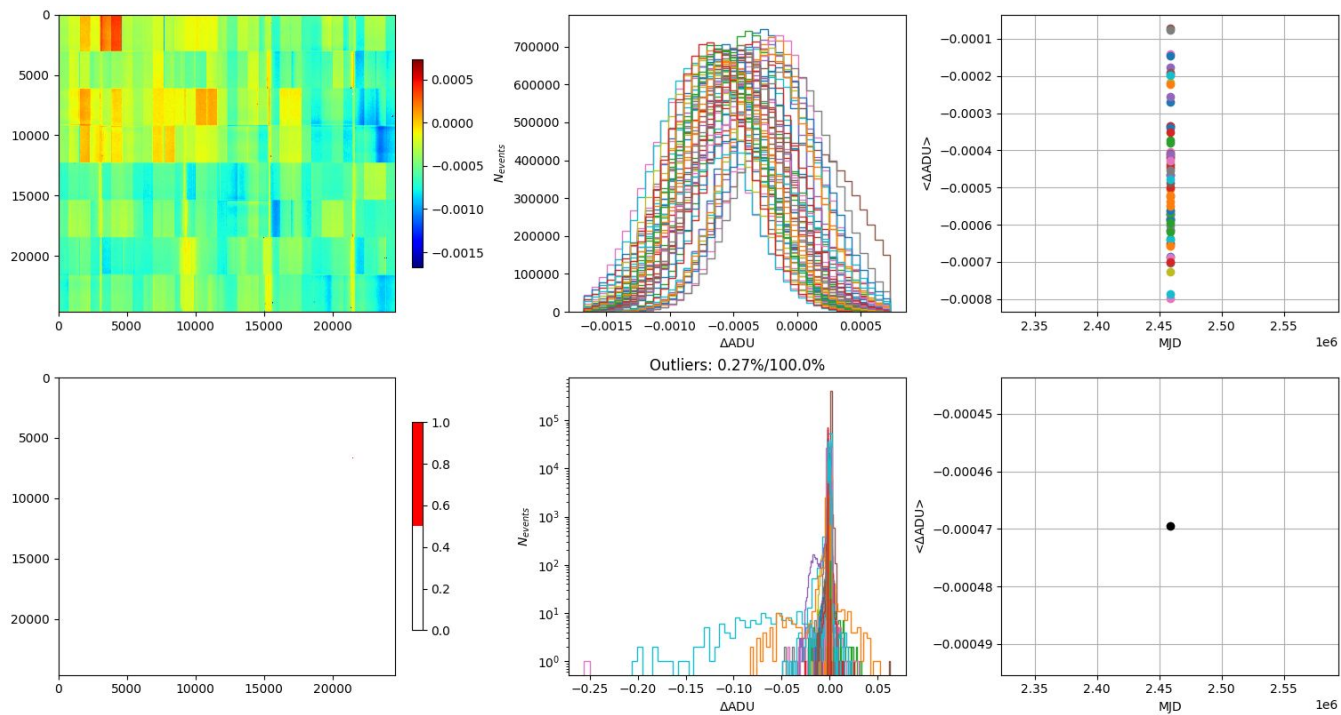


# ZTF Master Bias Studies

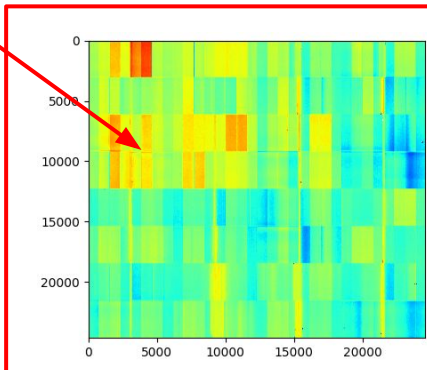
Ph.Rosnet & Ph.Gris  
Laboratoire de Physique de Clermont

# Bias and Master Bias

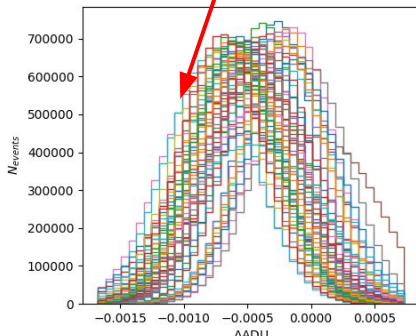
- **Bias runs**
  - Bias frames: exposure time  $t = 0\text{s}$ , camera's shutter closed ( $I(x,y)=0$ )
  - Bias runs ~ every day
  - 20 runs per day (~5-6 min in total)
  - Overscan subtraction included
  - Analysis : Y2019
- **Master bias**
  - Data from 2019 runs are splitted in 20 days periods
  - For each period: master bias are estimated:
    - 3-sigma clipping applied by quadrant
    - mean and sigma for each pixel
  - Master bias stability:
    - The first period of 2019 is taken as reference
    - All other periods: subtraction of the master bias to the reference



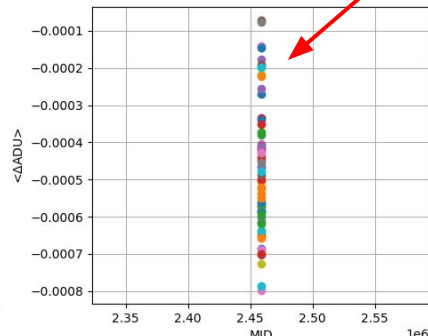
$\Delta\text{ADU}$  (FP - mosaic)



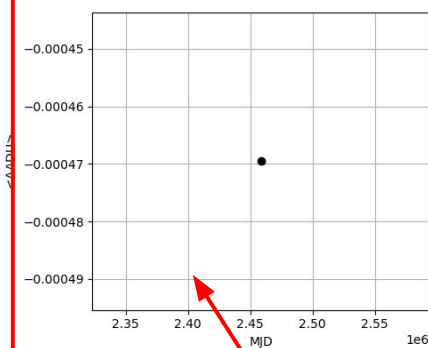
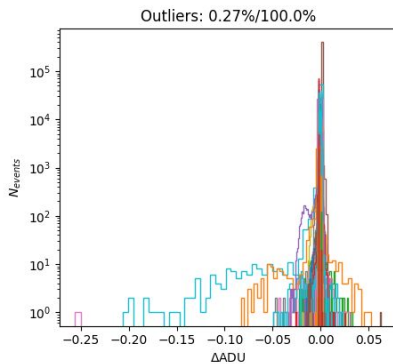
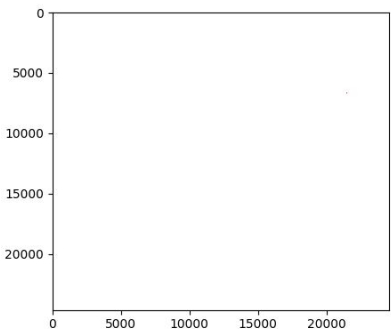
$\Delta\text{ADU}$  (FP - histogram)



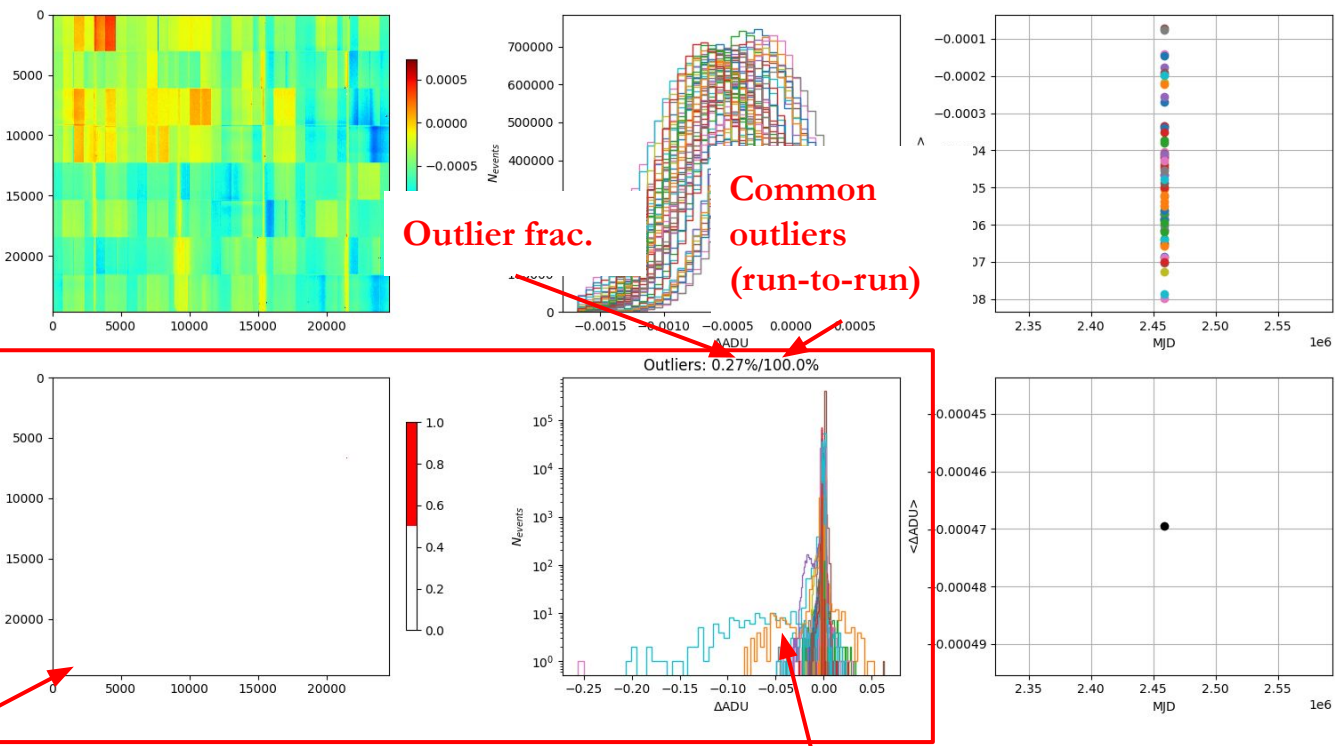
$\langle\Delta\text{ADU}\rangle$  per quadrant vs time



3- $\sigma$  clipped



$\langle\Delta\text{ADU}\rangle$  FP vs time



**Outliers**

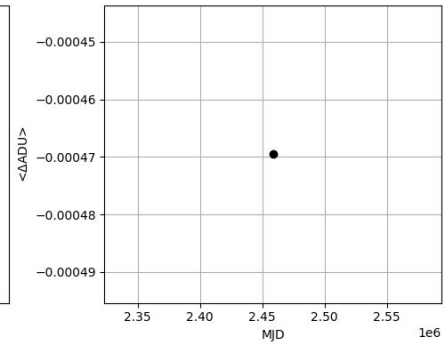
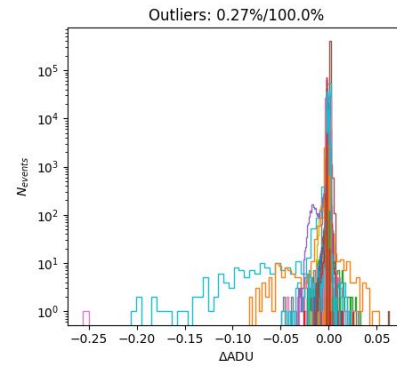
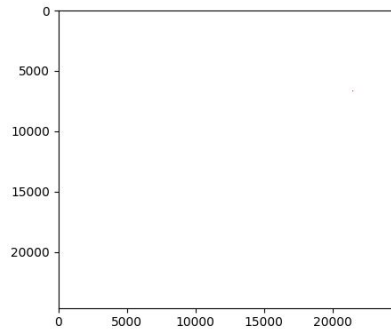
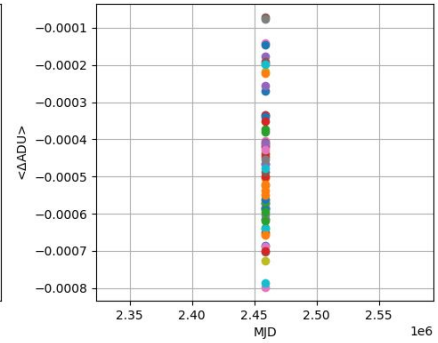
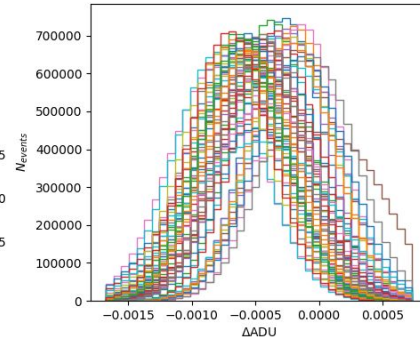
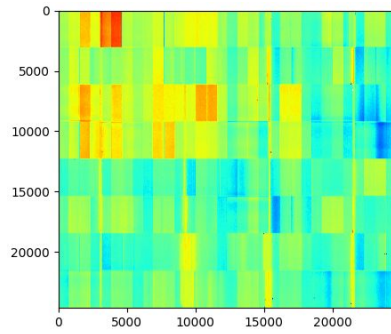
**Outlier frac.**

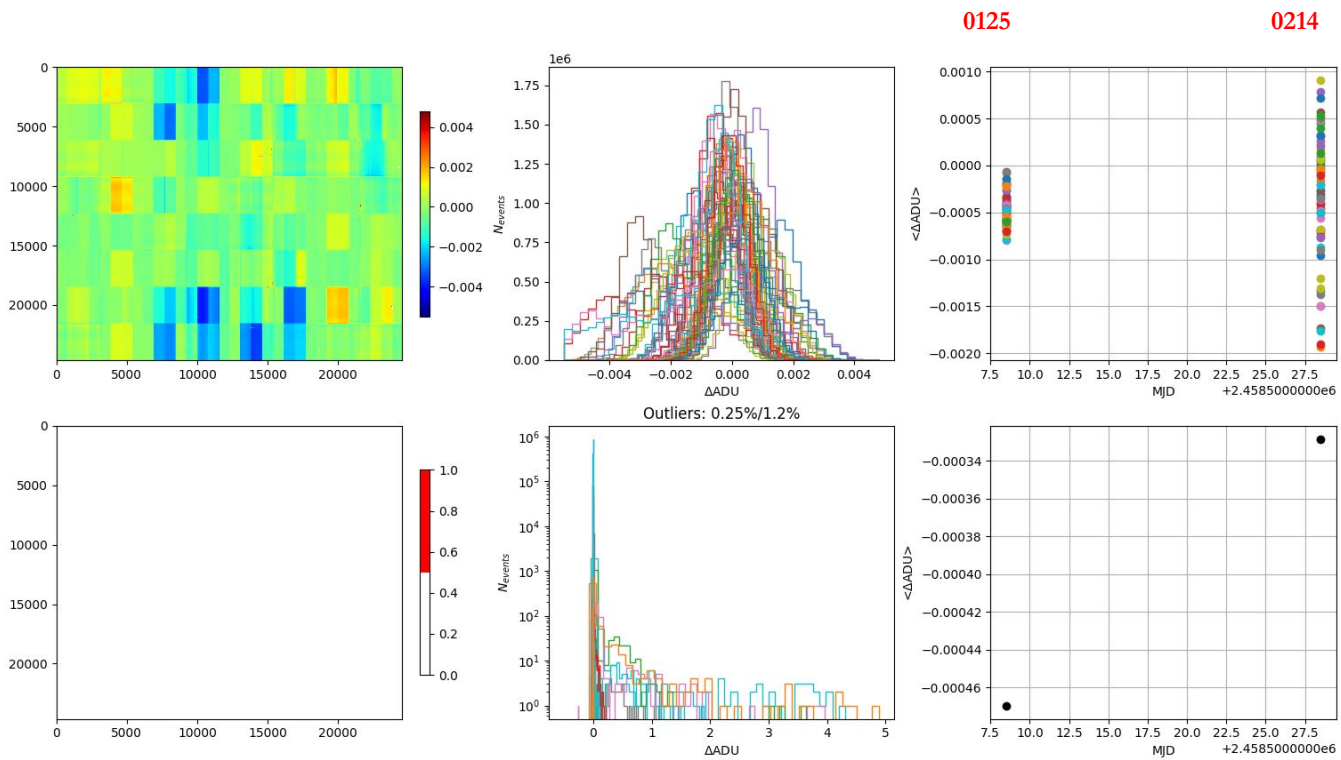
**Common outliers (run-to-run)**

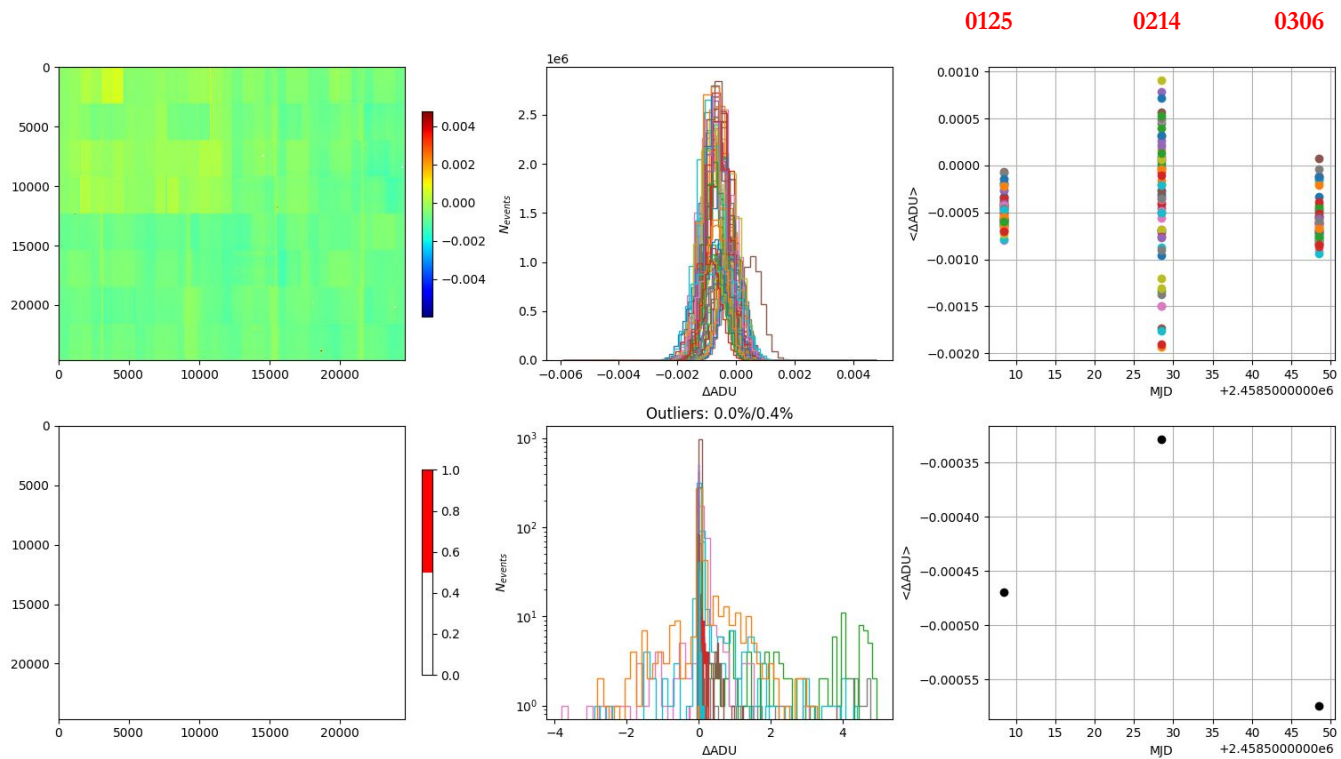
**FP position**

**$\Delta ADU$  (histo)**

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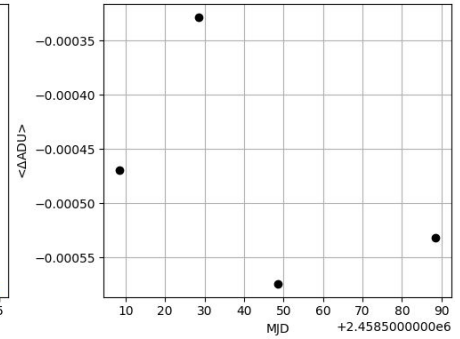
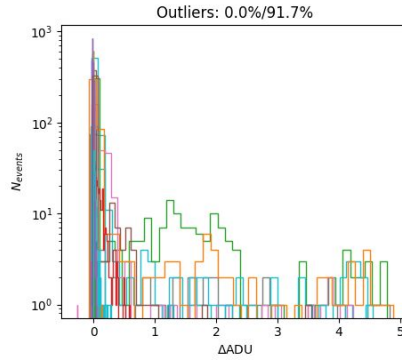
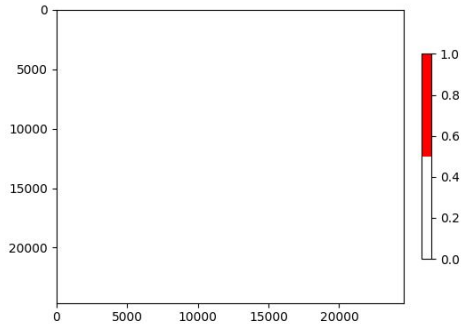
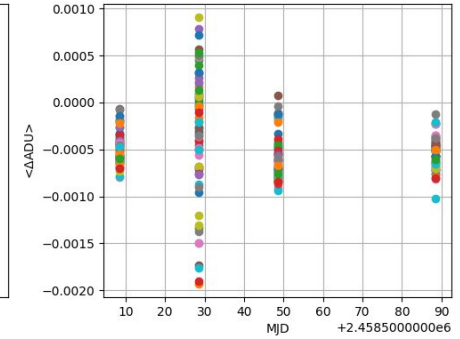
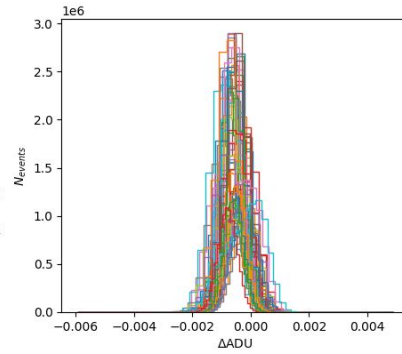
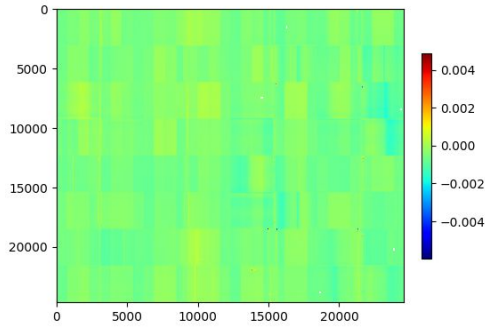




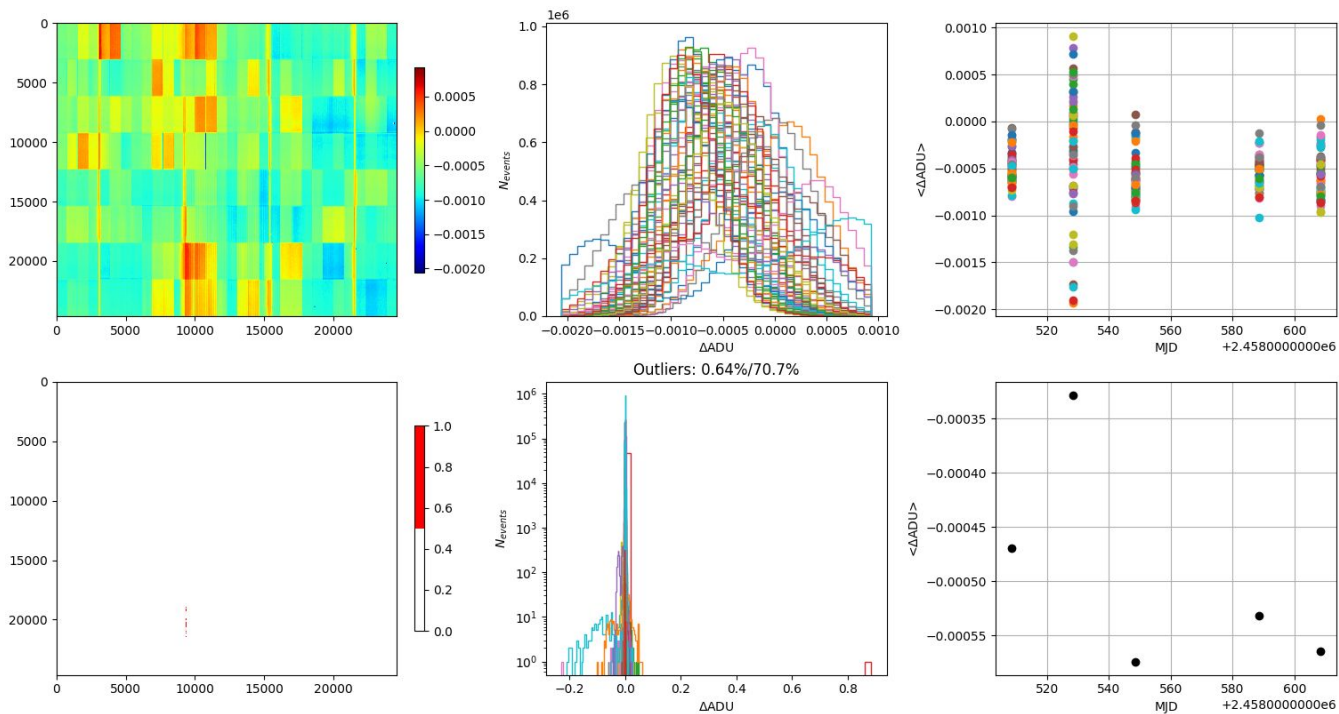




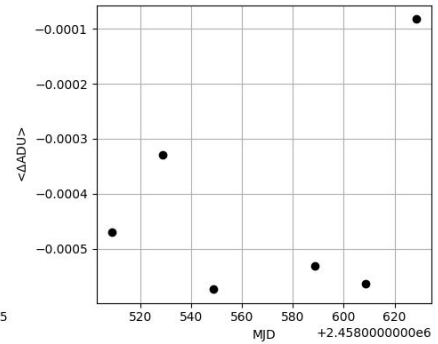
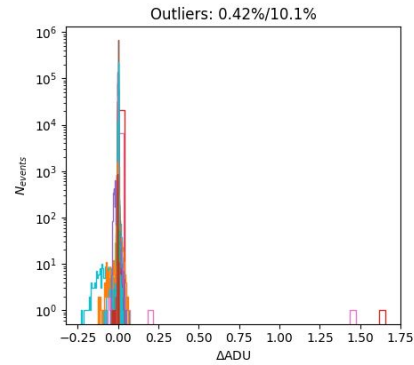
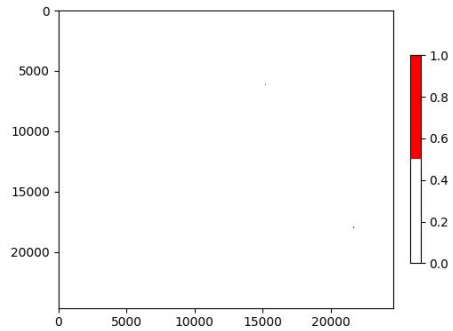
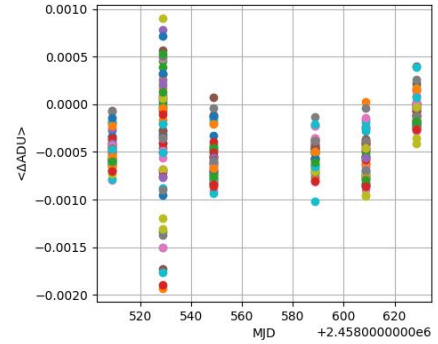
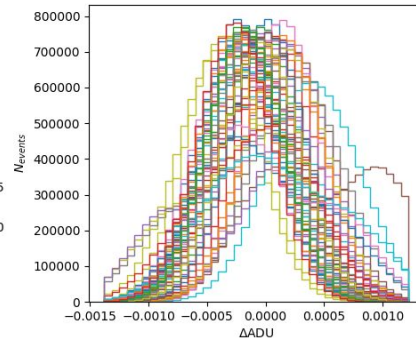
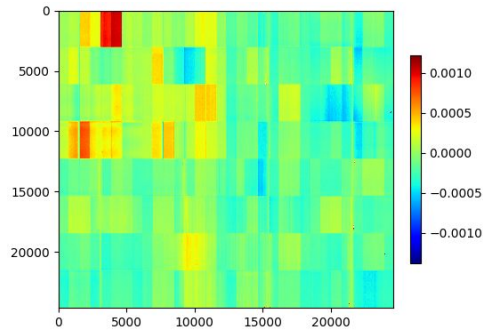
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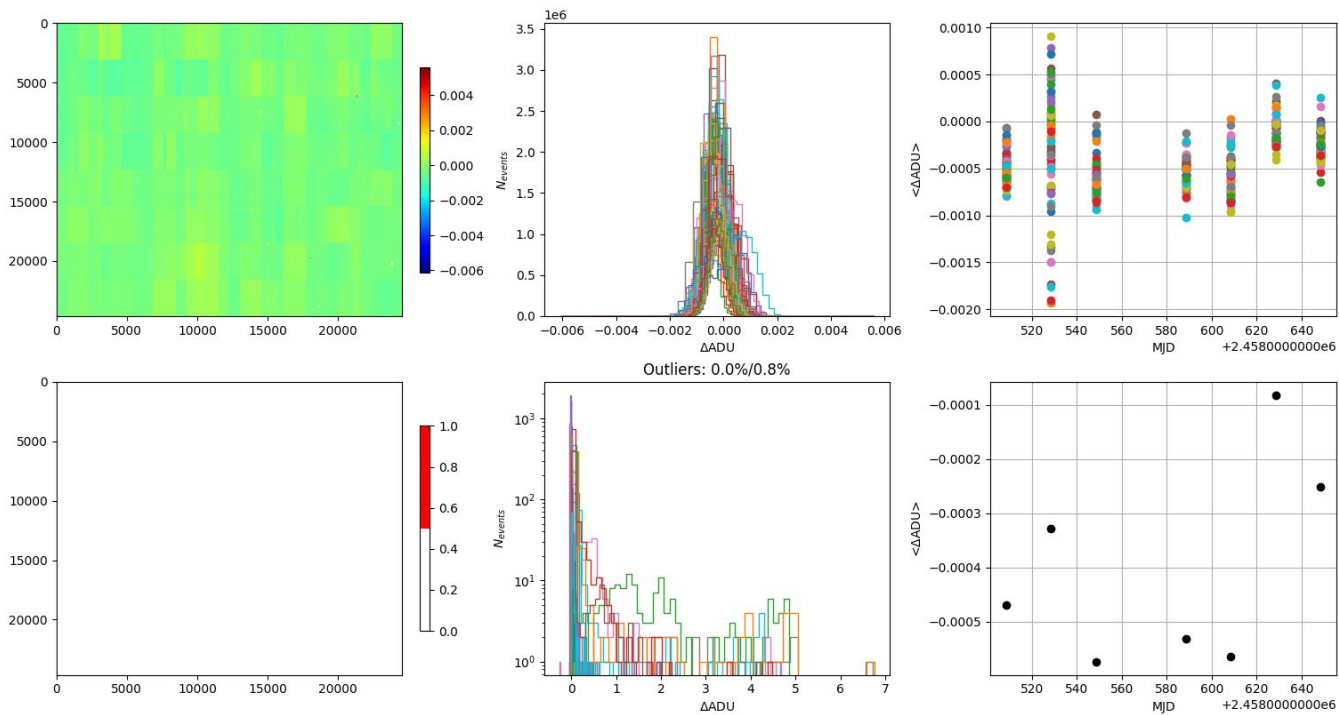
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## Conclusion

- Processing master bias for year 2019
- Very stable after 6 months
- Outliers 0.64% max