



# TIC 198153540 TRANSITS VALIDATION REPORT

This document is created by the WATSON report generator (<https://github.com/PlanetHunters/watson>) and focuses on the target star TIC 198153540.

RA (deg)	Dec (deg)	V (mag)	J (mag)	H (mag)	K (mag)
14:04:22.59	46:31:09.84	-	-	-	-

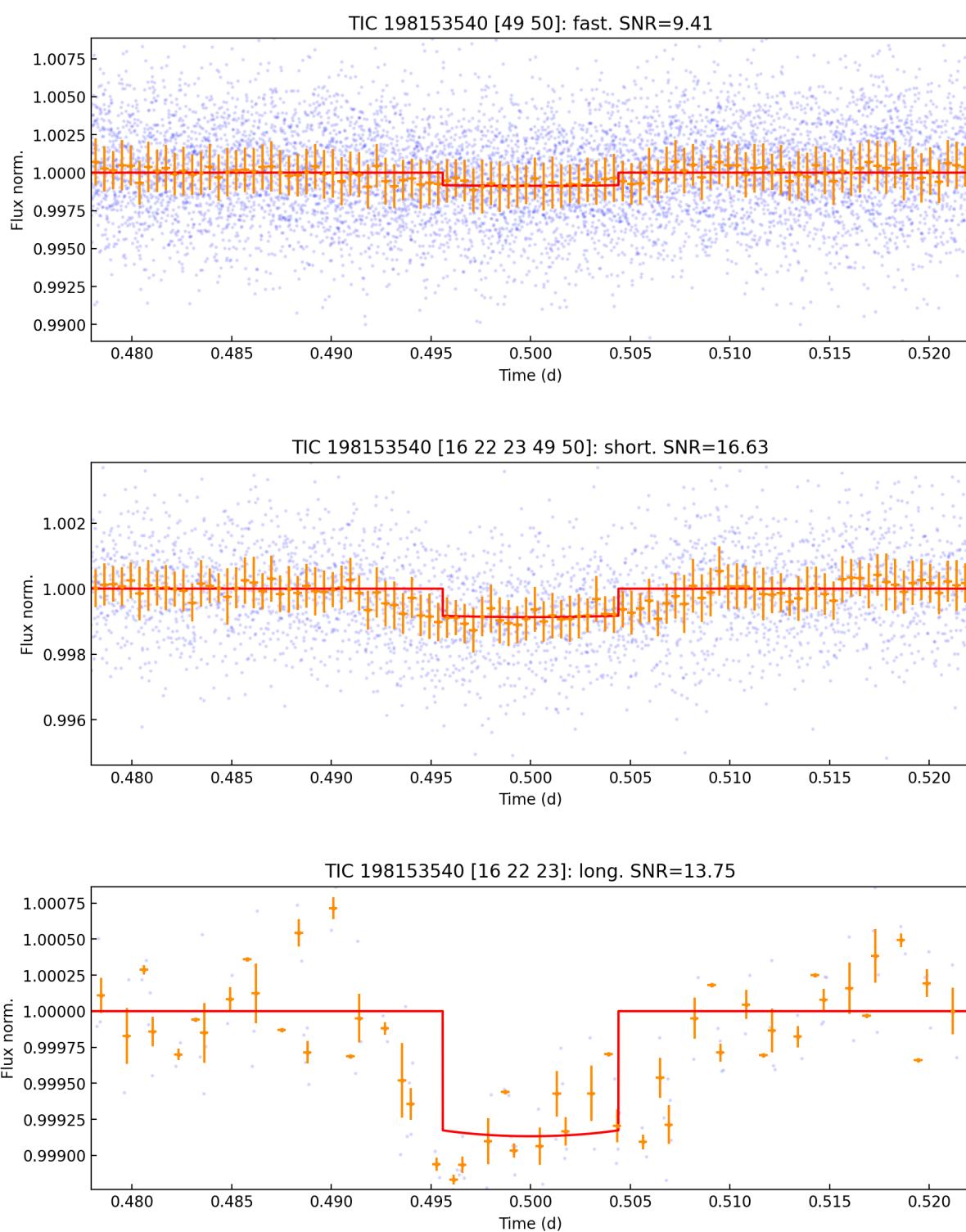
**Table 1:** The proposed target parameters.

T0 (d)	Period (d)	Duration (h)	Depth (ppt)
1741.586	8.0217	1.7	0.867

**Table 2:** The candidate parameters.

Metric	Value	Passed
fast_snr	9.415	True
short_snr	16.626	True
long_snr	13.747	True
folded_cadences_snr	0.223	True
snr_p_t0	35.439	True
snr_p_2t0	4.87	False
snr_2p_t0	30.102	True
snr_2p_2t0	18.228	True
snr_p2_t0	4.87	False
snr_p2_t02	2.146	True
snr_p_score	0.137	False
snr_2p_score	11.874	True
snr_p2_score	0.077	False
transit_offset_ra	211.098	True
transit_offset_dec	46.52	True
transit_offset_err	0.015	True
transit_offset_pos	0.004	True
core_flux_snr	0.133	nan
halo_flux_snr	-0.304	nan
og_score	-2.285	nan
centroids_ra_snr	-1.165	True
centroids_dec_snr	-0.478	True

**Table 3:** The results of the numerical tests.



**Figure 1:** Folded curve for all available cadences.



# WATSON Transits Validation Report: TIC 198153540

Fri, 06 January 2023, 06:37:05

TIC 198153540 Transits depth analysis  $T_0=1741.59$   $P=8.02d$

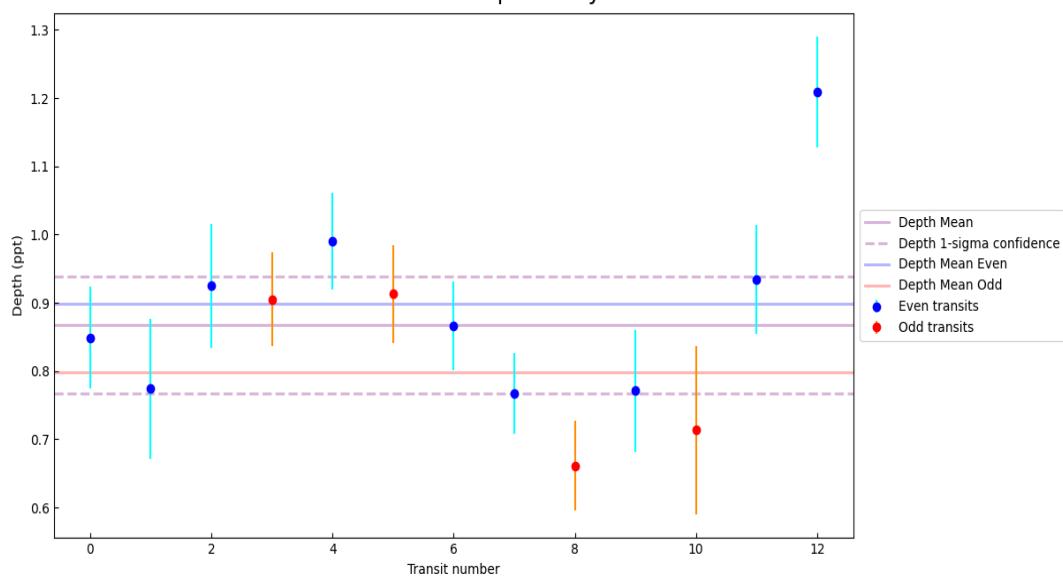


Figure 2: The candidate single-transits depths plot.

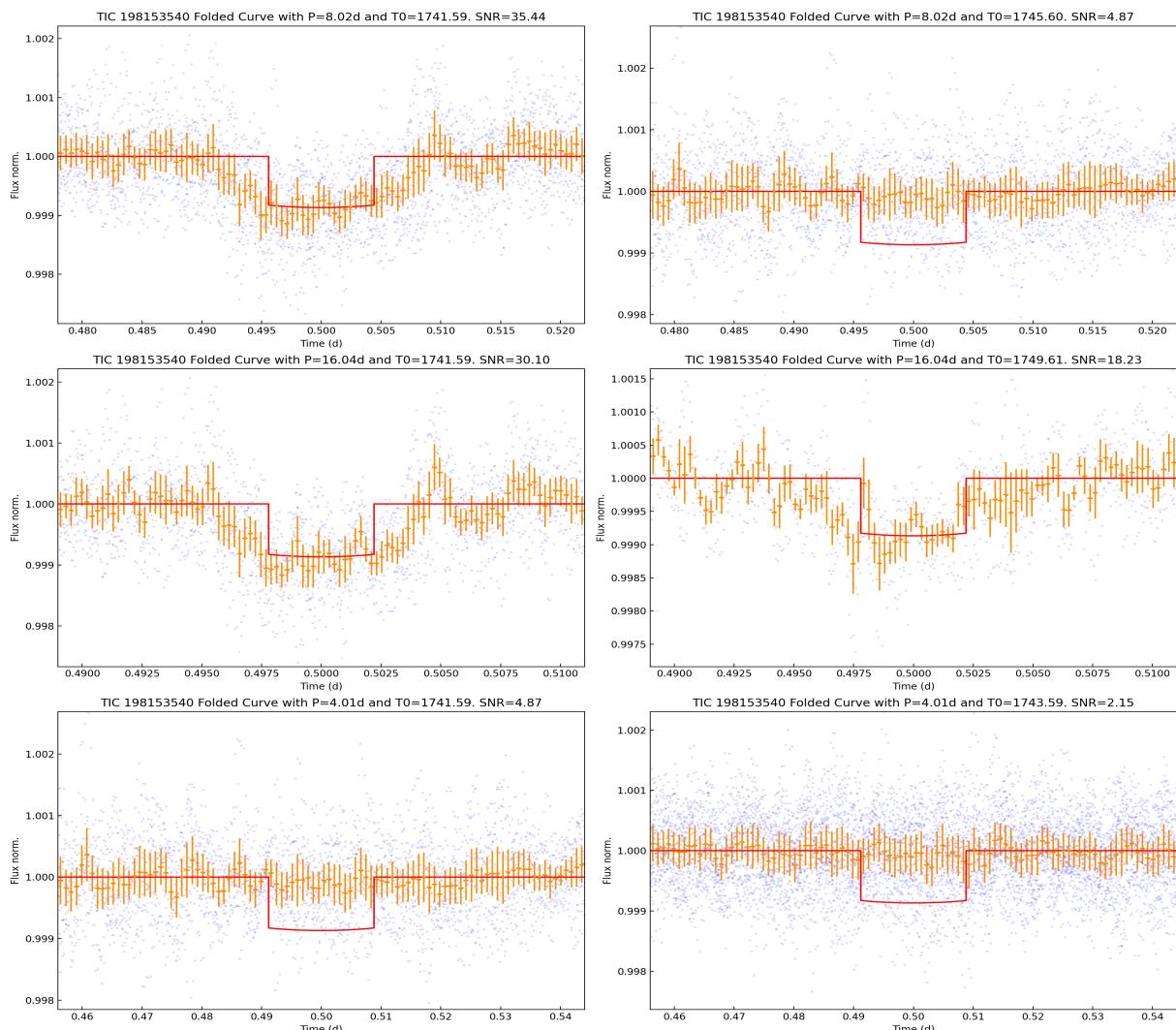
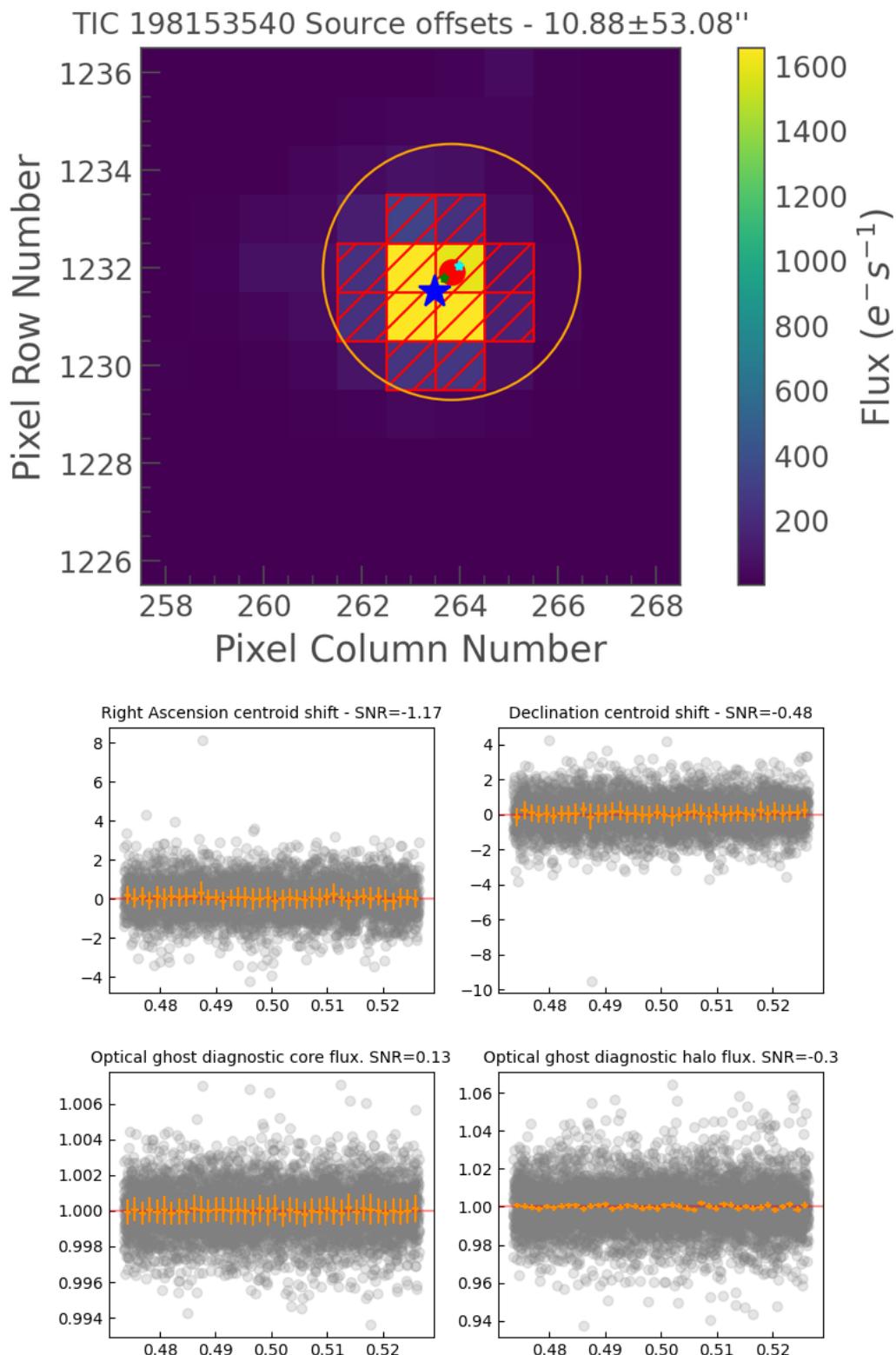
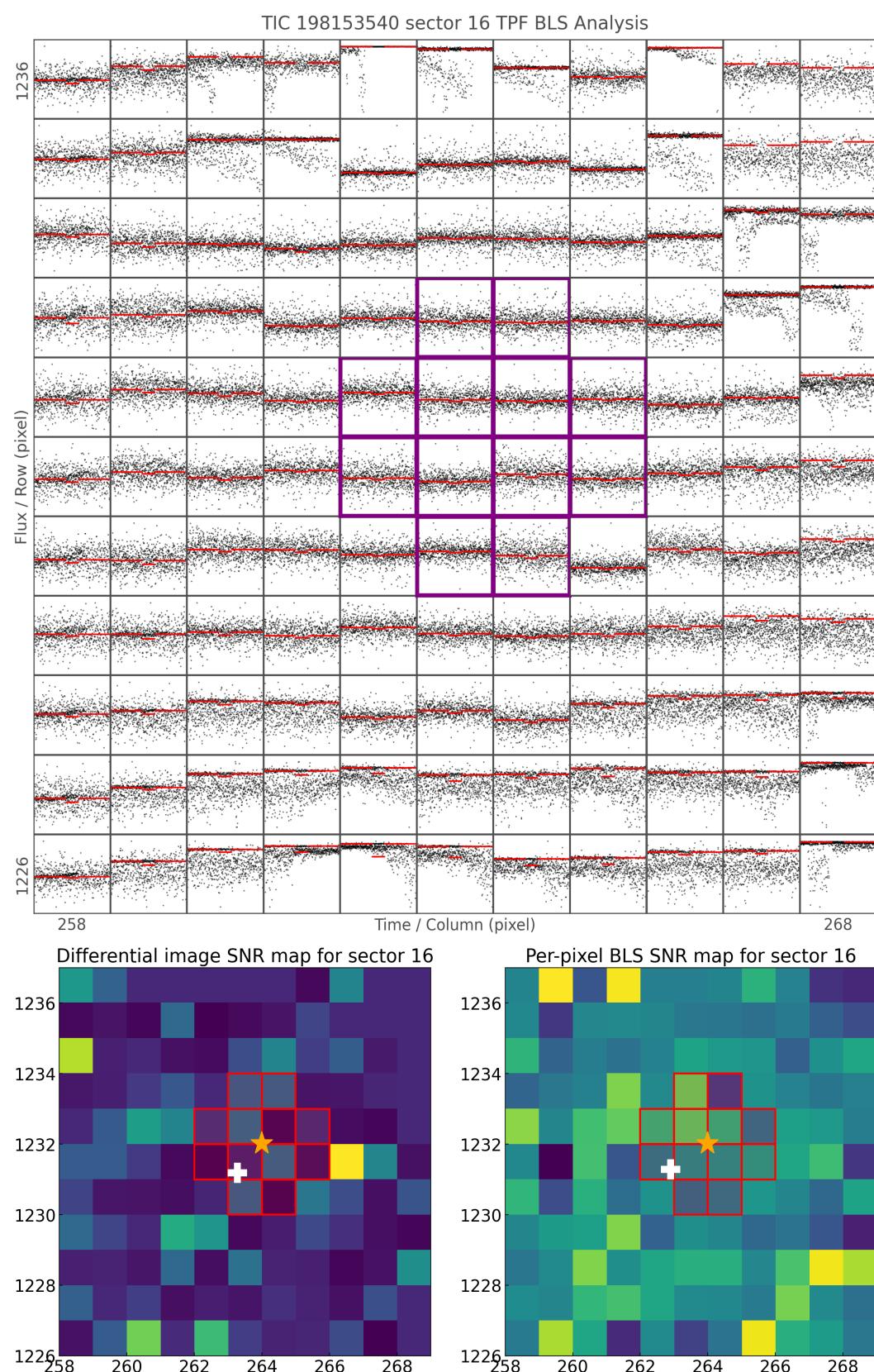


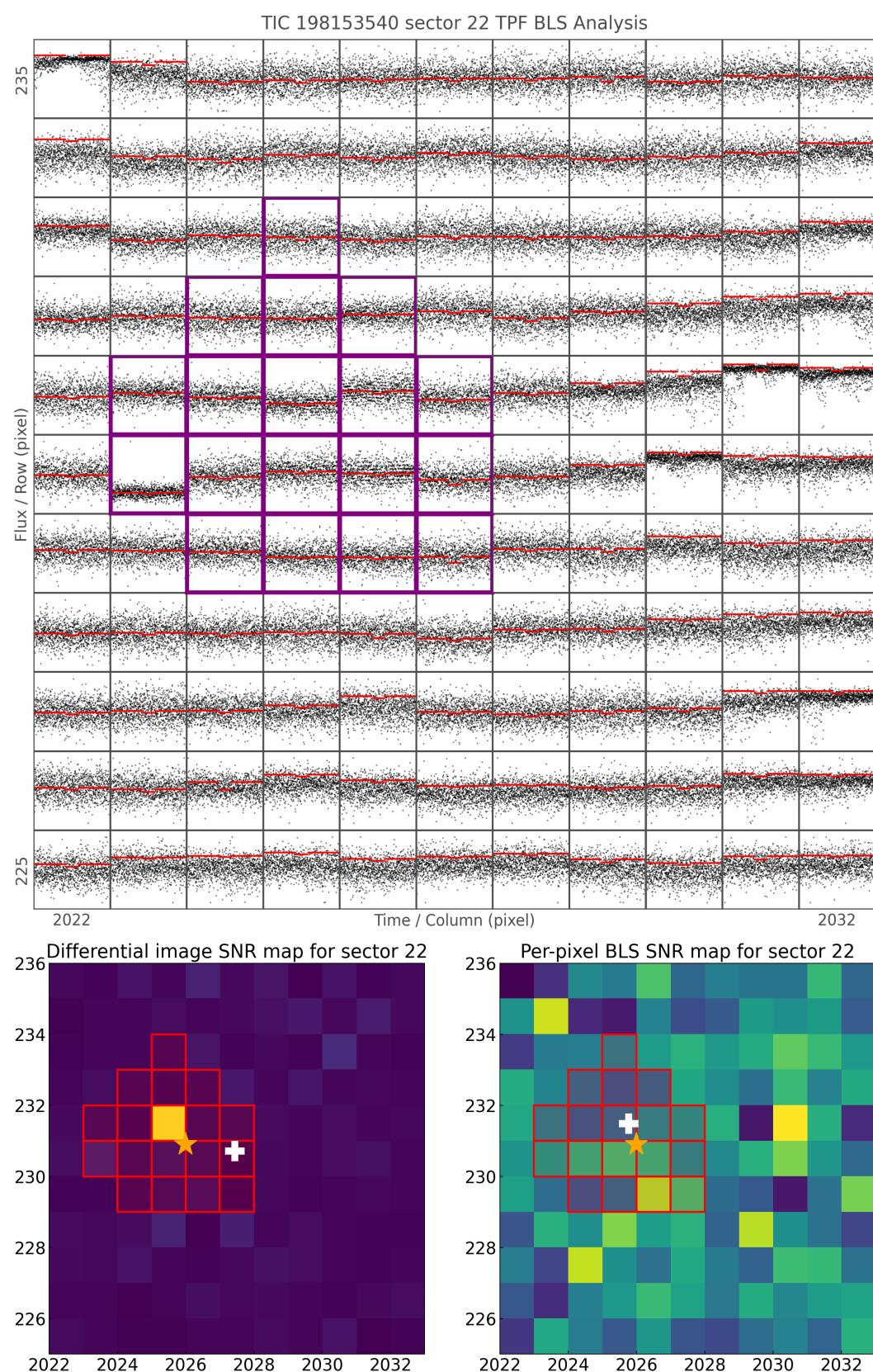
Figure 3: Above, the candidate folded at its found period for the found epoch and epoch +  $P/2$ . Middle, the candidate folded at its harmonic for the found epoch and epoch +  $P$ . Bottom, the candidate folded at its subharmonic for the found epoch and epoch +  $P/2$ , where the candidate has been masked.



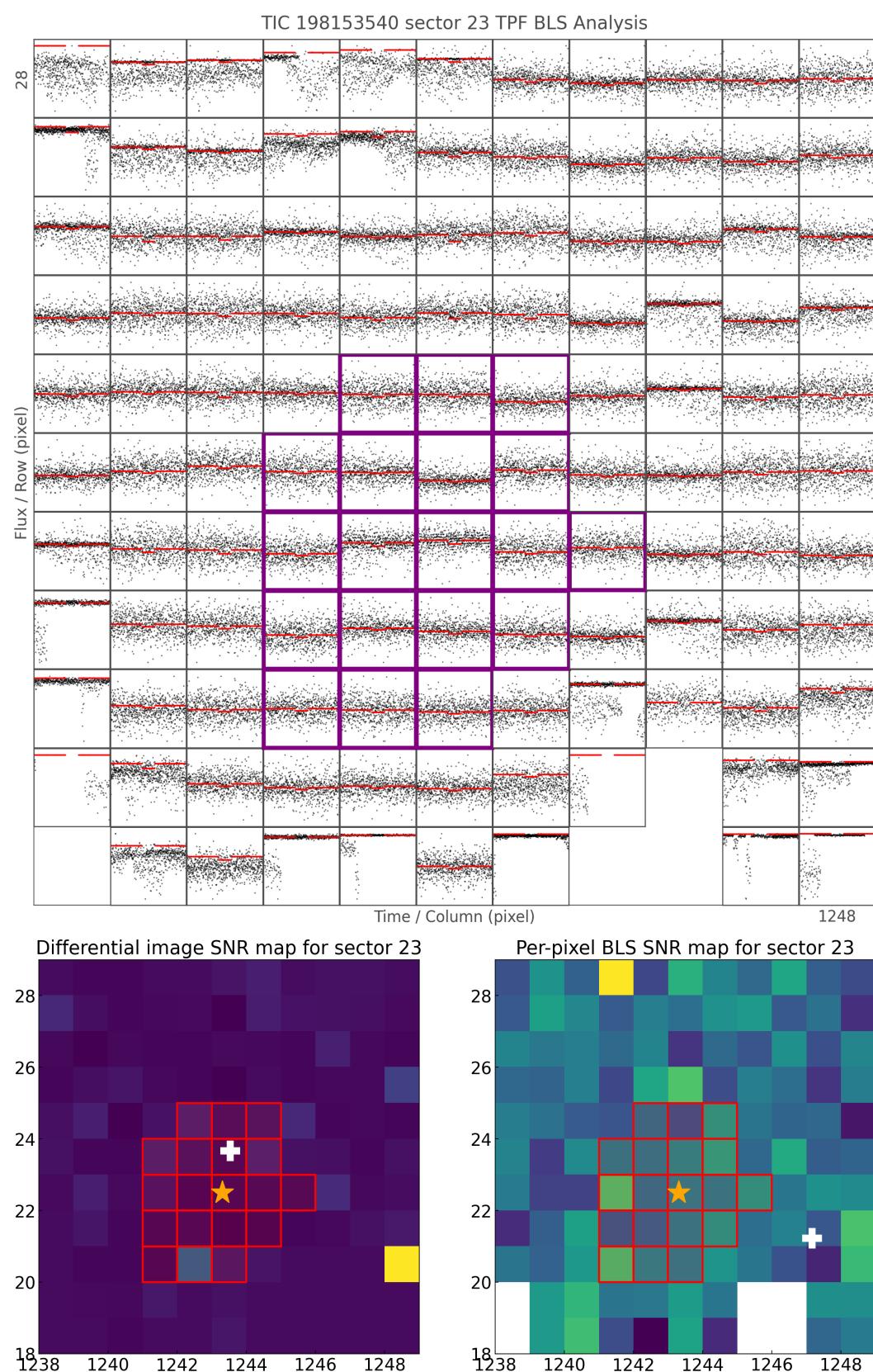
**Figure 4:** Above, the computed target offset (red circle) from the differential image offset (cyan dot) and the per-pixel BLS SNR offset (green dot). Middle left, the right ascension centroid shift with binning. Middle right, the declination centroid shift with binning. Bottom left, optical ghost diagnostic curve for core flux. Bottom right, optical ghost diagnostic curve for halo flux



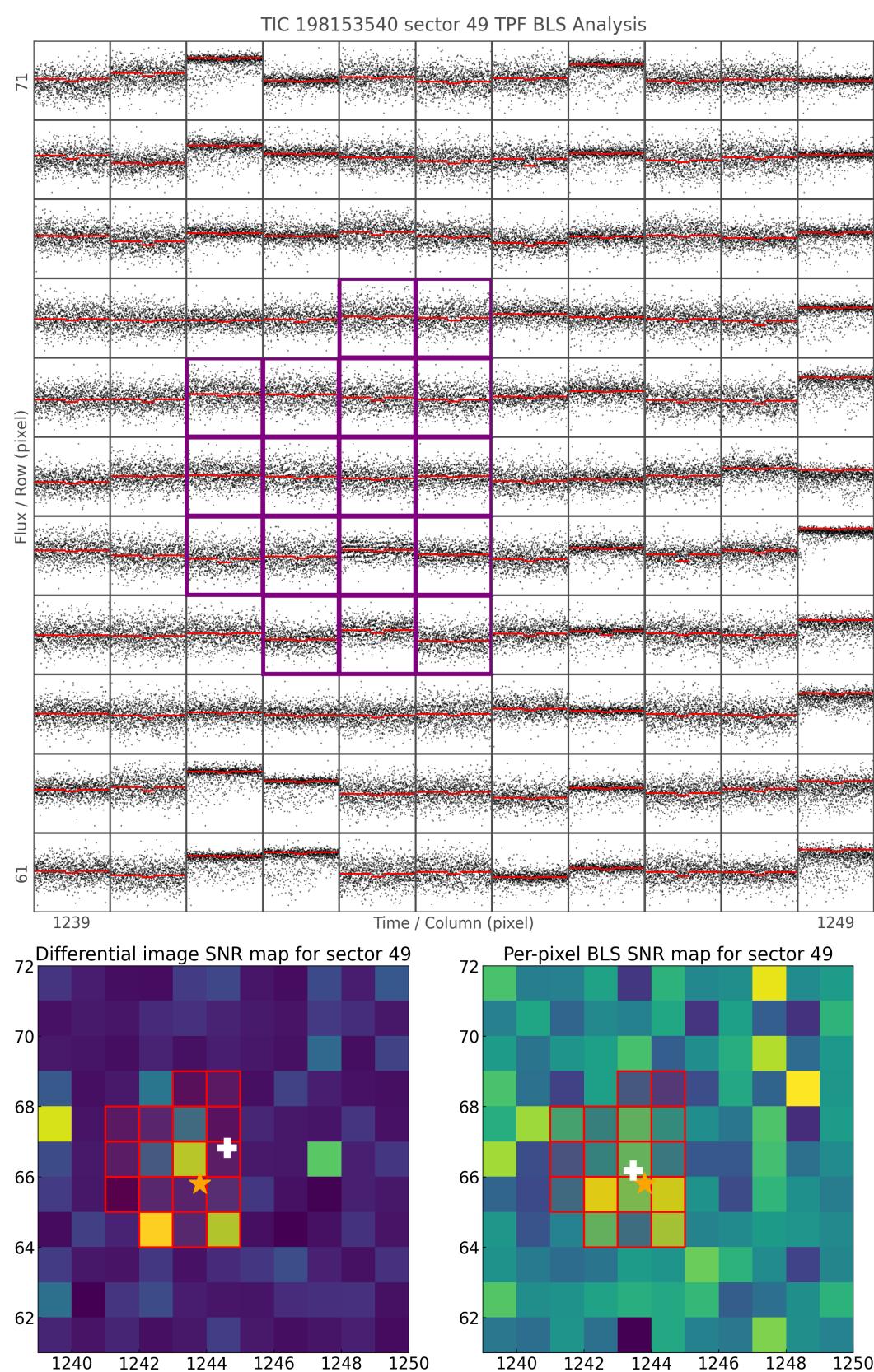
**Figure 5:** Above, the TPF and per-pixel BLS SNR best fits. Bottom left, the per-pixel BLS SNR for each pixel. Bottom right, the differential images SNR for each pixel. The target position is represented by a red star and the TPF independent source offset is represented by a white plus.



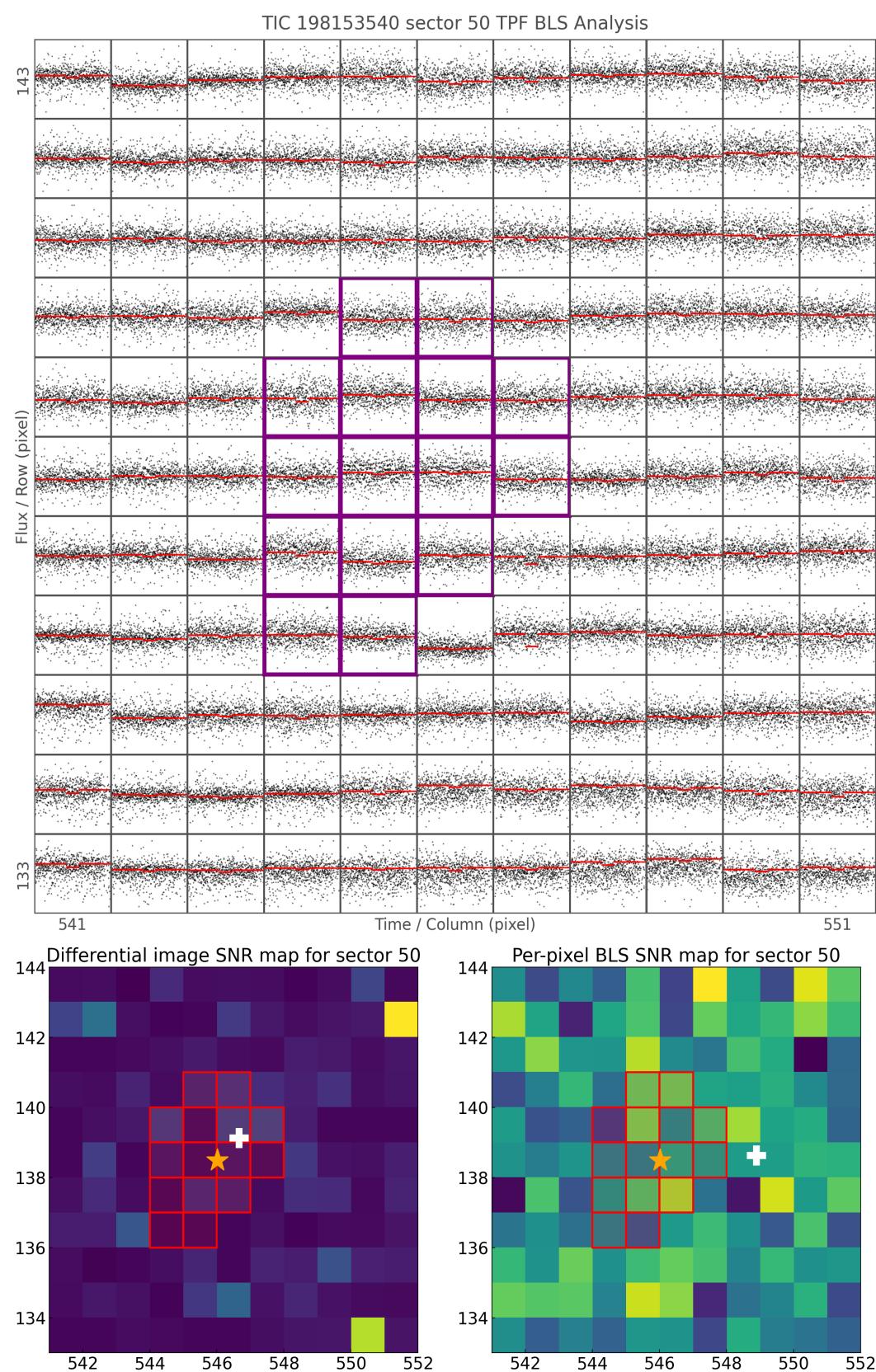
**Figure 6:** Above, the TPF and per-pixel BLS SNR best fits. Bottom left, the per-pixel BLS SNR for each pixel. Bottom right, the differential images SNR for each pixel. The target position is represented by a red star and the TPF independent source offset is represented by a white plus.



**Figure 7:** Above, the TPF and per-pixel BLS SNR best fits. Bottom left, the per-pixel BLS SNR for each pixel. Bottom right, the differential images SNR for each pixel. The target position is represented by a red star and the TPF independent source offset is represented by a white plus.



**Figure 8:** Above, the TPF and per-pixel BLS SNR best fits. Bottom left, the per-pixel BLS SNR for each pixel. Bottom right, the differential images SNR for each pixel. The target position is represented by a red star and the TPF independent source offset is represented by a white plus.

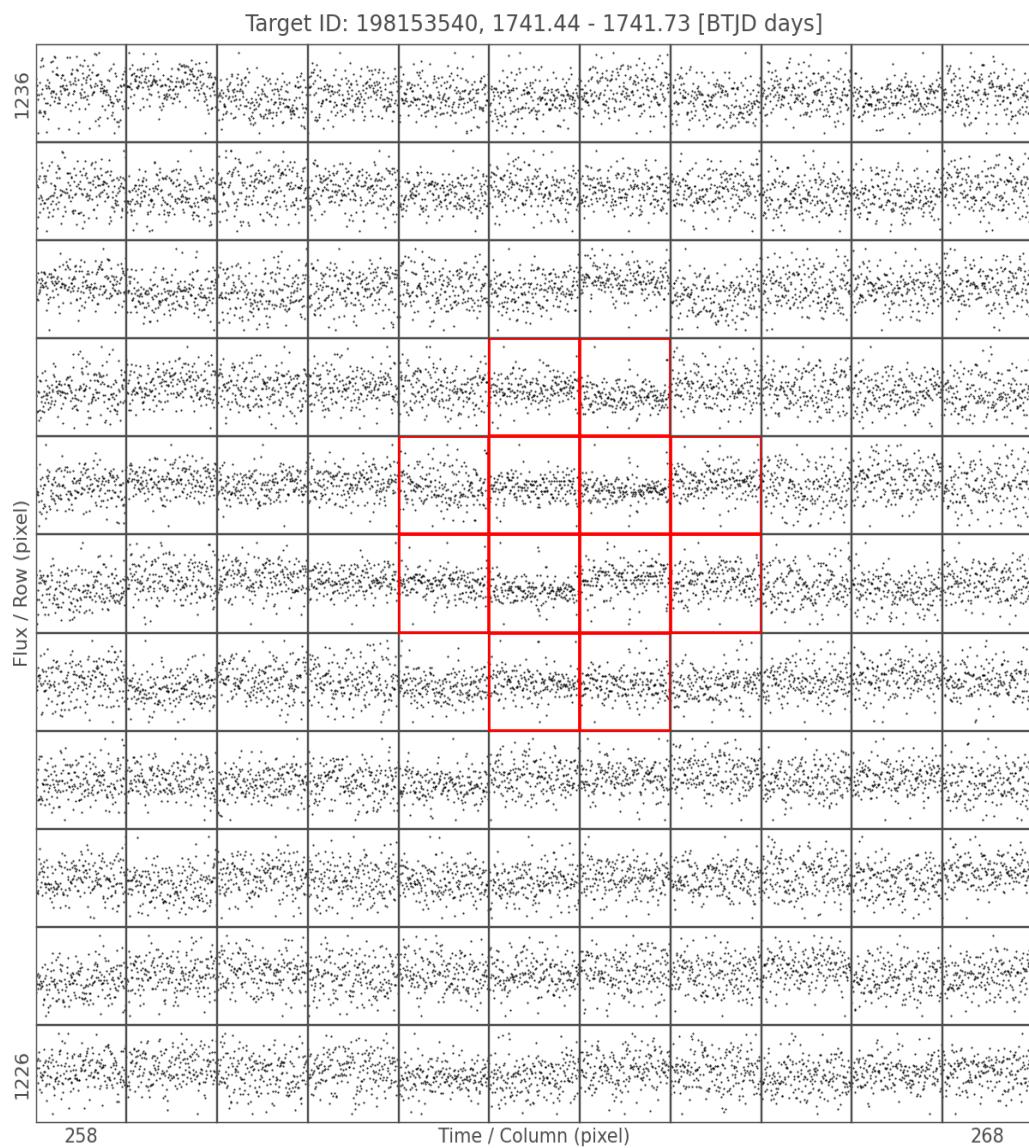
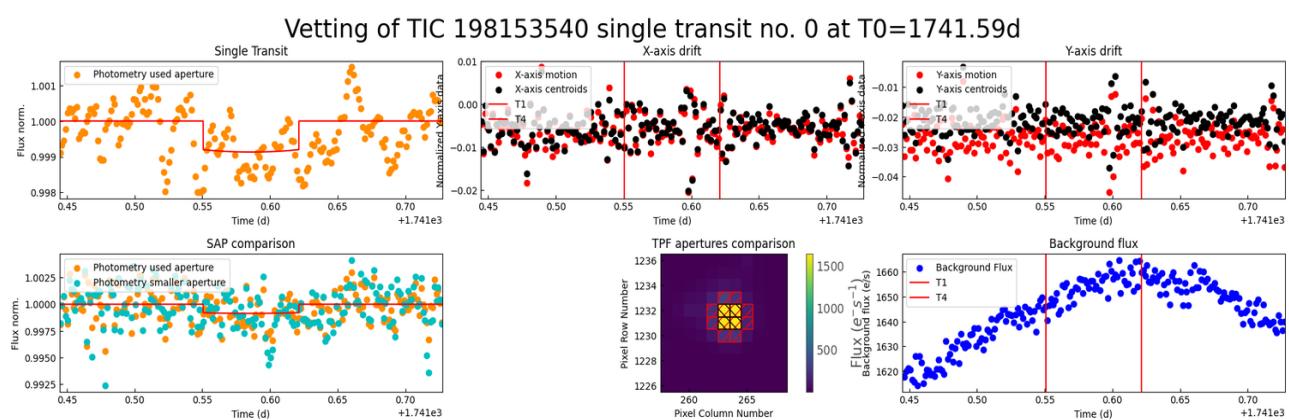


**Figure 9:** Above, the TPF and per-pixel BLS SNR best fits. Bottom left, the per-pixel BLS SNR for each pixel. Bottom right, the differential images SNR for each pixel. The target position is represented by a red star and the TPF independent source offset is represented by a white plus.



The next pages will contain each of the single-transits vetting sheets with the next information:

1. **TOP-LEFT:** Plot with single transit photometry found in the analyzed curve (with momentum dumps, if any).
2. **TOP-CENTER:** Plot with X-axis data drift (X-axis motion vs X-axis centroid offset) around the transit times.
3. **TOP-RIGHT:** Plot with Y-axis data drift (Y-axis motion vs Y-axis centroid offset) around the transit times.
4. **CENTER-LEFT:** Plot with SAP for used aperture vs SAP for smaller aperture around the transit times.
5. **CENTER-CENTER:** Plot with smaller aperture over used aperture on the target.
6. **CENTER-RIGHT:** Plot with single transit photometry found in the analyzed curve around the transit times.
7. **BOTTOM:** Plot TPF flux measurements for each pixel around the transit times.

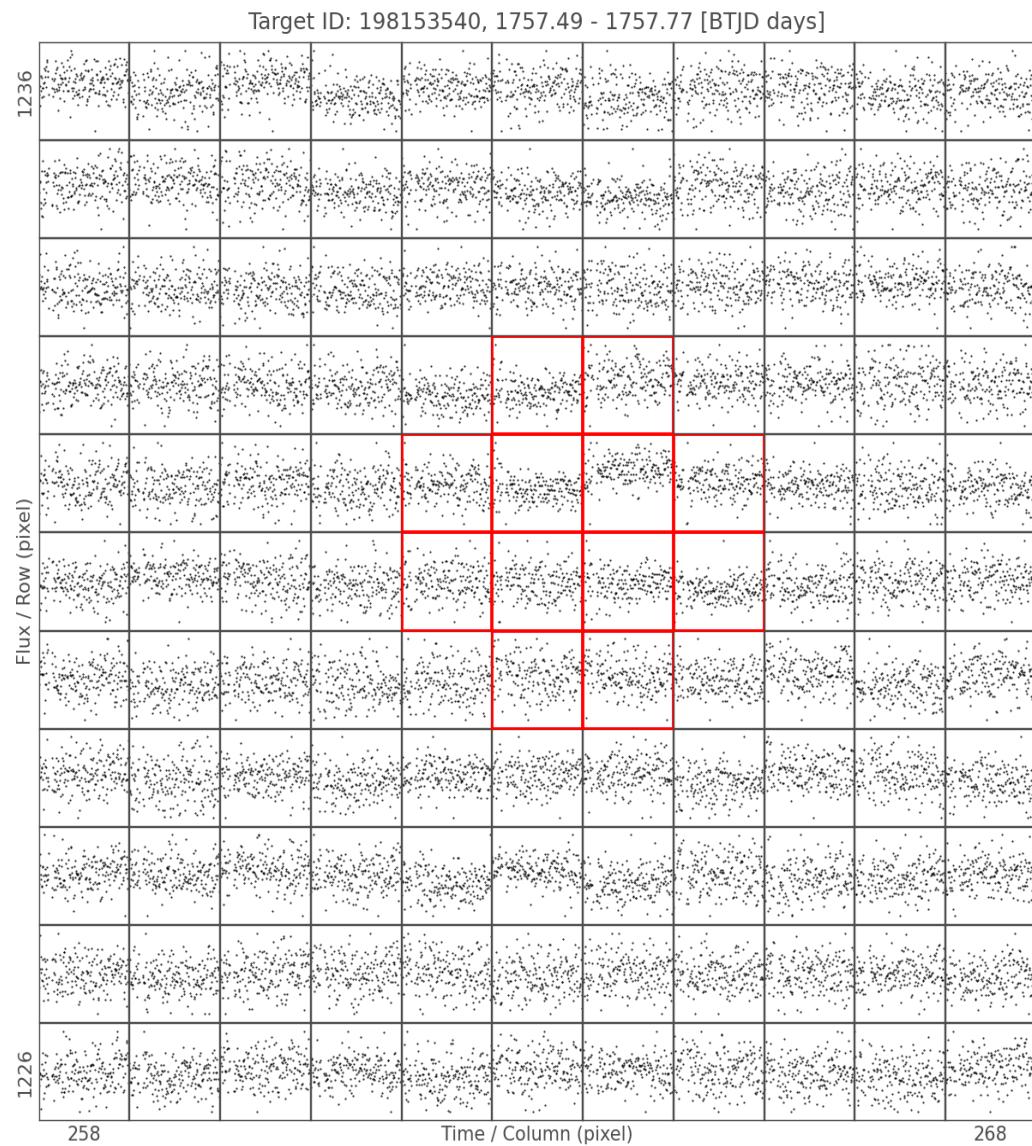
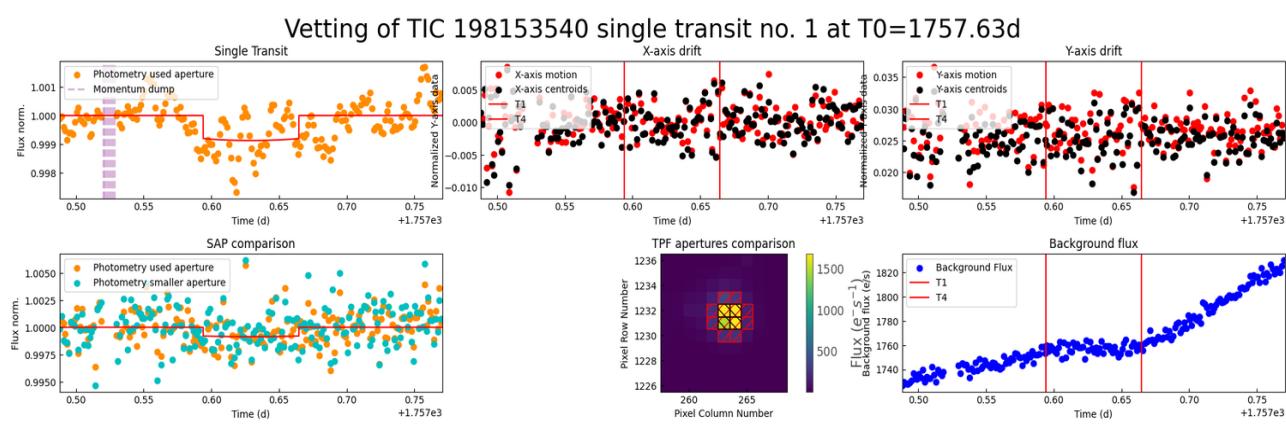


**Figure 10:** The single transit no. 0 vetting plots



# WATSON Transits Validation Report: TIC 198153540

Fri, 06 January 2023, 06:37:11

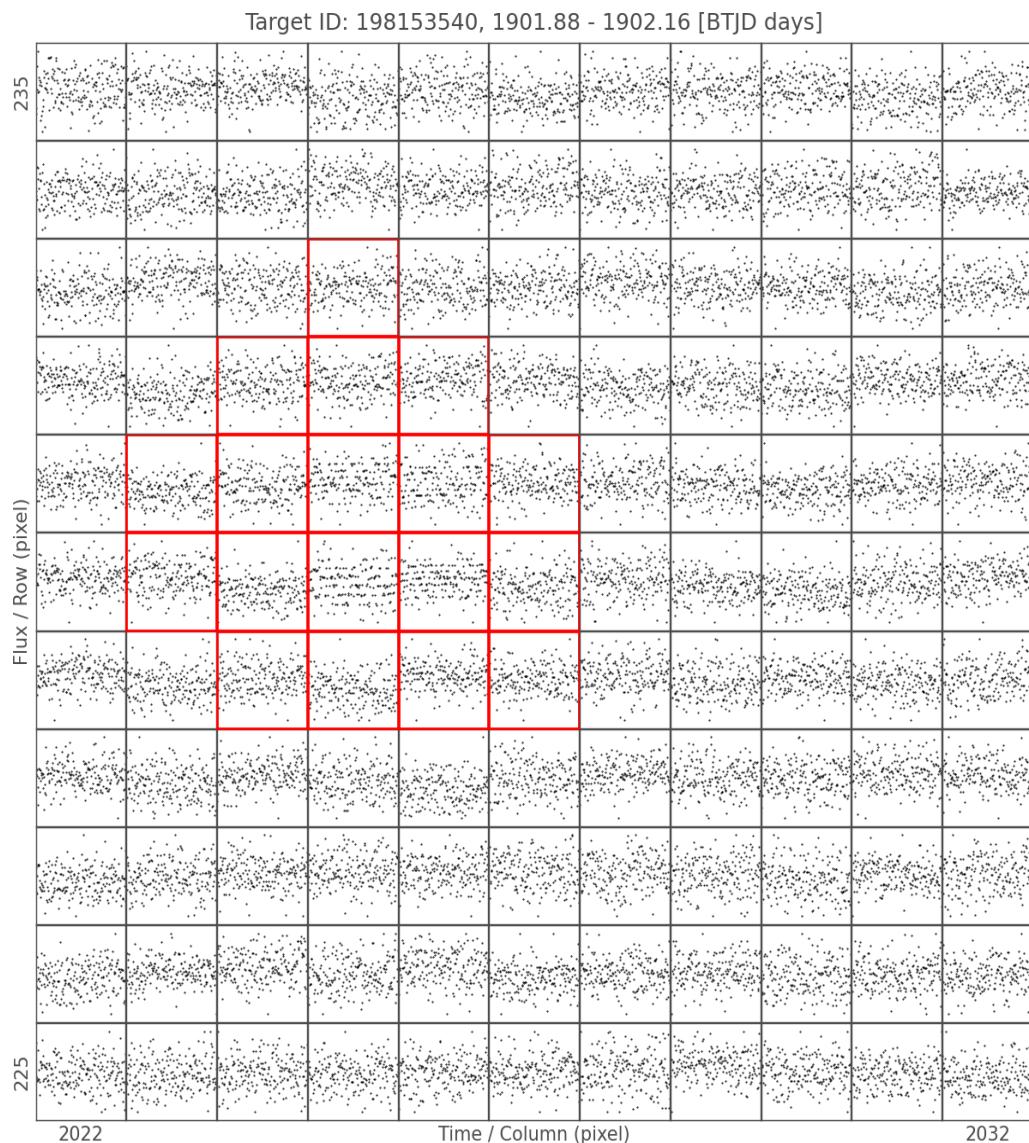
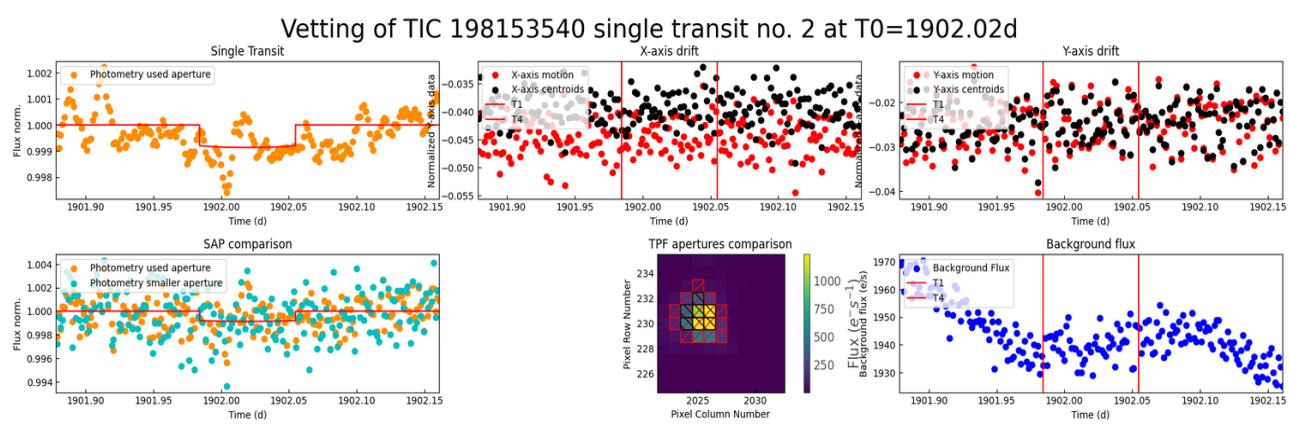


**Figure 11:** The single transit no. 1 vetting plots

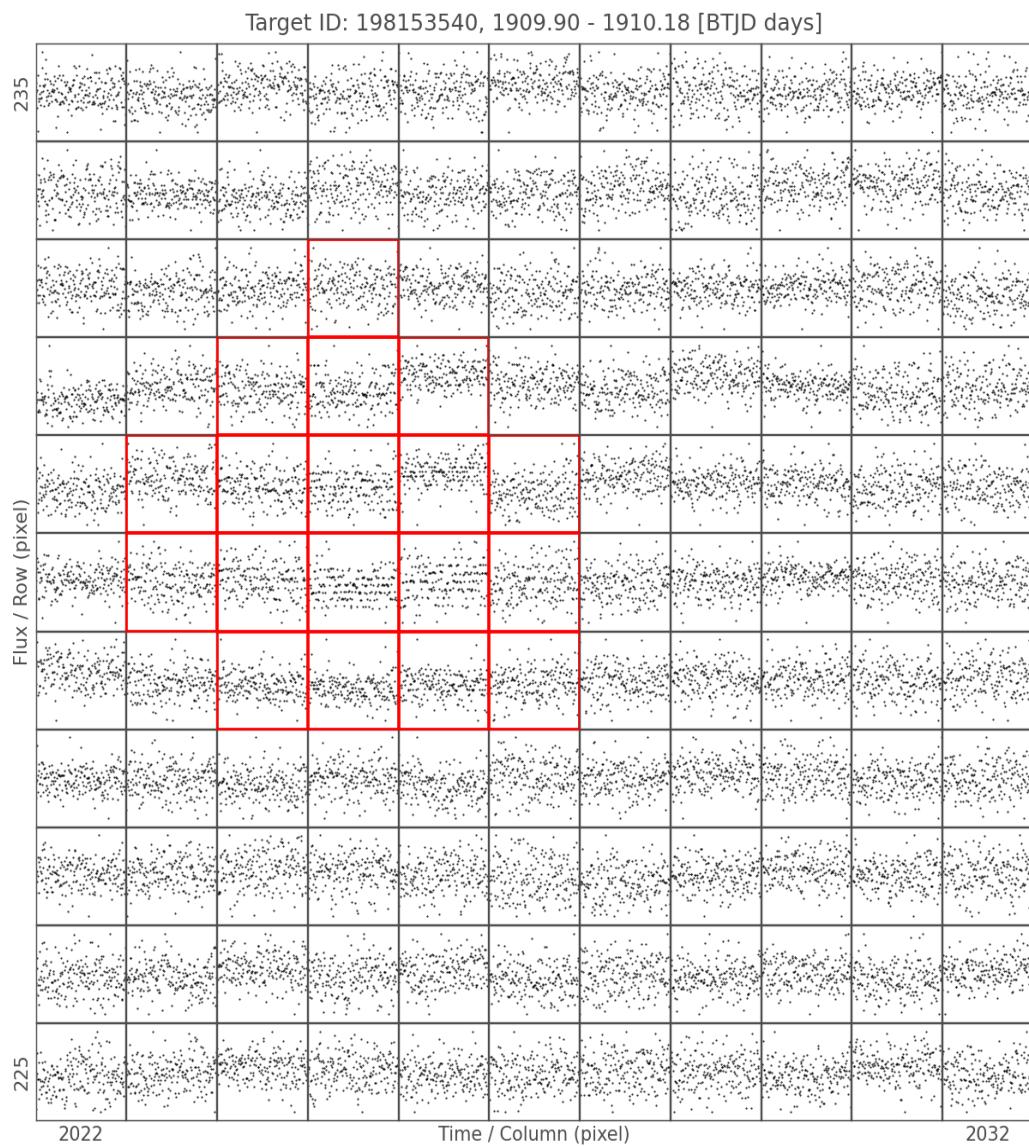
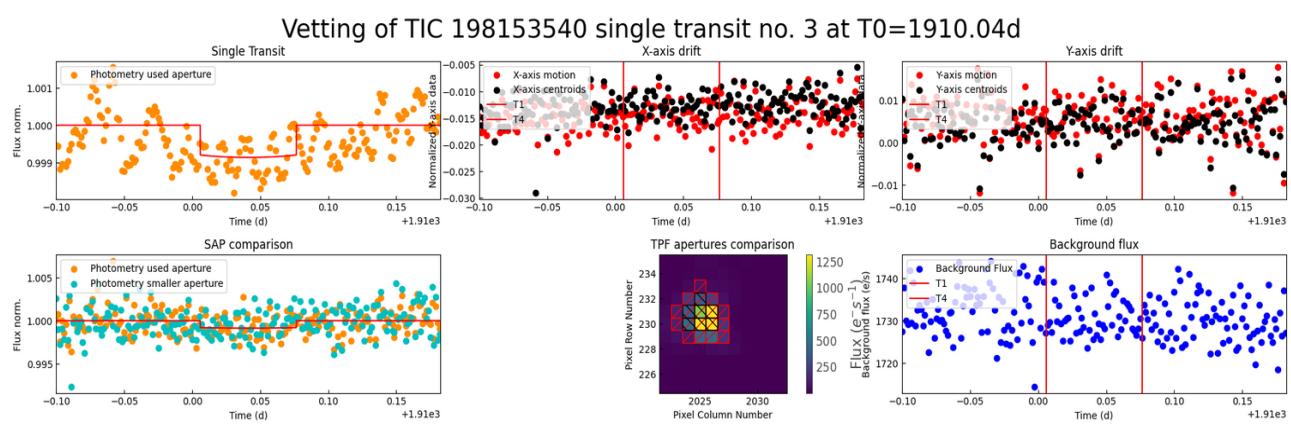


# WATSON Transits Validation Report: TIC 198153540

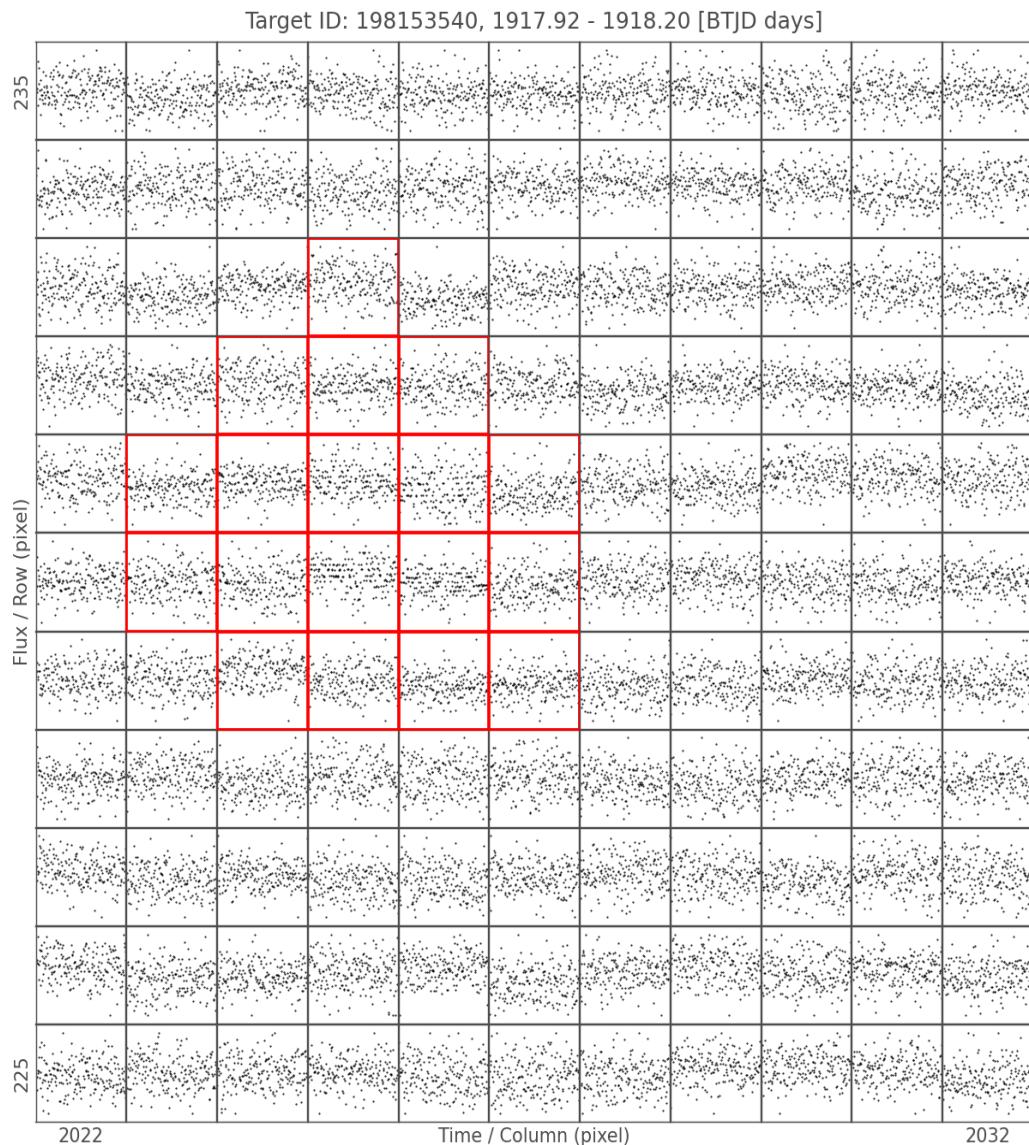
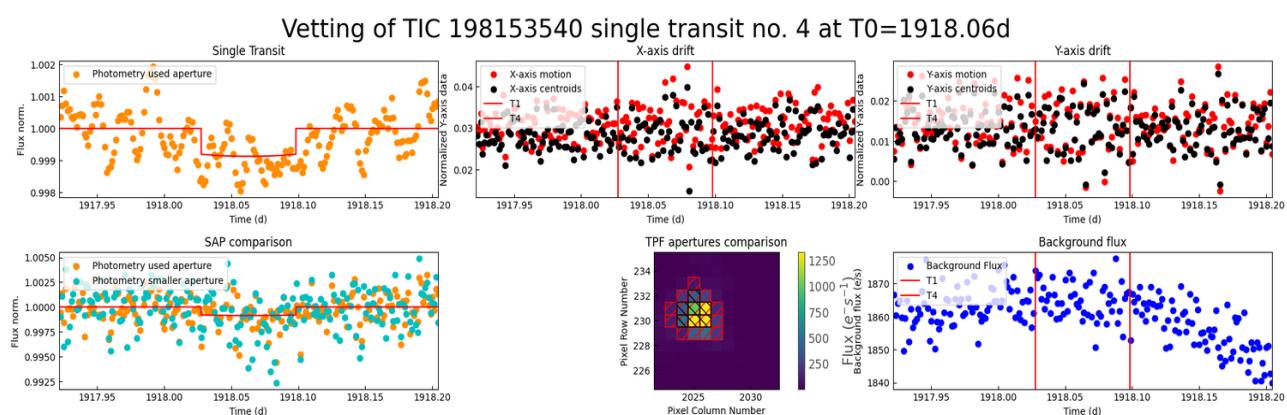
Fri, 06 January 2023, 06:37:12



**Figure 12:** The single transit no. 2 vetting plots



**Figure 13:** The single transit no. 3 vetting plots

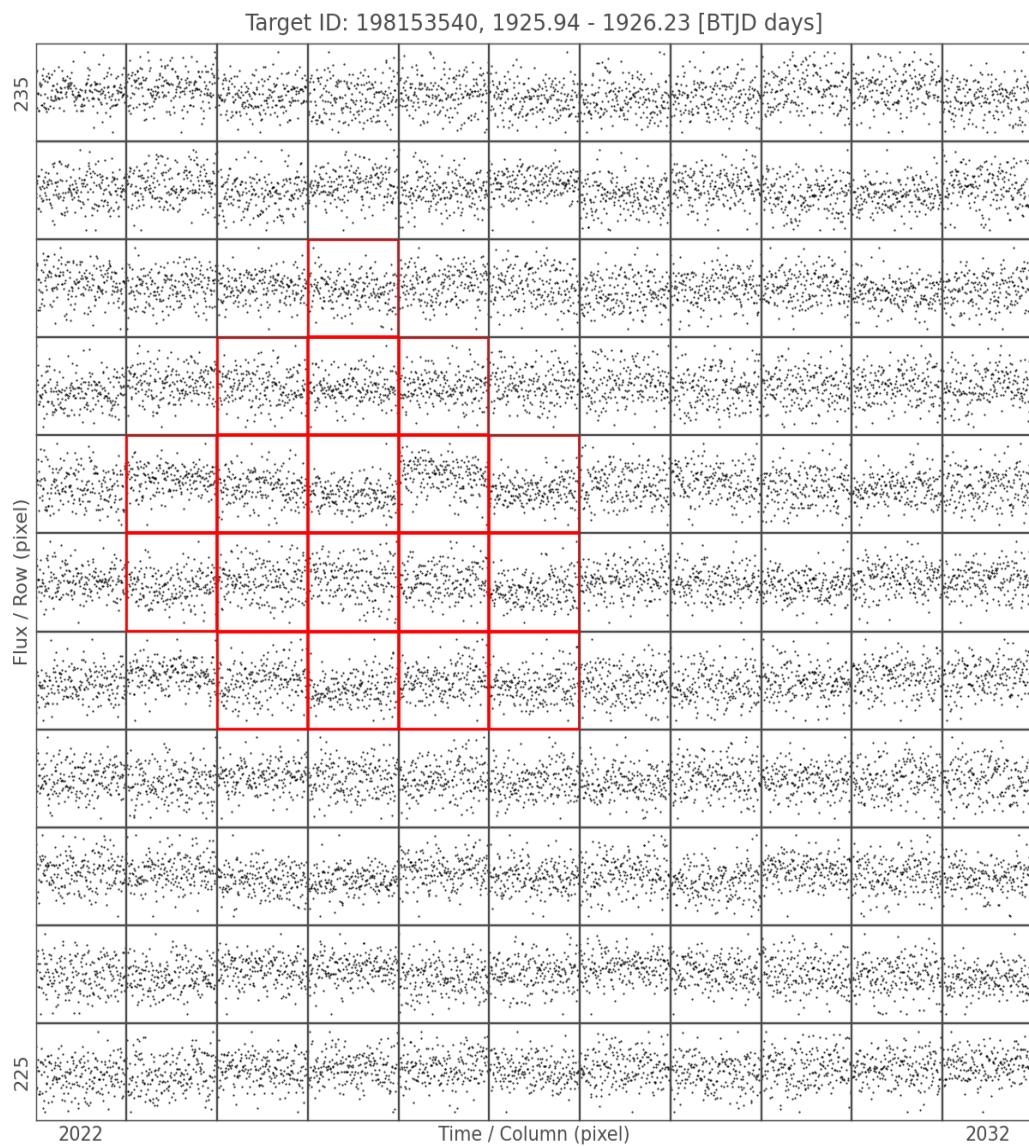
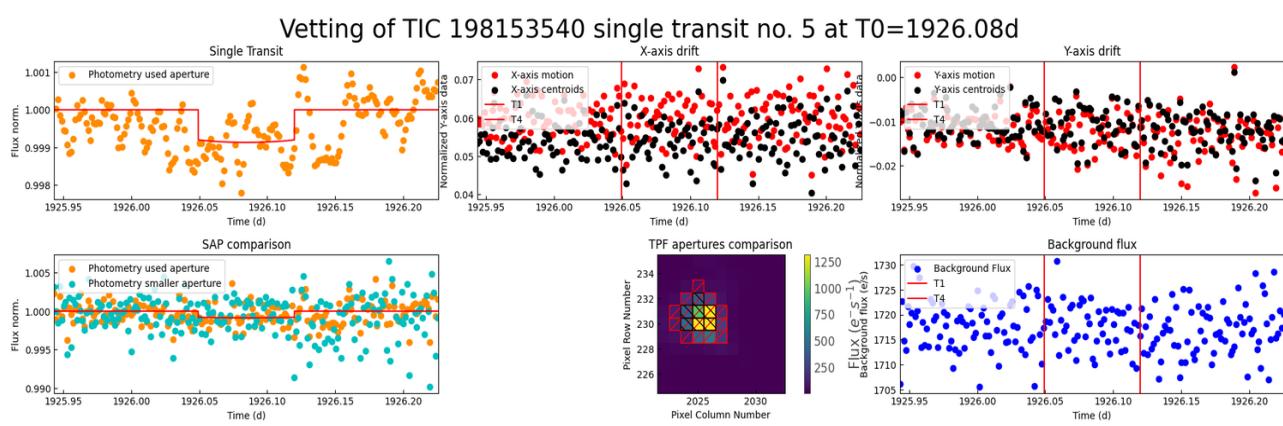


**Figure 14:** The single transit no. 4 vetting plots

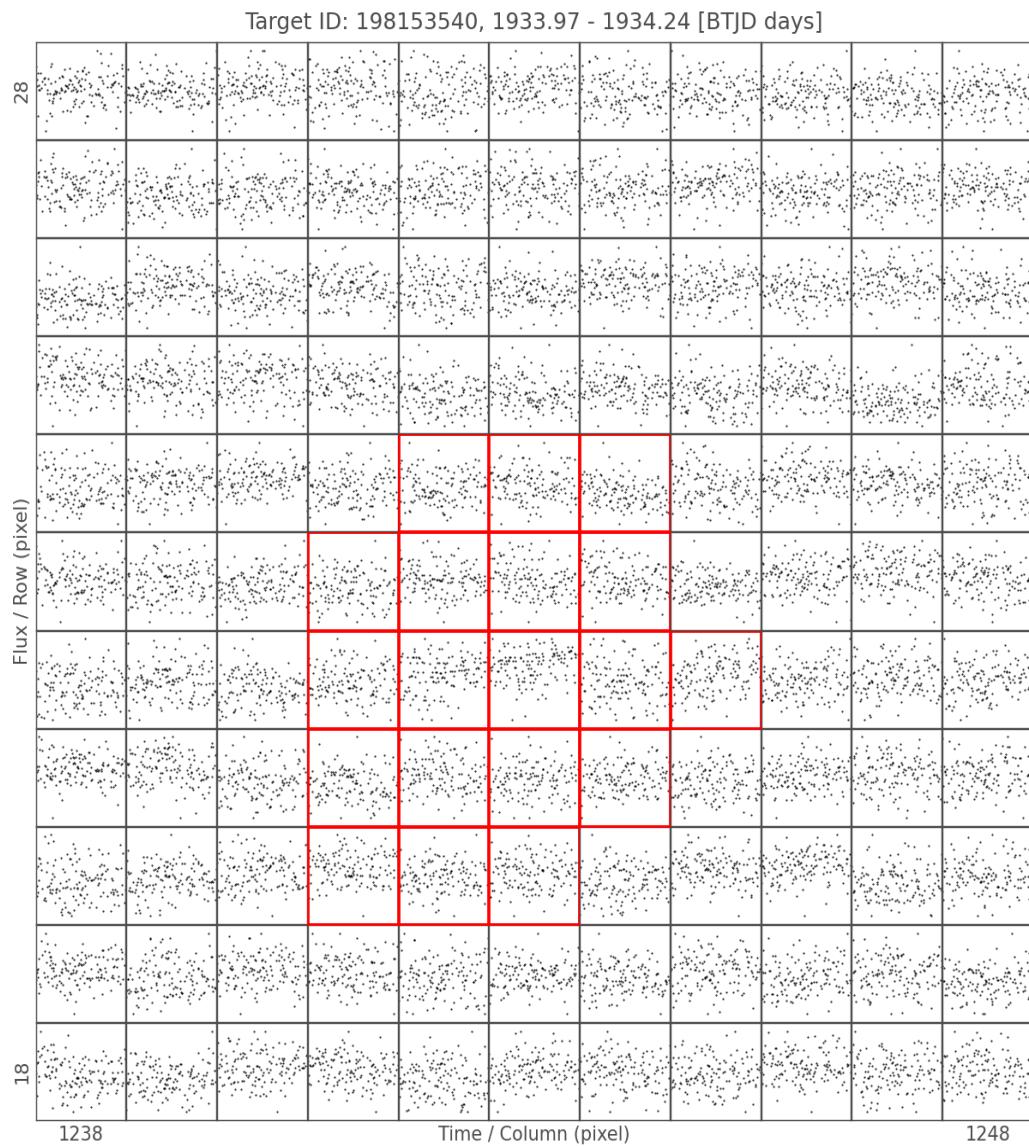
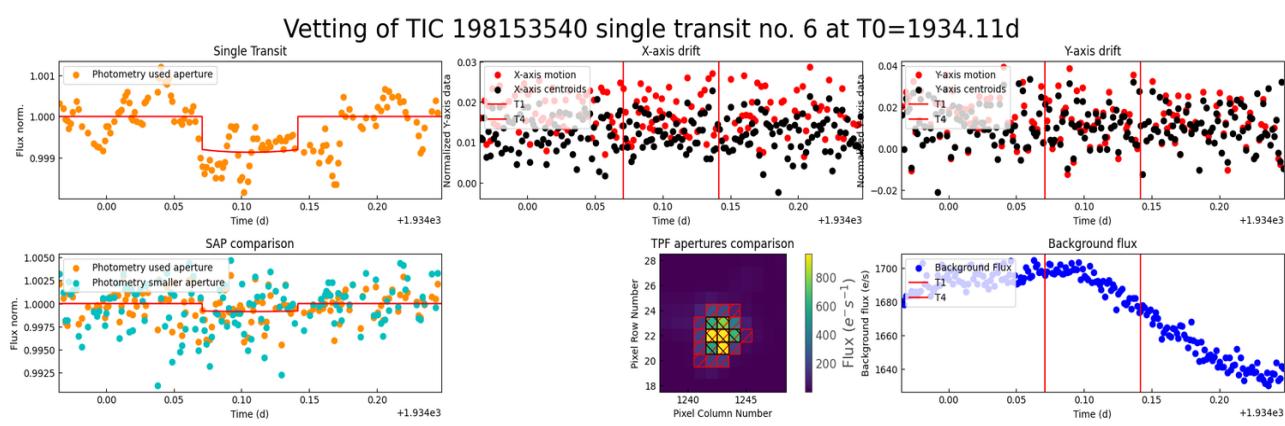


## WATSON Transits Validation Report: TIC 198153540

Fri, 06 January 2023, 06:37:12



**Figure 15:** The single transit no. 5 vetting plots

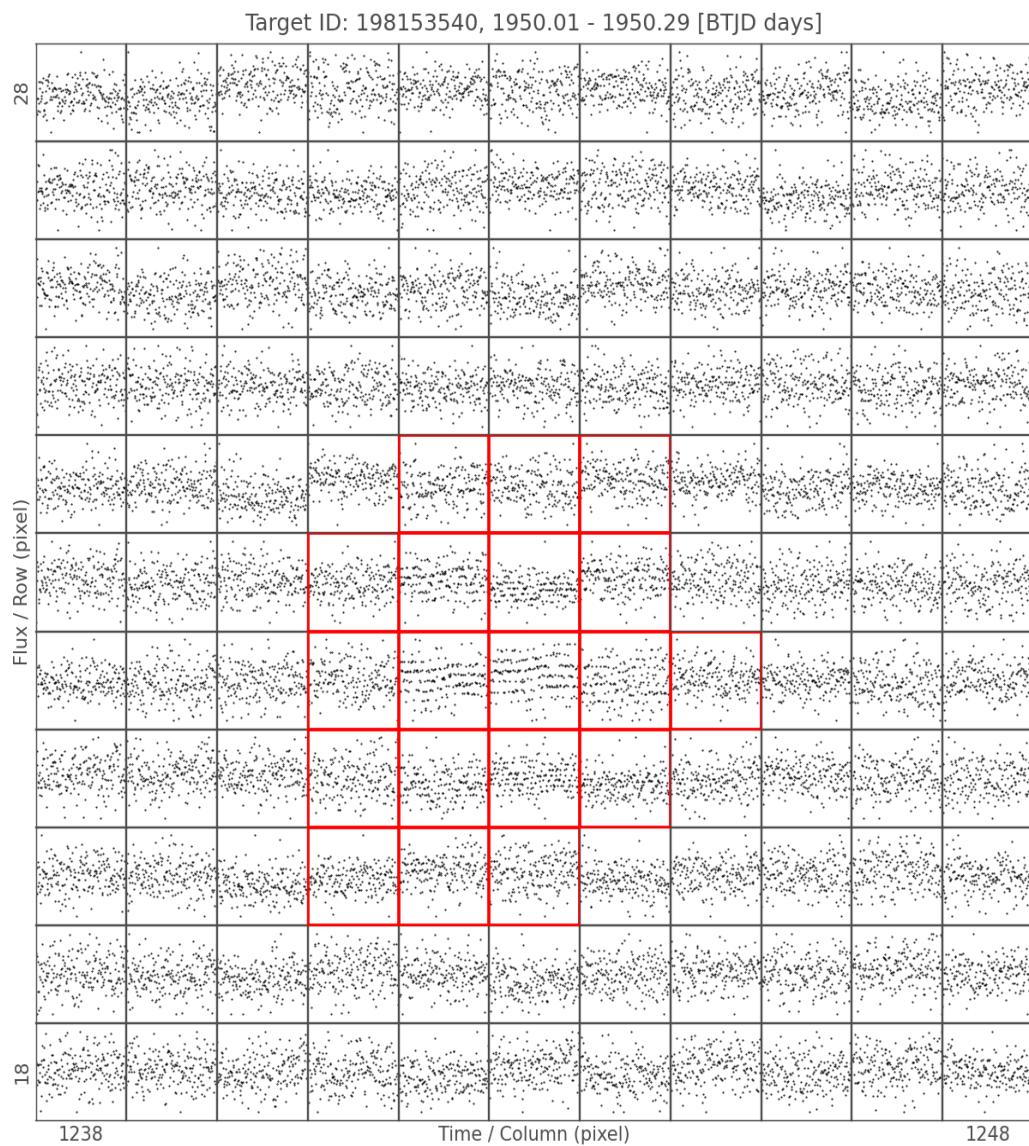
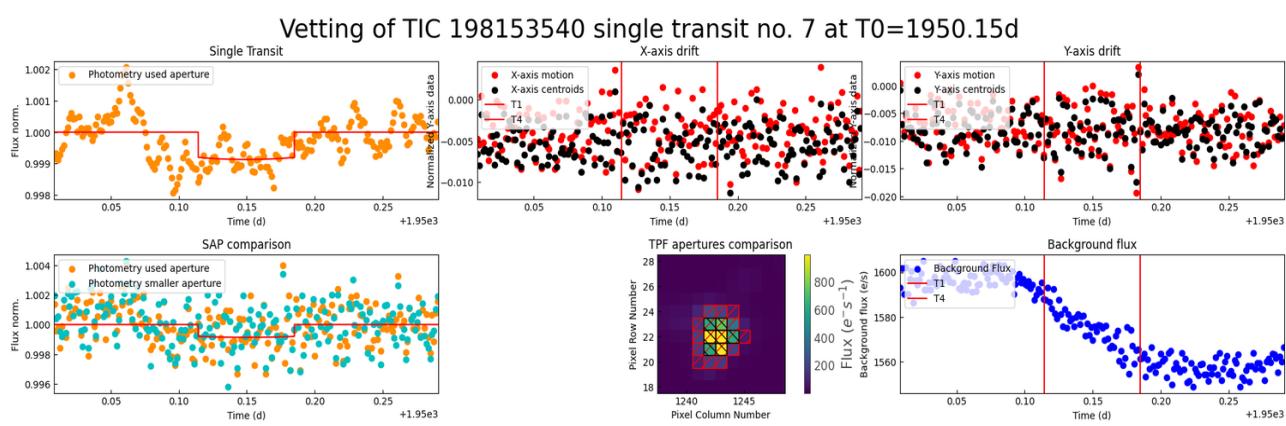


**Figure 16:** The single transit no. 6 vetting plots

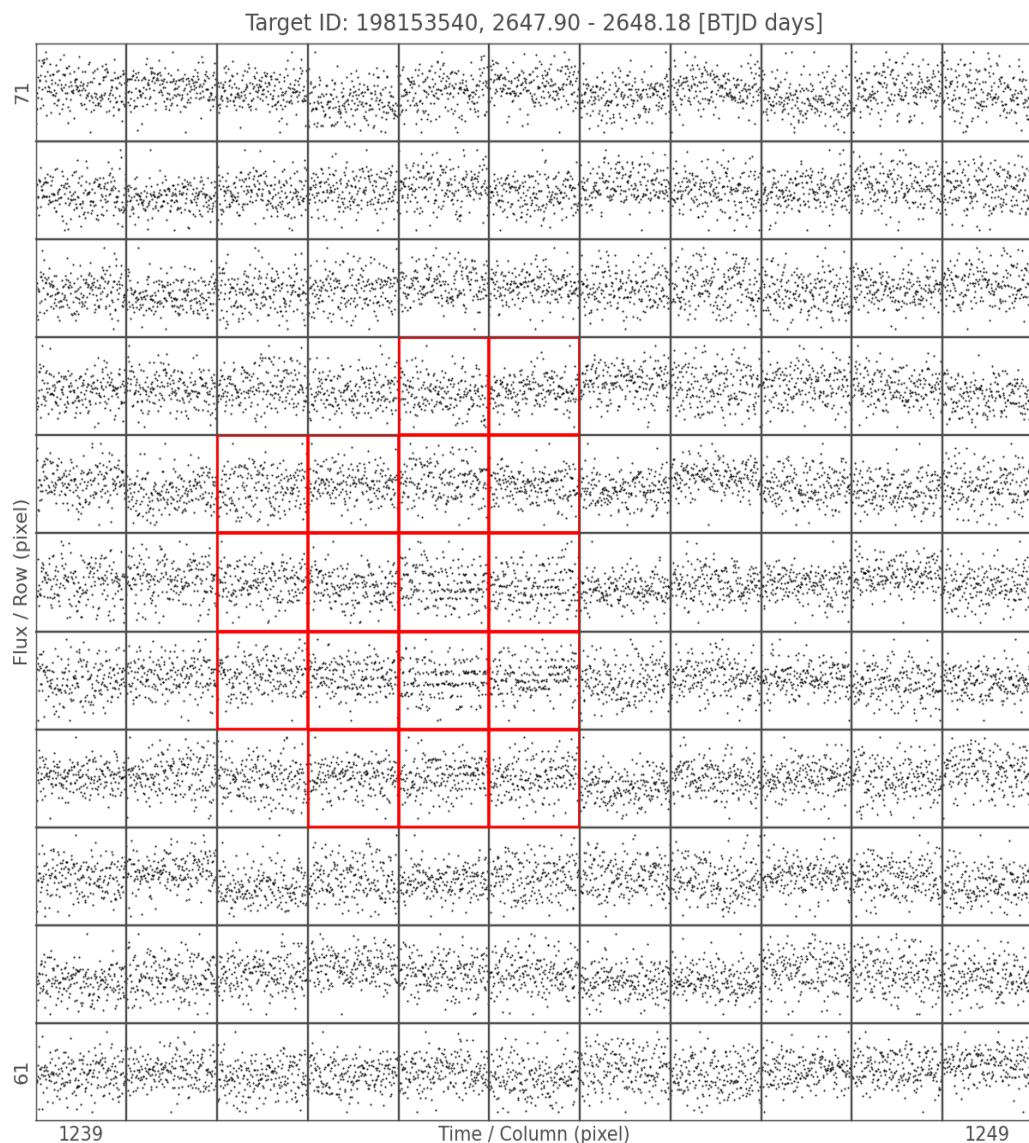
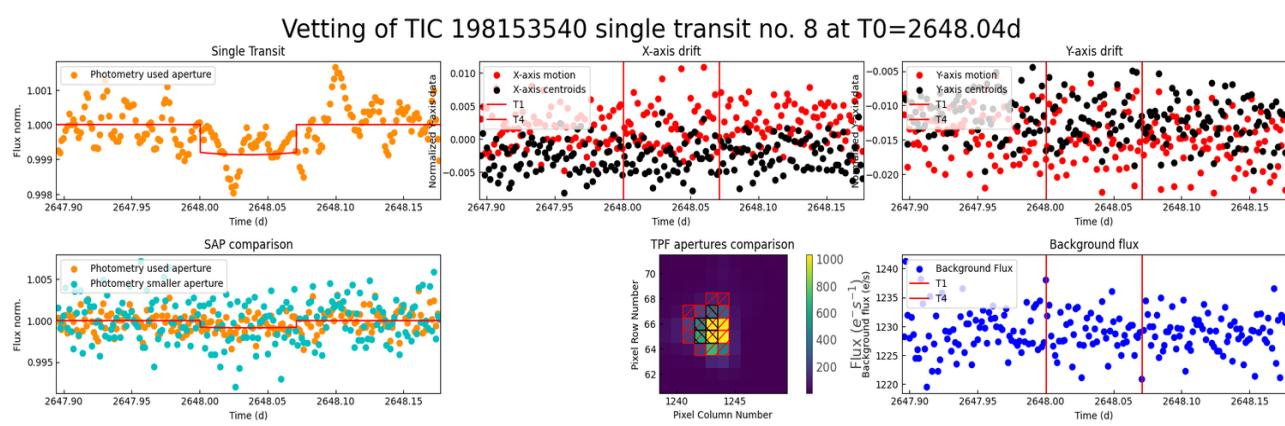


# WATSON Transits Validation Report: TIC 198153540

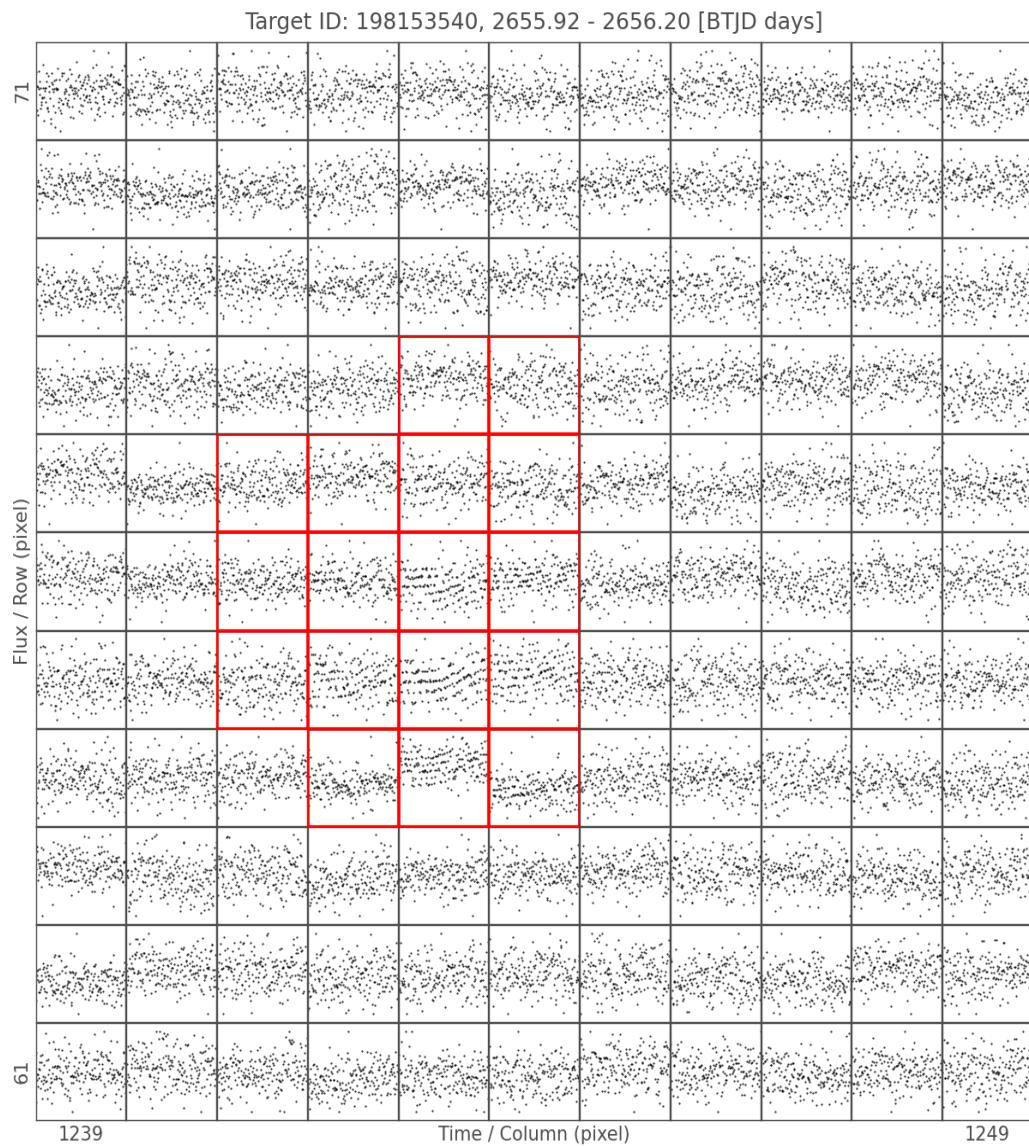
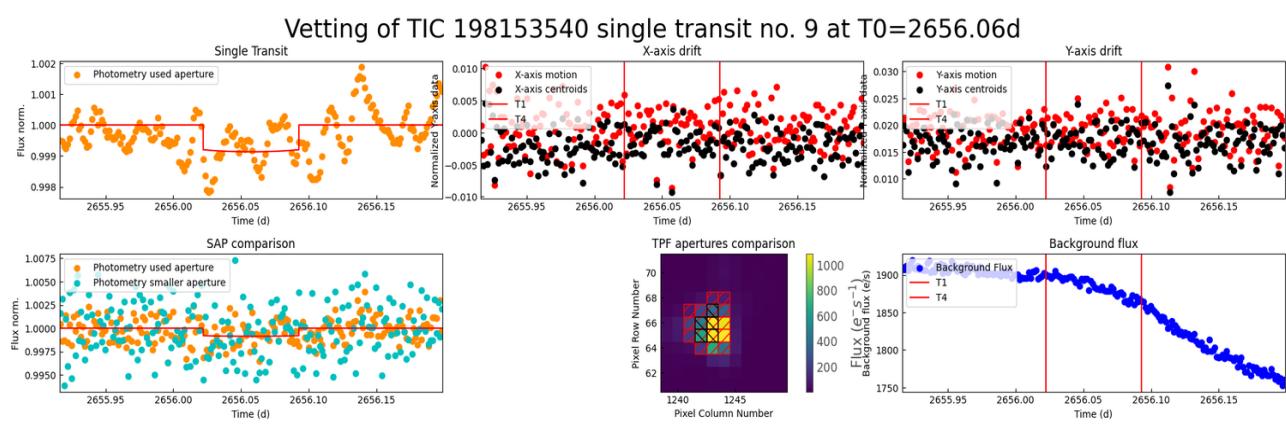
Fri, 06 January 2023, 06:37:13



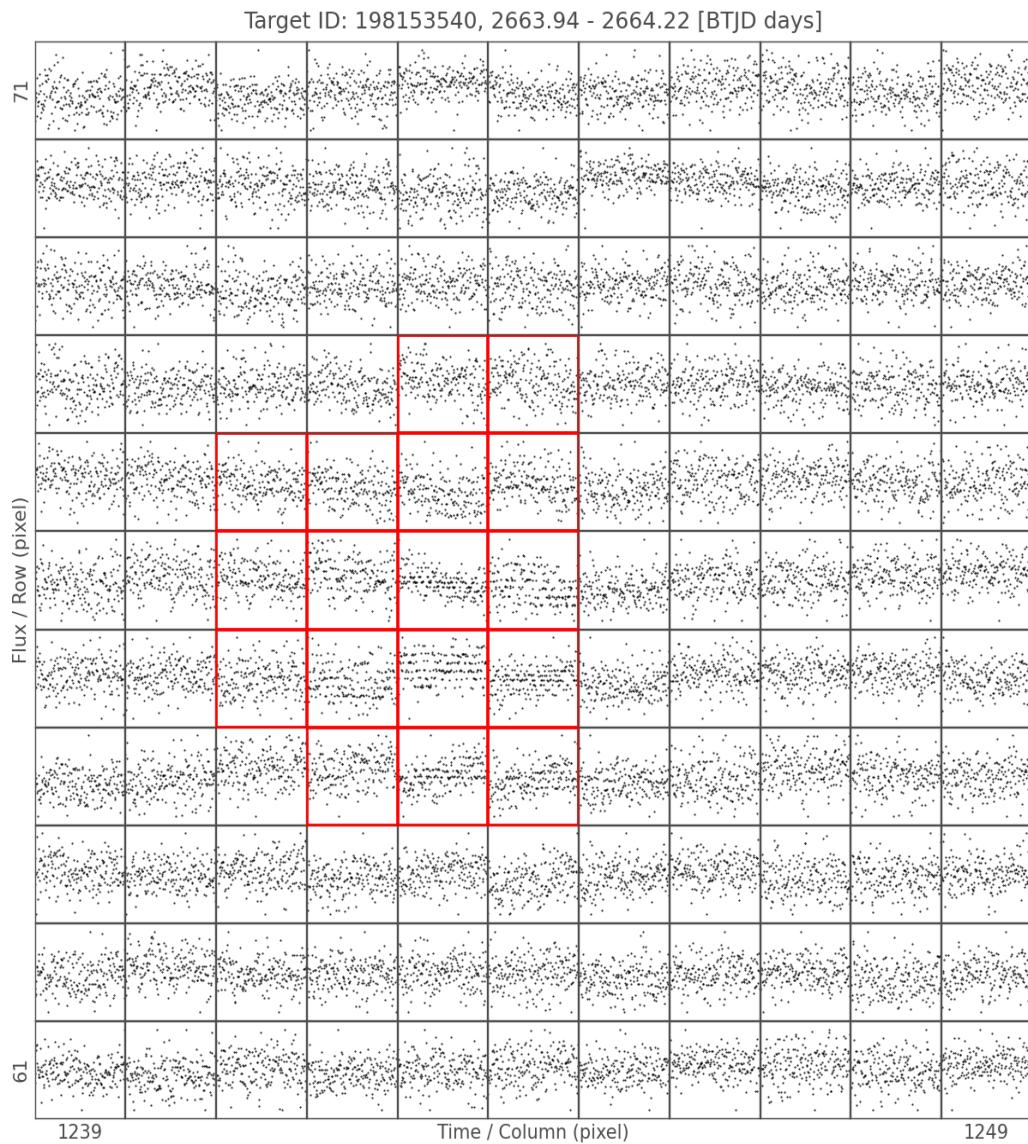
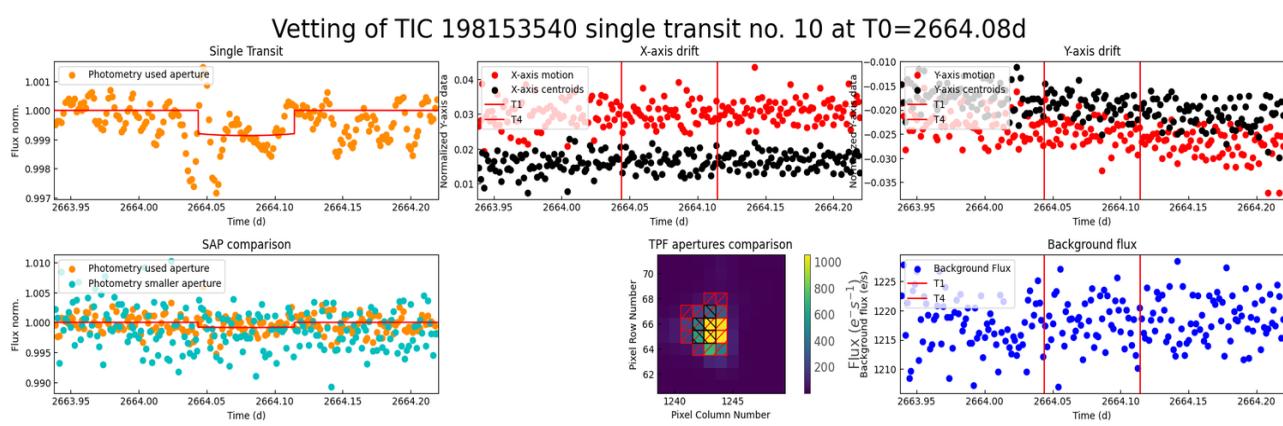
**Figure 17:** The single transit no. 7 vetting plots



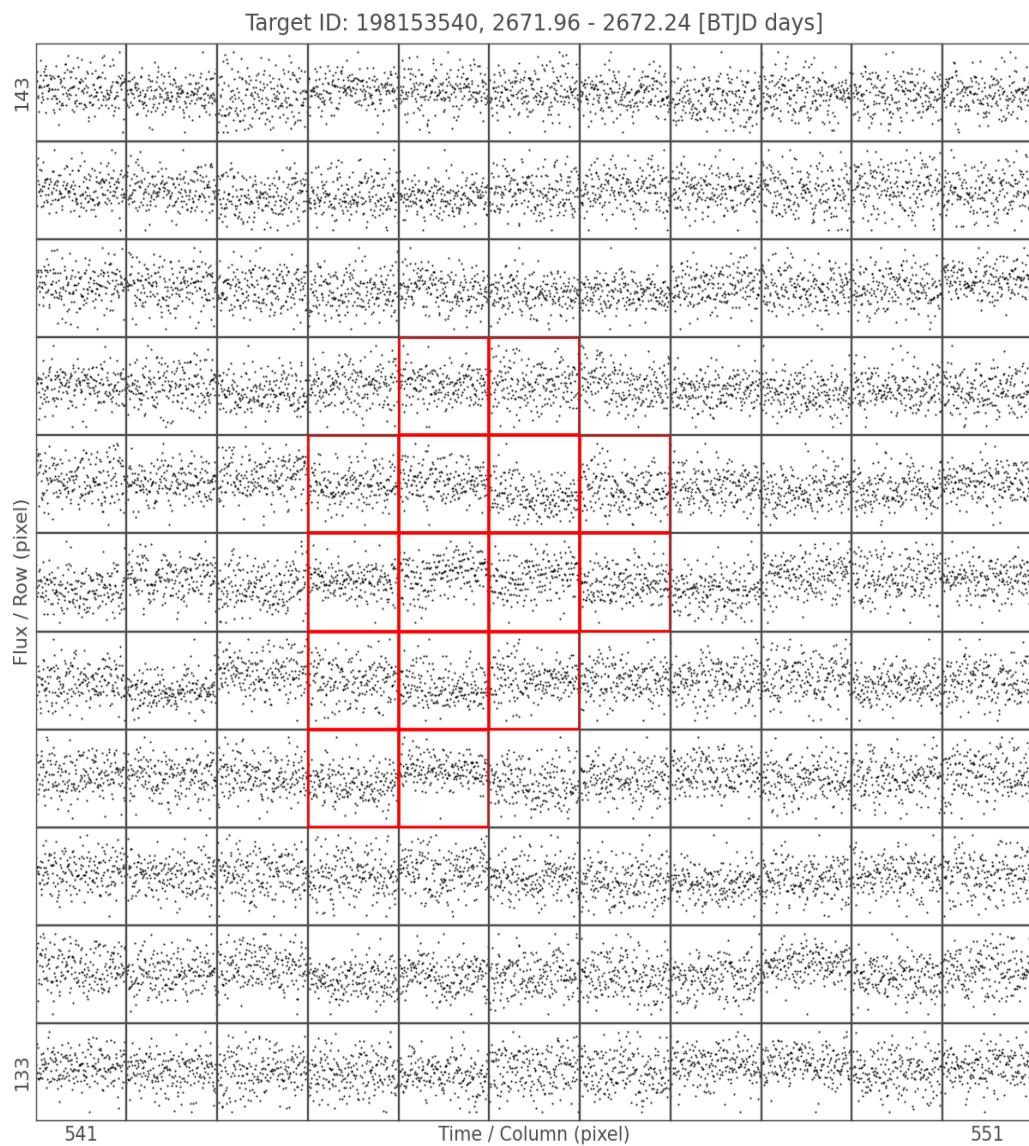
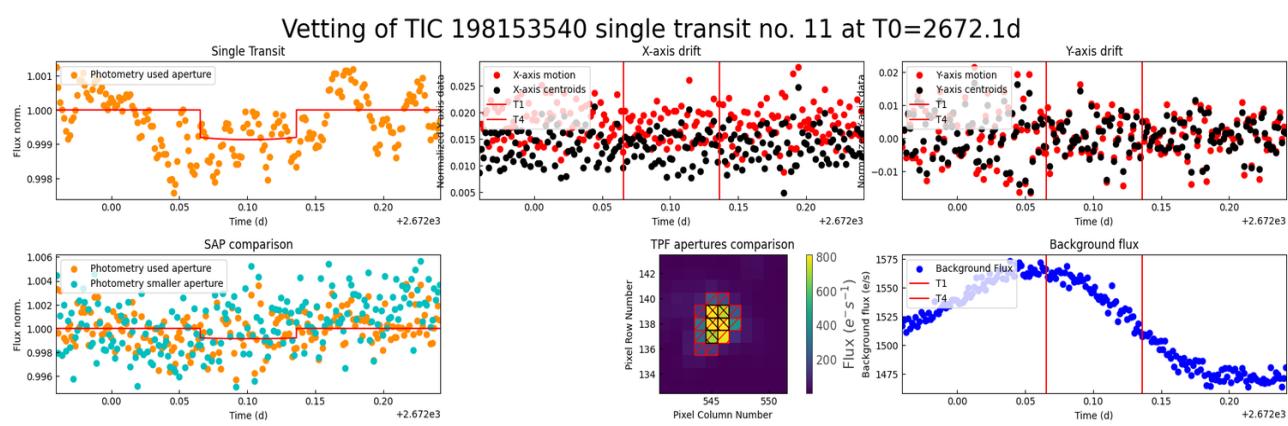
**Figure 18:** The single transit no. 8 vetting plots



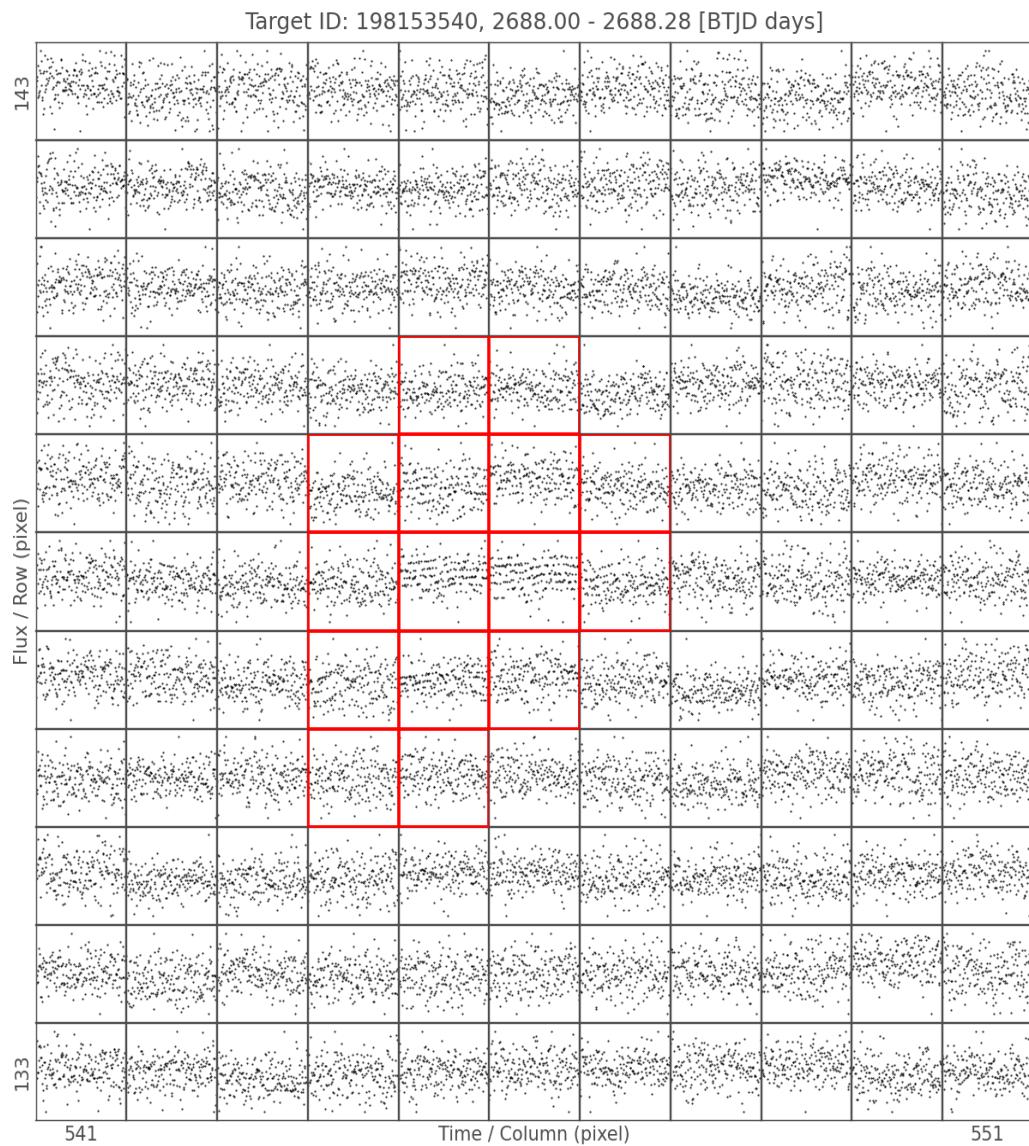
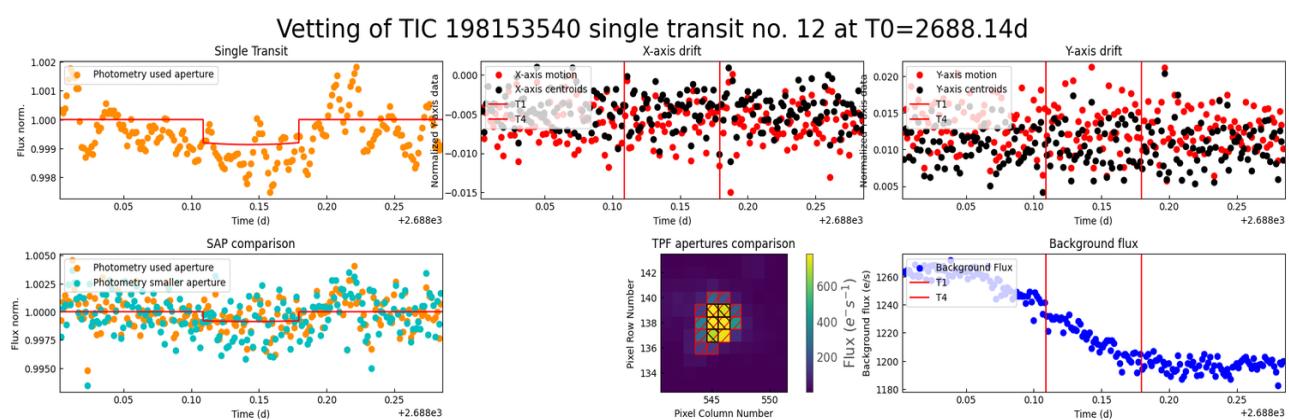
**Figure 19:** The single transit no. 9 vetting plots



**Figure 20:** The single transit no. 10 vetting plots



**Figure 21:** The single transit no. 11 vetting plots



**Figure 22:** The single transit no. 12 vetting plots