

ZTF Bias Studies

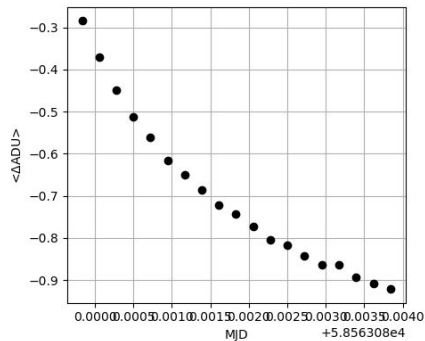
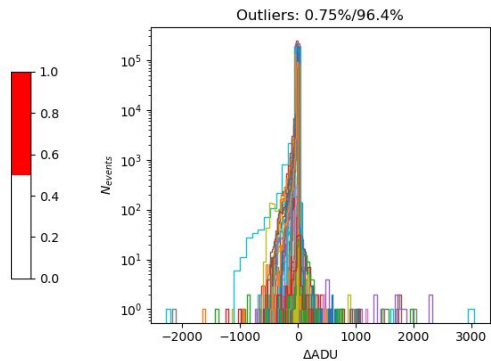
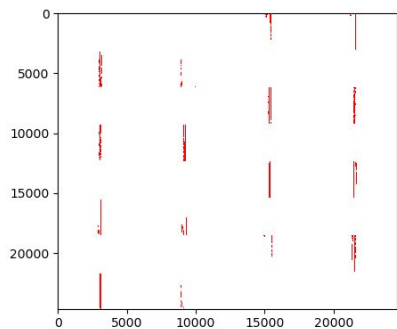
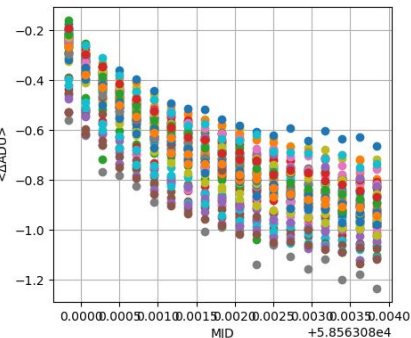
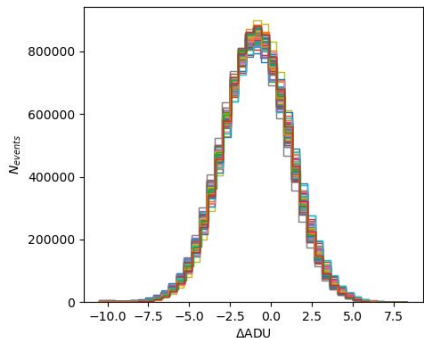
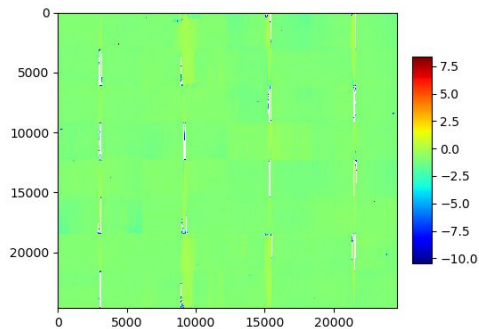
Ph.Rosnet & Ph.Gris
Laboratoire de Physique de Clermont

Bias runs

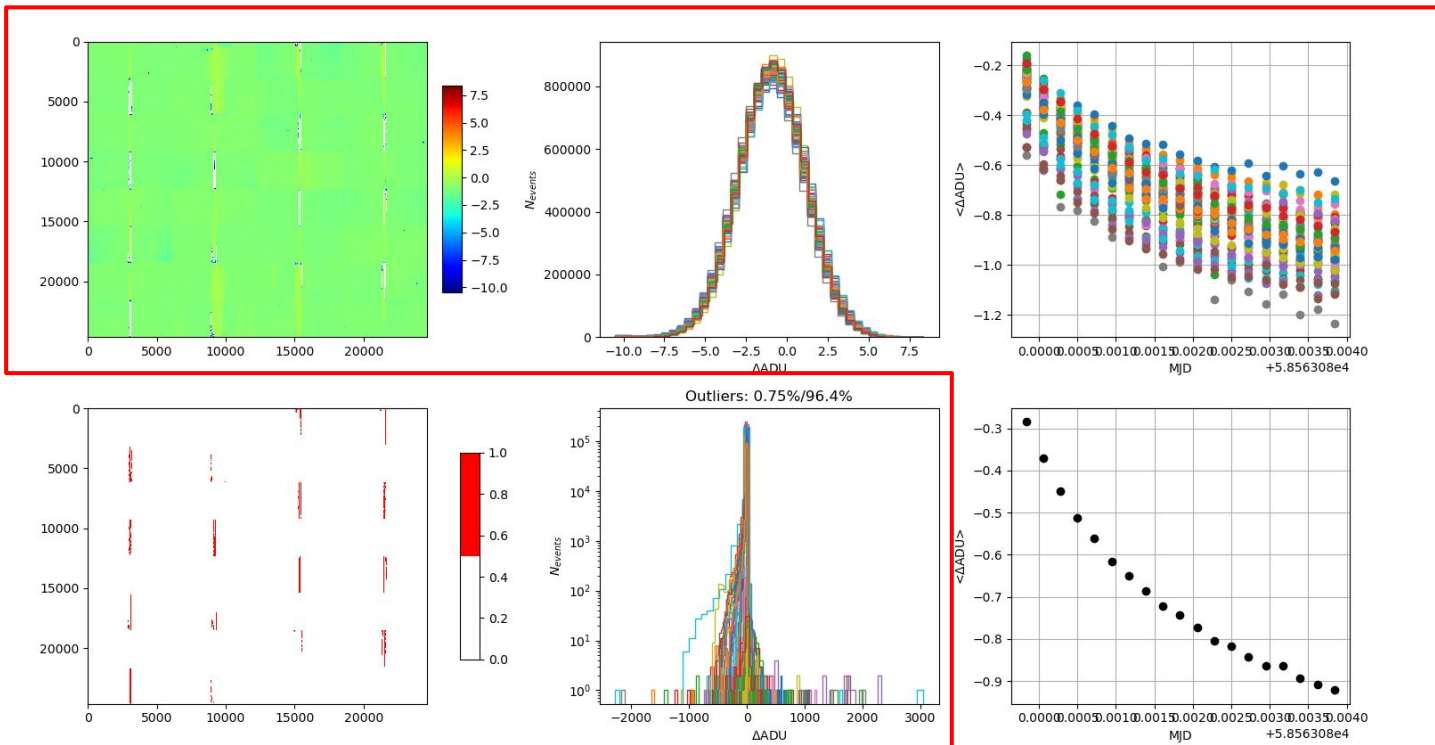
- Bias frames: exposure time $t = 0\text{s}$, camera's shutter closed ($I(x,y)=0$)
- Bias runs ~ every day
- 20 runs per day (~5-6 min in total)
- Periods analyzed in the following: 2019/03/21 - 2019/04/09
- Overscan subtraction included

Bias runs

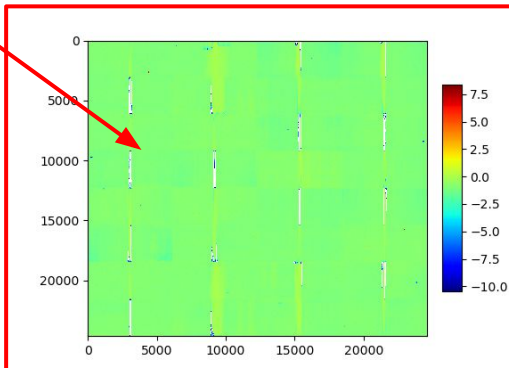
- **First study: daily comparisons**
- **Reference run: the first run of the day**
- **All other runs are subtracted (pixel-to-pixel)**
- **3-sigma clipping applied (for each run)**



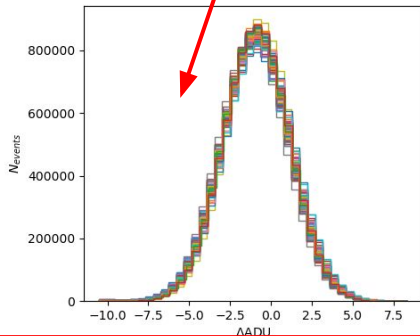
3- σ clipped



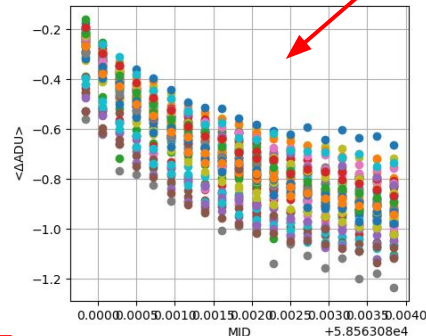
Δ ADU (FP - mosaic)



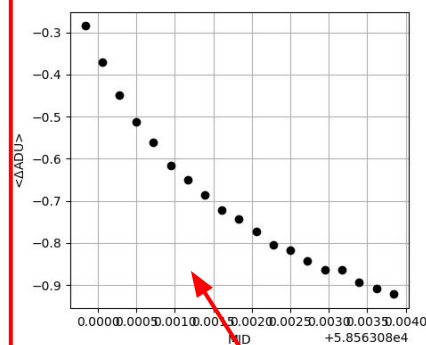
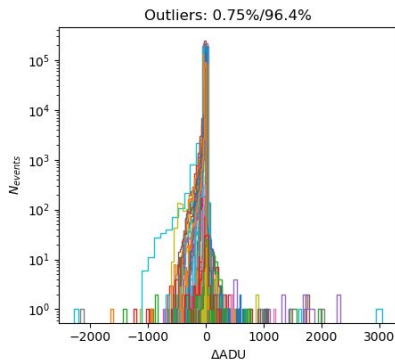
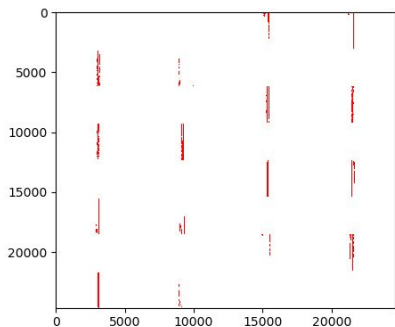
Δ ADU (FP - histogram)



$\langle \Delta$ ADU \rangle per quadrant vs time

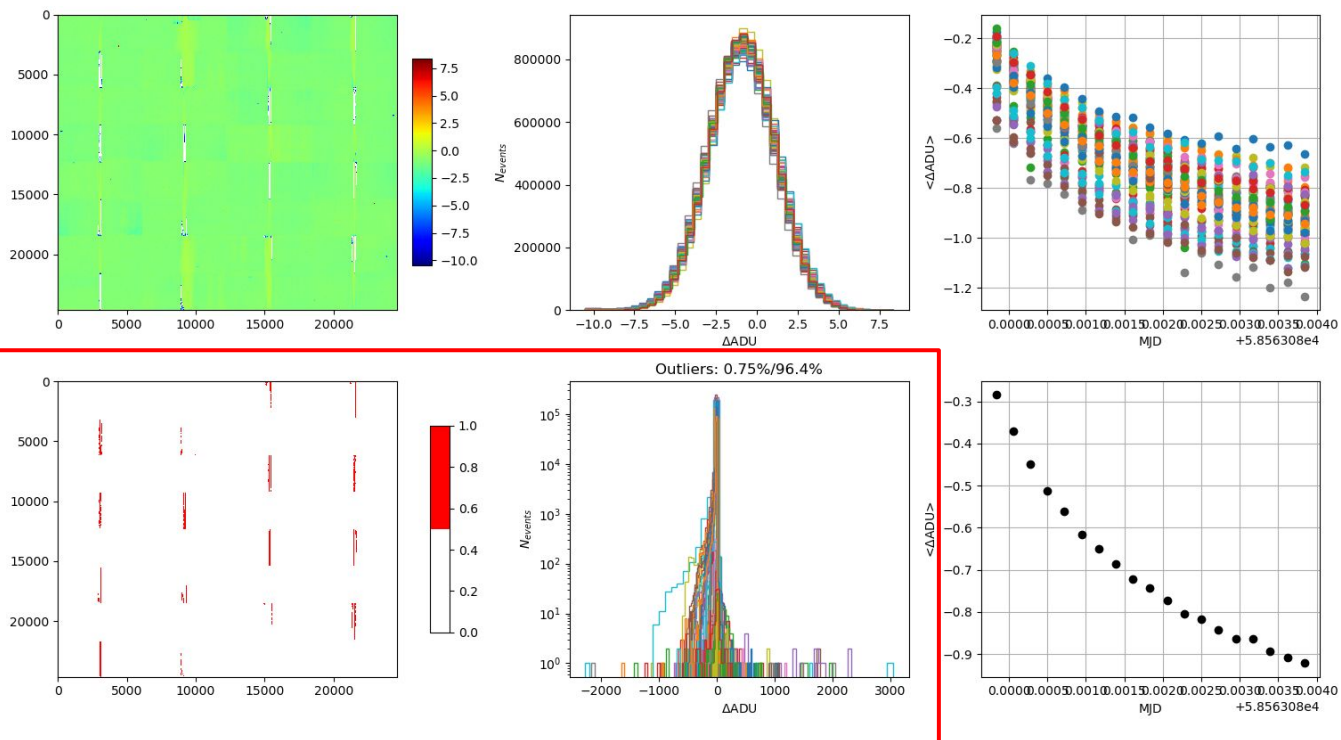


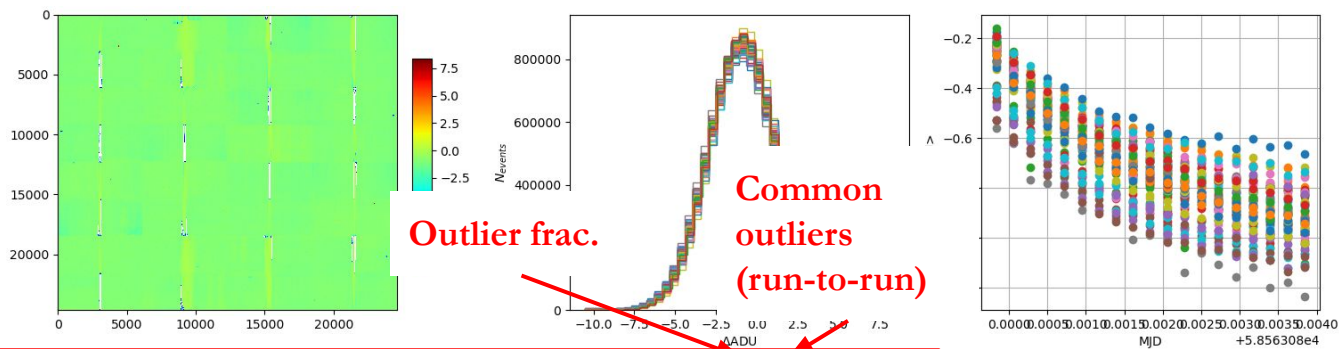
3- σ clipped



$\langle \Delta$ ADU \rangle FP vs time

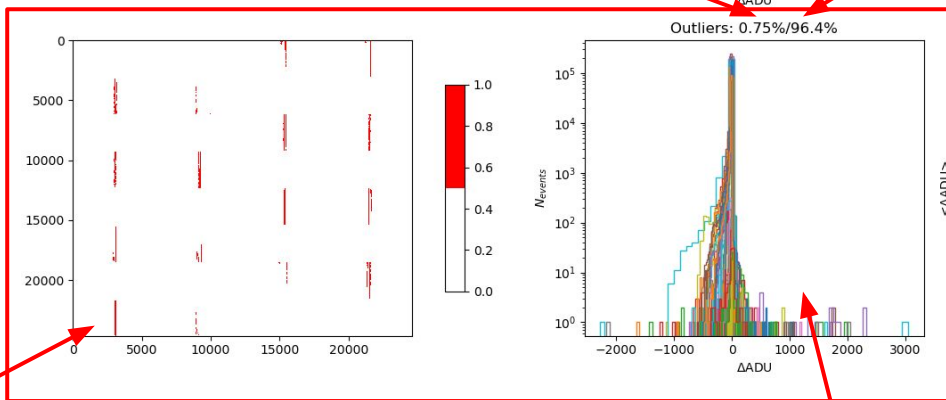
Outliers





Outlier frac.

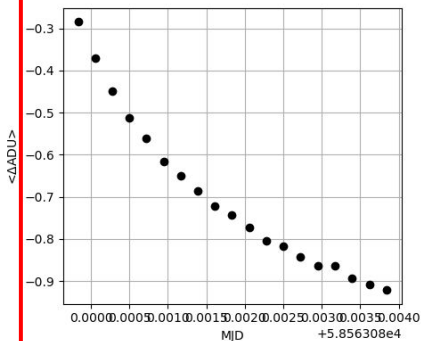
Common outliers (run-to-run)



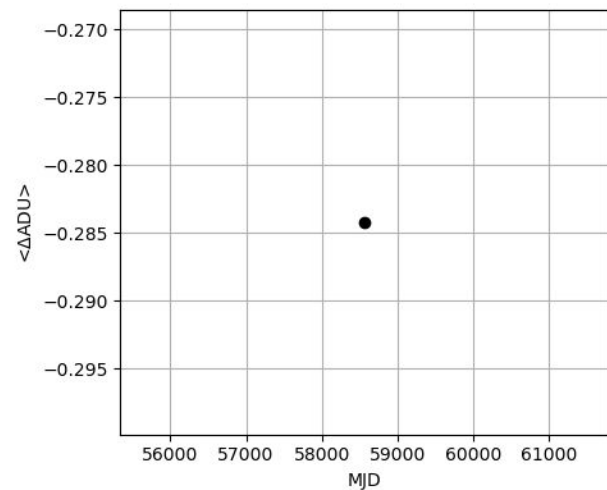
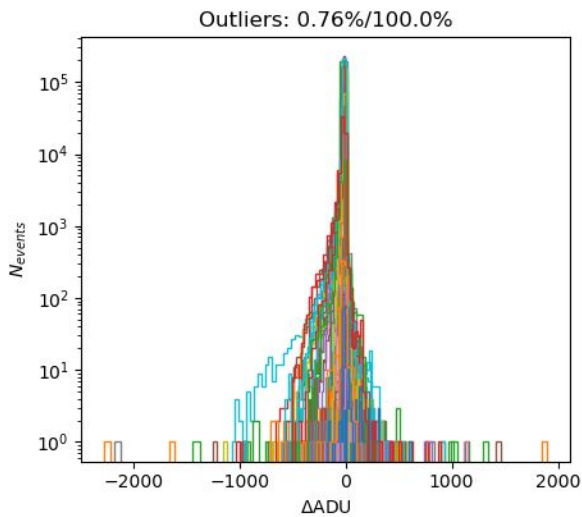
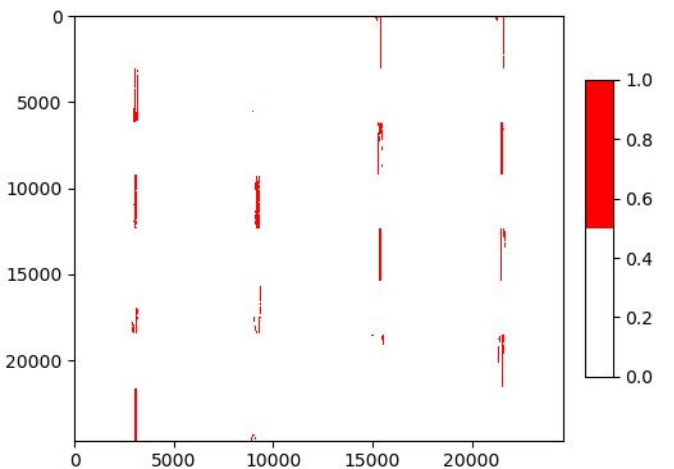
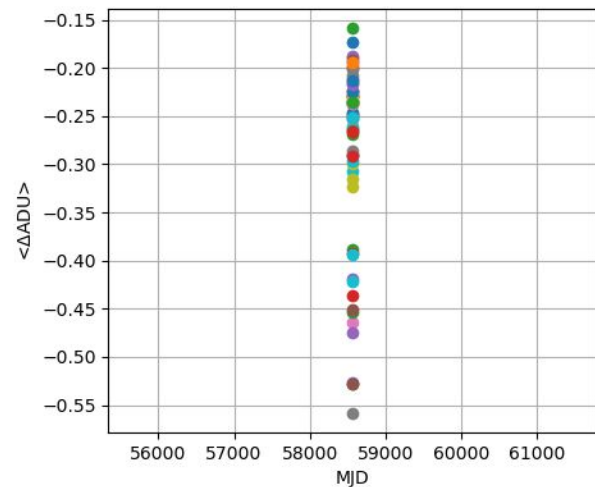
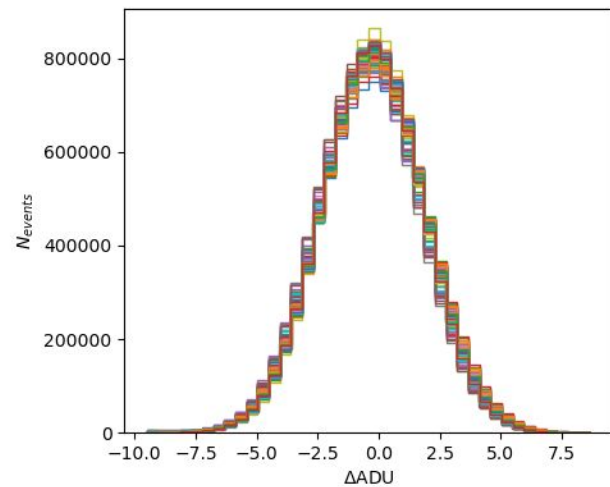
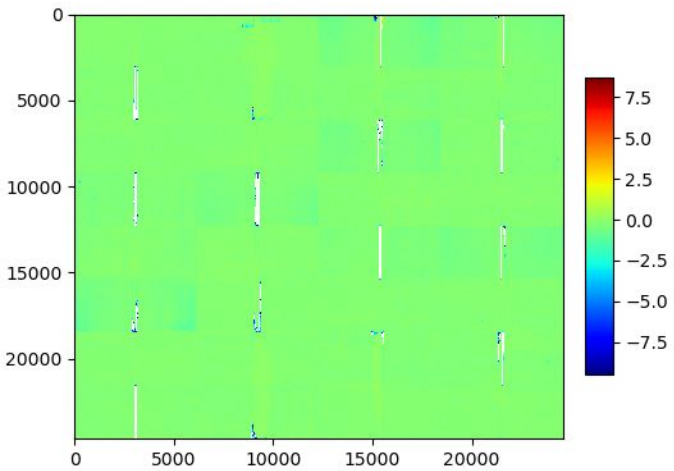
Outliers

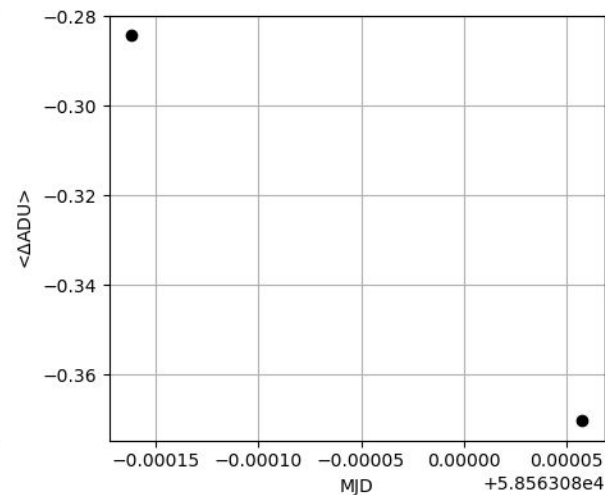
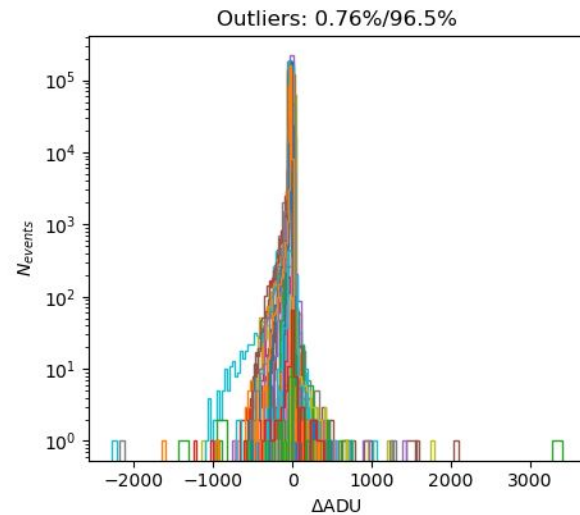
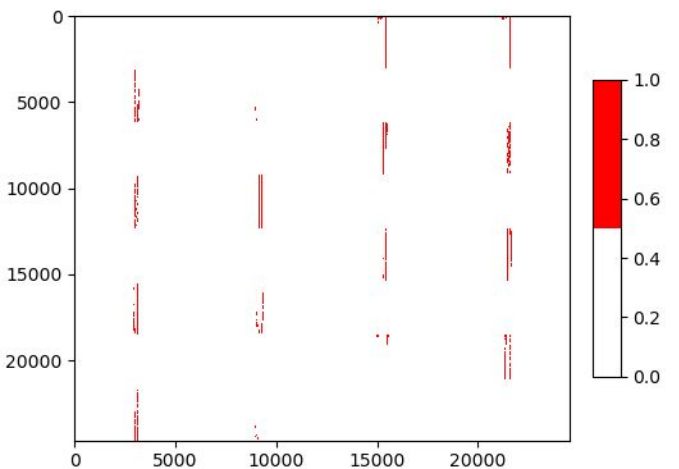
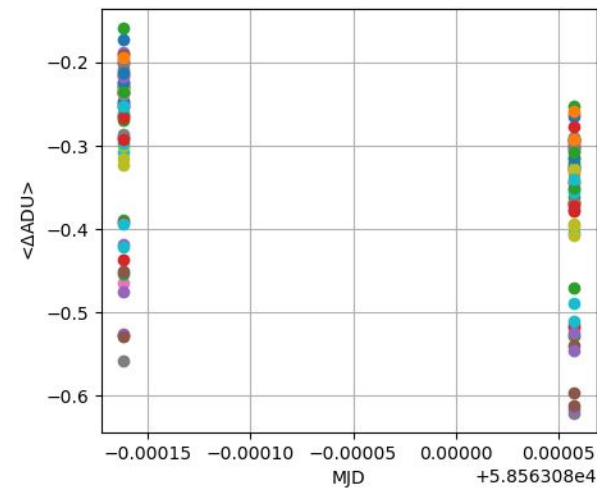
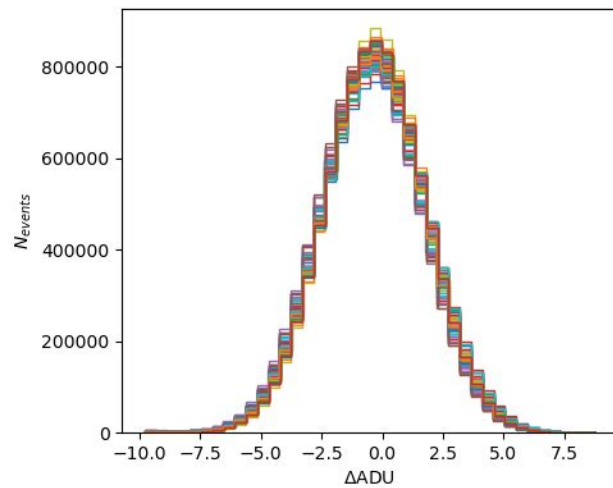
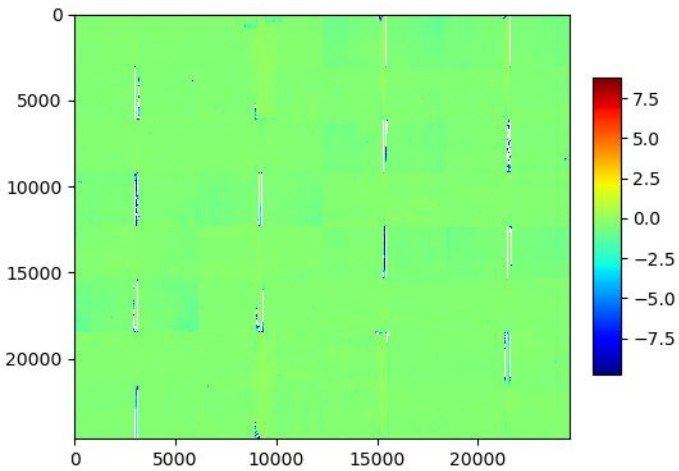
Outliers: 0.75%/96.4%

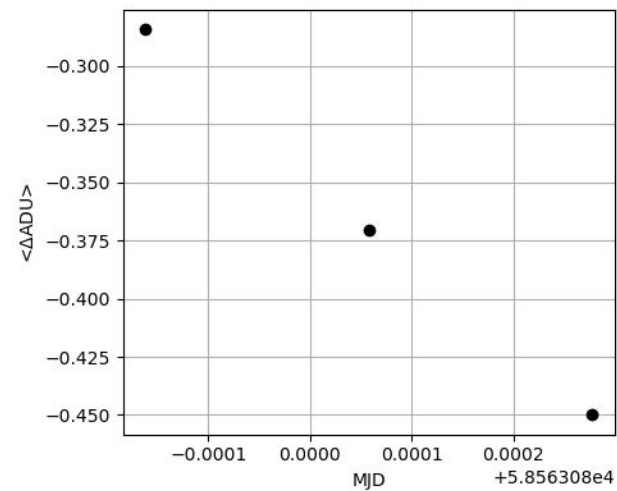
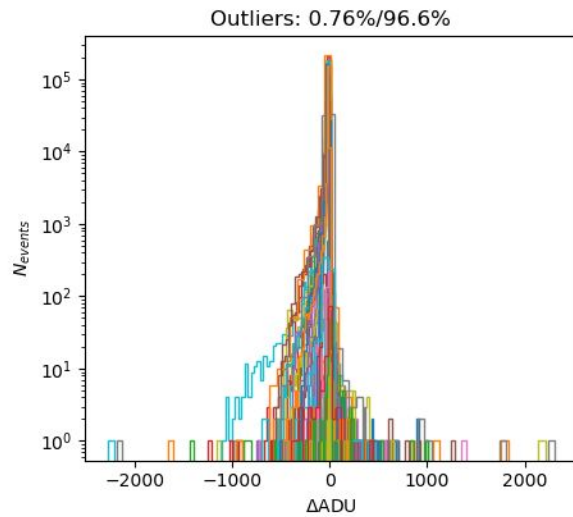
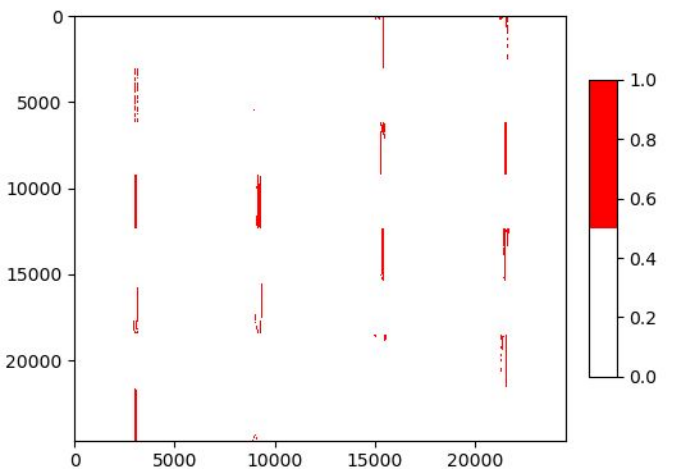
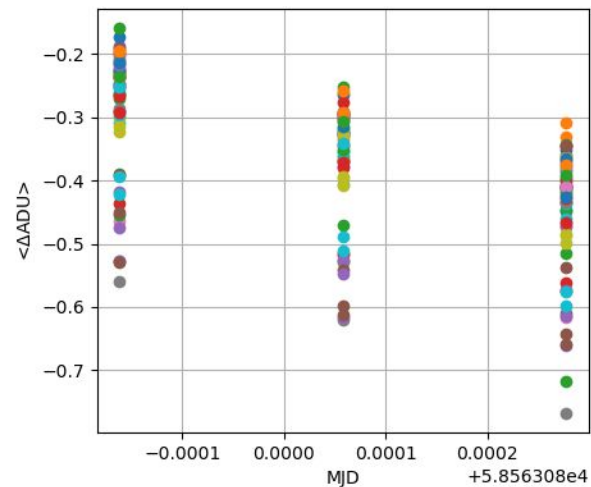
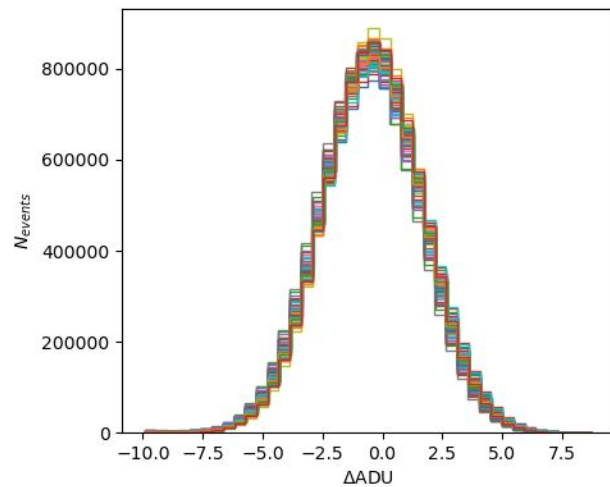
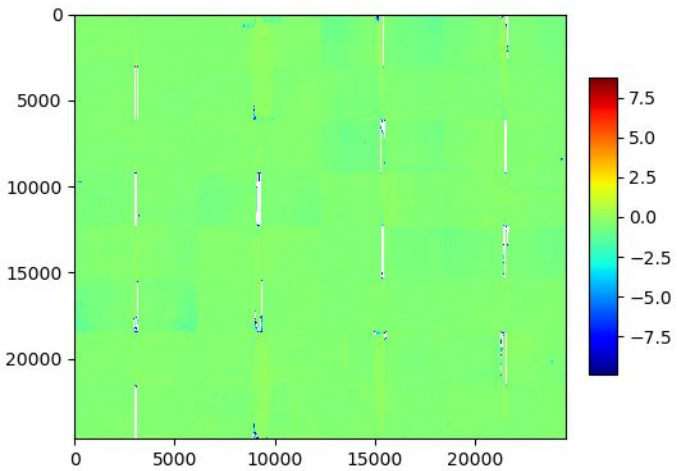
ΔADU (histo)

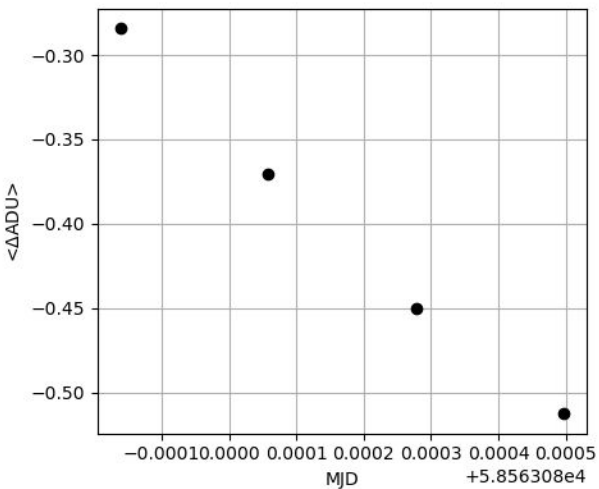
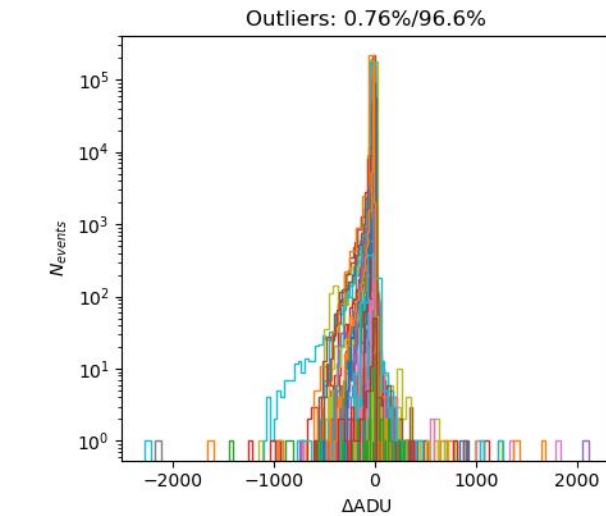
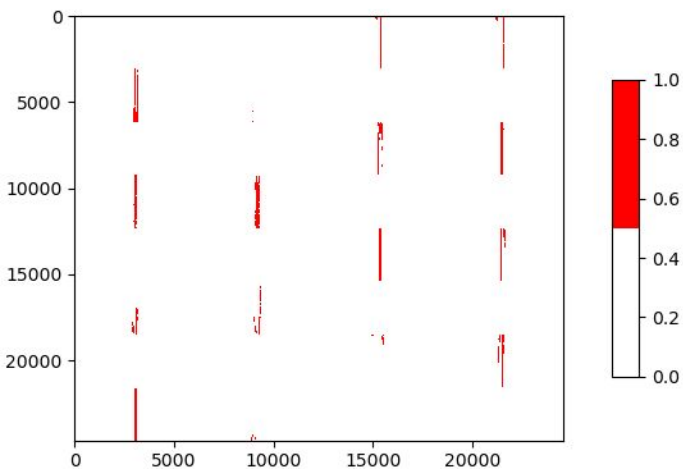
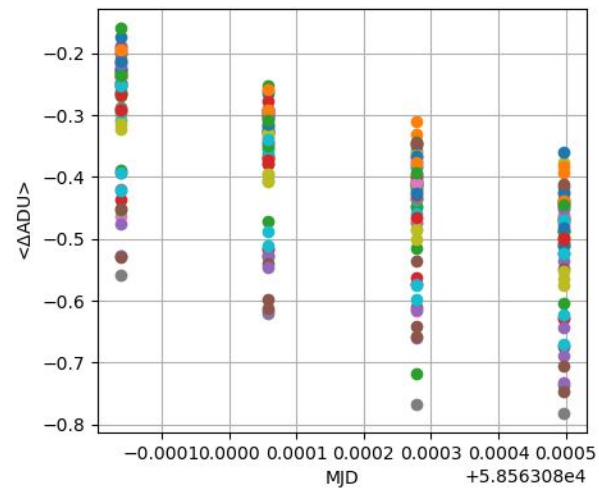
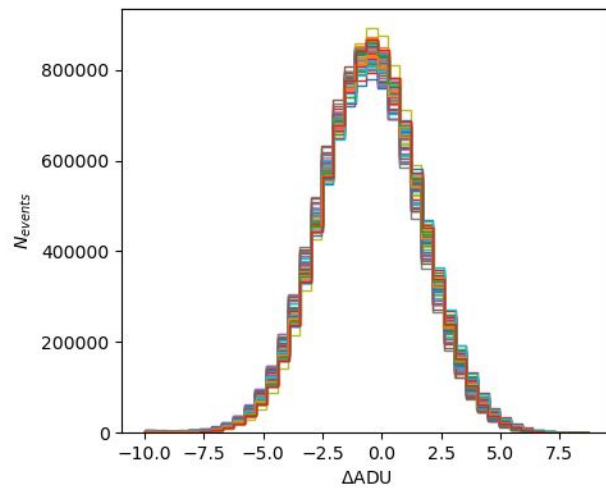
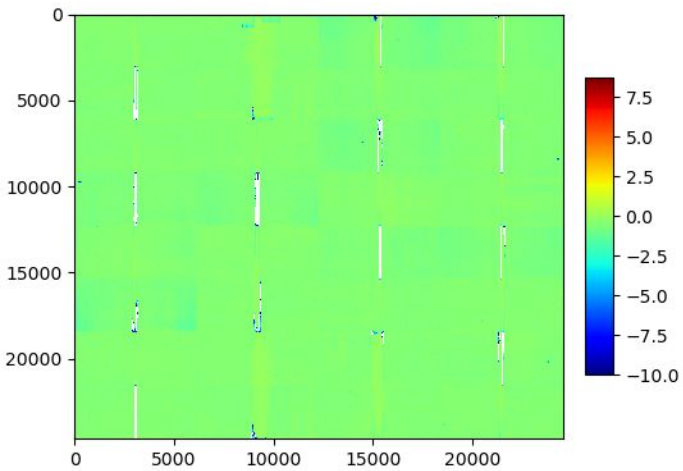


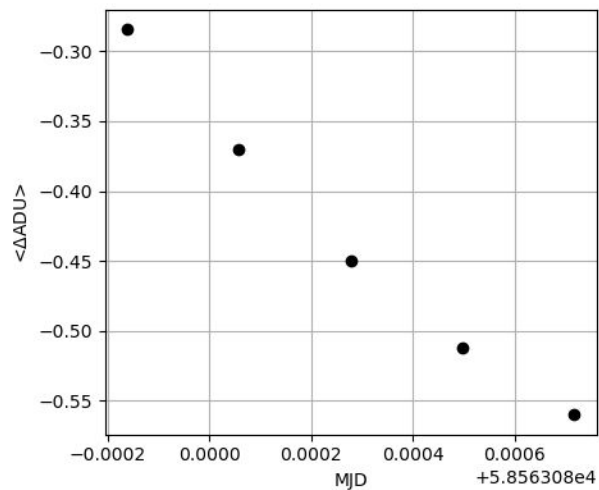
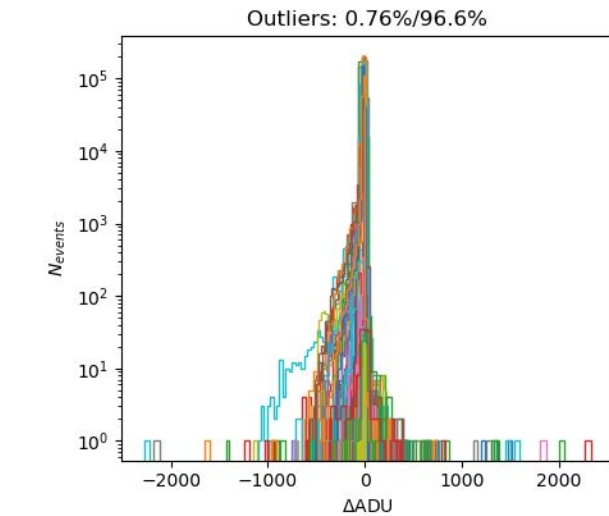
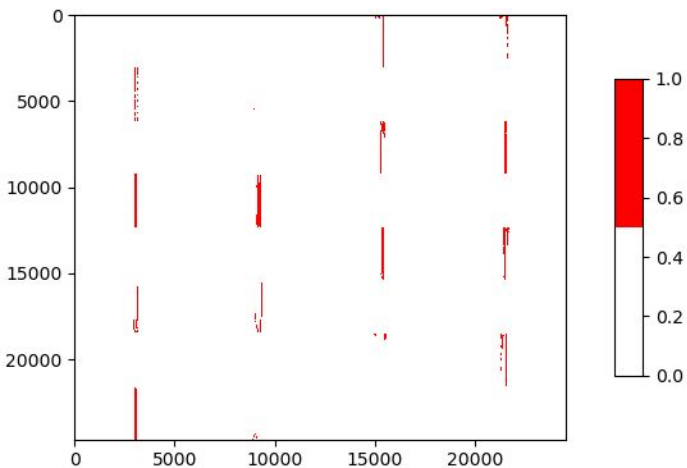
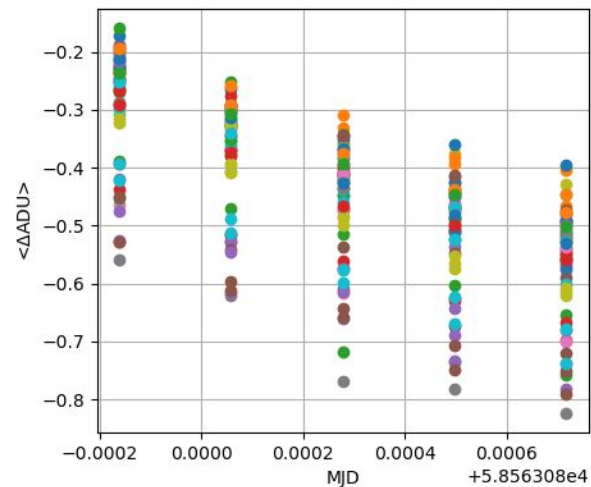
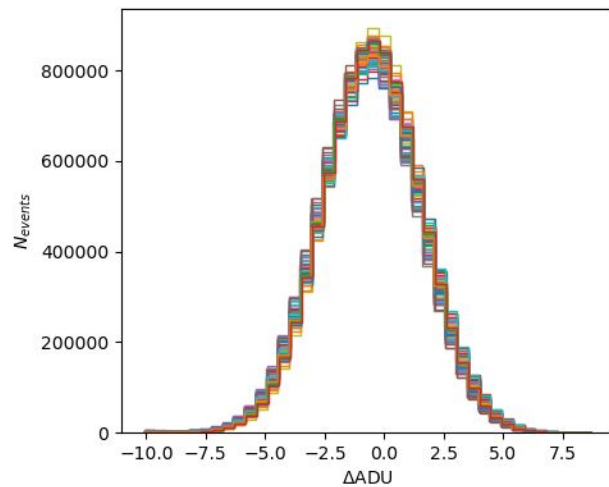
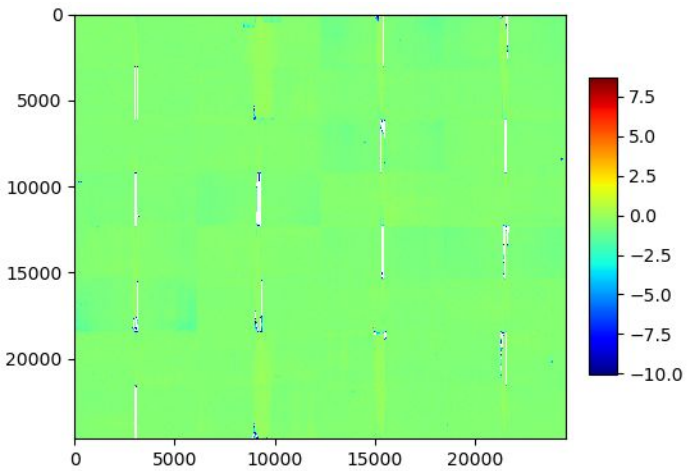
FP position

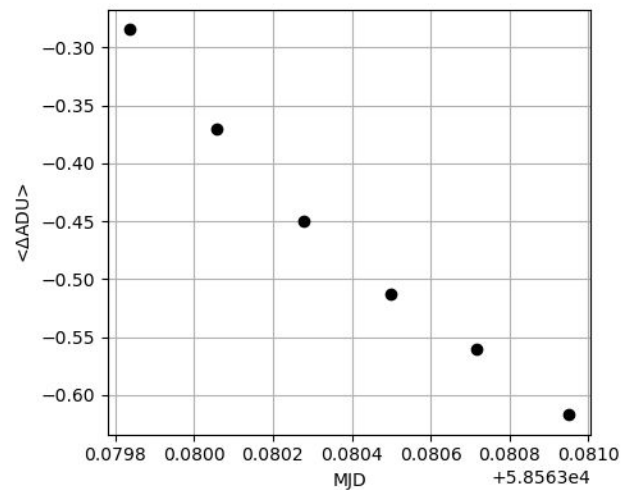
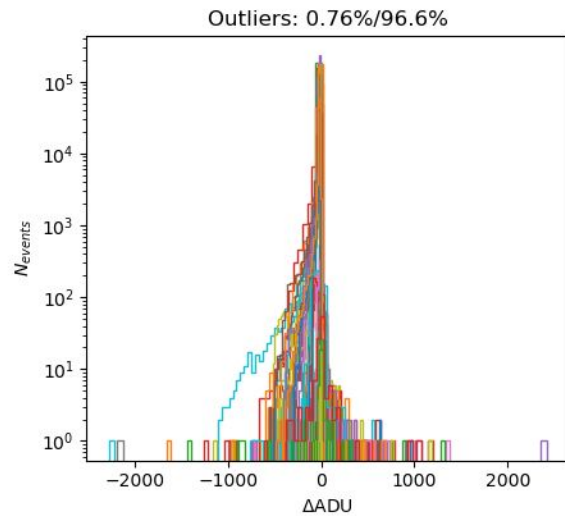
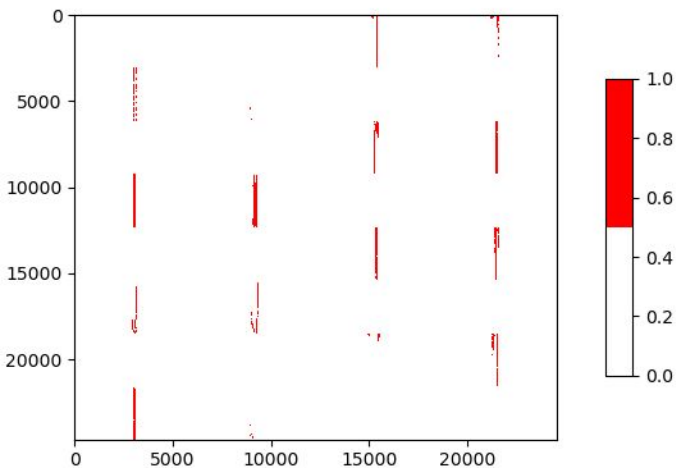
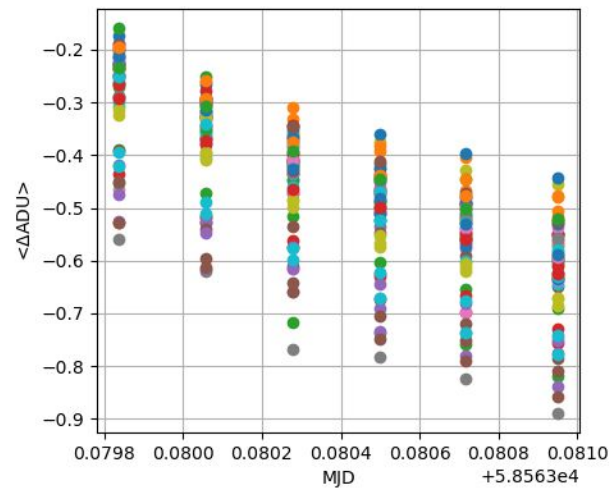
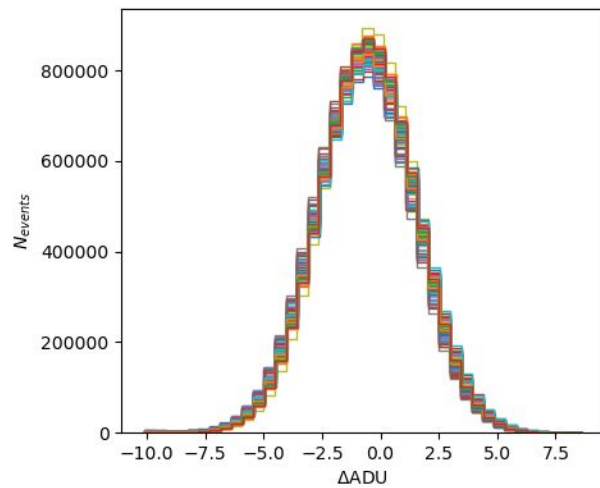
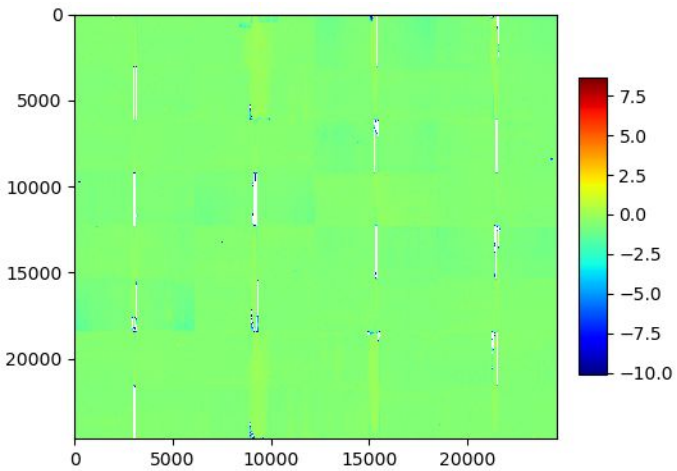


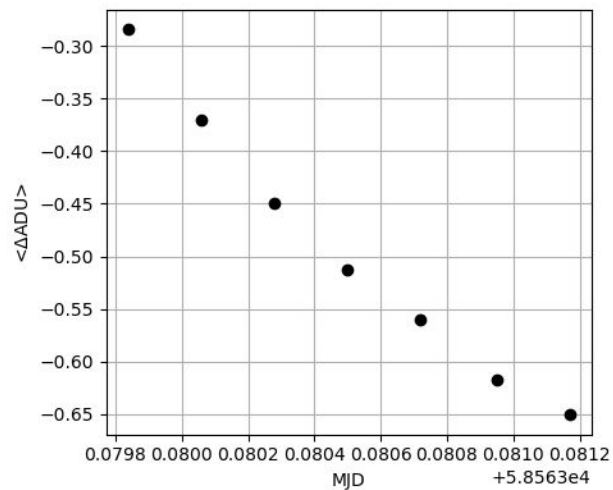
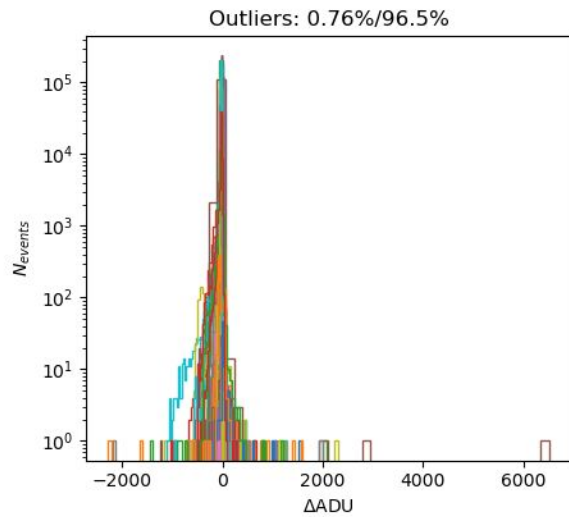
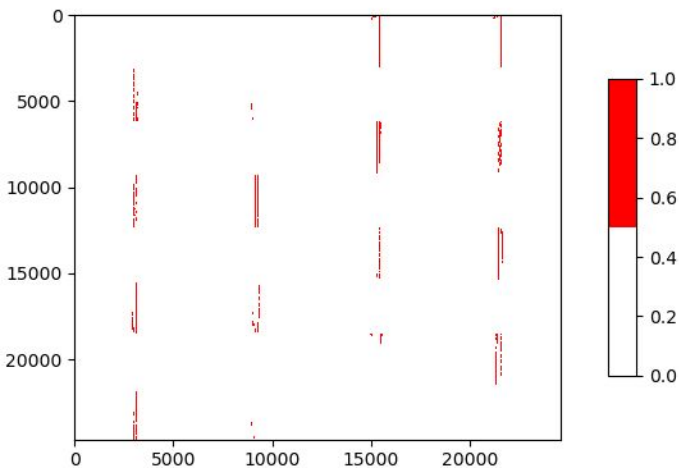
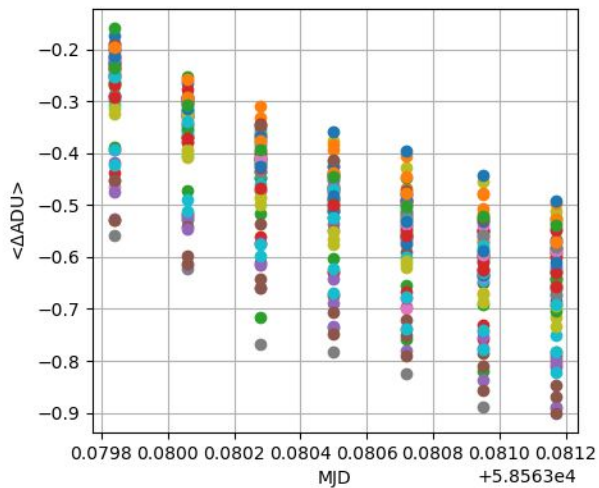
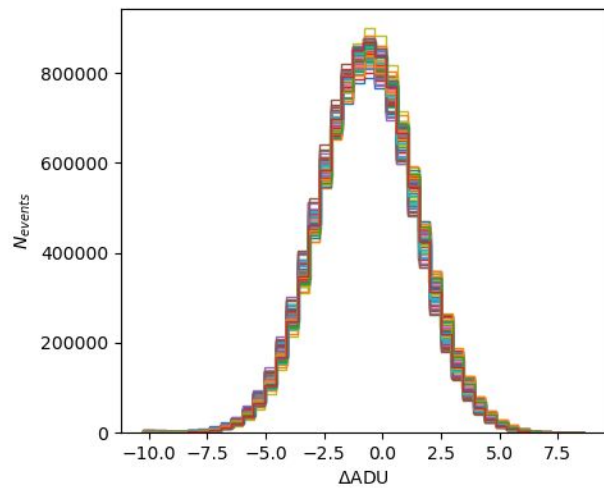
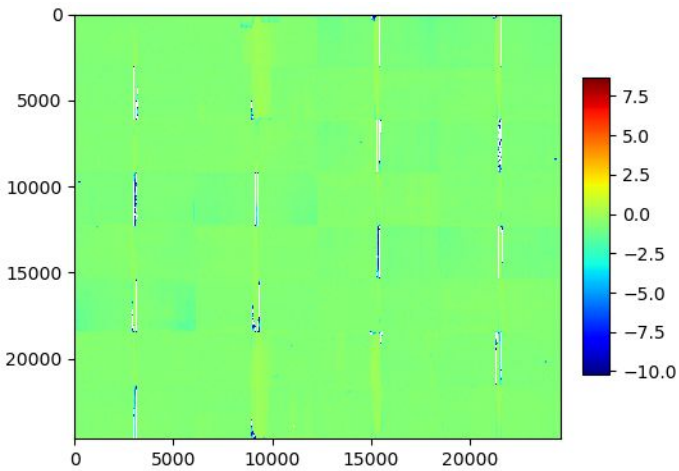


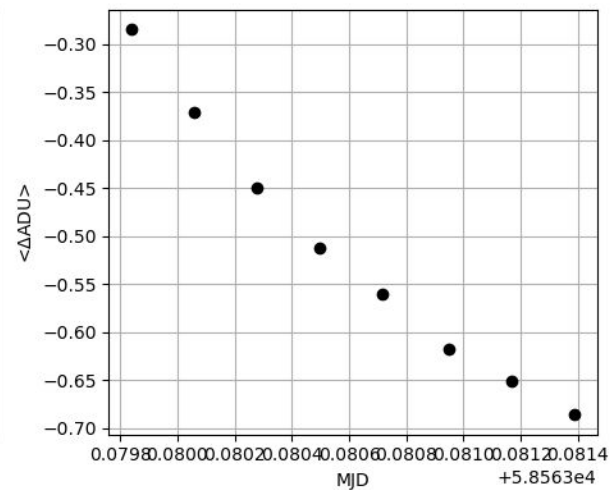
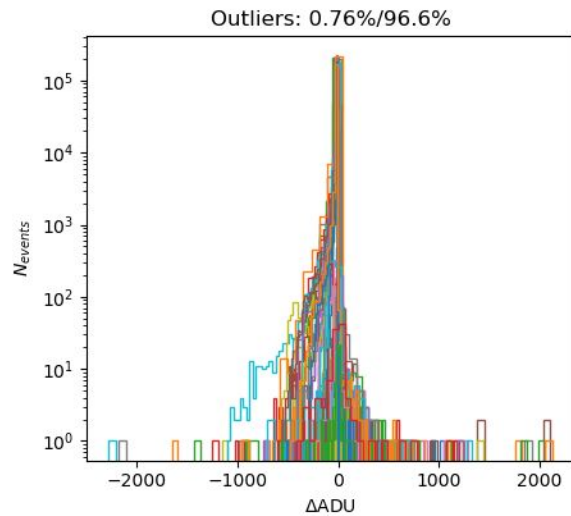
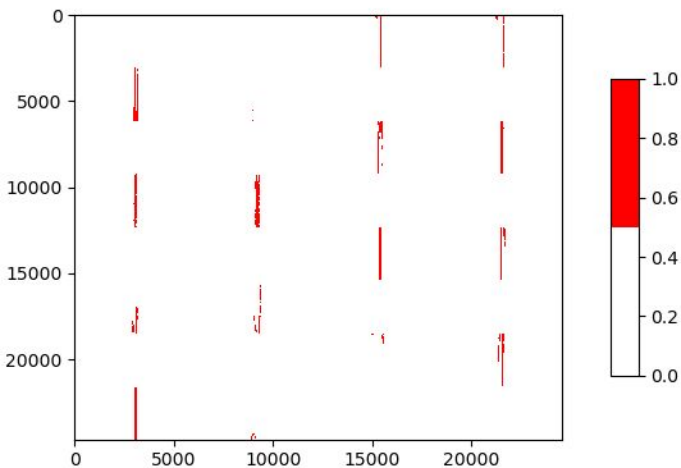
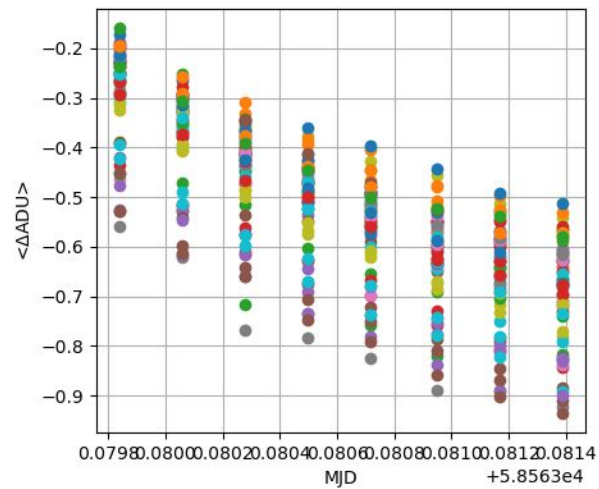
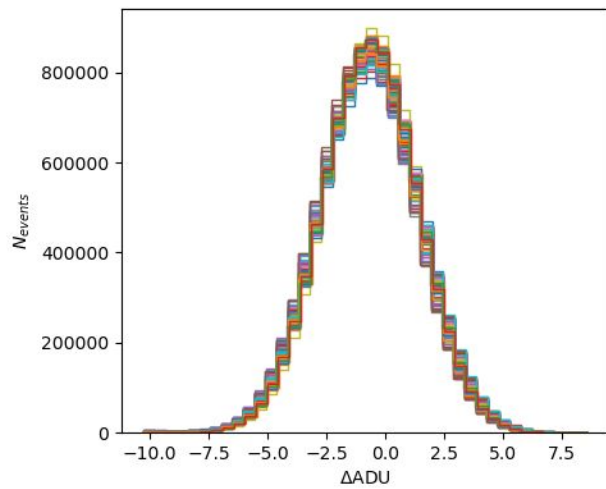
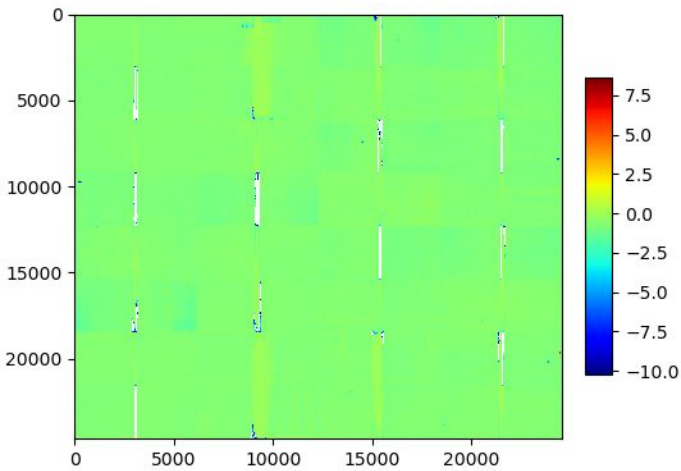


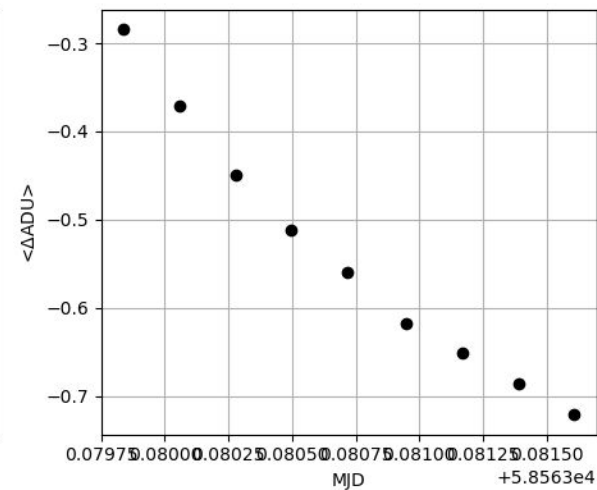
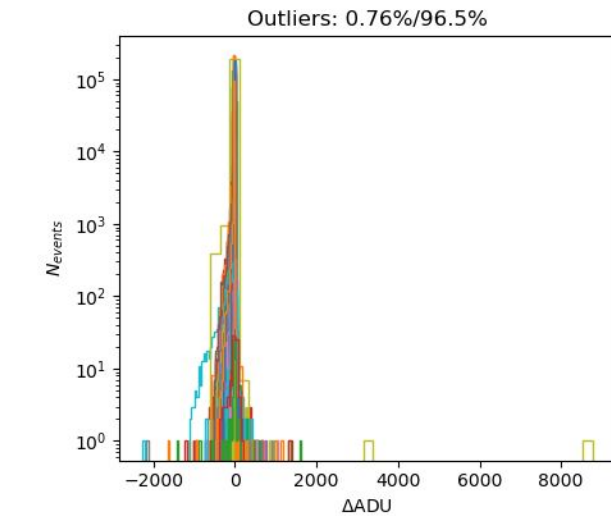
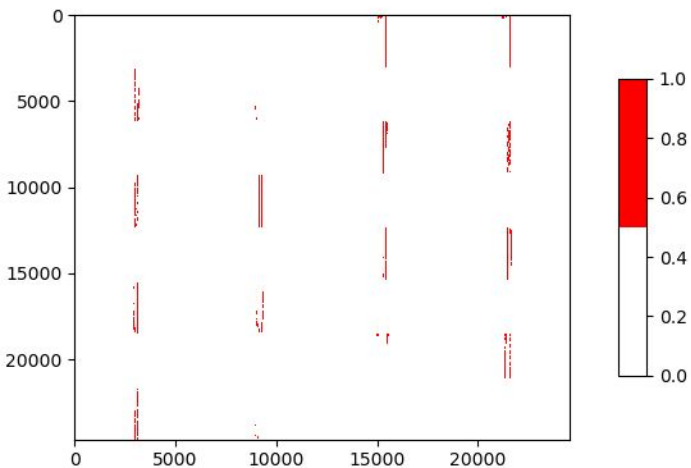
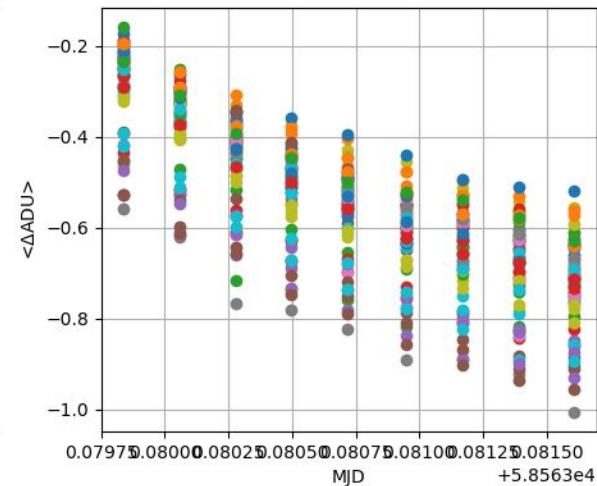
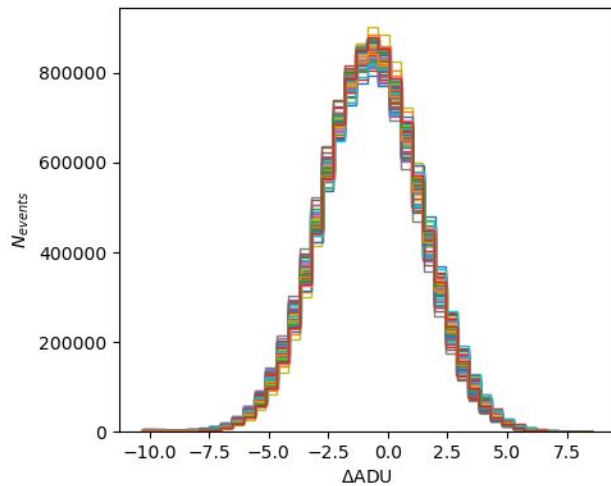
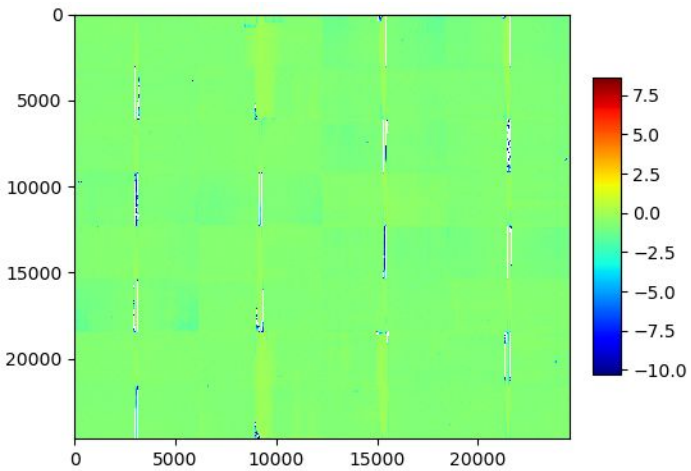


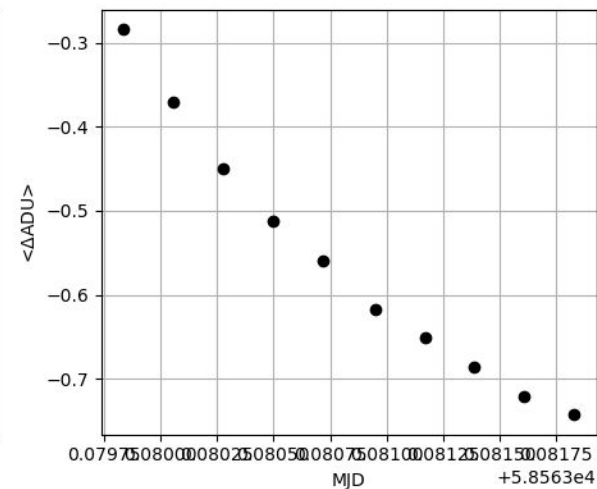
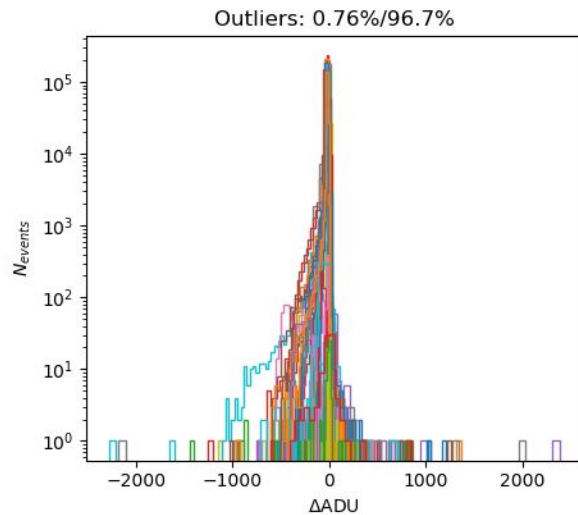
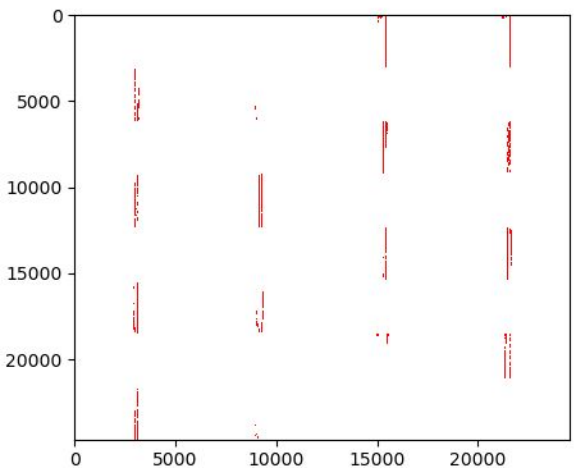
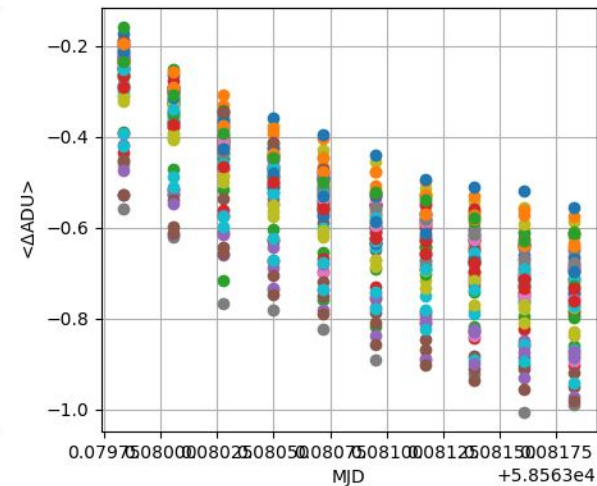
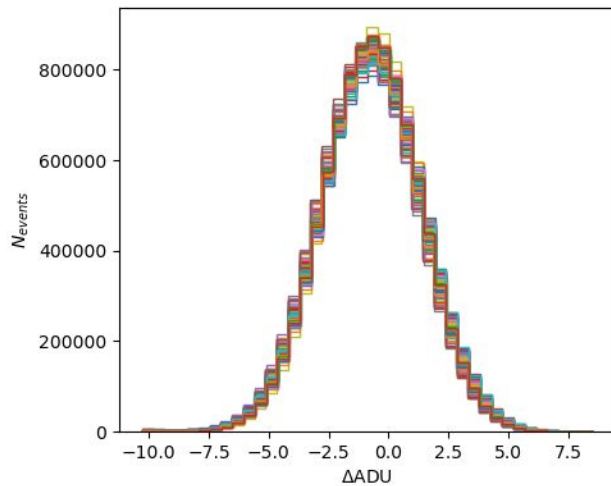
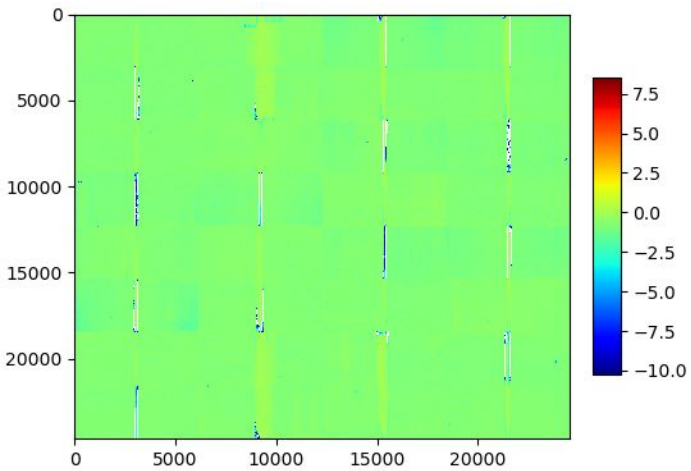


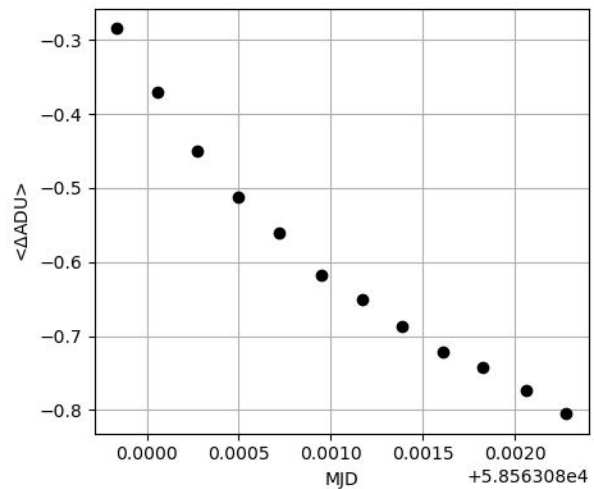
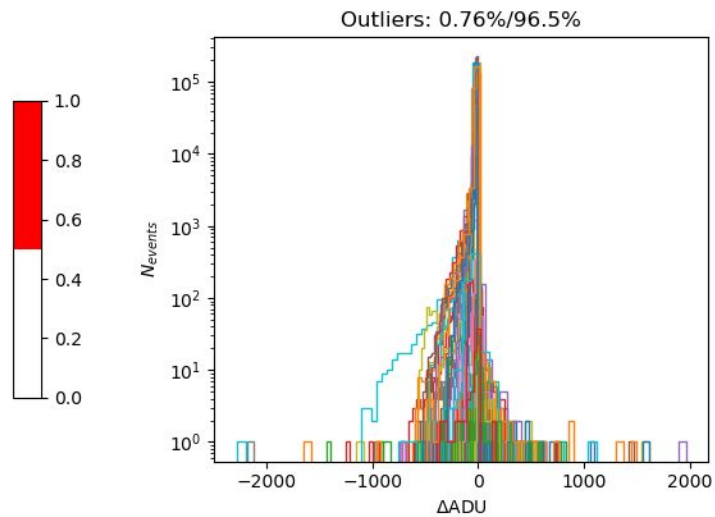
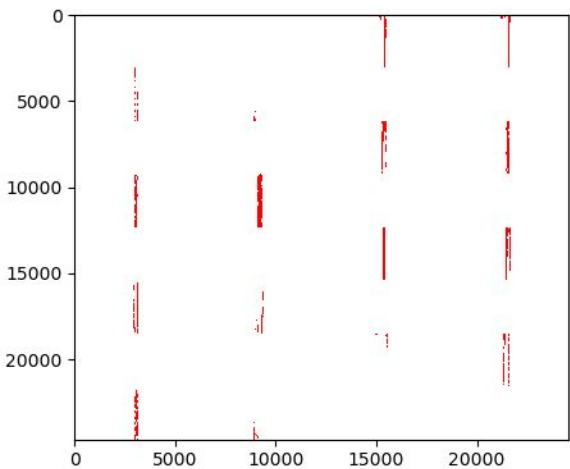
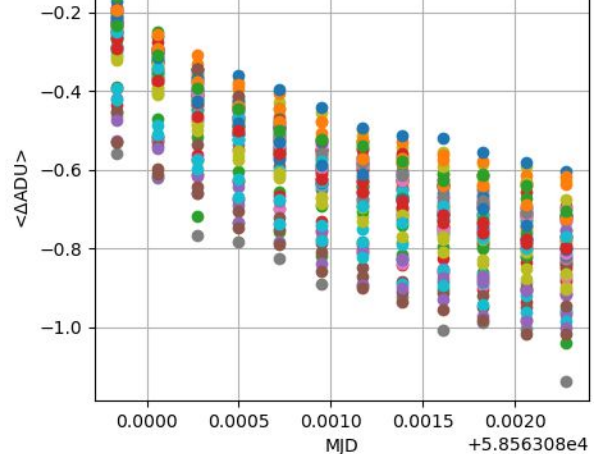
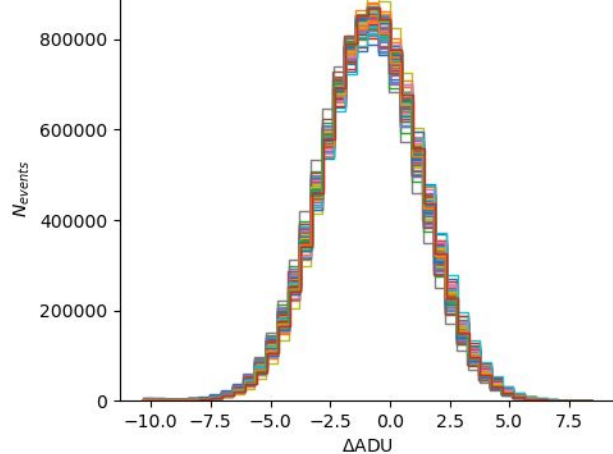
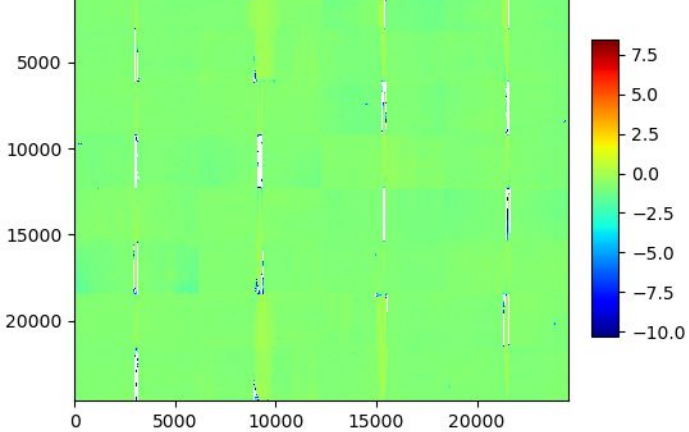


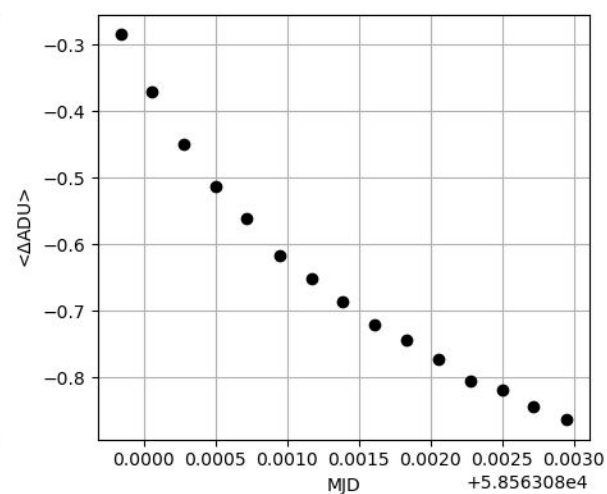
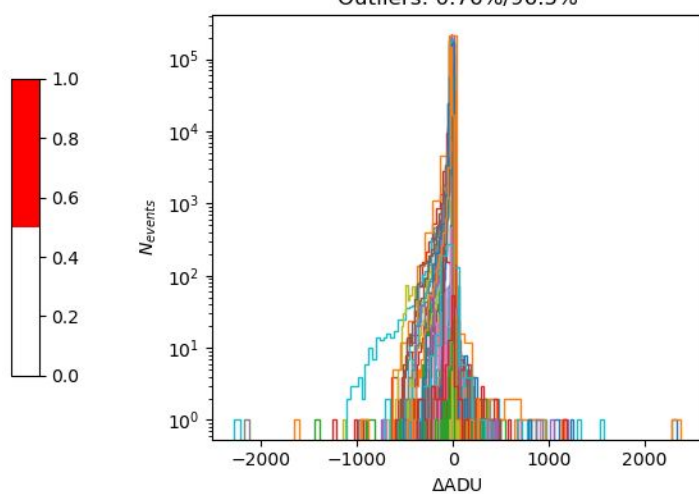
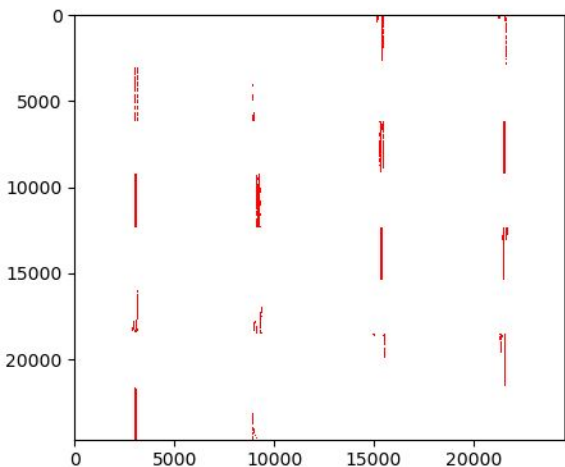
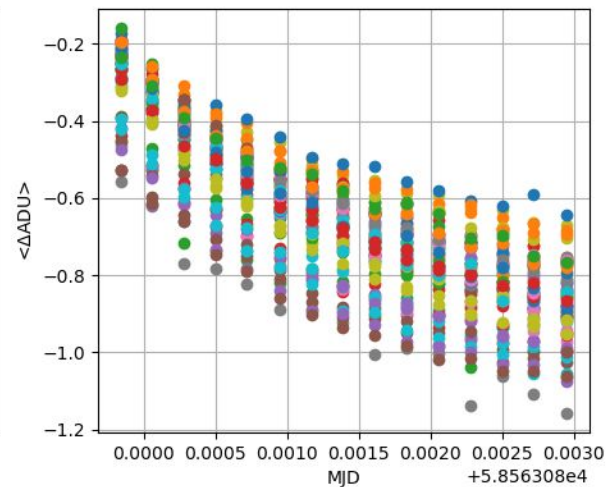
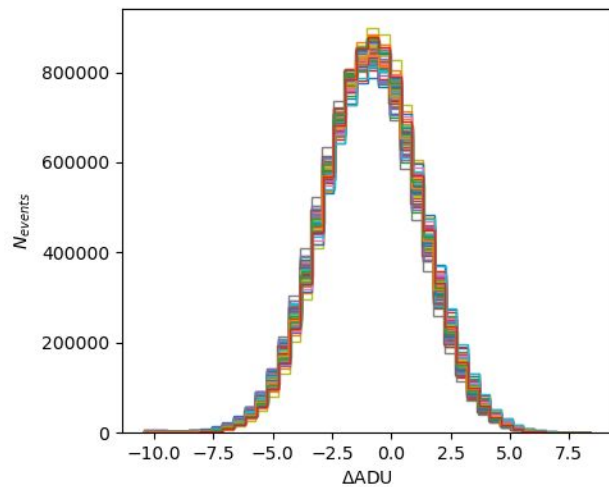
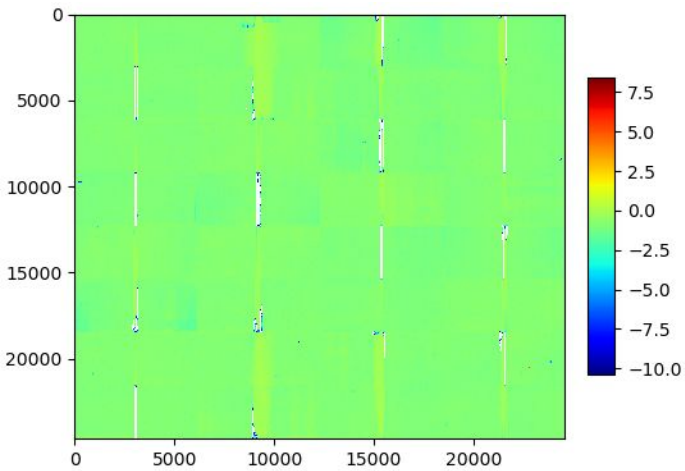


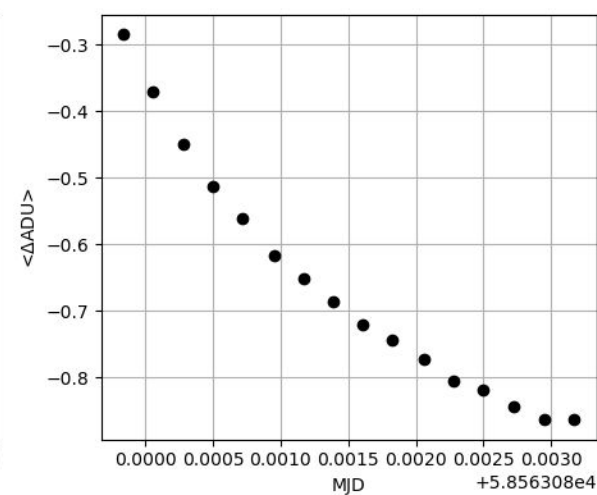
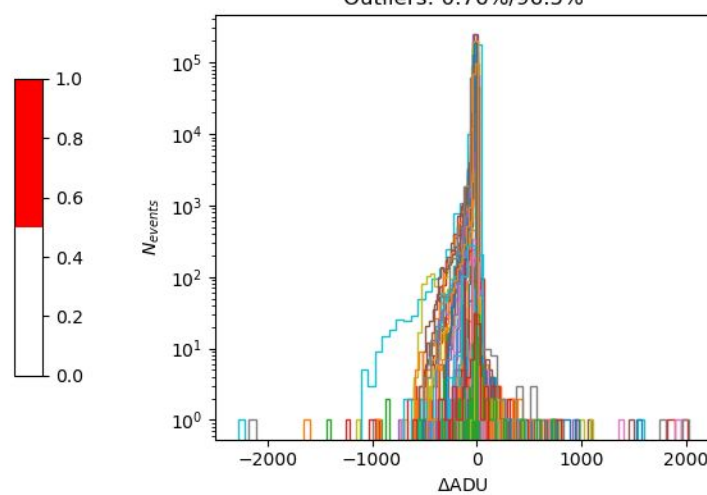
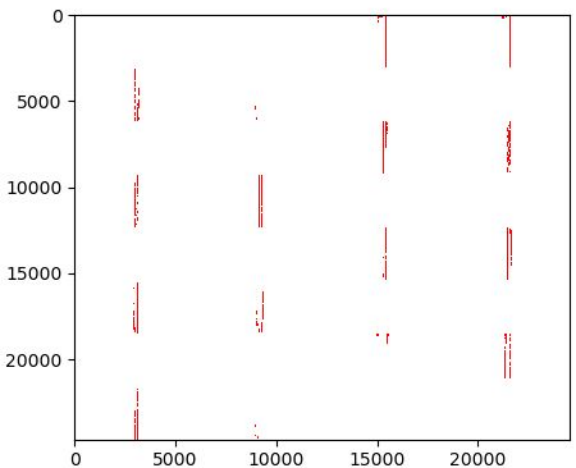
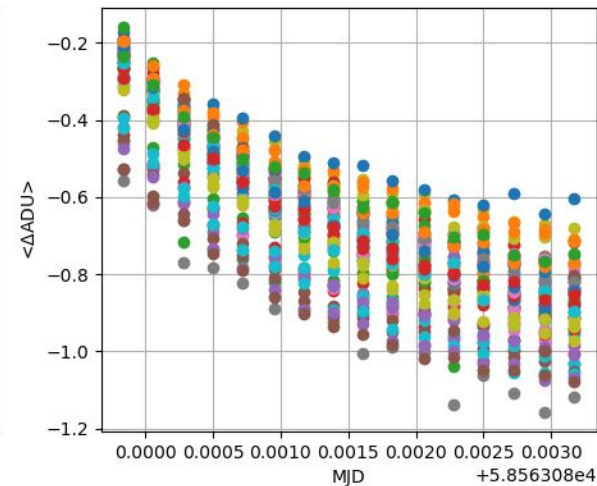
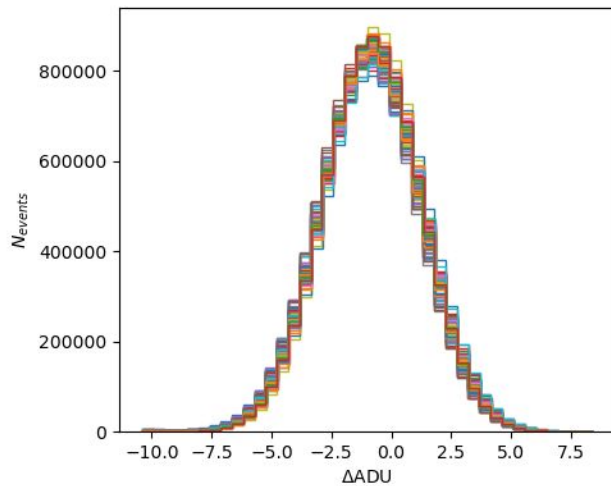
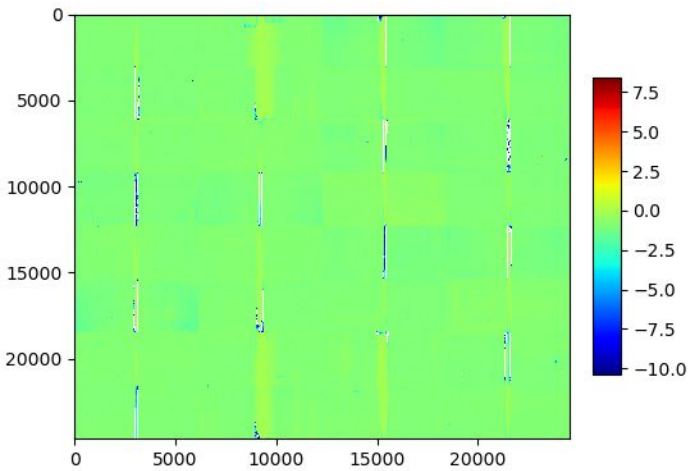


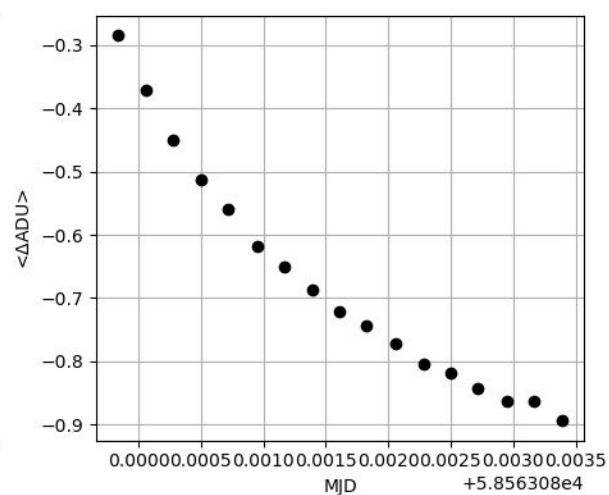
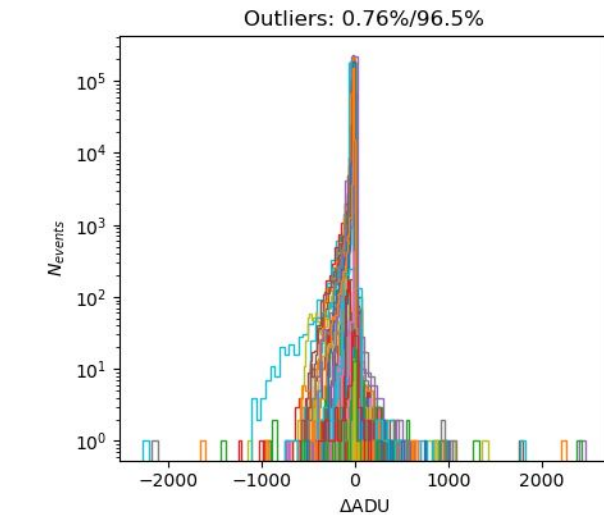
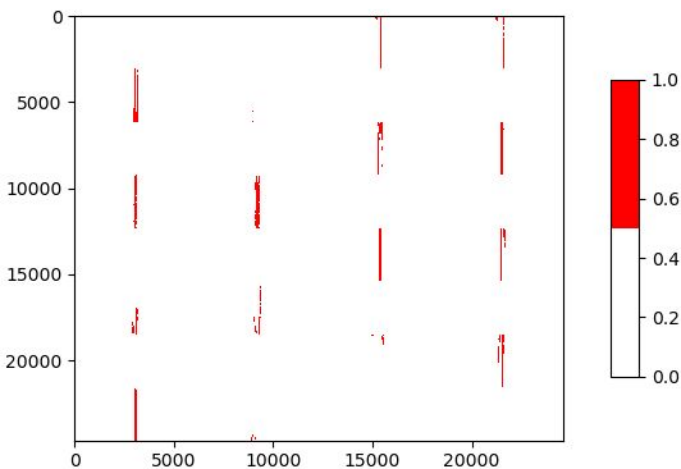
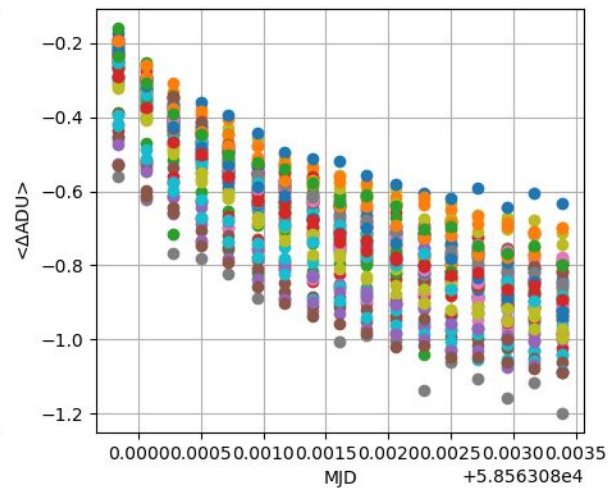
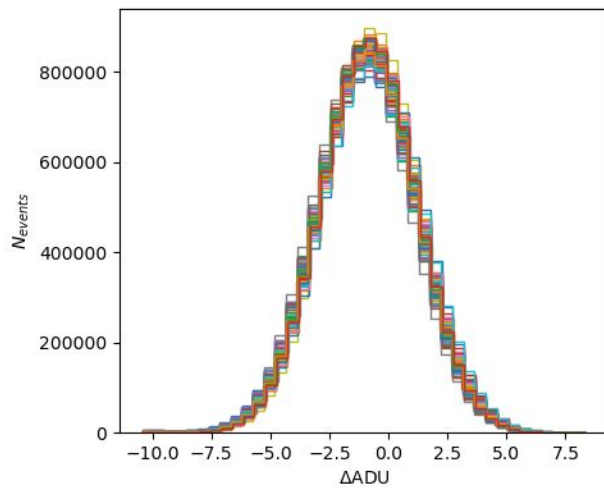
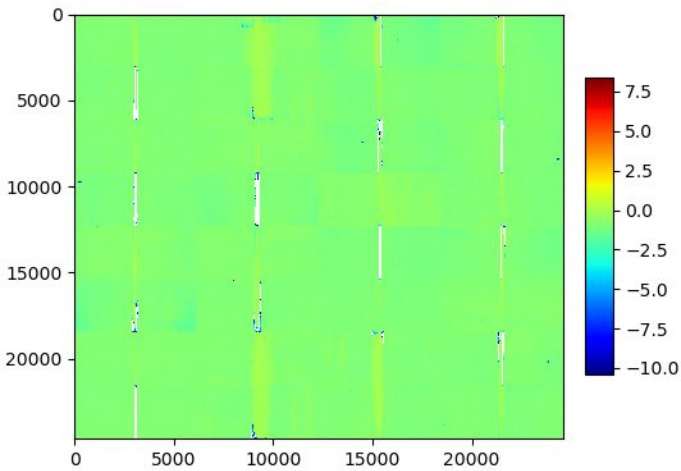


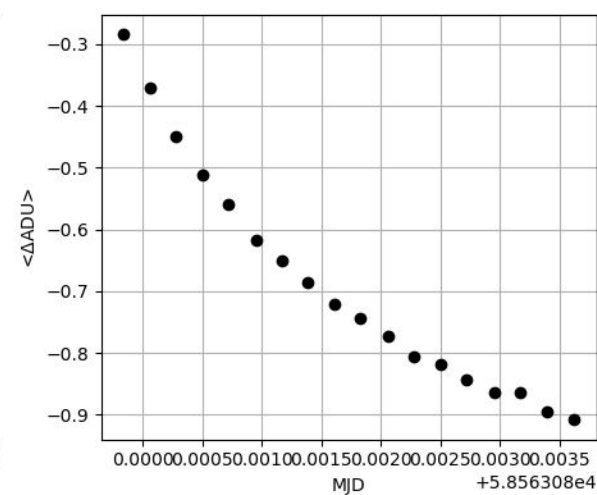
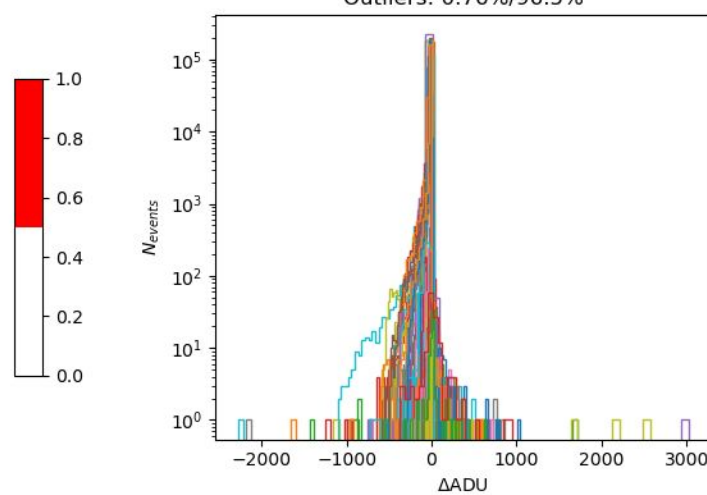
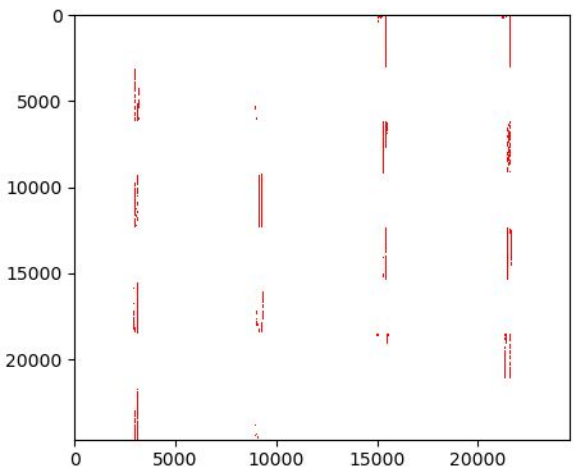
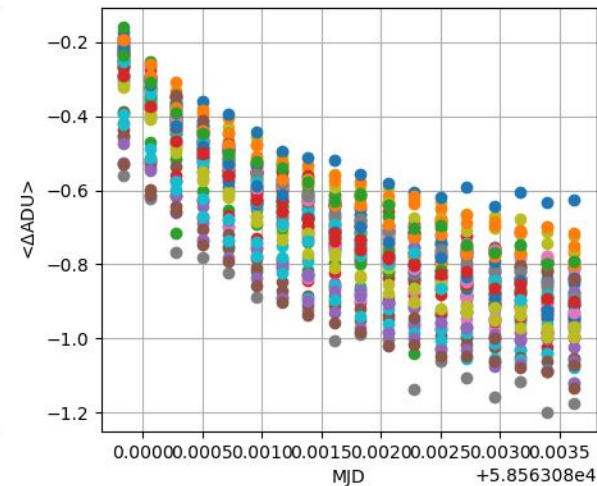
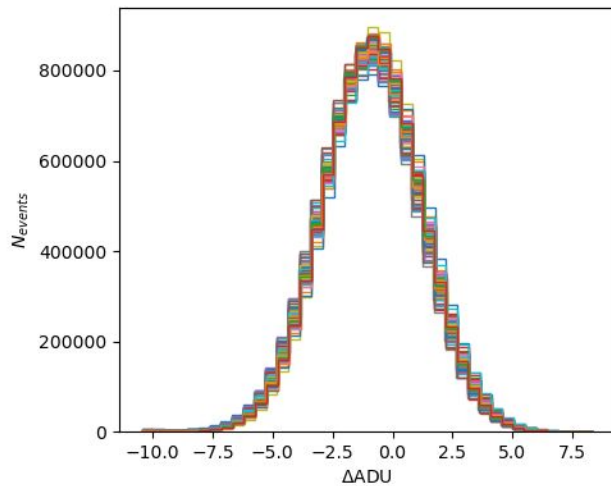
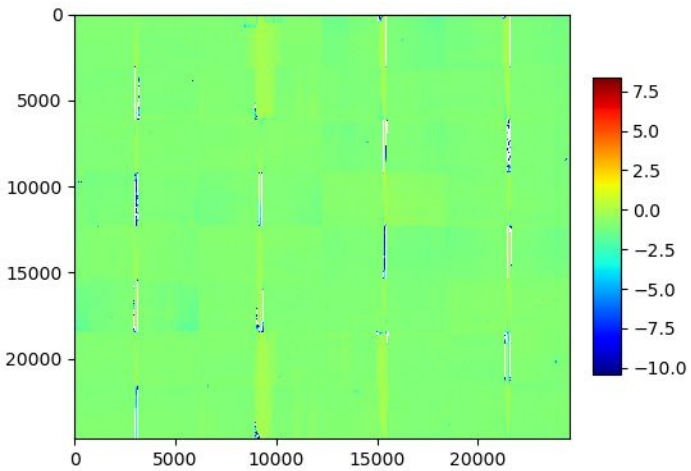


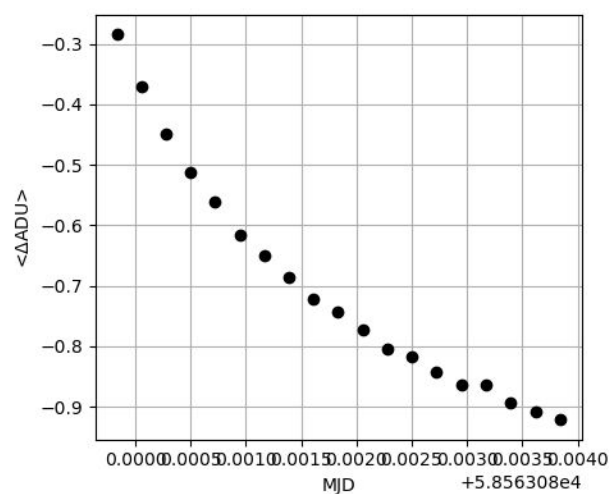
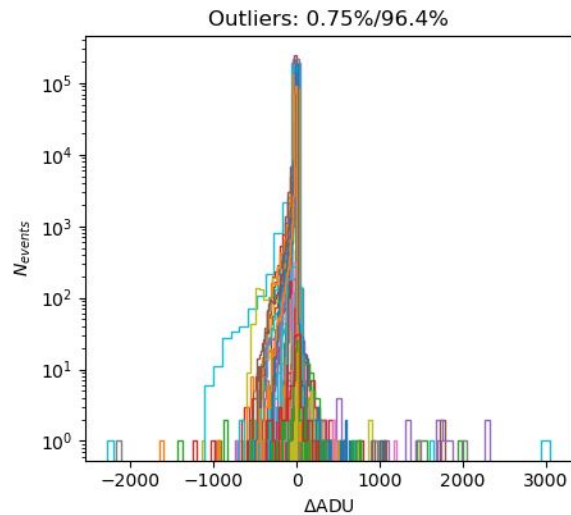
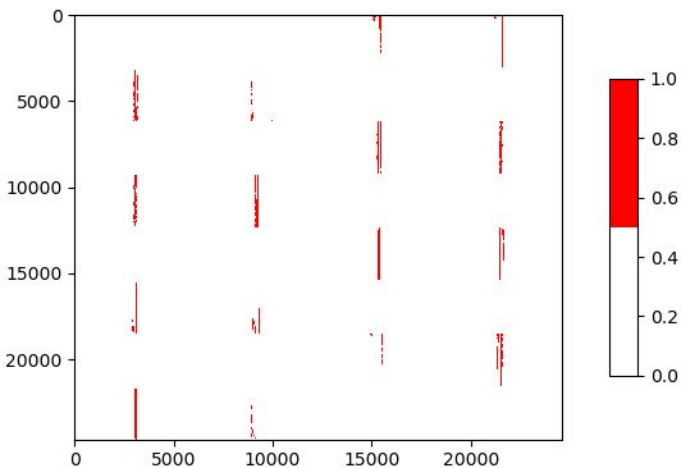
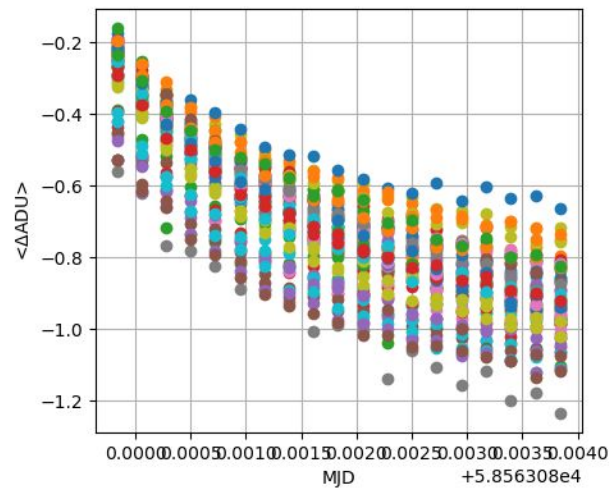
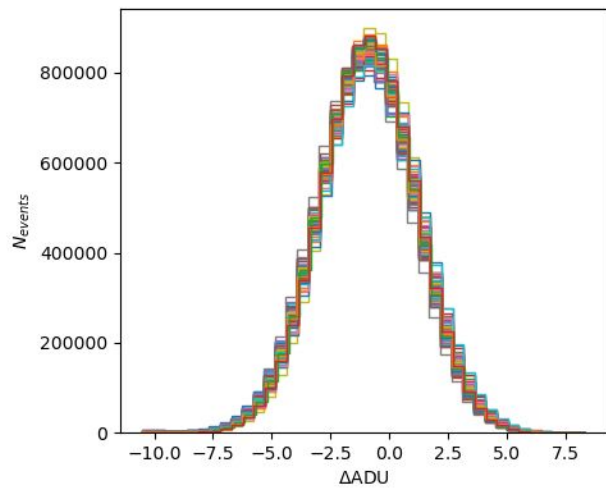
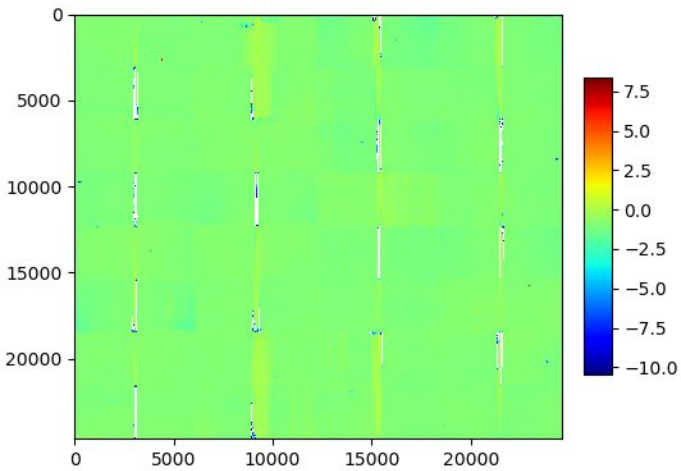




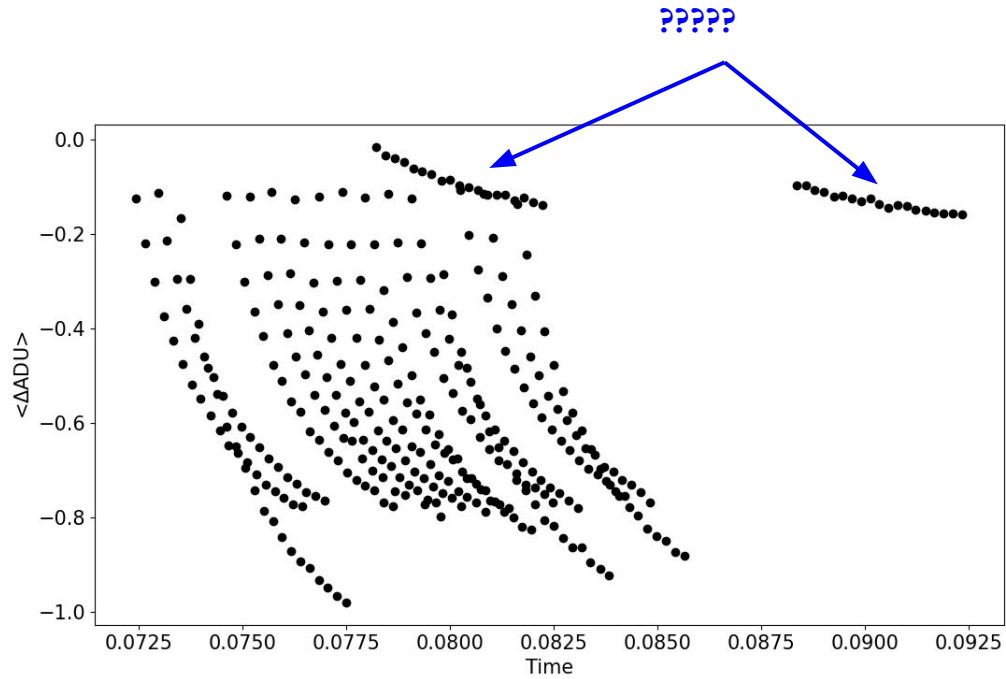


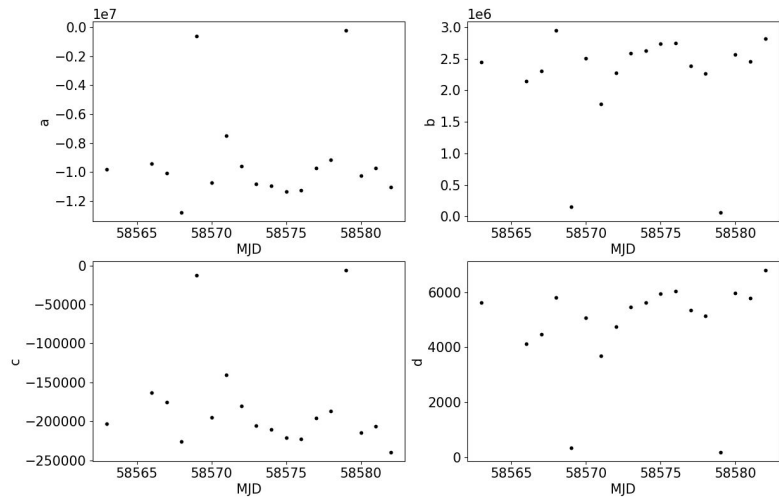
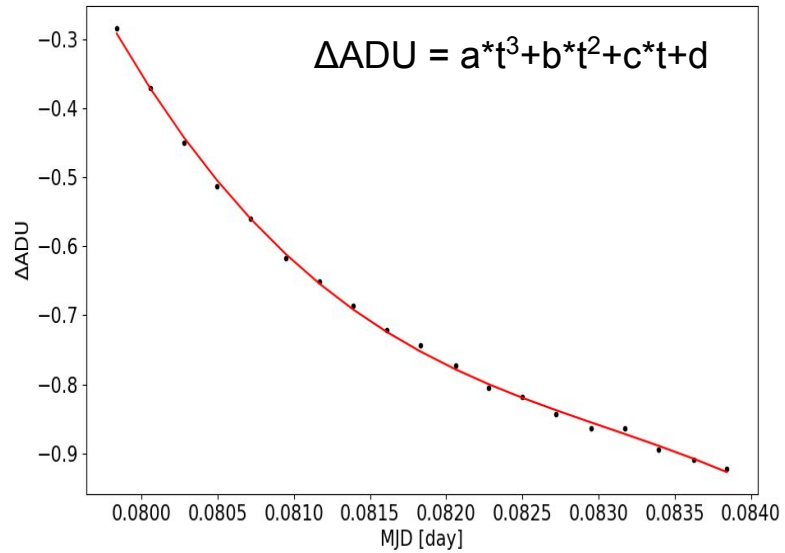




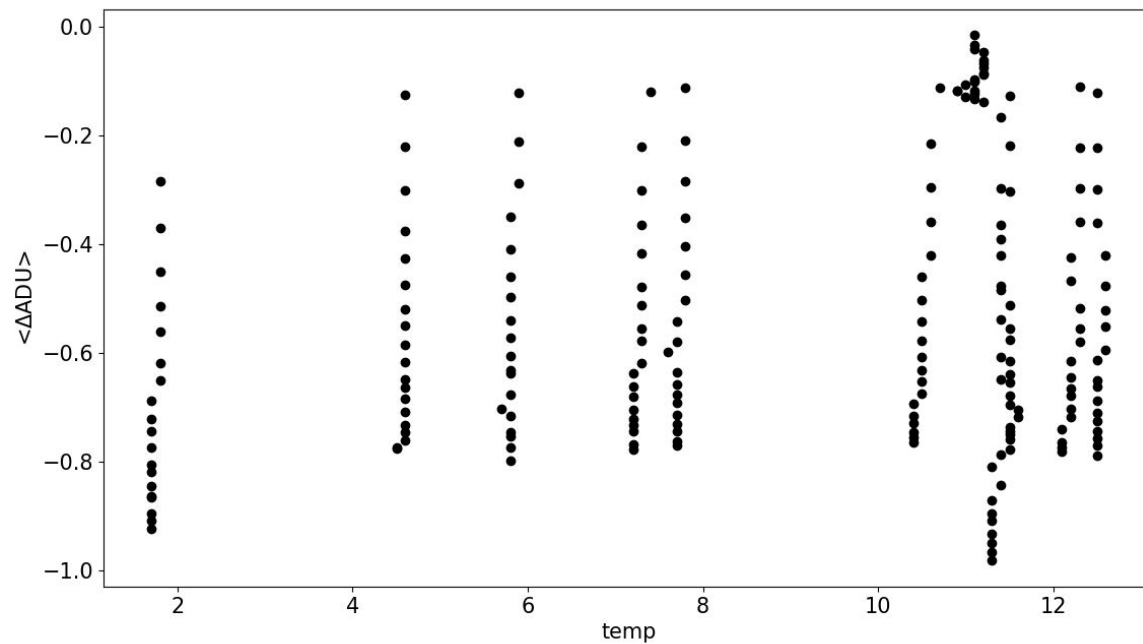


- Decrease of ΔADU vs time





Correlation with temp?



External temp.

Conclusion

- ADU counts variations vs time (over 5 minutes)
- Investigating correlations with temp(s)
- Outliers: consistent at the 95% level (what about the others?)

- In progress : master bias with 3-sigma clipping