



CoRot Imagerie pipeline

- ◆ Written by C. Charades, R. Den Hartog, R. Cautain, L. Jorda and P. Chabaud

My contribution:

- ◆ Test robustness and increase efficiency
- ◆ Test the pipeline for saturated stars

Transforms N1 images into N2 light curves

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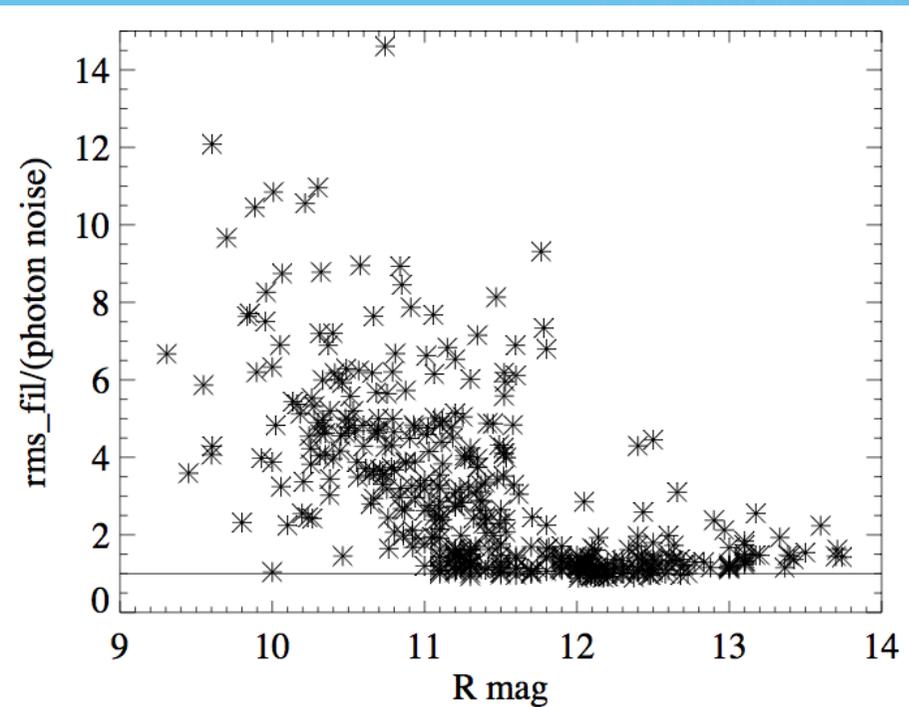
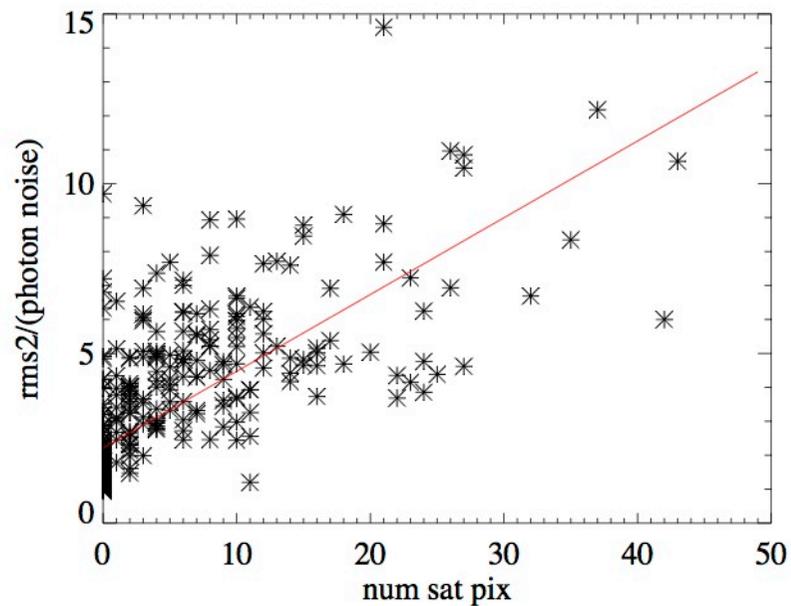


Summary previous results



Pipeline is working well except for saturated stars.

Saturation depends on the color, position on the CCD, magnitude...





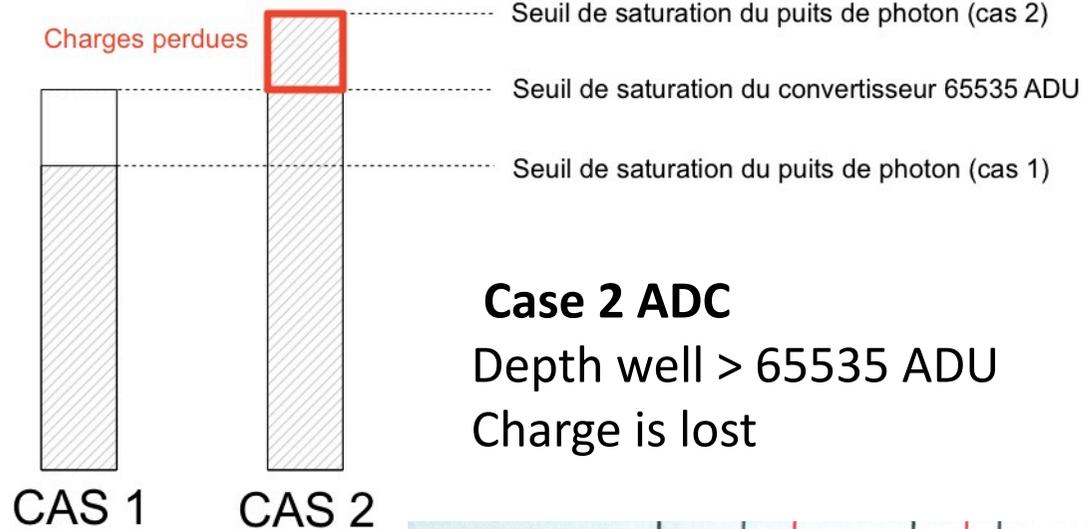
Loss of charge



Case 1 Blooming

Depth well < 65535 ADU

Charge is conserved



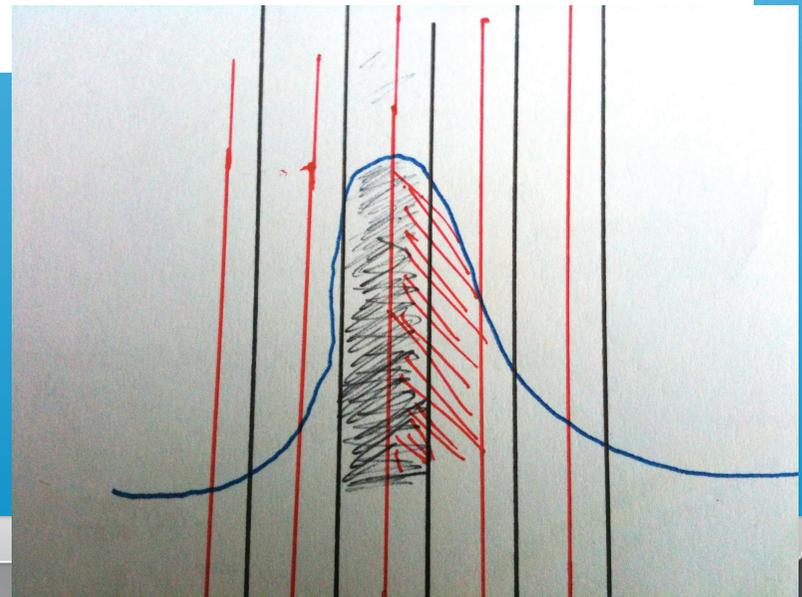
Case 2 ADC

Depth well > 65535 ADU

Charge is lost

This lost charge varies with the jitter creating the extra noise.

Will be very difficult to recover the flux.

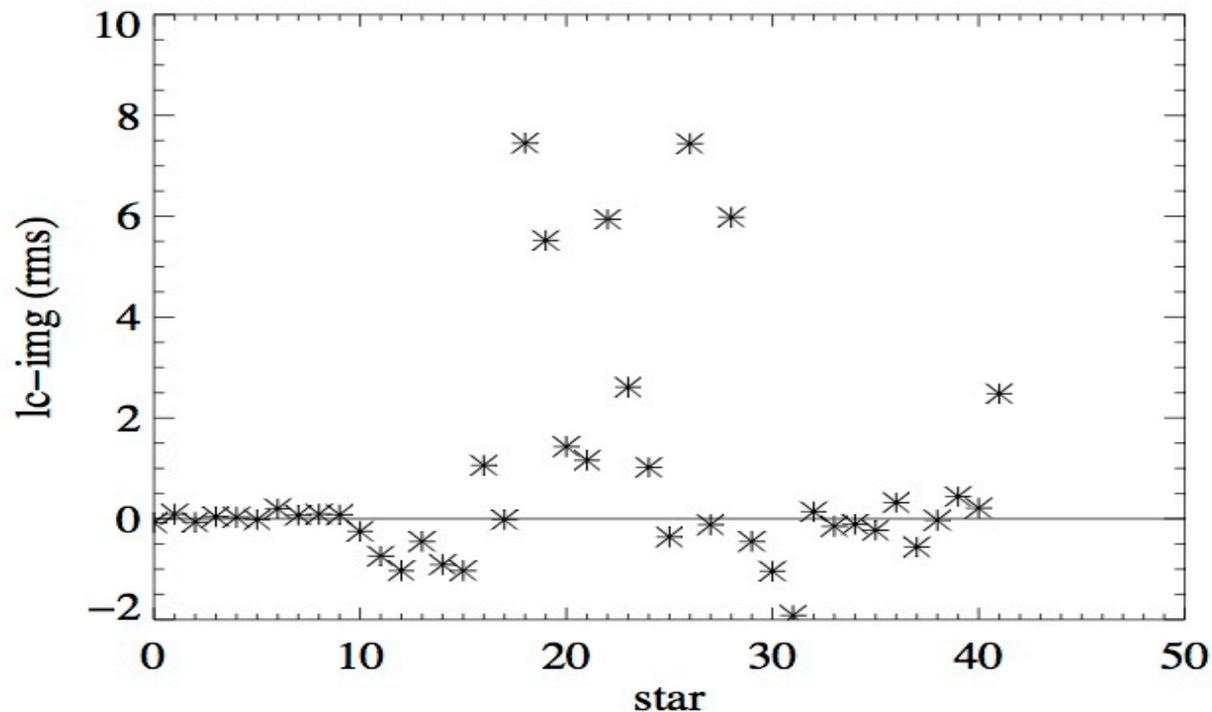




Comparison with onboard pipeline



We tested the pipeline performance for non saturated stars relative to the onboard pipeline using stars that have been observed in more than 1 run.



Imagette is better

LC is better



Provide centroid light curves



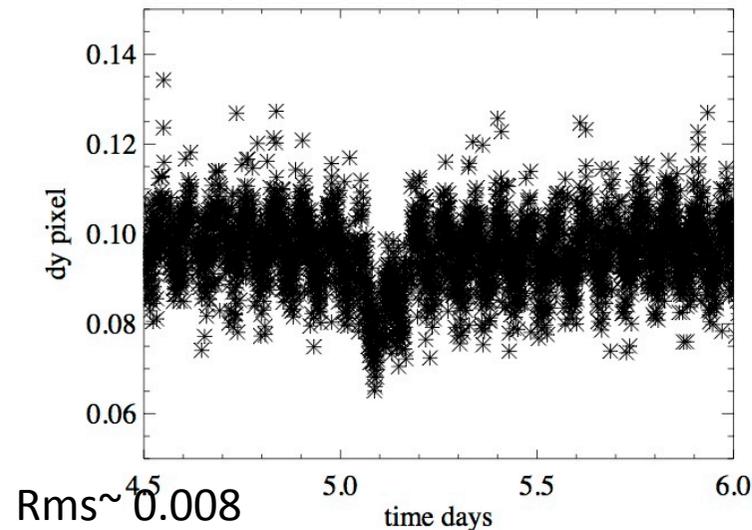
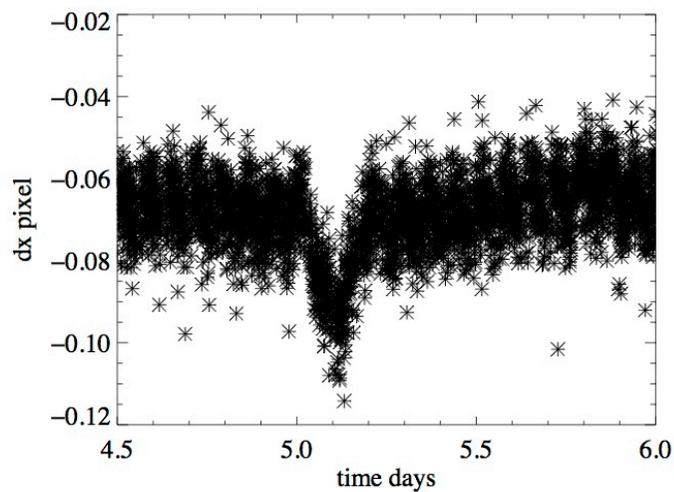
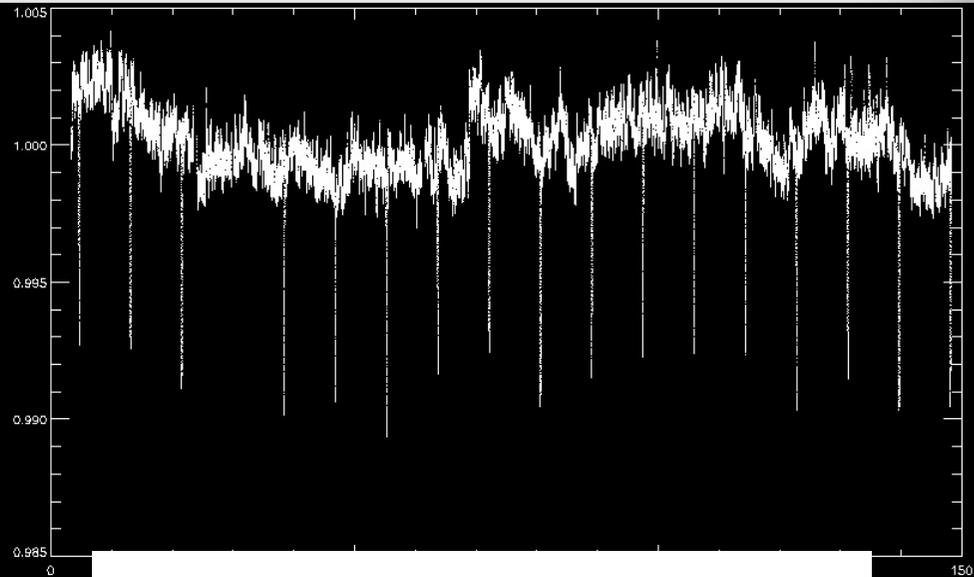
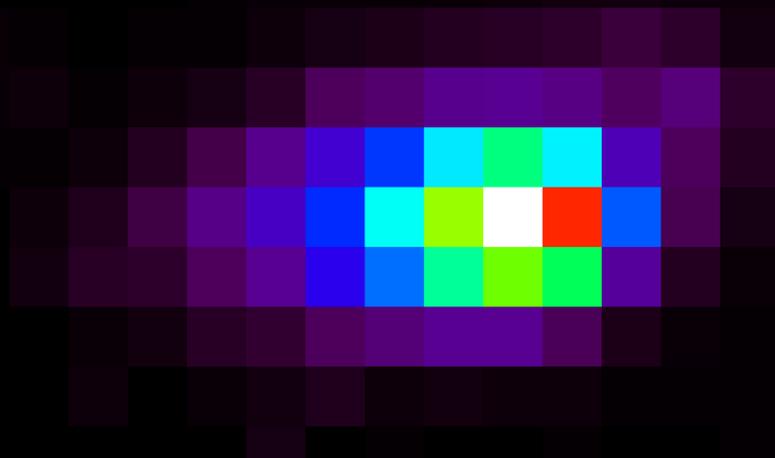
- The pipeline computes the centroid to perform the photometry but this was not given as an output.
- Following the procedures by Michel Auvergne I compute the centroid of each image relative to the mean stellar position in CCD (line of sight used to guide COROT).
- I am developing an alarm pipeline for imagerettes that will provide centroid information that can be used with the other indicators to test objects for follow up.
- The alarm pipeline still needs to be tested but preliminary results are encouraging.
- In the near future we will provide the centroid information with the N2 light curve.



Example of contaminating binary



0102377877

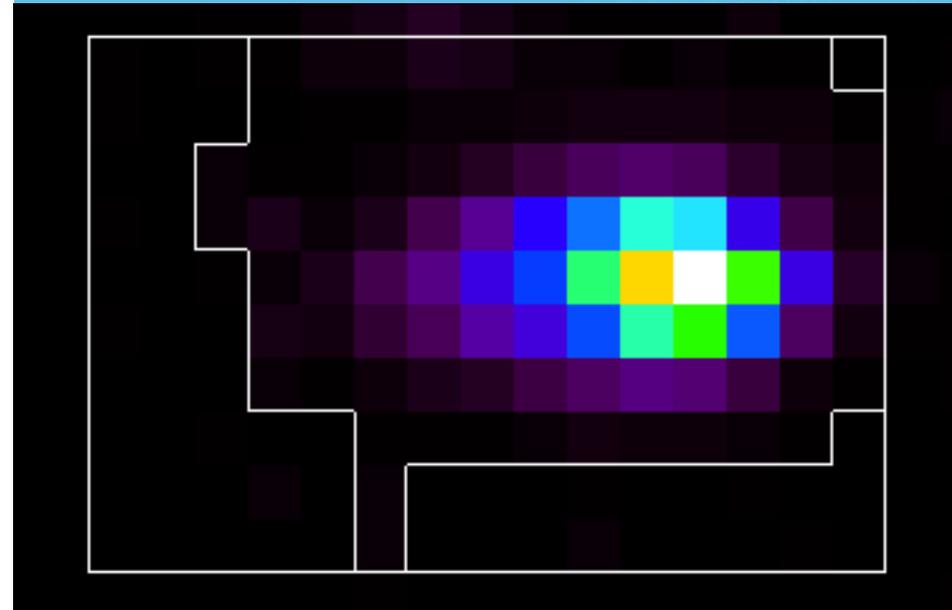
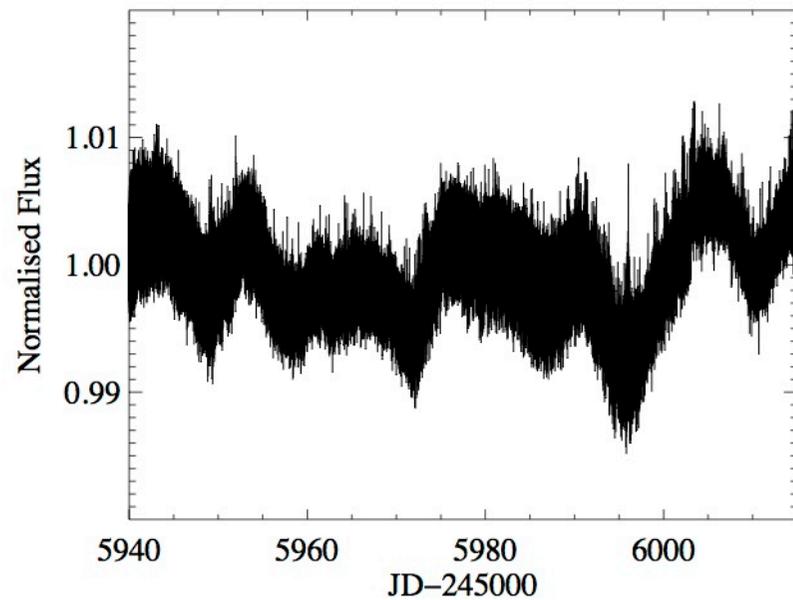




CoRoT-7 new observations



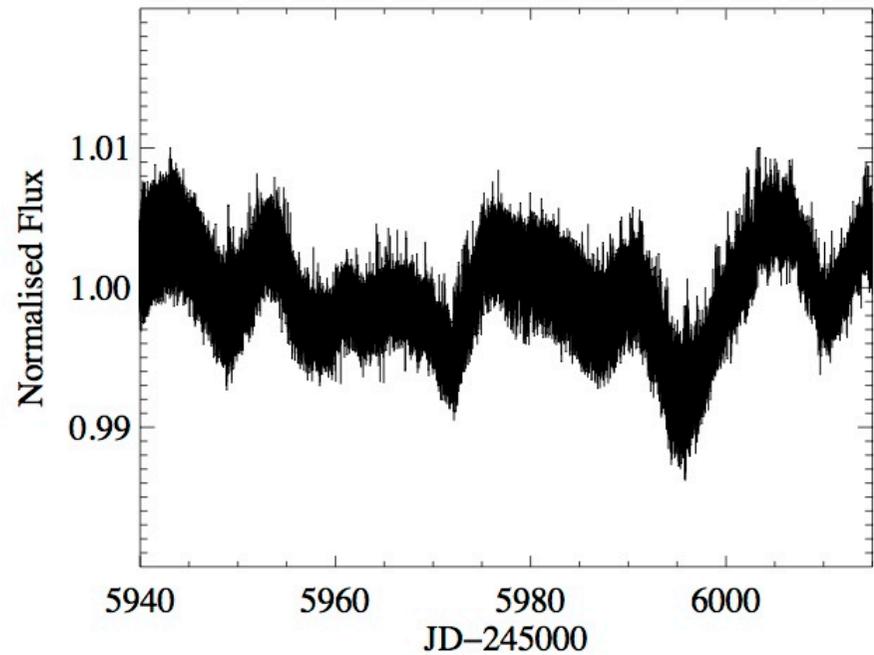
Use CoRoT-7 as a test case to improve the pipeline



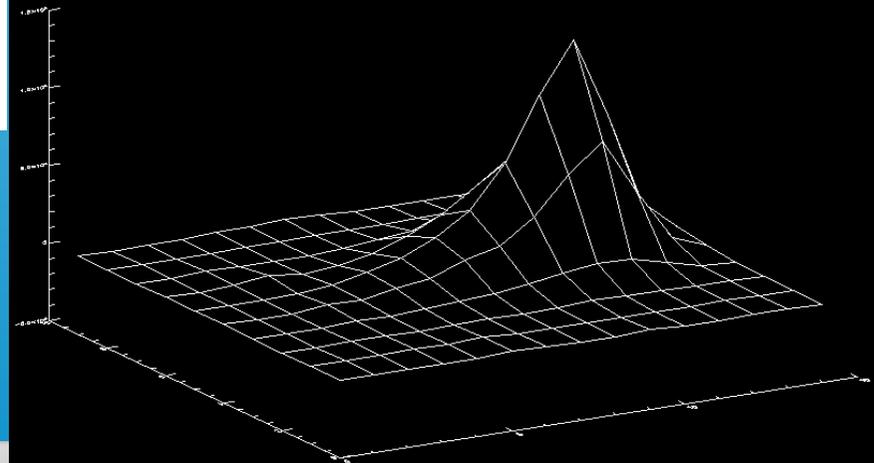
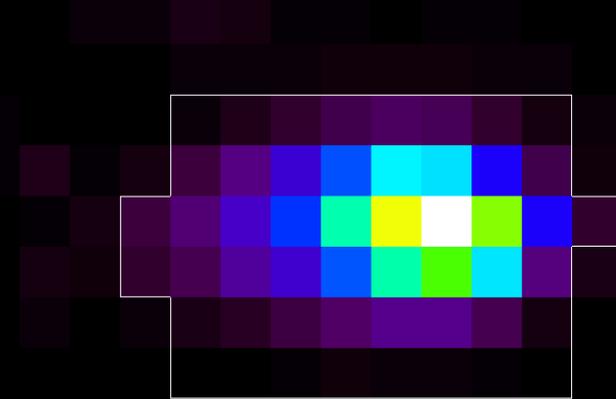
- Noise level= 1.92 higher than the previous observation of CoRoT-7 Noise=1.2



Optimization

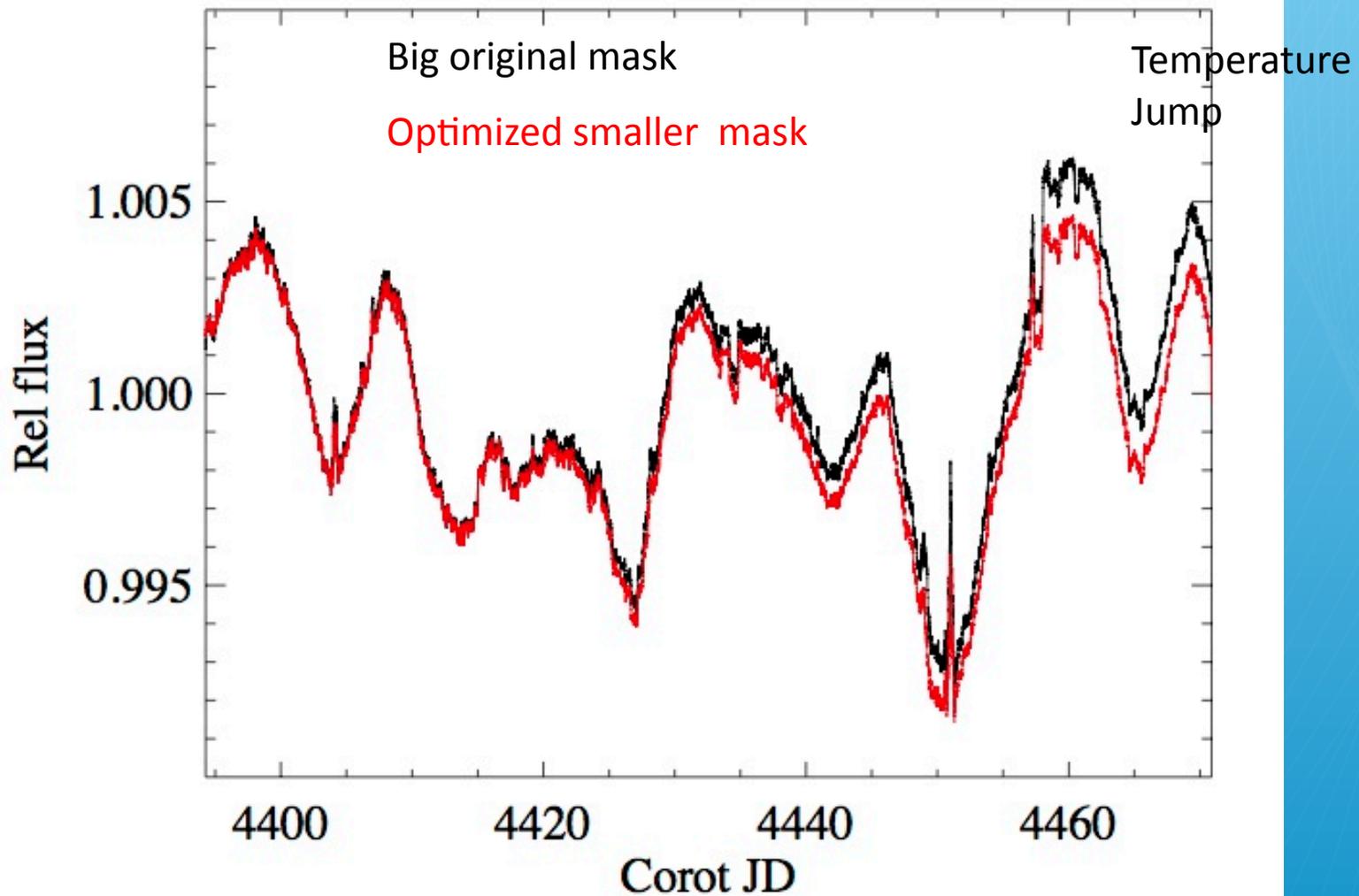


- Noise level 1.4



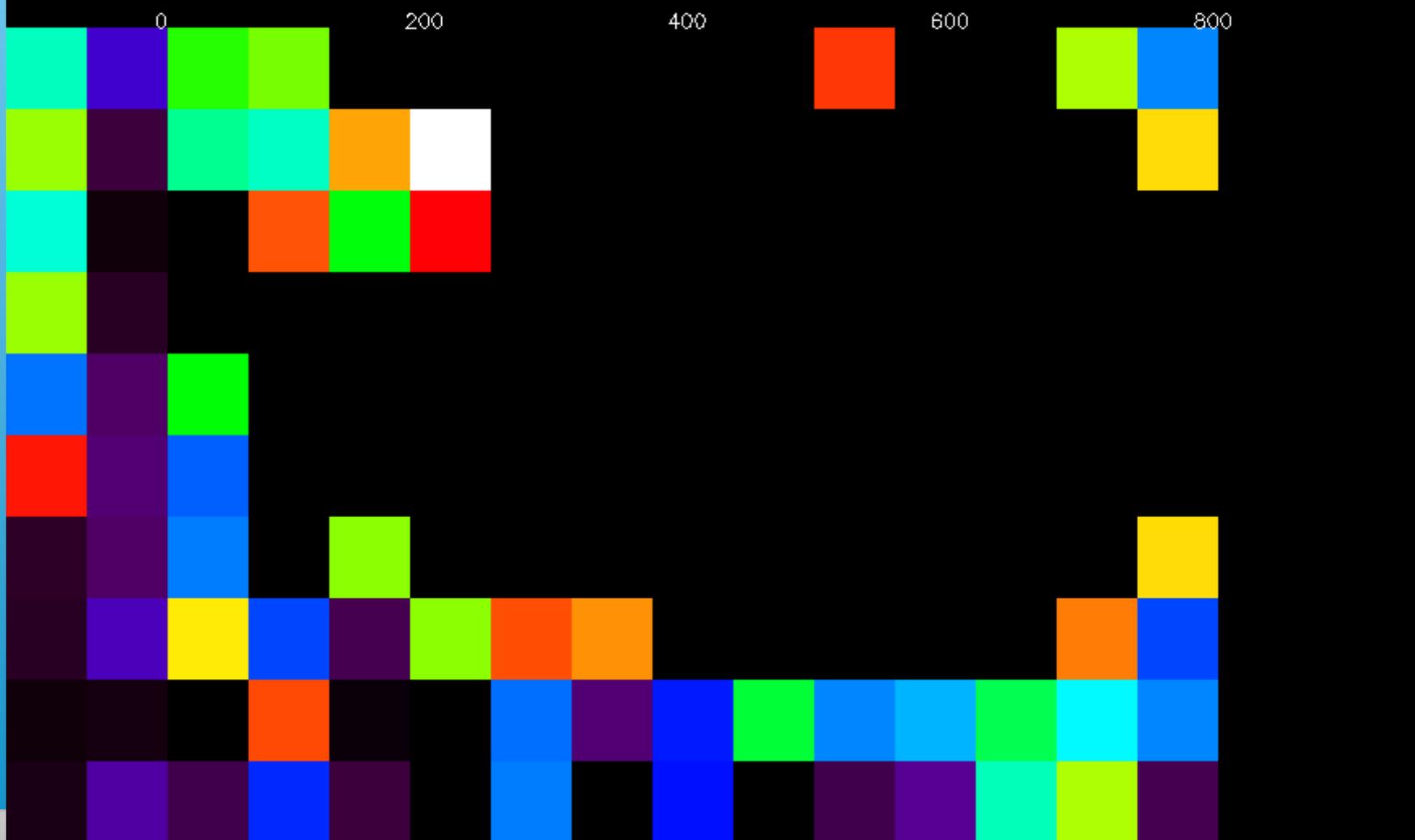


Comparison



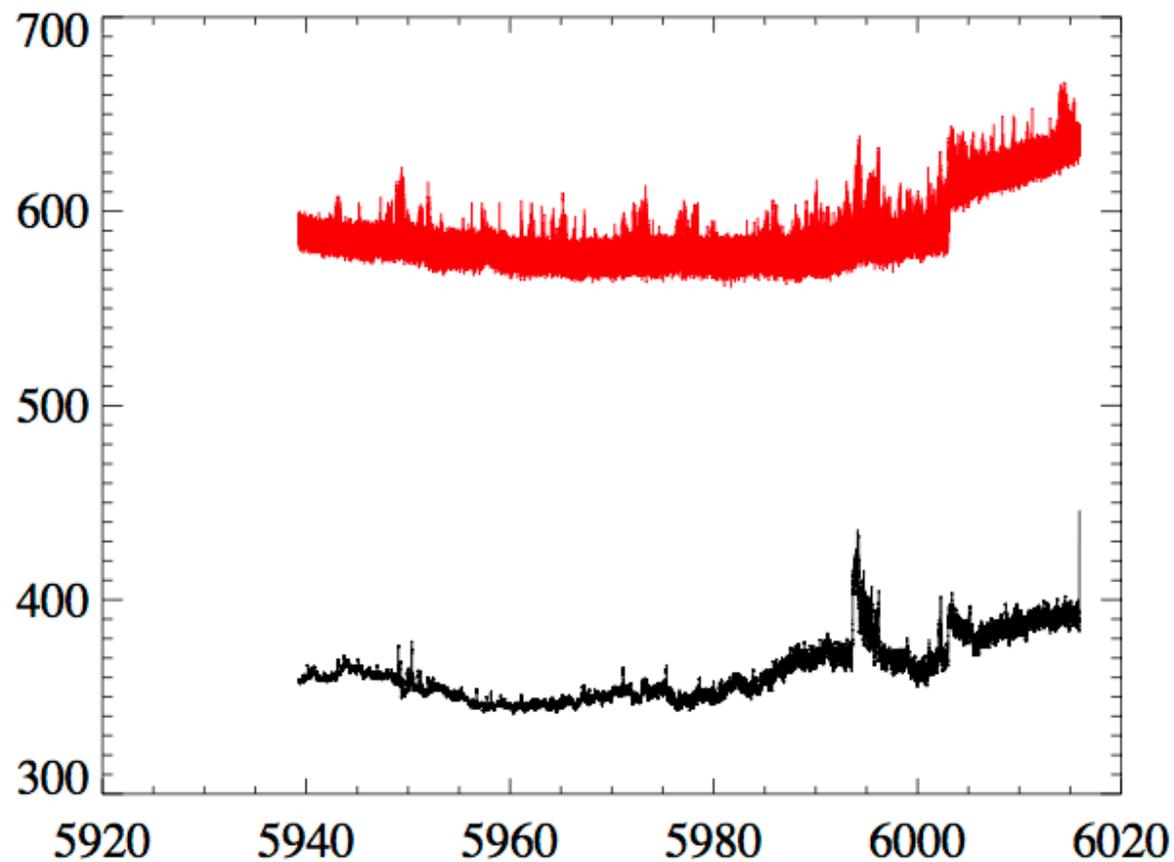


Background level





Residual Background?



If we use the background to correct both masks photometry they agree very well. Different caused can be affecting the background. Study the best way to correct it.



Summary -- Future work



- The current imagette pipeline is generally working well.
- The size of the mask can be optimized for special objects but in general is better to be conservative.
- We will test the implementation of the barycenter in the alarm imagette pipeline. This will allow to rule out some contaminating eclipsing binaries.
- There seems to be an under correction of the background level that would affect both the light curves and the imagettes. Background variations will affect long term variability. Poor background estimation can affect the depth of transits. NEEDS CONFIRMATION – STILL UNDER TEST
- We are also implementing the efficiency and temperature corrections in the imagette pipeline.
- We will continue to improve the imagette pipeline.