Noise x Exposure Time

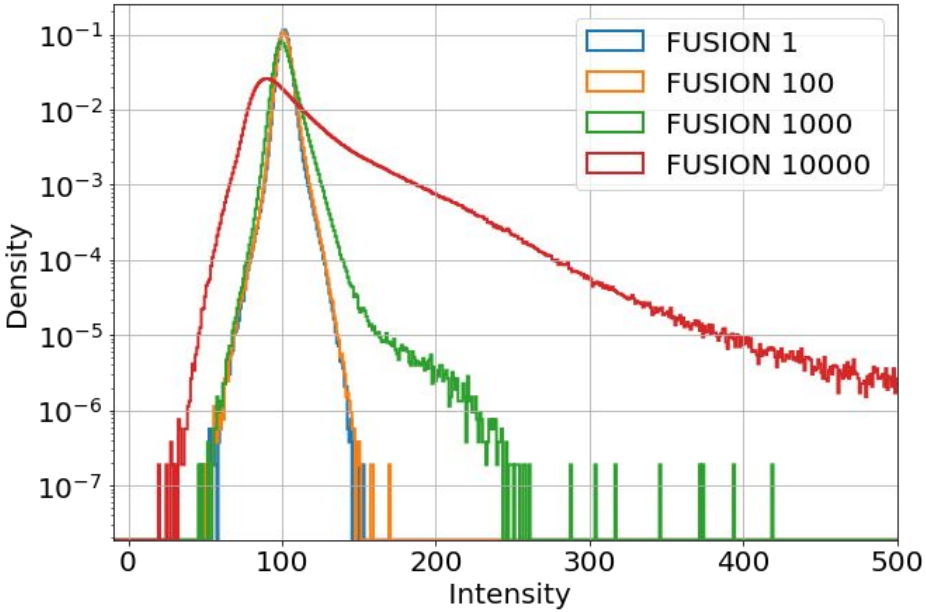
Flash vs. Fusion

PART 2

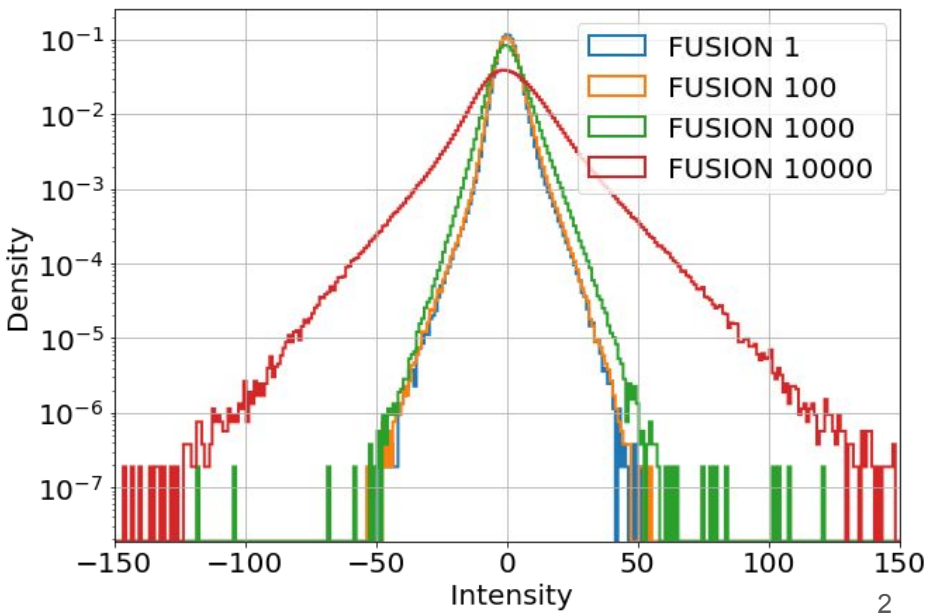
Now subtracting pedestal *as done for CYGNO*

- **Fusion** intensity distribution becomes practically symmetrical

BEFORE



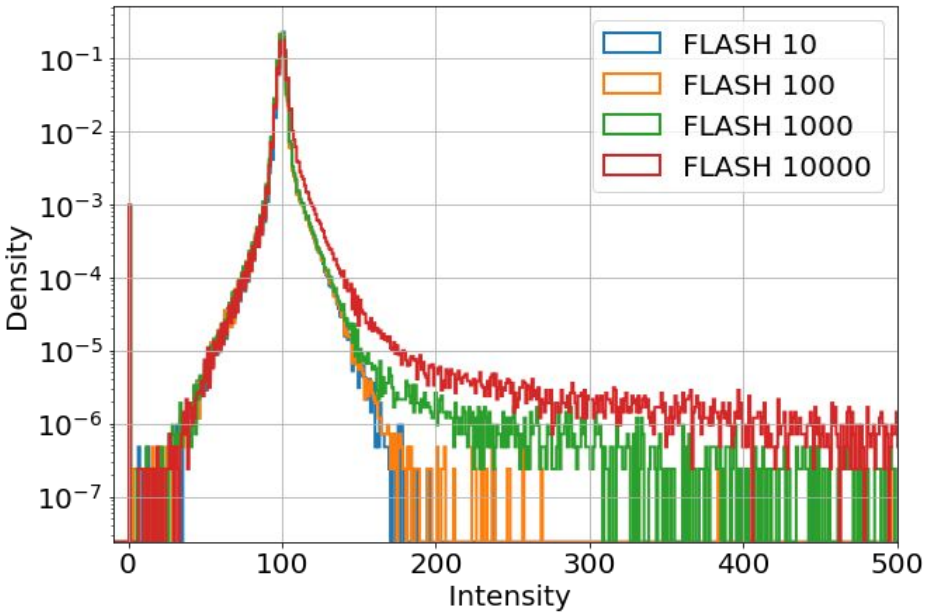
AFTER



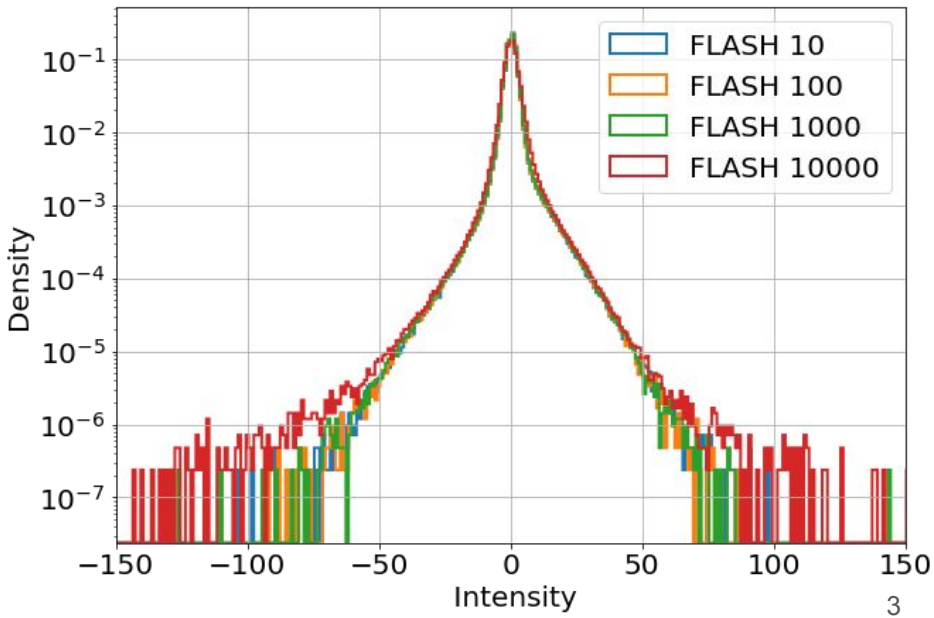
Now subtracting pedestal *as done for CYGNO*

- **Flash** also becomes more symmetrical

BEFORE

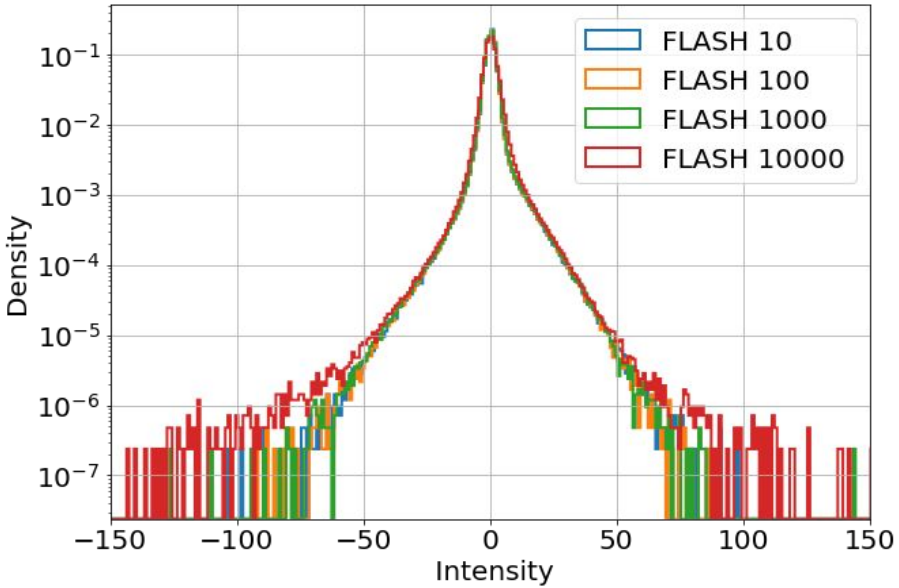


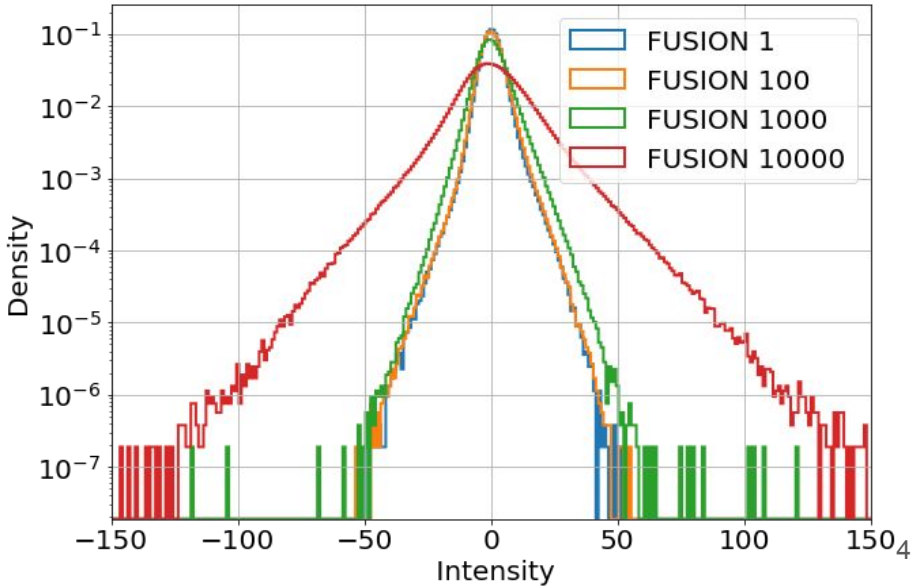
AFTER



Now subtracting pedestal *as done for CYGNO*

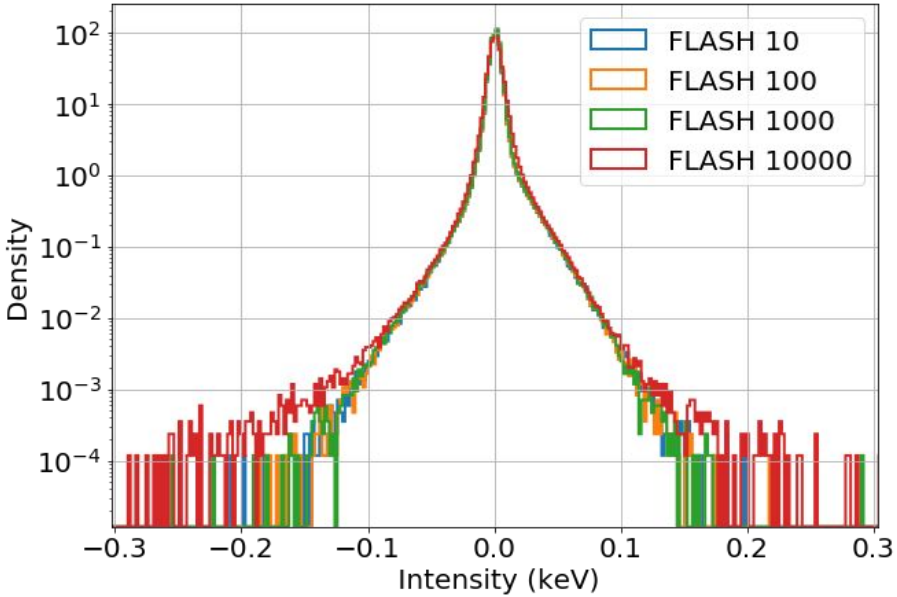
- For 1s, a small increase of the **Fusion** noise can be observed
- For 10s, **Fusion** noise “explodes” due to dark current
- **Flash** suffers less impact with exposure time since its dark current is much lower

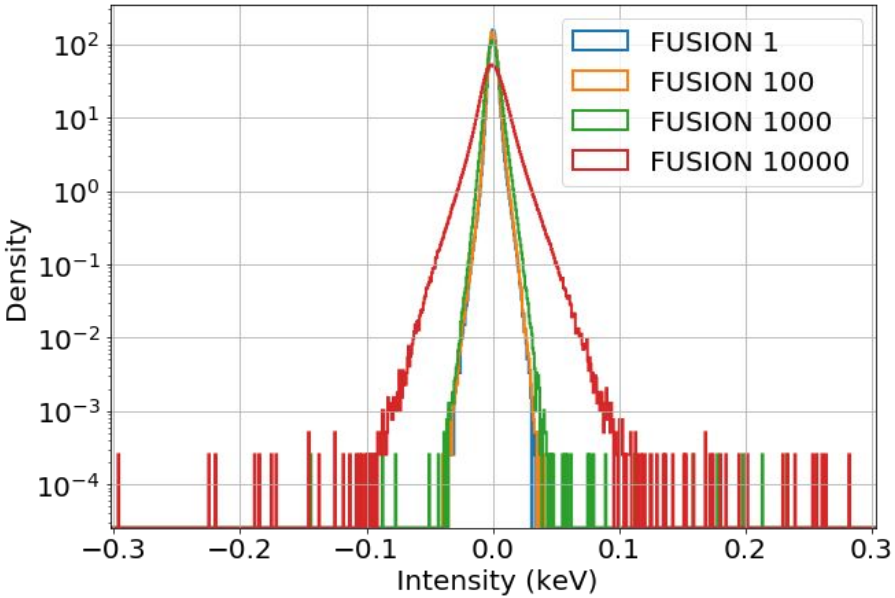




Now subtracting pedestal *as done for CYGNO*

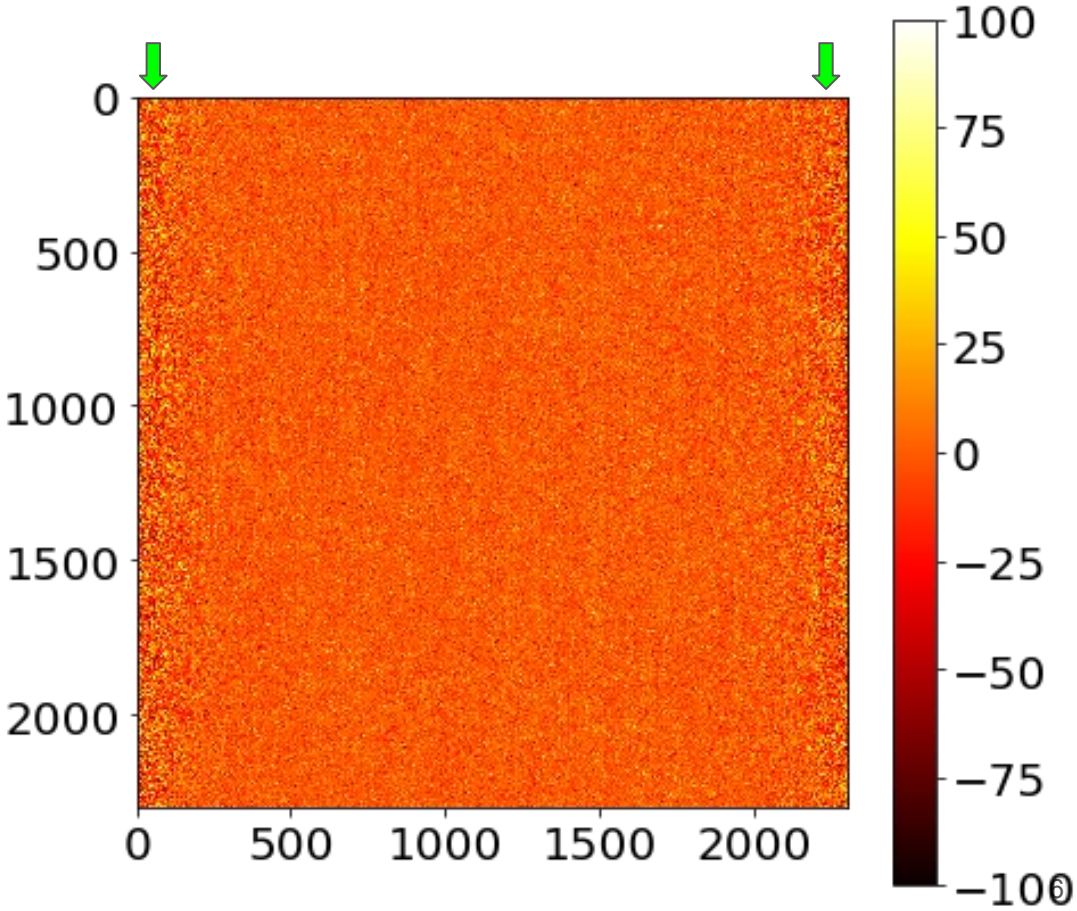
- For 1s, even with an increase of noise, **Fusion** noise distribution is still narrower
- For 10s, **Fusion** noise “explodes” due to dark current, however in keV it is still competitive with **Flash**





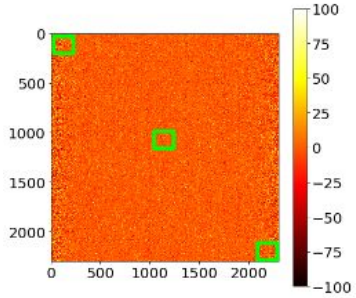
Now subtracting pedestal *as done for CYGNO*

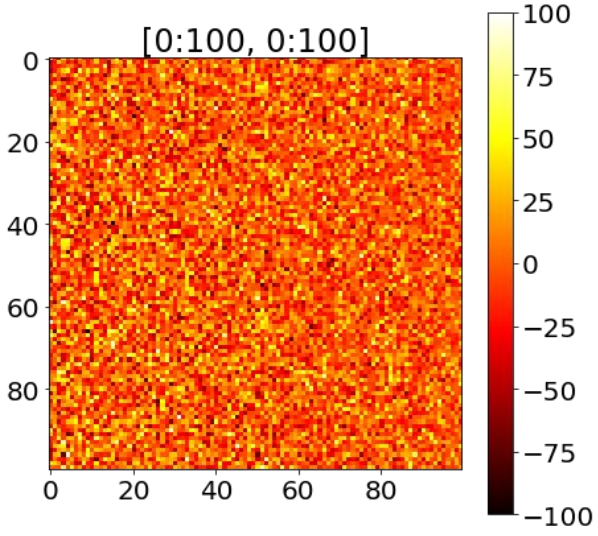
- Subtracting pedestal, **Fusion** becomes practically symmetrical
  - Higher noise level at the edges

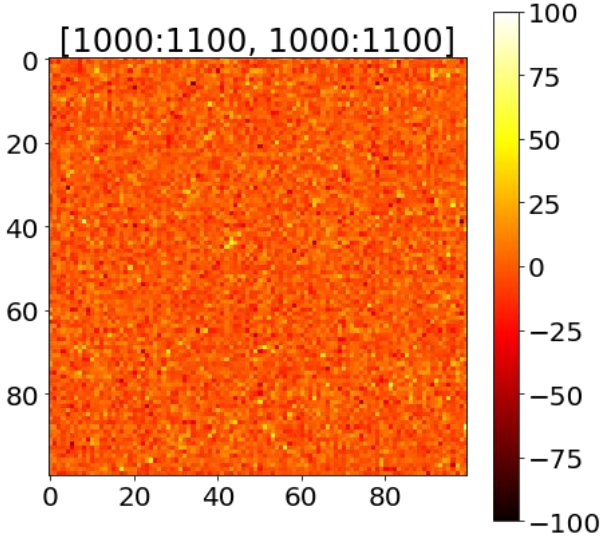


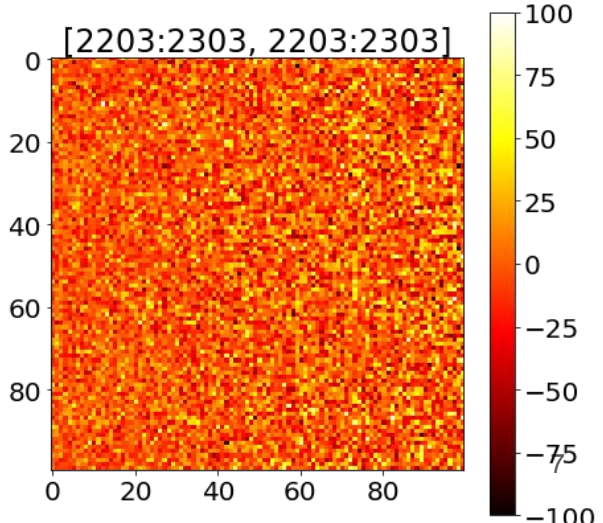
Now subtracting pedestal *as done for CYGNO*

- **Zoom** in three different regions of the Fusion sensor



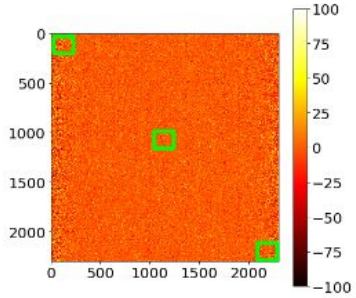




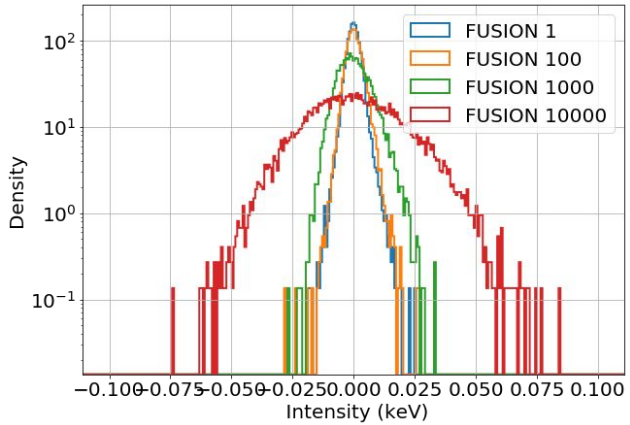


Now subtracting pedestal *as done for CYGNO*

- And their histograms



[0:100, 0:100]



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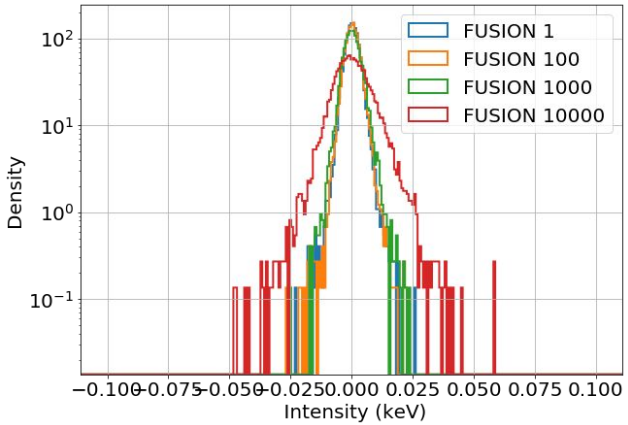
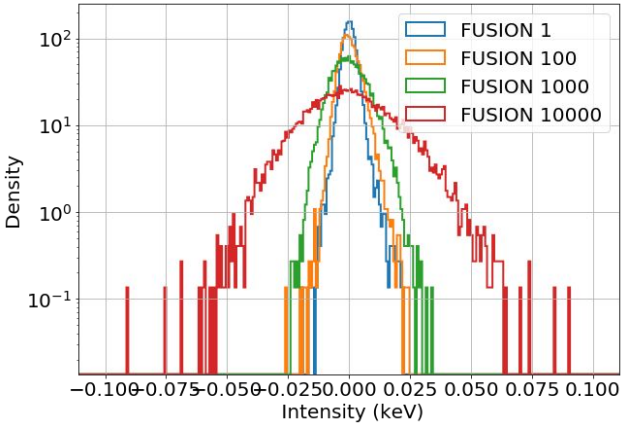


[2203:2303, 2203:2303]



Noise x Exposure Time

Air vs. Water Cooling

PART 3

Air x Water Cooling

- Datasets used for this study

3 ottobre 2018 Orca Flash black - no lens			
817	100	10	camera only (blaked/no lens)
818	100	100	camera only (blaked/no lens)
819	100	1000	camera only (blaked/no lens)
820	100	10000	camera only (blaked/no lens)

FUSION Pedestals with endcap AIR-COOLING			
3939	1000	10000	Camera with endcap
3940	1000	1000	Camera with endcap
3941	1000	500	Camera with endcap
3942	1000	100	Camera with endcap
3943	1000	50	Camera with endcap
3944	1000	10	Camera with endcap

ORCA flash Pedestals with endcap AIR-COOLING			
3933	1000	10000	Camera with endcap
3934	1000	1000	Camera with endcap
3935	1000	500	Camera with endcap
3936	1000	100	Camera with endcap
3937	1000	50	Camera with endcap
3938	1000	10	Camera with endcap

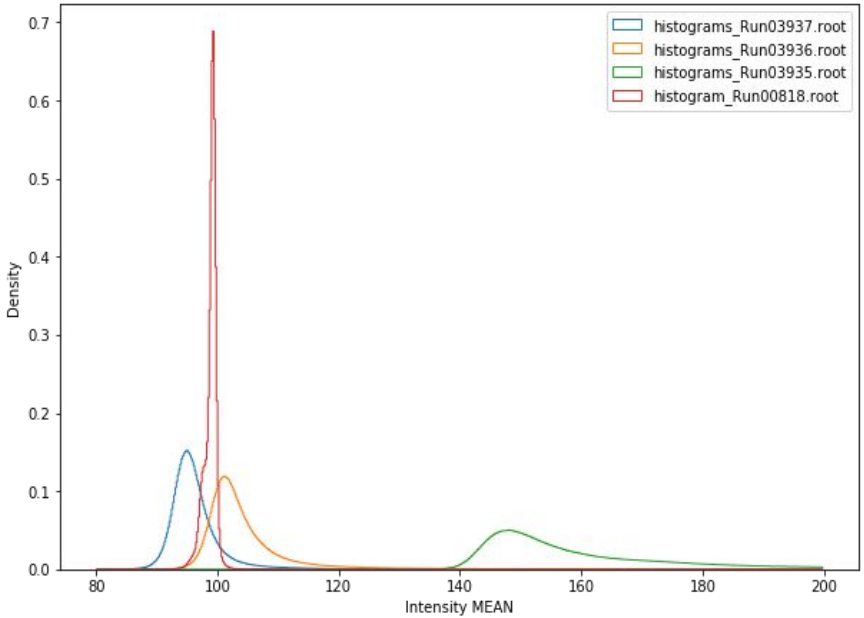
FUSION Pedestals with endcap WATER-COOLING (slow scan)			
3951	100	10000	Camera with endcap
3952	100	1000	Camera with endcap
3953	100	500	Camera with endcap
3954	100	100	Camera with endcap
3955	100	50	Camera with endcap
3956	100	10	Camera with endcap

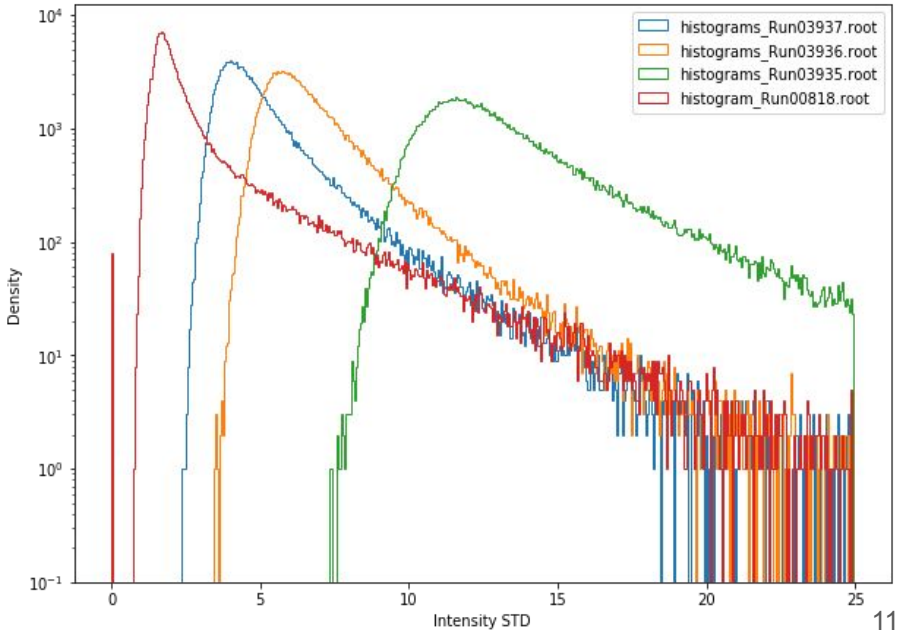
ORCA flash Pedestals with endcap WATER-COOLING (normal scan)			
3945	100	10000	Camera with endcap
3946	100	1000	Camera with endcap
3947	100	500	Camera with endcap
3948	100	100	Camera with endcap
3949	100	50	Camera with endcap
3950	100	10	Camera with endcap

Air x Water Cooling

- Datasets **NOT** used for this study

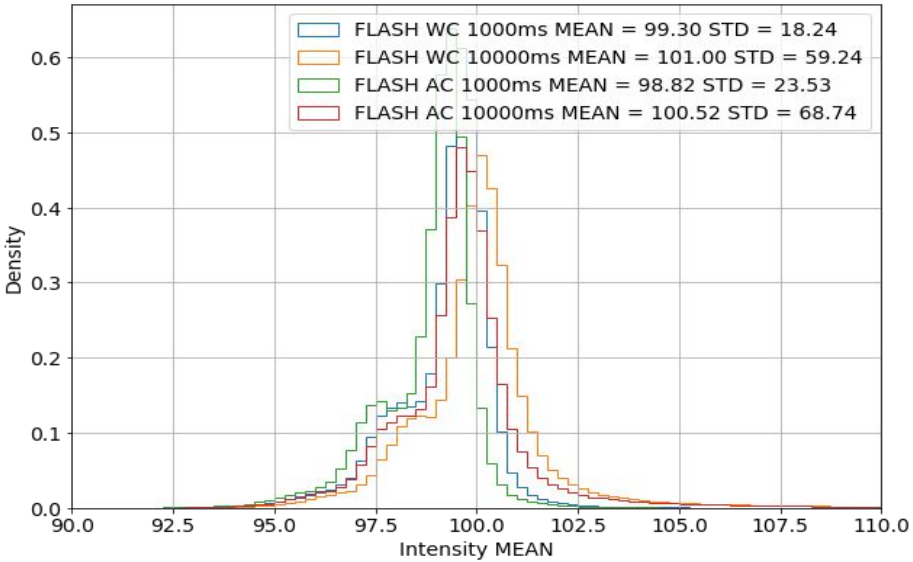
ORCA flash Pedestals with endcap AIR-COOLING			
3933	1000	10000	Camera with endcap
3934	1000	1000	Camera with endcap
3935	1000	500	Camera with endcap
3936	1000	100	Camera with endcap
3937	1000	50	Camera with endcap
3938	1000	10	Camera with endcap

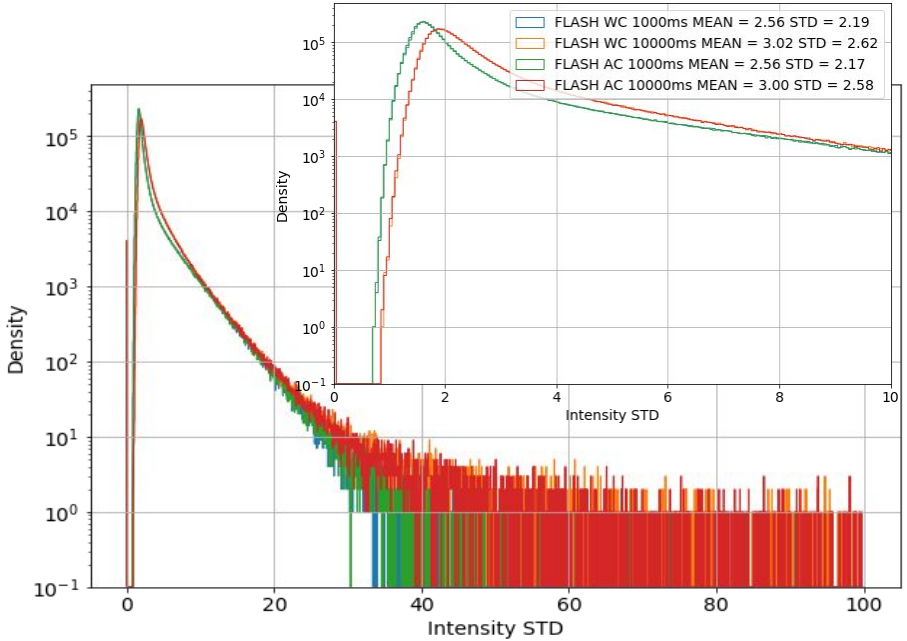




Air x Water Cooling

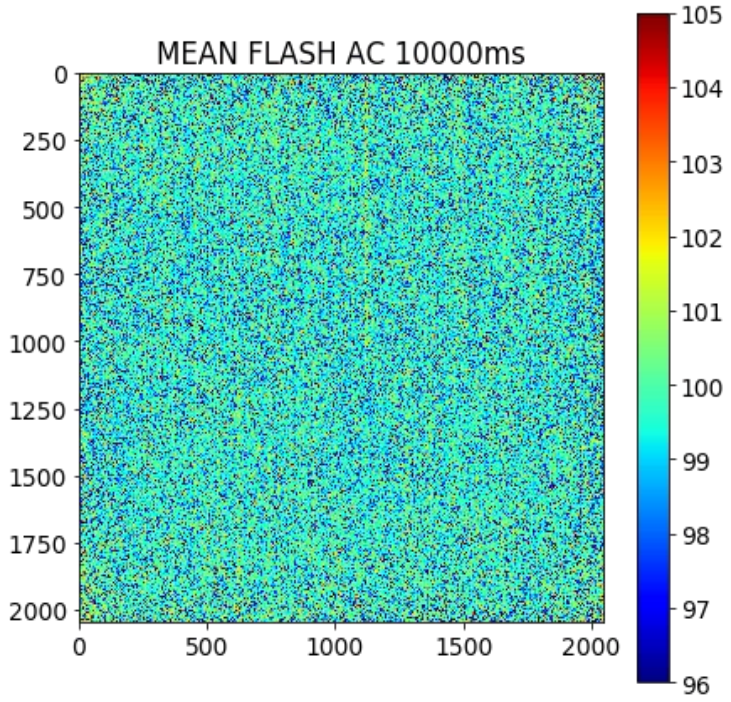
- FLASH MEAN and STD distributions
  - even for long exposure times, no significant difference...

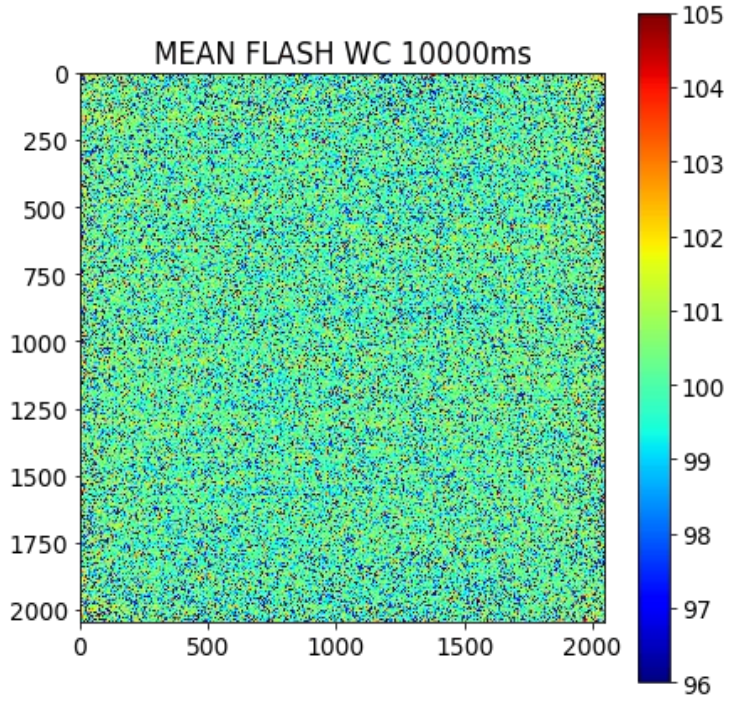




Air x Water Cooling

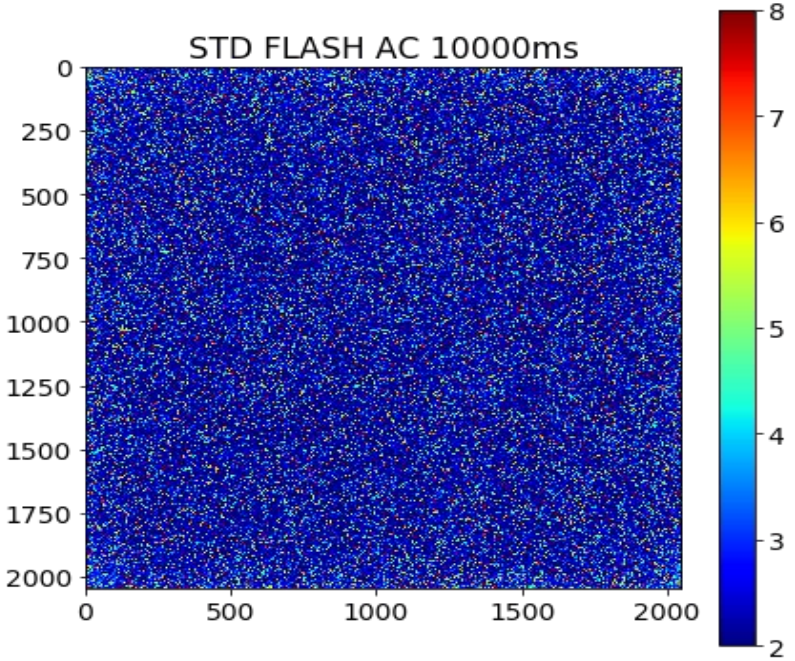
- FLASH MEAN and STD distributions
  - even for long exposure times, no significant difference...

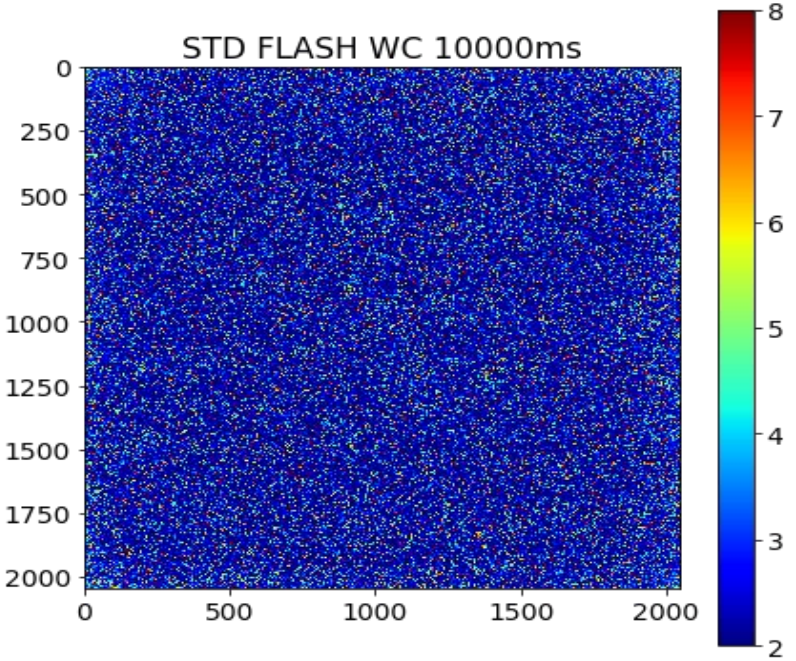




Air x Water Cooling

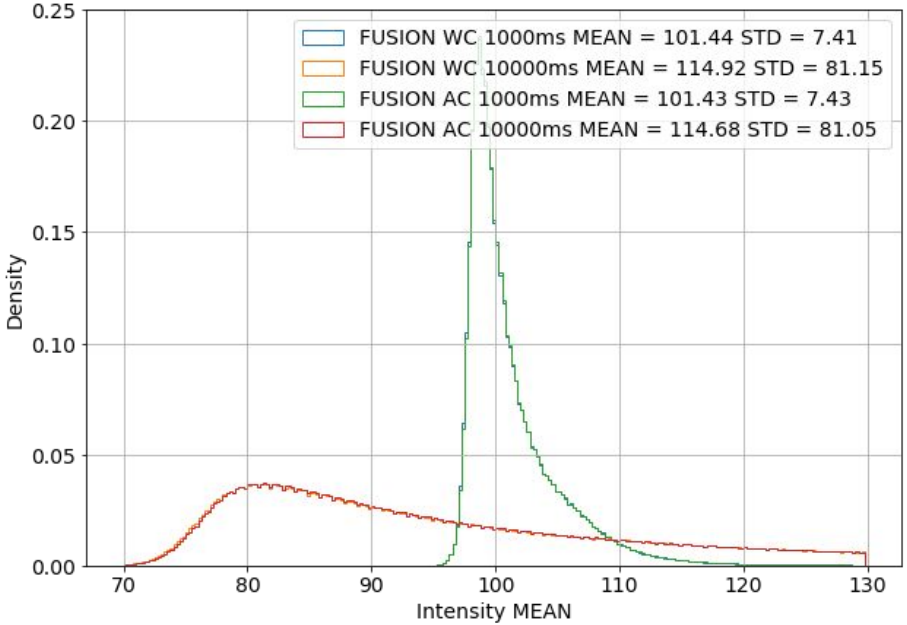
- FLASH MEAN and STD distributions
  - even for long exposure times, no significant difference...

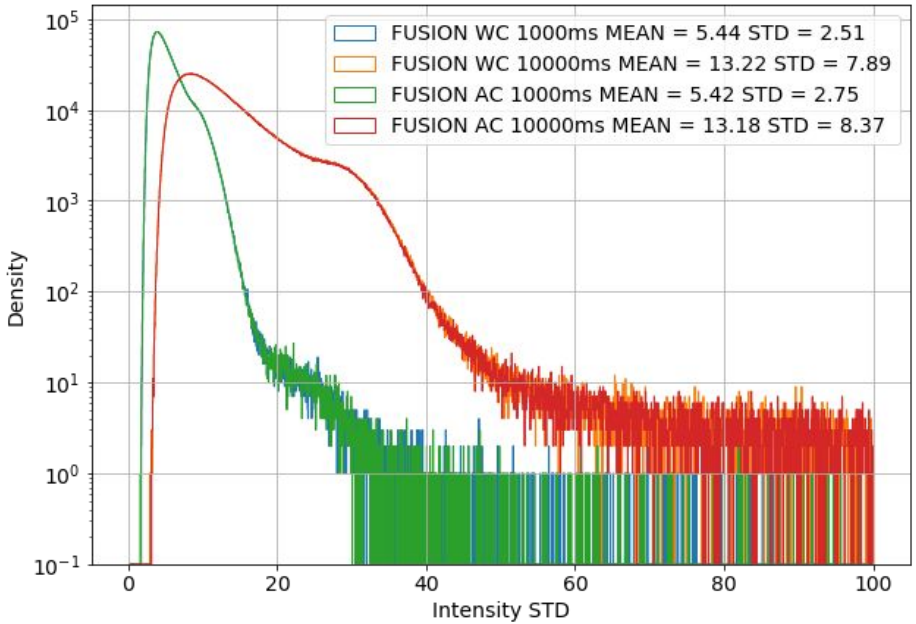




Air x Water Cooling

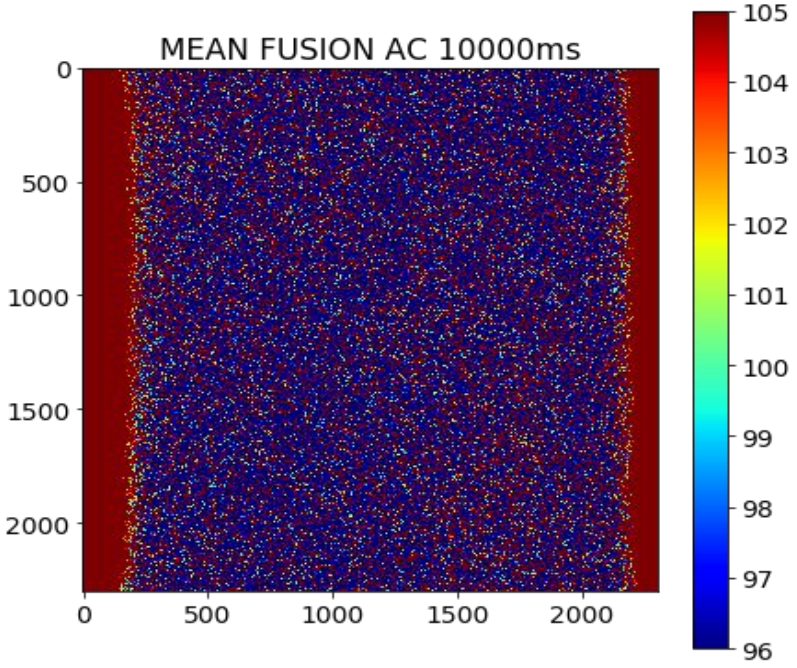
- FUSION MEAN and STD distributions
  - even for long exposure times, no significant difference...

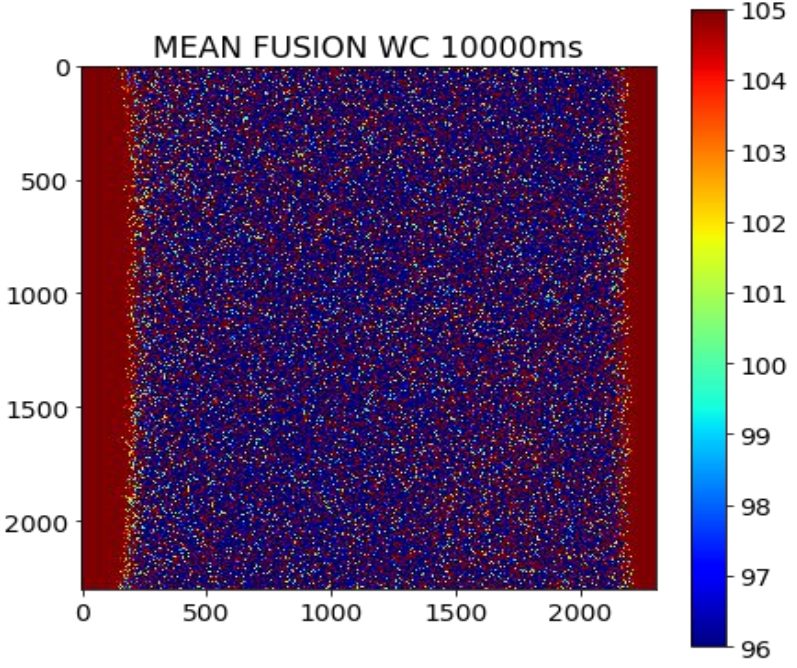




Air x Water Cooling

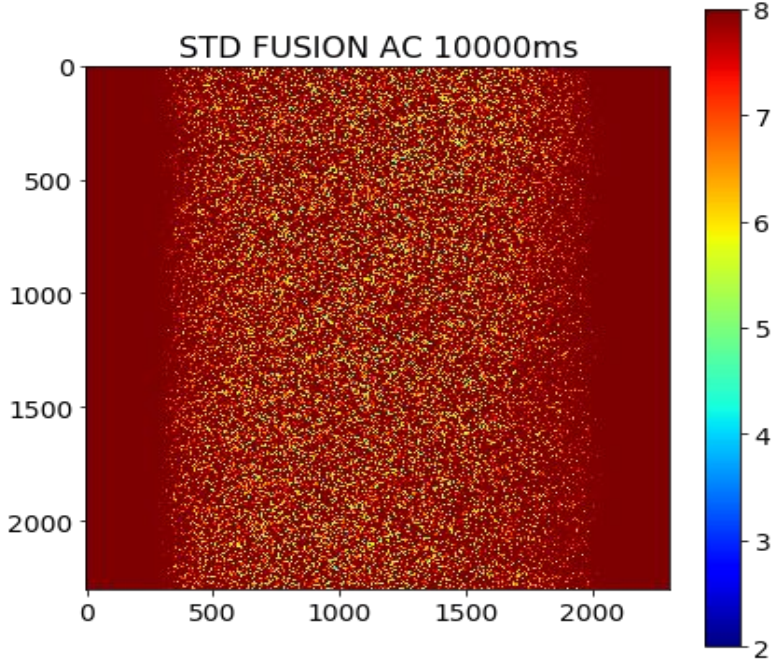
- FUSION MEAN and STD distributions
  - even for long exposure times, no significant difference...

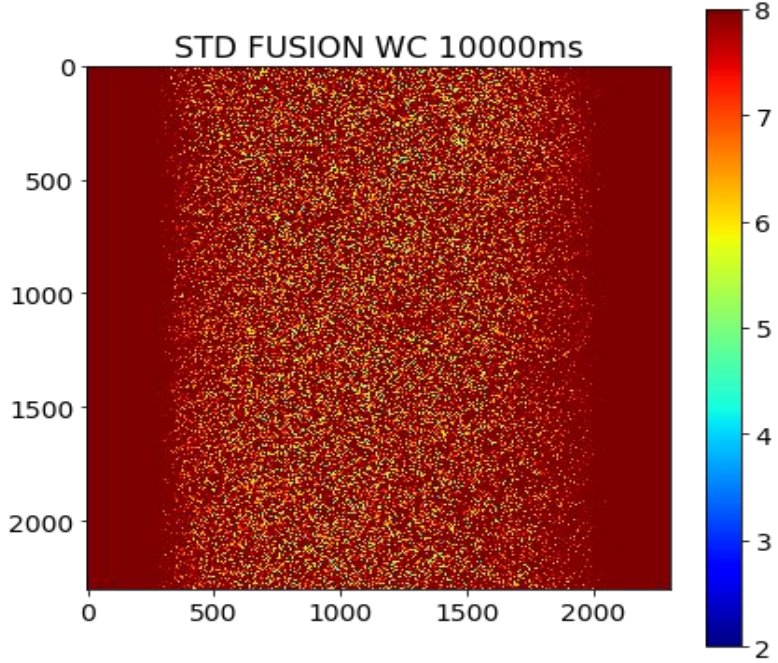




Air x Water Cooling

- FUSION MEAN and STD distributions
  - even for long exposure times, no significant difference...





To be continued...