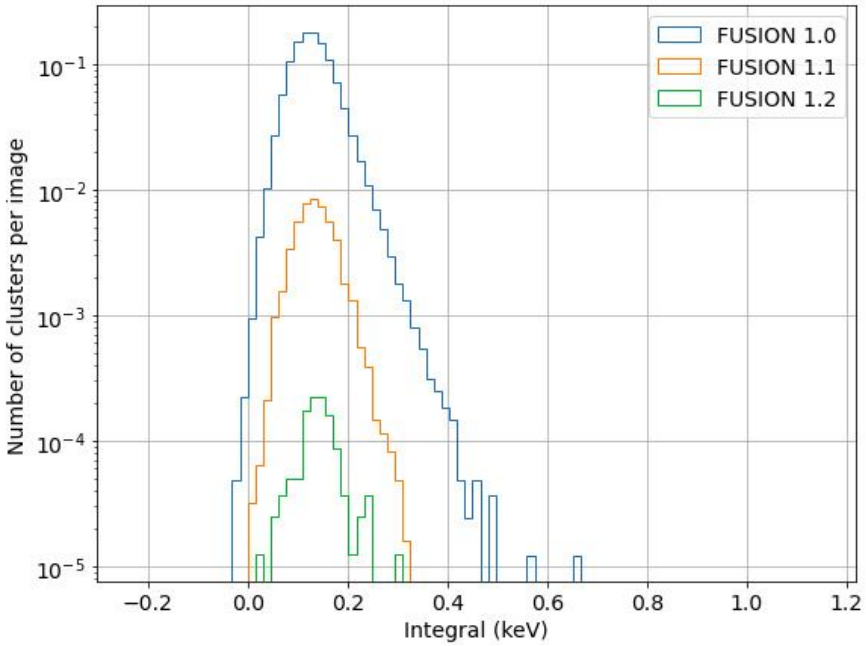


0.2% of clusters with energy > 0.6 keV

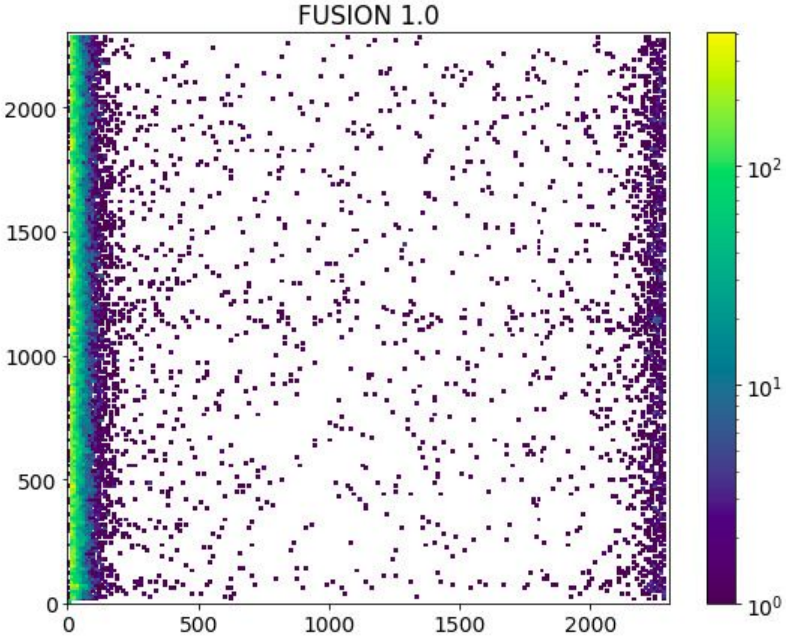
0.0% of clusters with energy > 0.6 keV

FUSION fake clusters Preliminary results

Energy distribution

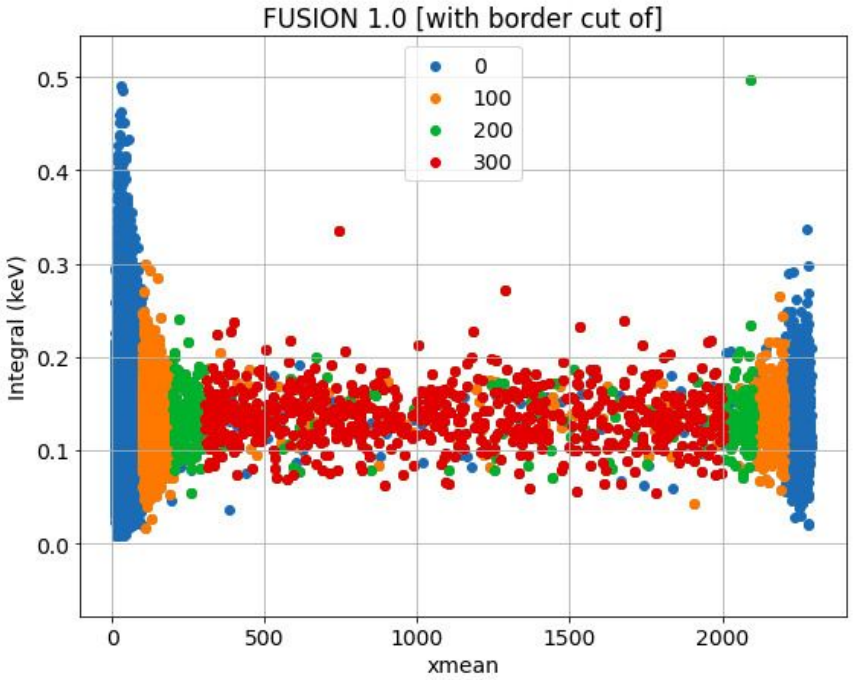


Positions in the sensor

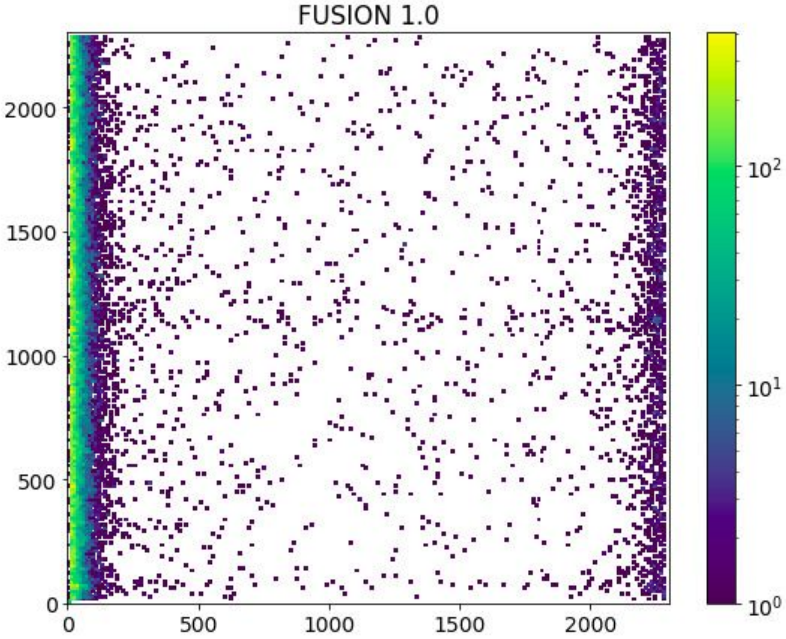


FUSION fake clusters Preliminary results

Energy vs. x position *(different border cuts)*

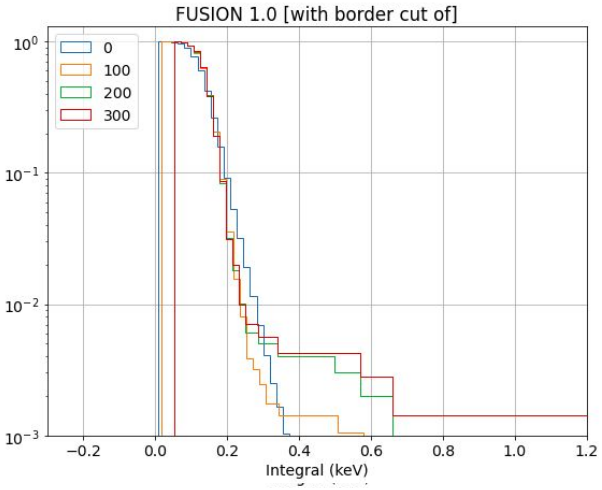


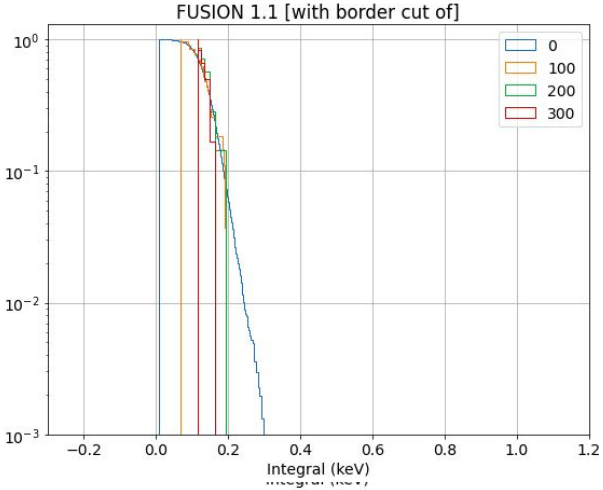
Positions in the sensor



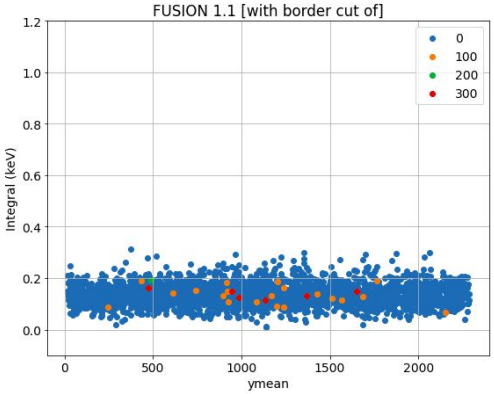
FUSION fake clusters Preliminary results

Energy inverse CDF *(different border cuts and different threshold values)*





not enough statistics…



0.2% of clusters with energy > 0.3 keV (cut = 100)

Conclusions

- Strategy and Preliminary results have been shown for discussion
  - Fake cluster rate:
    - impact of the borders
    - and of threshold values
- Simulation is running in INFN cloud *working very well*
- Part of the final results will be included in the noise paper
  - relating fake clusters with sensors' noise characteristics