Data Validation (DV) Report
for TESS ID 356016119
Sectors 14 - 26

This Data Validation Report was produced in the
TESS Science Processing Operations Center (SPOC) Pipeline
at NASA Ames Research Center

07-Aug-2020 07:54:30 Z

Contents

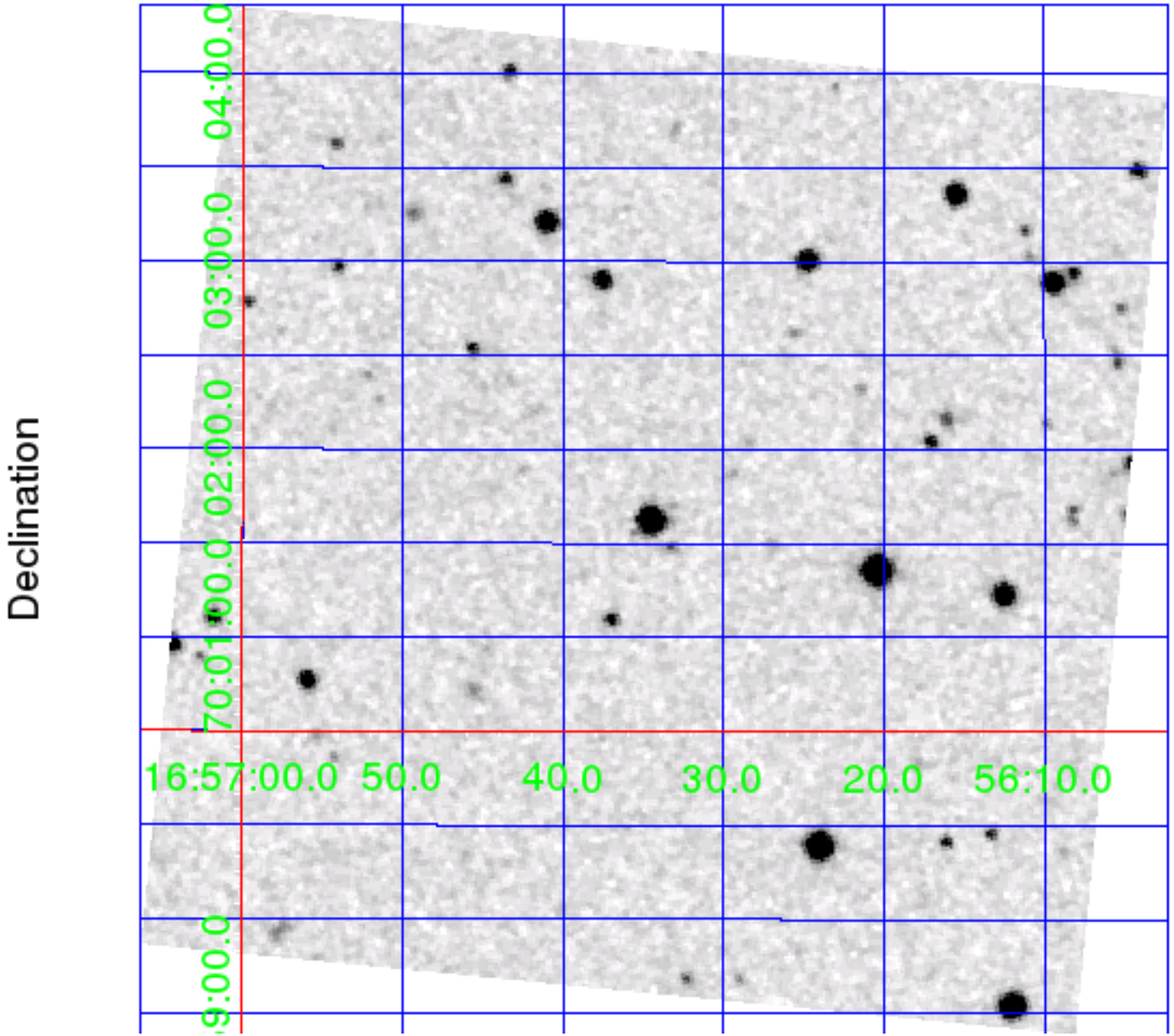
1 Summary

Target Properties	Value	Uncertainty	Units	Provenance
Catalog ID	356016119			
TOI ID	2094			
TESS Name	-			
RA	254.14322996	0	degrees	TIC8
Dec	70.02731556	0	degrees	TIC8
Magnitude	12.2669	0.0073455		TIC8
Radius	0.377	0.011	Solar radii	TIC8
Effective Temperature	3457	157	Kelvin	TIC8
log(g)	4.848	0.00178	cm/sec^2	TIC8
[M/H]	0.000	0	Solar metallicity	Solar
Stellar Density	6.826	0.205	Solar density	TIC8-Derived
Limb Darkening Coefficient 1	0.66994			
Limb Darkening Coefficient 2	0.25499			
Limb Darkening Coefficient 3	-0.19305			
Limb Darkening Coefficient 4	0.033554			
Number of Planet Candidates	1			
TOI Model	csv-file-toi-catalog-07-29-20-edited.csv			
TESS Names Model	-			
External TCE Model	-			
Software Revision	spoc-5.0.5-20200728-1-g55229f0867			
Date Report Generated	07-Aug-2020 07:54:30 Z			

Sector	Target Table	Camera/ CCD	Crowding Metric	Flux Fraction
14	167	3:1	0.9858	0.7732
15	169	3:2	0.9898	0.7362
16	174	3:2	0.9890	0.6932
17	176	4:3	0.9799	0.7659
19	184	4:2	0.9875	0.7815
20	191	4:2	0.9889	0.7524
21	196	4:2	0.9828	0.8107
22	202	4:1	0.9835	0.8219
23	221	4:1	0.9883	0.8148
24	242	3:1	0.9822	0.7681
25	245	3:1	0.9758	0.7874
26	254	3:1	0.9306	0.7447

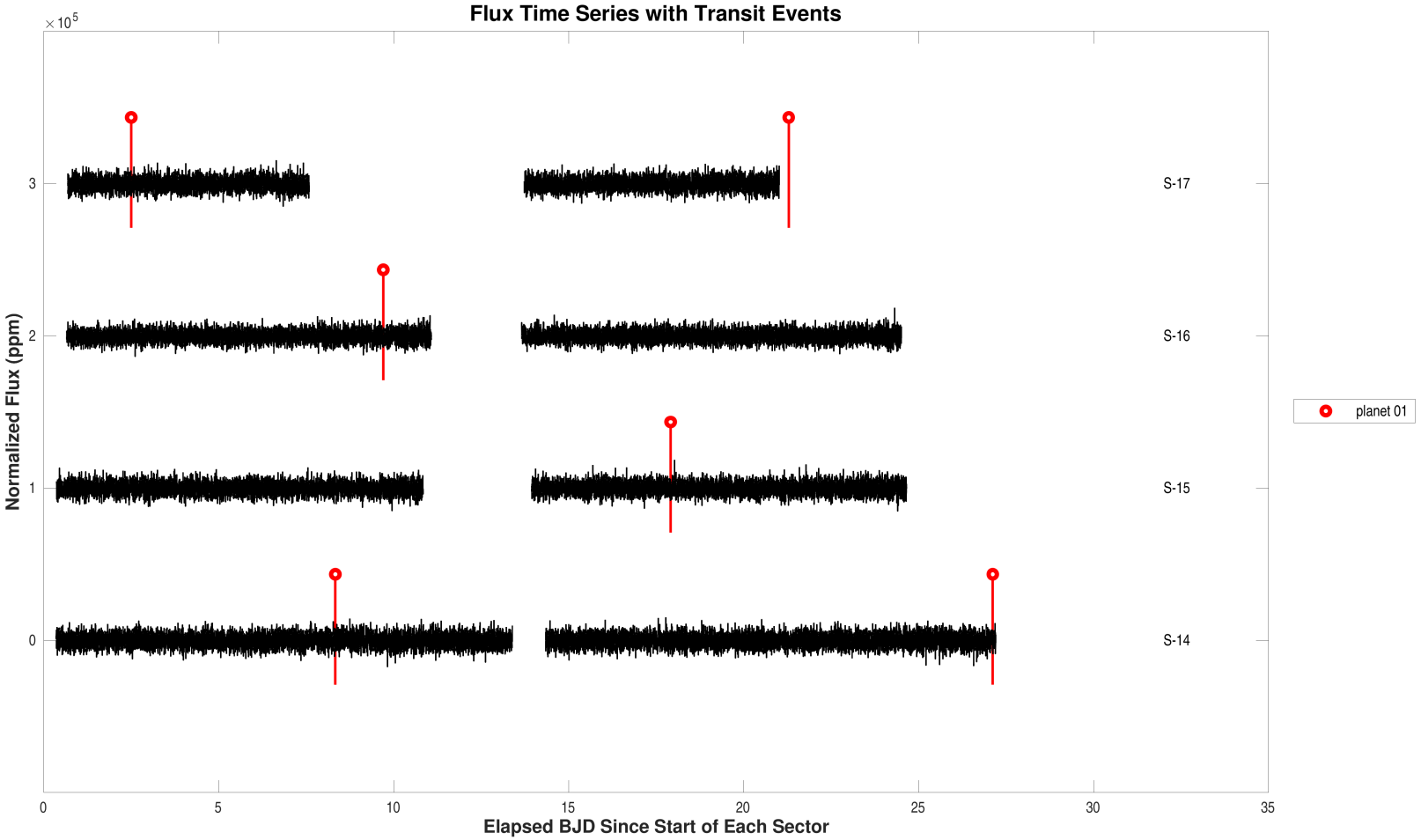
Planet Candidate	TOI ID	TESS Name	TOI Correlation	Period (days)	Period Ratio	Epoch (BTJD)	Semi-major Axis (AU)	Radius (Re)	Seff	Teq (K)	False Alarm	Suspected EB
1	2094.01	-	0.95	18.792	1.00	1691.329	0.10	1.5	1.9	298	2.66e-14	false

2 Survey Image

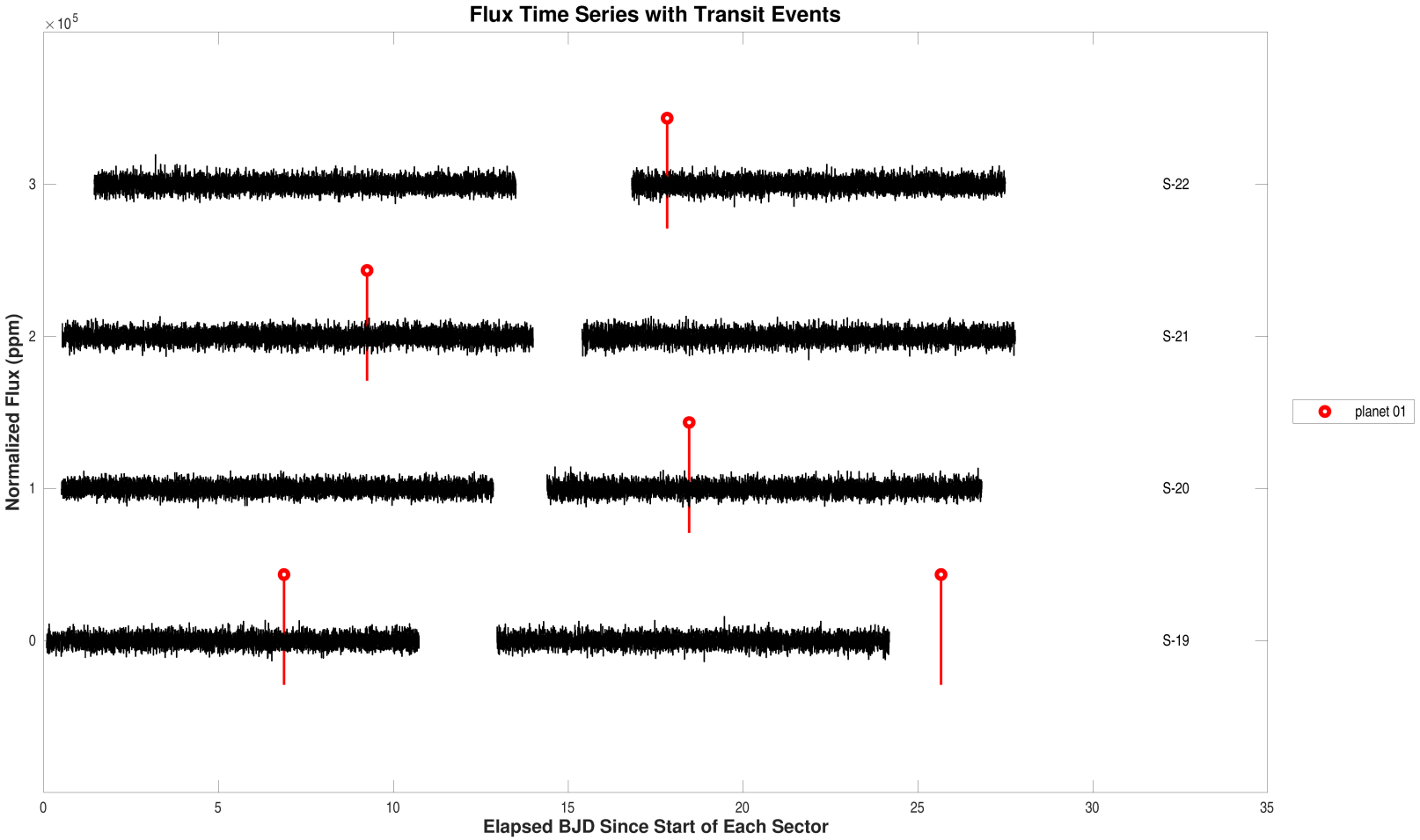


Digitized Sky Survey (DSS) red image. The 5' x 5' image is centered on the J2000 coordinates of target (356016119).

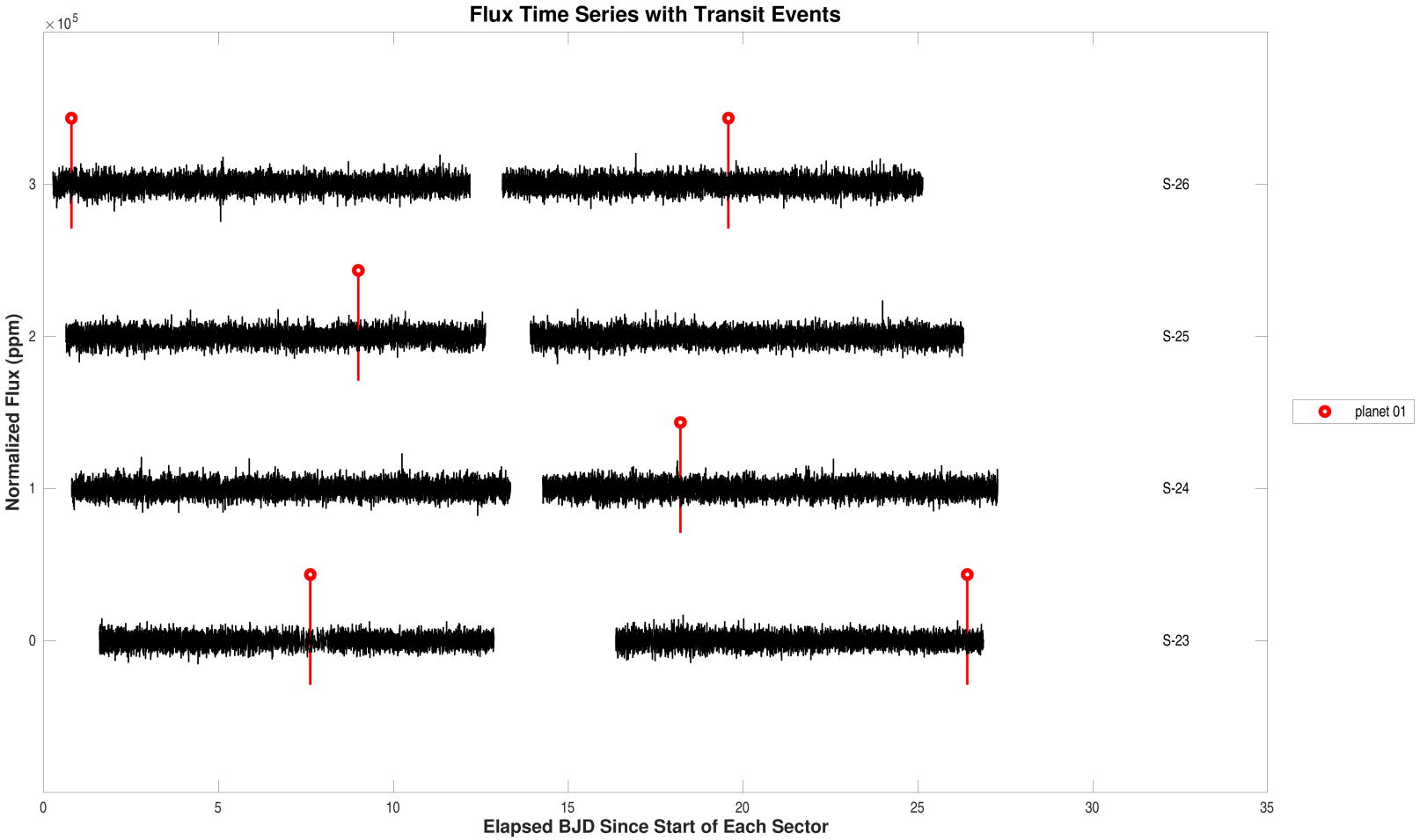
3 Flux Time Series



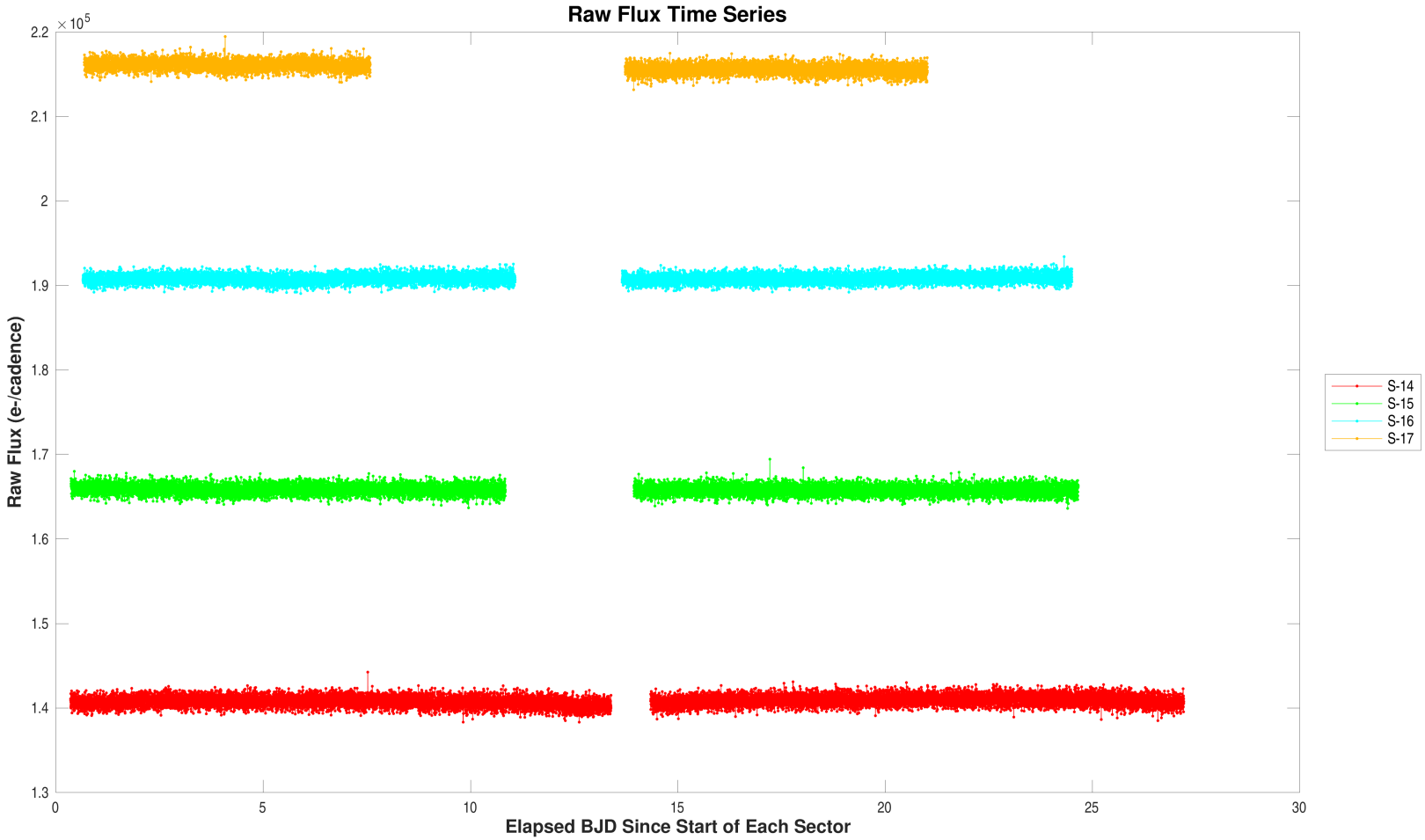
Summary plot of sector-stitched flux time series and transits for target 356016119, marked with DV fitted epoch/period (or TPS epoch/period if fit was not successful). Transits of identified planets are labeled with epoch BTJD and orbital period. For the data of sector 14, target table 167, start BJD is 2458683 and the vertical offset is 0 ppm. For the data of sector 15, target table 169, start BJD is 2458711 and the vertical offset is 100000 ppm. For the data of sector 16, target table 174, start BJD is 2458738 and the vertical offset is 200000 ppm. For the data of sector 17, target table 176, start BJD is 2458764 and the vertical offset is 300000 ppm.
Open `./summary-plots/0000000356016119-00-flux-dv-fit-14-167.fig`



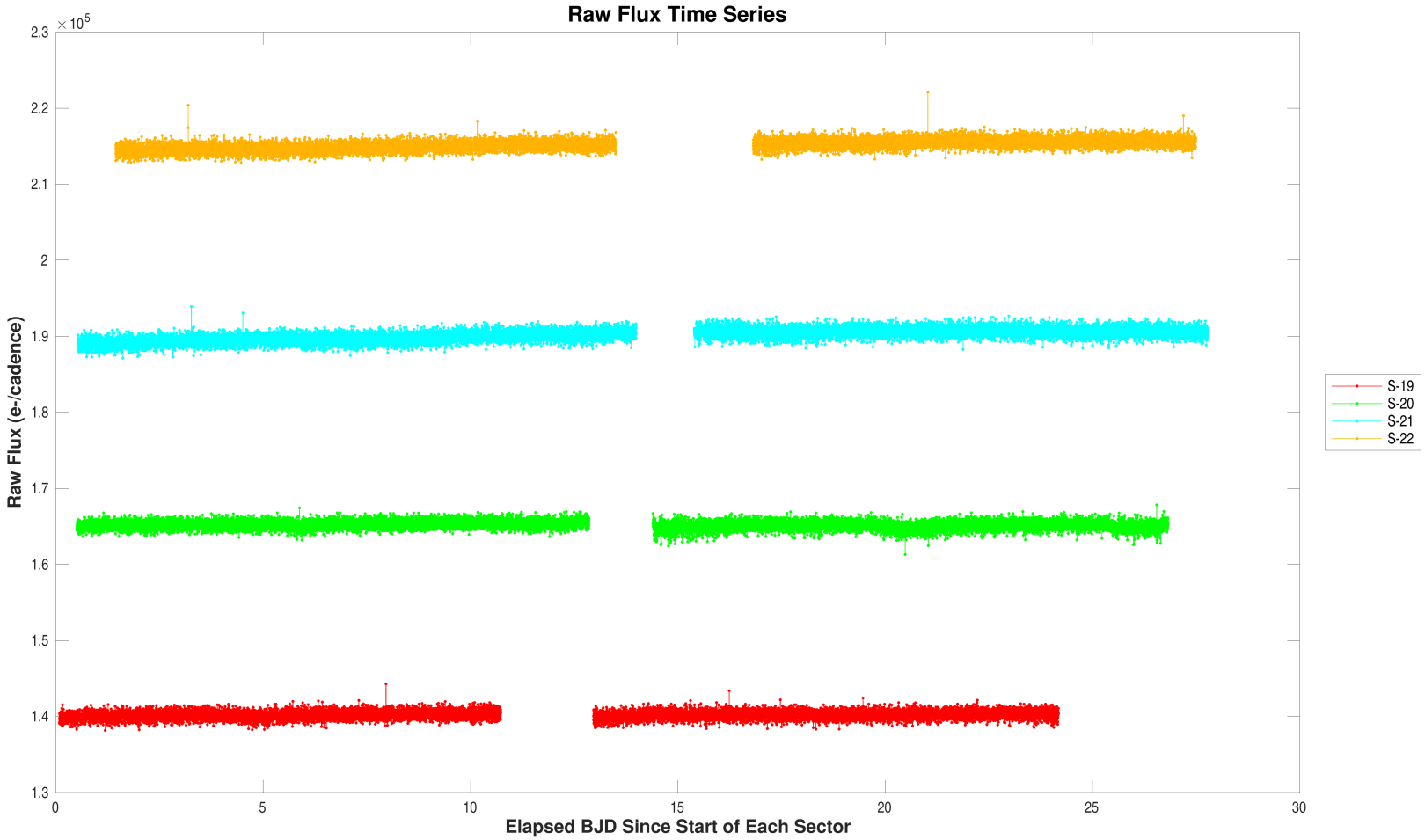
Summary plot of sector-stitched flux time series and transits for target 356016119, marked with DV fitted epoch/period (or TPS epoch/period if fit was not successful). Transits of identified planets are labeled with epoch BTJD and orbital period. For the data of sector 19, target table 184, start BJD is 2458816 and the vertical offset is 0 ppm. For the data of sector 20, target table 191, start BJD is 2458842 and the vertical offset is 100000 ppm. For the data of sector 21, target table 196, start BJD is 2458870 and the vertical offset is 200000 ppm. For the data of sector 22, target table 202, start BJD is 2458899 and the vertical offset is 300000 ppm.
Open `./summary-plots/0000000356016119-00-flux-dv-fit-19-184.fig`



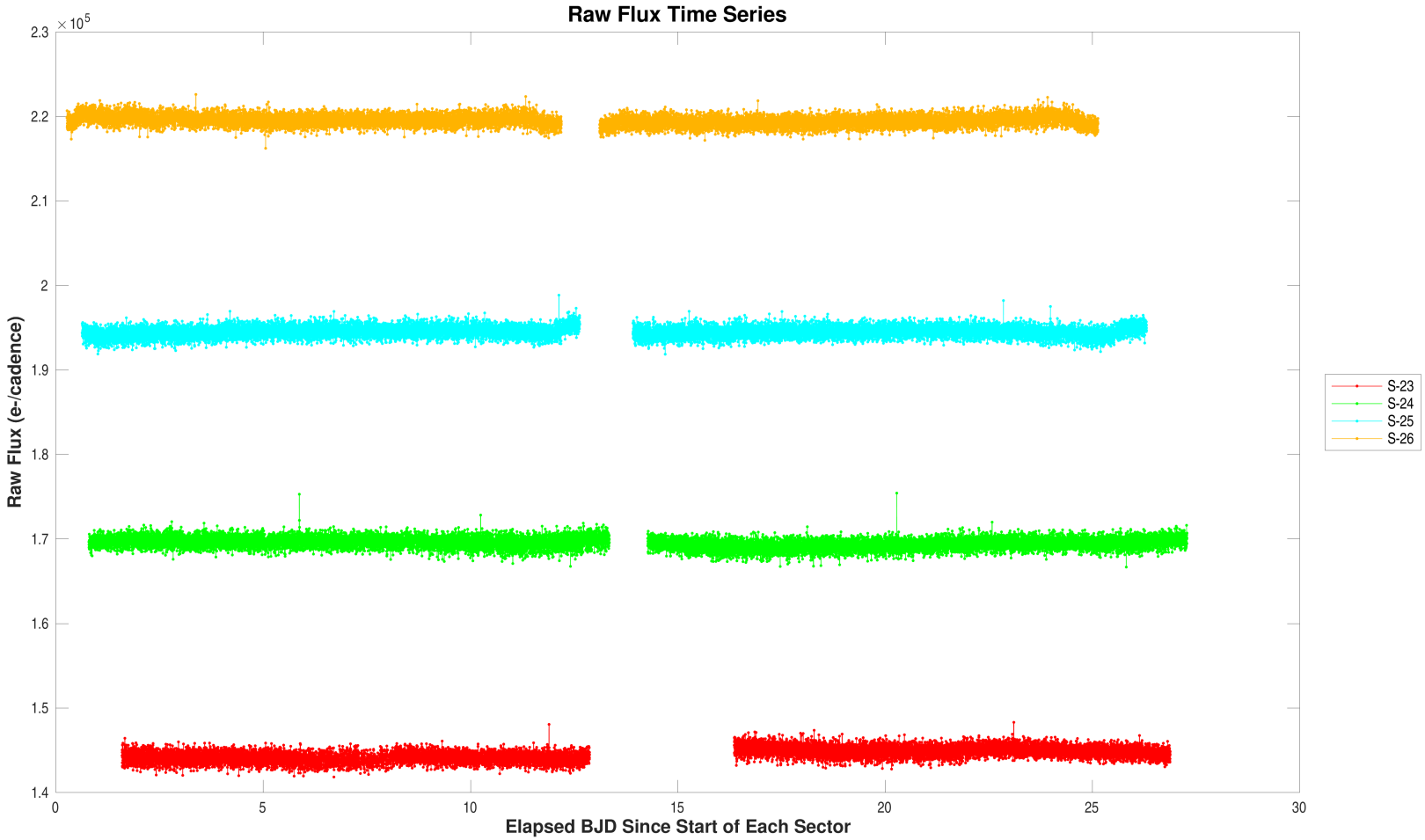
Summary plot of sector-stitched flux time series and transits for target 356016119, marked with DV fitted epoch/period (or TPS epoch/period if fit was not successful). Transits of identified planets are labeled with epoch BTJD and orbital period. For the data of sector 23, target table 221, start BJD is 2458928 and the vertical offset is 0 ppm. For the data of sector 24, target table 242, start BJD is 2458955 and the vertical offset is 100000 ppm. For the data of sector 25, target table 245, start BJD is 2458983 and the vertical offset is 200000 ppm. For the data of sector 26, target table 254, start BJD is 2459010 and the vertical offset is 300000 ppm.
Open `./summary-plots/0000000356016119-00-flux-dv-fit-23-221.fig`



Summary plot of raw flux time series. For the data of sector 14, target table 167, start BJD is 2458683 and the vertical offset is 0 electrons/cadence. For the data of sector 15, target table 169, start BJD is 2458711 and the vertical offset is 25000 electrons/cadence. For the data of sector 16, target table 174, start BJD is 2458738 and the vertical offset is 50000 electrons/cadence. For the data of sector 17, target table 176, start BJD is 2458764 and the vertical offset is 75000 electrons/cadence.
Open `./summary-plots/0000000356016119-00-raw-flux-14-167.fig`



Summary plot of raw flux time series. For the data of sector 19, target table 184, start BJD is 2458816 and the vertical offset is 0 electrons/cadence. For the data of sector 20, target table 191, start BJD is 2458842 and the vertical offset is 25000 electrons/cadence. For the data of sector 21, target table 196, start BJD is 2458870 and the vertical offset is 50000 electrons/cadence. For the data of sector 22, target table 202, start BJD is 2458899 and the vertical offset is 75000 electrons/cadence.
Open `./summary-plots/0000000356016119-00-raw-flux-19-184.fig`



Summary plot of raw flux time series. For the data of sector 23, target table 221, start BJD is 2458928 and the vertical offset is 0 electrons/cadence. For the data of sector 24, target table 242, start BJD is 2458955 and the vertical offset is 25000 electrons/cadence. For the data of sector 25, target table 245, start BJD is 2458983 and the vertical offset is 50000 electrons/cadence. For the data of sector 26, target table 254, start BJD is 2459010 and the vertical offset is 75000 electrons/cadence.
Open `./summary-plots/0000000356016119-00-raw-flux-23-221.fig`

4 Dashboards

Planet Candidate 1

<table>
<tr><td rowspan="2">Model Fitter</td><td colspan="2">Stellar Radius
0.4 ± 0.0 Solar units</td><td rowspan="2">Core Aperture Correlation Statistic
Value = 5.17
Significance = 100.00%
Halo Aperture Correlation Statistic
Value = -3.81
Significance = 0.01%
Core/Halo Ratio
Ratio = -1.36</td><td rowspan="2">Ghost Diagnostic Test</td></tr>
<tr><td colspan="2">Period = 18.8 ± 0.0 days
Depth = 1551 ± 202 ppm
Planet Radius = 1.5 ± 1.0 Earth radii
Semi-major Axis = 0.1 ± 0.0 AU
Effective Stellar Flux = 1.9 ± 0.3
Equilibrium Temperature = 298 ± 14 Kelvin
Chi-squared/DoF = 0.8
SNR = 8.2</td></tr>
<tr><td rowspan="2">Eclipsing Binary Discrimination Test</td><td colspan="2">Odd-Even Depth Comparison Statistic
Value = 2.76e-01
Significance = 59.93%</td><td>Offsets Relative to Out of Transit Centroid
Source RA Offset = 9.72e-02 ± 3.23e+00 arcsec (0.03 σ)
Source Dec Offset = -4.84e+00 ± 6.58e+00 arcsec (-0.74 σ)
Source Offset Distance = 4.84e+00 ± 6.58e+00 arcsec (0.74 σ)
Offsets Relative to TIC Position
Source RA Offset = -2.43e+00 ± 3.23e+00 arcsec (-0.75 σ)
Source Dec Offset = -4.38e+00 ± 6.58e+00 arcsec (-0.67 σ)
Source Offset Distance = 5.02e+00 ± 5.96e+00 arcsec (0.84 σ)</td><td>Difference Image Centroid Offsets</td></tr>
<tr><td>Shorter Period Comparison Statistic
Value = N/A
Significance = N/A</td><td>Longer Period Comparison Statistic
Value = N/A
Significance = N/A</td><td>False Alarm = 2.66e-14
Transit Count = 19
Max Multiple Event Statistic = 7.7</td><td>Bootstrap Test</td></tr>
</table>

Summary of model fitter results and validation test results for target 356016119, planet candidate 1. In general, green denotes that the candidate is likely a planet, while red denotes that the candidate is unlikely to be a planet. Cyan denotes that no data is available. The color of the Model Fitter block is: green, when the SNR of the fit is greater than or equal to 10; yellow, if the SNR is greater than or equal to 7.1 but less than 10; red, if the SNR is less than 7.1 or if the fitter failed. The color of the Ghost Diagnostic Test and Eclipsing Binary Discrimination Test blocks are: green, when the significance is within 2-sigma; yellow, when the significance is between 2- and 3-sigma; red when the significance is greater than 3-sigma. The color of the Difference Image Centroid Offsets block is: green, when the max offset distance sigma is less than or equal to 2; yellow, when the max sigma is between 2 and 3; red when the max sigma is greater than 3. The color of the Bootstrap Test block is green whenever the false alarm probability is less than 10^{-12}, low enough to limit the total number of false alarms from a four year mission to less than one. If the false alarm probability is greater than 10^{-12}, the color of the Bootstrap Test block is: green, when the false alarm probability is less than or equal to the CCDF of a Gaussian distribution at the observed maximum multiple event statistic; yellow when the false alarm probability is between 1 and 2 times that of a Gaussian distribution at the max multiple event statistic; and red when the false alarm probability is more than 2 times that of a Gaussian distribution at the max multiple event statistic.

5 Pixel Level Diagnostics

To reduce clutter, the catalog IDs in the difference images have been replaced by indices representing distance from the target star. The mapping between the indices and the catalog IDs is found in a table at the end of this section.

5.1 Planet Candidate 1

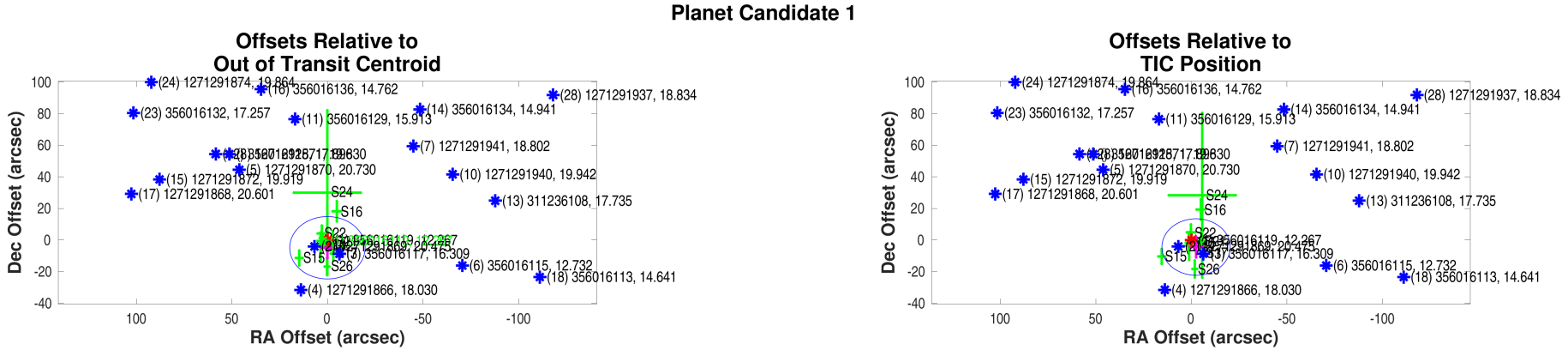
Multi-Sector Average PRF Fit of the Difference Images

Mean offset from the PRF fit to the out of transit image

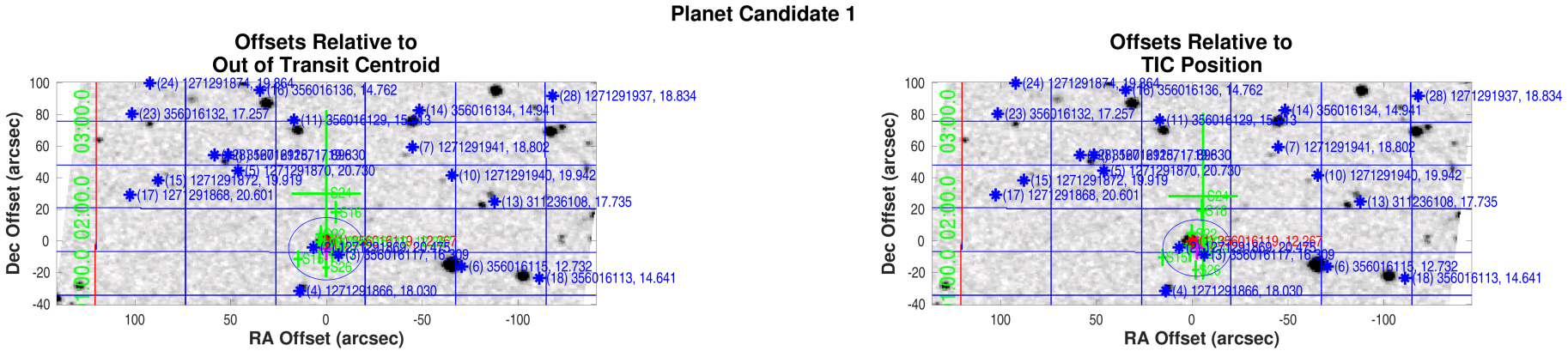
	RA	Dec	Units
Offset	$0.0972 \pm 3.23e+00$	$-4.8440 \pm 6.58e+00$	arcseconds
Offset/σ	0.03	-0.74	
Offset Distance	$4.8450 \pm 6.58e+00$		arcseconds
Offset Distance/σ	0.74		
3σ Radius	19.7446		arcseconds

Mean offset from the TIC RA and Dec

	RA	Dec	Units
Offset	$-2.4346 \pm 3.23e+00$	$-4.3846 \pm 6.58e+00$	arcseconds
Offset/σ	-0.75	-0.67	
Offset Distance	$5.0151 \pm 5.96e+00$		arcseconds
Offset Distance/σ	0.84		
3σ Radius	17.8924		arcseconds



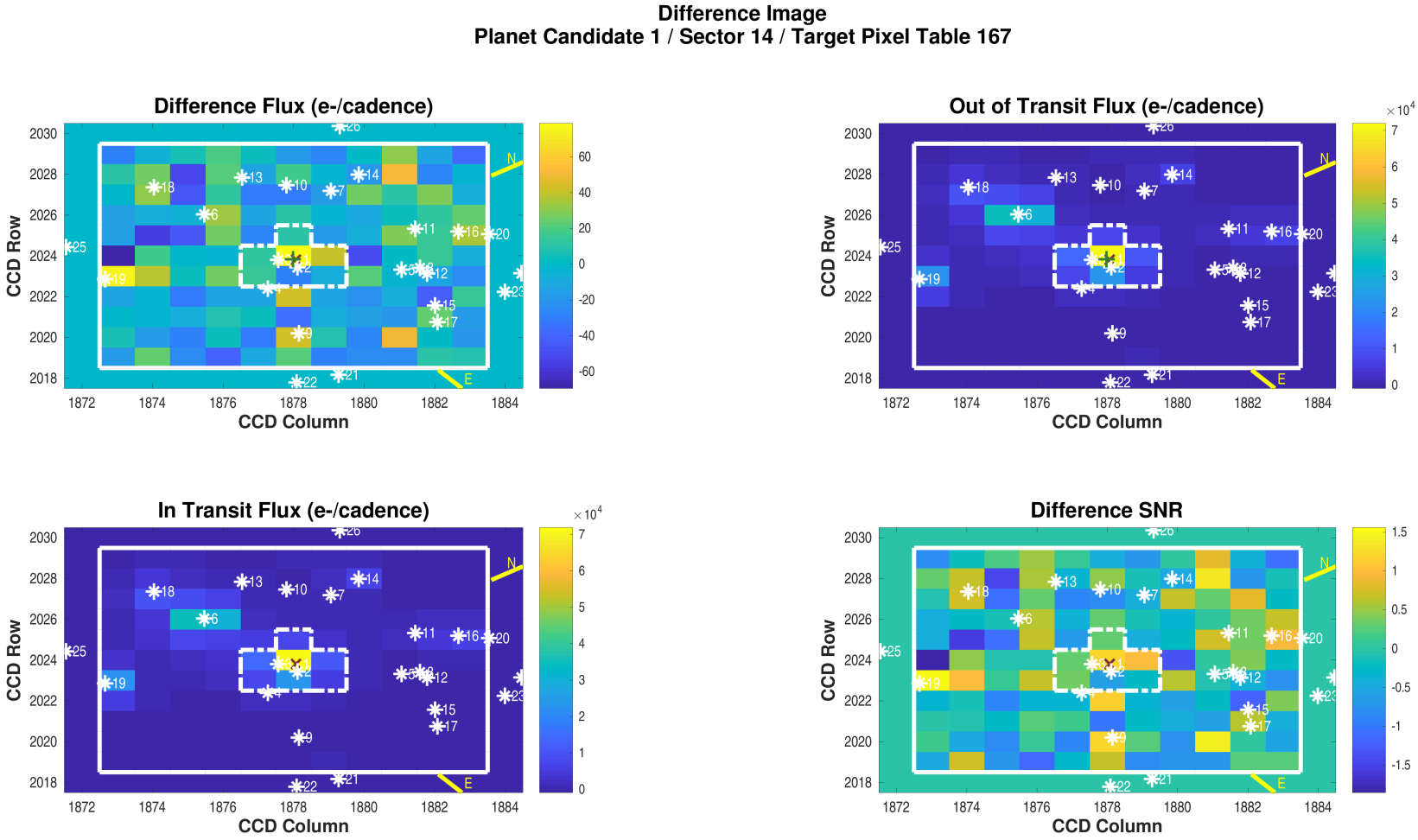
Difference image centroid offsets for target 356016119, planet candidate 1. Left: difference image PRF centroid offsets in RA and Dec with respect to the per sector out-of-transit centroids for the given target. Right: difference image PRF centroid offsets in RA and Dec with respect to the TC coordinates of the given target. Symbol key: green cross: per sector centroid offsets with 1-sigma error bars in RA and Dec; magenta cross: robust weighted mean offset over all sectors with 1-sigma error bars in RA and Dec; blue circle: 3-sigma radius of confusion for weighted mean offset; red asterisk: location of target star (out-of-transit centroid in left panel and TIC position in right panel); green asterisk: TIC location of target star with respect to out-of-transit centroid; blue asterisk: location of other TIC objects in the neighborhood. TIC ID and magnitude are noted in the text associated with each marked object. A constant error term of 2.5000 arcseconds has been added in quadrature to the computed uncertainty in the RA and Dec components of the robust mean offset.
Open `./planet-01/difference-image/0000000356016119-01-difference-image-centroid-offsets.fig`



Difference image centroid offsets for target 356016119, planet candidate 1, diplayed on survey image for given target. Left: difference image PRF centroid offsets in RA and Dec with respect to the per sector out-of-transit centroids for the given target. Right: difference image PRF centroid offsets in RA and Dec with respect to the TIC coordinates of the given target. Symbol key: green cross: per sector centroid offsets with 1-sigma error bars in RA and Dec; magenta cross: robust weighted mean offset over all sectors with 1-sigma error bars in RA and Dec; blue circle: 3-sigma radius of confusion for weighted mean offset; red asterisk: location of target star (out-of-transit centroid in left panel and TIC position in right panel); green asterisk: TIC location of target star with respect to out-of-transit centroid; blue asterisk: location of other TIC objects in the neighborhood. TIC ID and magnitude are noted in the text associated with each marked object. A constant error term of 2.5000 arcseconds has been added in quadrature to the computed uncertainty in the RA and Dec components of the robust mean offset.
Open `./planet-01/difference-image/0000000356016119-01-difference-image-centroid-offsets-survey.fig`

Difference Image Summary Metrics

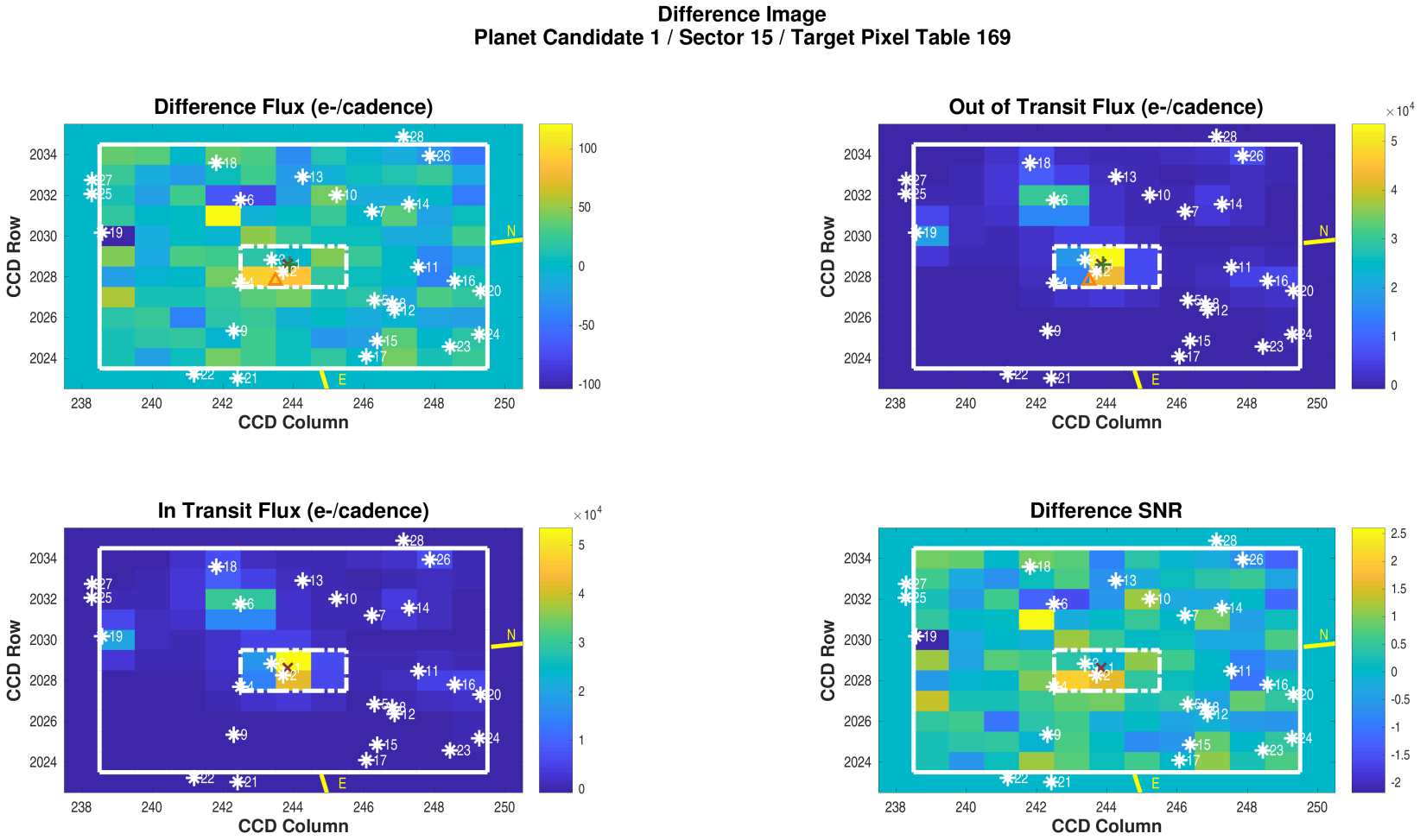
Number of Difference Images	Number of Metrics	Number of Good Metrics	Fraction of Good Metrics	Quality Threshold
12	9	0	0.0000	0.70



Difference image for target 356016119, planet candidate 1, sector 14, target pixel table 167. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 1; number of valid in-transit cadences = 37; number of in-transit cadence gaps = 0; number of valid out-of-transit cadences = 98; number of out-of-transit cadence gaps = 0. Difference image quality metric = N/A.
Open `./planet-01/difference-image/0000000356016119-01-difference-image-14-167.fig`

PRF Fit of the Difference Image

The out of transit image centroid and difference image centroid could not be calculated for target 356016119, planet candidate 1, in target table 167.



Difference image for target 356016119, planet candidate 1, sector 15, target pixel table 169. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 1; number of valid in-transit cadences = 36; number of in-transit cadence gaps = 1; number of valid out-of-transit cadences = 92; number of out-of-transit cadence gaps = 5. Difference image quality metric = 0.41 (not good).
Open `./planet-01/difference-image/0000000356016119-01-difference-image-15-169.fig`

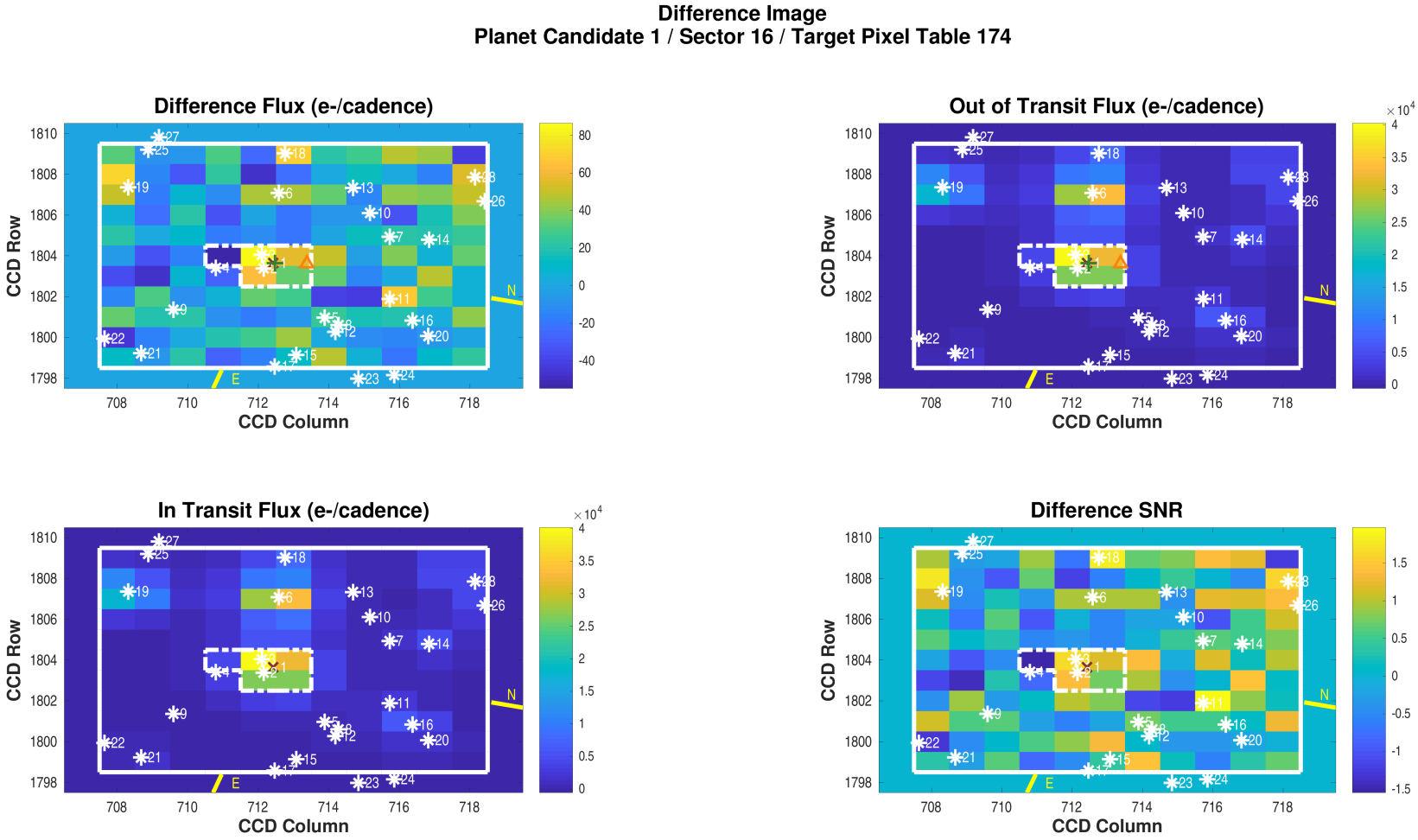
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$2028.59 \pm 2.45e-04$	$243.89 \pm 3.95e-04$	pixels	$254.14292606 \pm 2.59e-06$	$70.02758922 \pm 2.87e-06$	degrees
Difference Image Centroid	$2027.81 \pm 2.73e-01$	$243.49 \pm 1.99e-01$	pixels	$254.15500072 \pm 1.42e-03$	$70.02444239 \pm 1.31e-03$	degrees
Offset	$-0.7855 \pm 2.73e-01$	$-0.4011 \pm 1.99e-01$	pixels	$14.8475 \pm 1.79e+00$	$-11.3286 \pm 4.72e+00$	arcseconds
Offset/σ	-2.88	-2.02		8.28	-2.40	
Offset Distance	$0.8820 \pm 2.63e-01$		pixels	$18.6758 \pm 3.55e+00$		arcseconds
Offset Distance/σ	3.35			5.26		

Offset from the TIC RA and Dec converted to pixels via motion polynomials

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$2028.62 \pm 3.44e-04$	$243.84 \pm 3.50e-04$	pixels	$254.14234649 \pm 0.00e+00$	$70.02731576 \pm 0.00e+00$	degrees
Difference Image Centroid	$2027.81 \pm 2.73e-01$	$243.49 \pm 1.99e-01$	pixels	$254.15500072 \pm 1.42e-03$	$70.02444239 \pm 1.31e-03$	degrees
Offset	$-0.8104 \pm 2.73e-01$	$-0.3493 \pm 1.99e-01$	pixels	$15.5604 \pm 1.74e+00$	$-10.3441 \pm 4.72e+00$	arcseconds
Offset/σ	-2.97	-1.76		8.93	-2.19	
Offset Distance	$0.8825 \pm 2.66e-01$		pixels	$18.6849 \pm 3.35e+00$		arcseconds
Offset Distance/σ	3.32			5.58		



Difference image for target 356016119, planet candidate 1, sector 16, target pixel table 174. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 1; number of valid in-transit cadences = 37; number of in-transit cadence gaps = 0; number of valid out-of-transit cadences = 97; number of out-of-transit cadence gaps = 0. Difference image quality metric = 0.23 (not good).
Open `./planet-01/difference-image/0000000356016119-01-difference-image-16-174.fig`

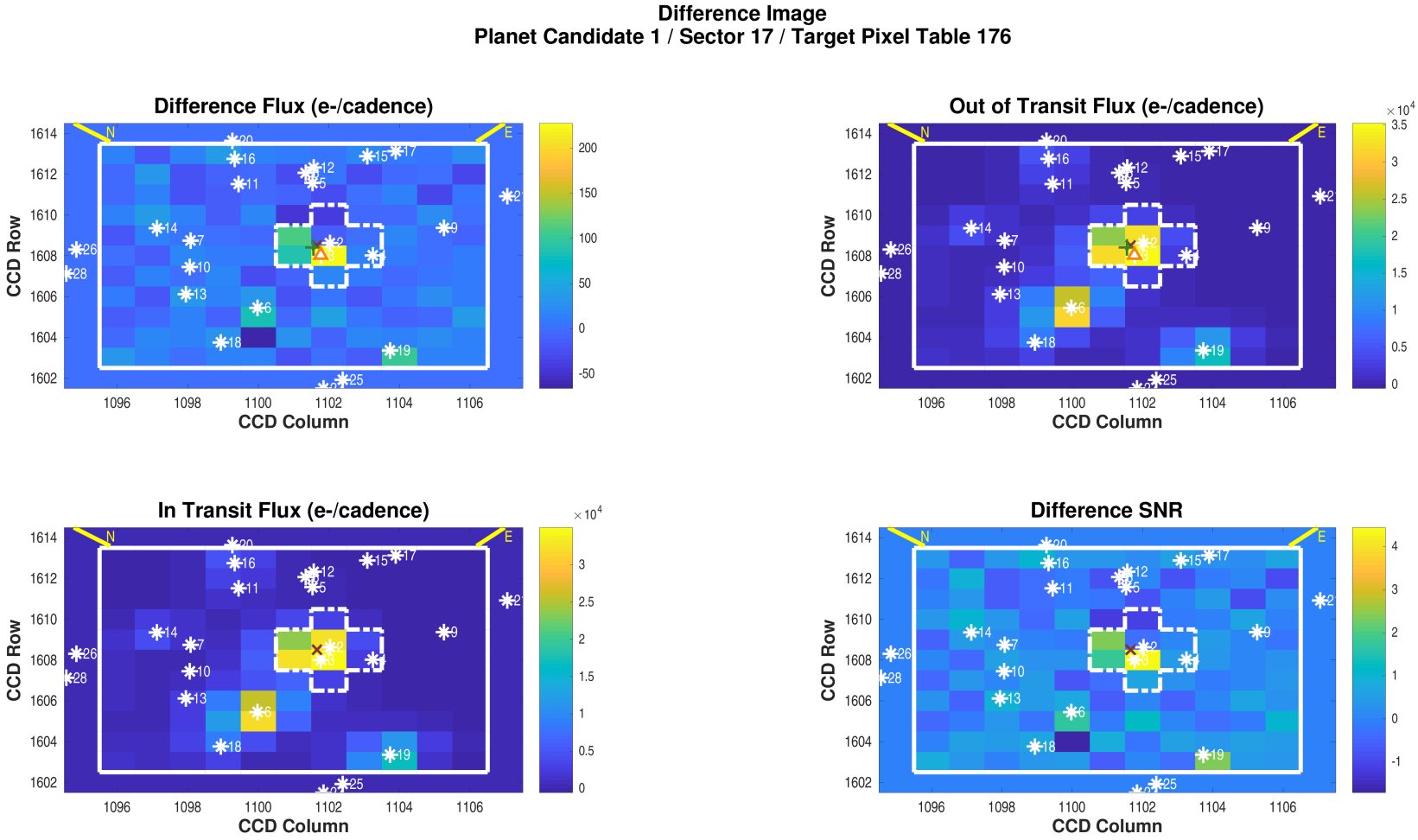
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$1803.64 \pm 2.74e-04$	$712.47 \pm 2.79e-04$	pixels	$254.14225857 \pm 1.78e-06$	$70.02763075 \pm 1.74e-06$	degrees
Difference Image Centroid	$1803.62 \pm 3.16e-01$	$713.37 \pm 3.11e-01$	pixels	$254.13831588 \pm 1.81e-03$	$70.03269549 \pm 1.78e-03$	degrees
Offset	$-0.0124 \pm 3.16e-01$	$0.8994 \pm 3.11e-01$	pixels	$-4.8481 \pm 2.22e+00$	$18.2331 \pm 6.41e+00$	arcseconds
Offset/σ	-0.04	2.89		-2.18	2.85	
Offset Distance	$0.8995 \pm 3.11e-01$		pixels	$18.8666 \pm 6.21e+00$		arcseconds
Offset Distance/σ	2.89			3.04		

Offset from the TIC RA and Dec converted to pixels via motion polynomials

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$1803.65 \pm 1.44e-04$	$712.42 \pm 1.24e-04$	pixels	$254.14234322 \pm 0.00e+00$	$70.02731576 \pm 0.00e+00$	degrees
Difference Image Centroid	$1803.62 \pm 3.16e-01$	$713.37 \pm 3.11e-01$	pixels	$254.13831588 \pm 1.81e-03$	$70.03269549 \pm 1.78e-03$	degrees
Offset	$-0.0222 \pm 3.16e-01$	$0.9528 \pm 3.11e-01$	pixels	$-4.9523 \pm 2.22e+00$	$19.3670 \pm 6.41e+00$	arcseconds
Offset/σ	-0.07	3.06		-2.23	3.02	
Offset Distance	$0.9531 \pm 3.11e-01$		pixels	$19.9901 \pm 6.23e+00$		arcseconds
Offset Distance/σ	3.06			3.21		



Difference image for target 356016119, planet candidate 1, sector 17, target pixel table 176. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 1; number of valid in-transit cadences = 36; number of in-transit cadence gaps = 1; number of valid out-of-transit cadences = 98; number of out-of-transit cadence gaps = 0. Difference image quality metric = 0.65 (not good).
Open `./planet-01/difference-image/0000000356016119-01-difference-image-17-176.fig`

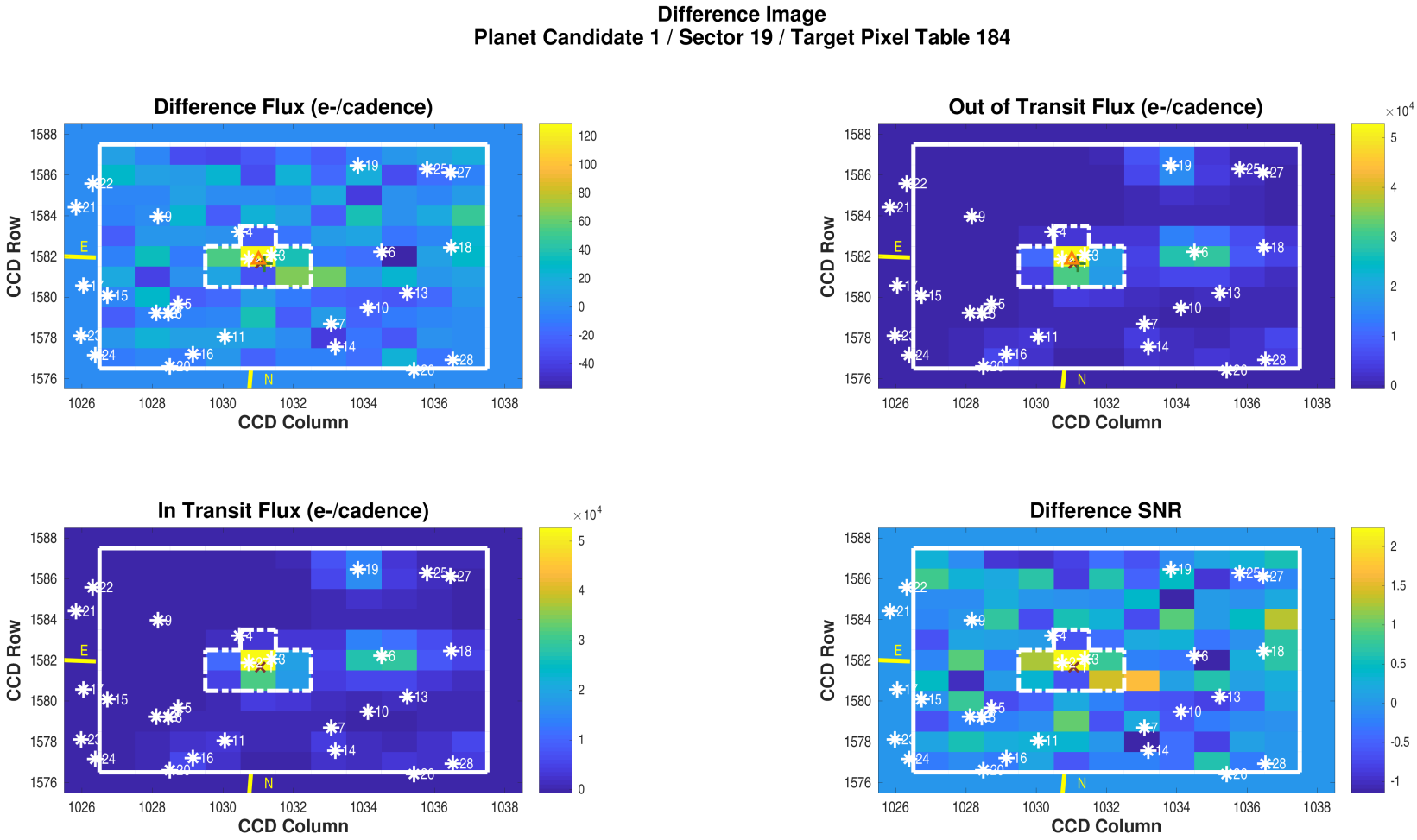
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$1608.41 \pm 2.89e-04$	$1101.56 \pm 3.04e-04$	pixels	$254.13998375 \pm 1.72e-06$	$70.02740325 \pm 1.88e-06$	degrees
Difference Image Centroid	$1608.03 \pm 2.11e-01$	$1101.77 \pm 1.97e-01$	pixels	$254.13754040 \pm 1.12e-03$	$70.02502975 \pm 1.21e-03$	degrees
Offset	$-0.3765 \pm 2.11e-01$	$0.2120 \pm 1.97e-01$	pixels	$-3.0045 \pm 1.38e+00$	$-8.5446 \pm 4.35e+00$	arcseconds
Offset/σ	-1.78	1.08		-2.18	-1.96	
Offset Distance	$0.4321 \pm 2.12e-01$		pixels	$9.0574 \pm 4.16e+00$		arcseconds
Offset Distance/σ	2.04			2.18		

Offset from the TIC RA and Dec converted to pixels via motion polynomials

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$1608.51 \pm 1.06e-04$	$1101.66 \pm 1.09e-04$	pixels	$254.14233999 \pm 0.00e+00$	$70.02731576 \pm 0.00e+00$	degrees
Difference Image Centroid	$1608.03 \pm 2.11e-01$	$1101.77 \pm 1.97e-01$	pixels	$254.13754040 \pm 1.12e-03$	$70.02502975 \pm 1.21e-03$	degrees
Offset	$-0.4713 \pm 2.11e-01$	$0.1078 \pm 1.97e-01$	pixels	$-5.9019 \pm 1.38e+00$	$-8.2297 \pm 4.35e+00$	arcseconds
Offset/σ	-2.23	0.55		-4.29	-1.89	
Offset Distance	$0.4834 \pm 2.13e-01$		pixels	$10.1272 \pm 3.68e+00$		arcseconds
Offset Distance/σ	2.27			2.75		



Difference image for target 356016119, planet candidate 1, sector 19, target pixel table 184. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 1; number of valid in-transit cadences = 38; number of in-transit cadence gaps = 0; number of valid out-of-transit cadences = 98; number of out-of-transit cadence gaps = 0. Difference image quality metric = 0.50 (not good).
Open `./planet-01/difference-image/0000000356016119-01-difference-image-19-184.fig`

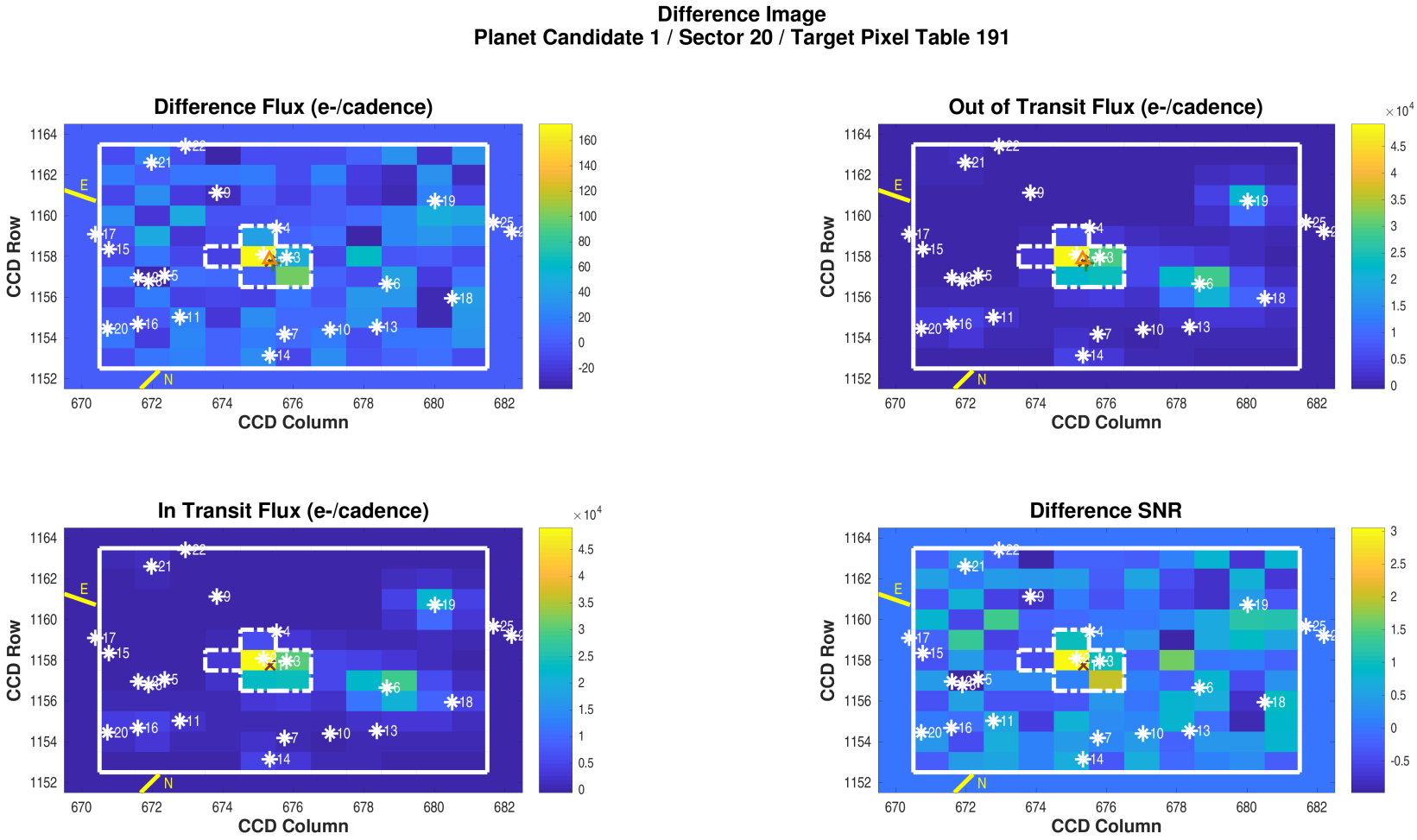
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$1581.64 \pm 3.09e-04$	$1031.18 \pm 3.94e-04$	pixels	$254.14029194 \pm 2.37e-06$	$70.02740584 \pm 1.87e-06$	degrees
Difference Image Centroid	$1581.84 \pm 4.25e-01$	$1031.01 \pm 3.93e-01$	pixels	$254.14329443 \pm 2.23e-03$	$70.02629677 \pm 2.44e-03$	degrees
Offset	$0.2014 \pm 4.25e-01$	$-0.1682 \pm 3.93e-01$	pixels	$3.6920 \pm 2.74e+00$	$-3.9926 \pm 8.80e+00$	arcseconds
Offset/σ	0.47	−0.43		1.35	−0.45	
Offset Distance	$0.2624 \pm 3.99e-01$		pixels	$5.4380 \pm 6.58e+00$		arcseconds
Offset Distance/σ	0.66			0.83		

Offset from the TIC RA and Dec converted to pixels via motion polynomials

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$1581.66 \pm 1.02e-04$	$1031.06 \pm 1.38e-04$	pixels	$254.14233367 \pm 0.00e+00$	$70.02731576 \pm 0.00e+00$	degrees
Difference Image Centroid	$1581.84 \pm 4.25e-01$	$1031.01 \pm 3.93e-01$	pixels	$254.14329443 \pm 2.23e-03$	$70.02629677 \pm 2.44e-03$	degrees
Offset	$0.1786 \pm 4.25e-01$	$-0.0480 \pm 3.93e-01$	pixels	$1.1814 \pm 2.74e+00$	$-3.6684 \pm 8.80e+00$	arcseconds
Offset/σ	0.42	−0.12		0.43	−0.42	
Offset Distance	$0.1849 \pm 4.16e-01$		pixels	$3.8539 \pm 8.35e+00$		arcseconds
Offset Distance/σ	0.44			0.46		



Difference image for target 356016119, planet candidate 1, sector 20, target pixel table 191. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 1; number of valid in-transit cadences = 36; number of in-transit cadence gaps = 1; number of valid out-of-transit cadences = 97; number of out-of-transit cadence gaps = 1. Difference image quality metric = 0.58 (not good).
Open `./planet-01/difference-image/0000000356016119-01-difference-image-20-191.fig`

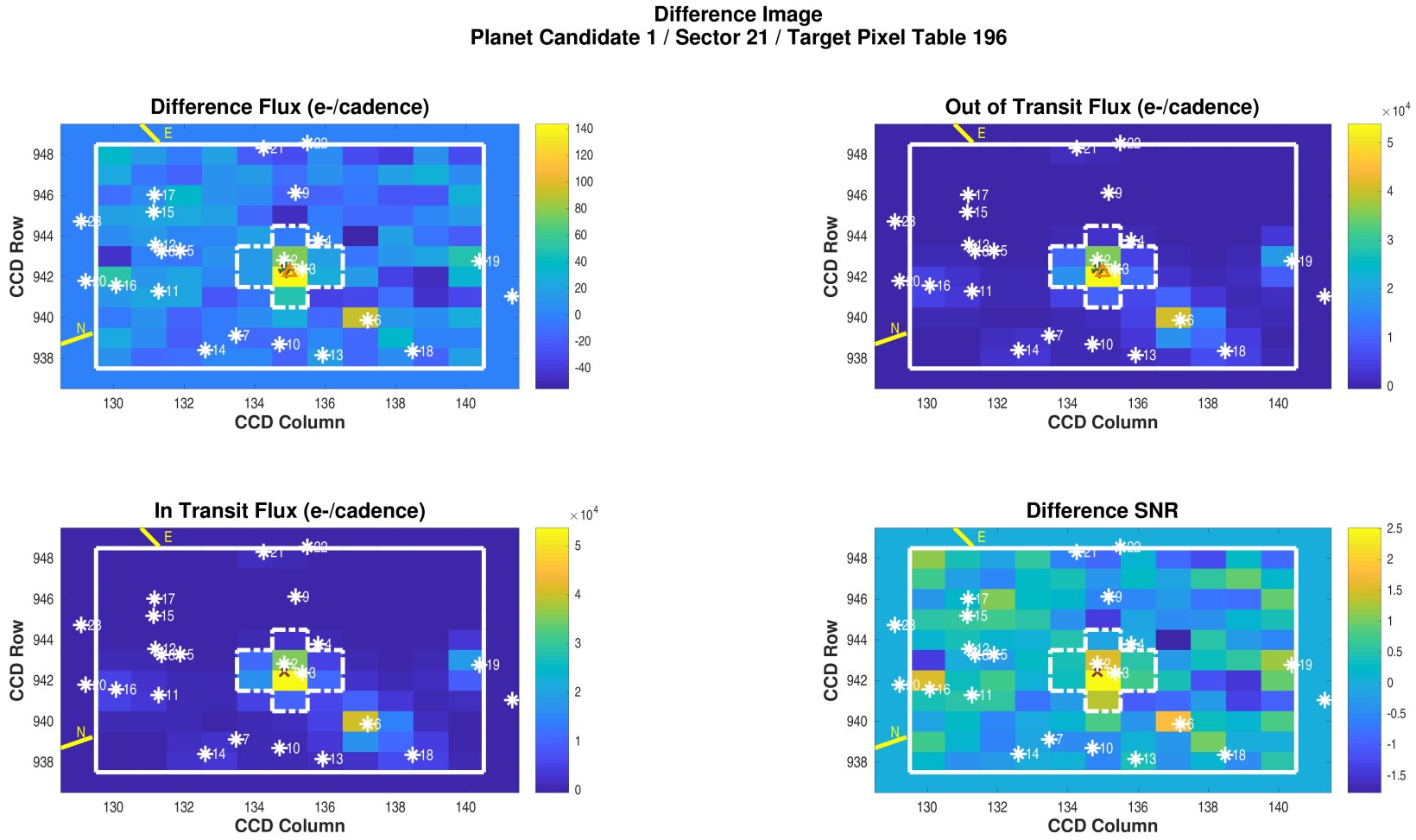
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$1157.67 \pm 3.61e-04$	$675.41 \pm 3.14e-04$	pixels	$254.14052863 \pm 1.93e-06$	$70.02750417 \pm 2.24e-06$	degrees
Difference Image Centroid	$1157.86 \pm 2.68e-01$	$675.32 \pm 2.35e-01$	pixels	$254.14345568 \pm 1.28e-03$	$70.02684307 \pm 1.59e-03$	degrees
Offset	$0.1876 \pm 2.68e-01$	$-0.0912 \pm 2.35e-01$	pixels	$3.5992 \pm 1.58e+00$	$-2.3799 \pm 5.71e+00$	arcseconds
Offset/σ	0.70	−0.39		2.28	−0.42	
Offset Distance	$0.2086 \pm 2.46e-01$		pixels	$4.3149 \pm 3.50e+00$		arcseconds
Offset Distance/σ	0.85			1.23		

Offset from the TIC RA and Dec converted to pixels via motion polynomials

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$1157.75 \pm 1.53e-04$	$675.34 \pm 1.20e-04$	pixels	$254.14233034 \pm 0.00e+00$	$70.02731577 \pm 0.00e+00$	degrees
Difference Image Centroid	$1157.86 \pm 2.68e-01$	$675.32 \pm 2.35e-01$	pixels	$254.14345568 \pm 1.28e-03$	$70.02684307 \pm 1.59e-03$	degrees
Offset	$0.1045 \pm 2.68e-01$	$-0.0160 \pm 2.35e-01$	pixels	$1.3838 \pm 1.58e+00$	$-1.7017 \pm 5.71e+00$	arcseconds
Offset/σ	0.39	−0.07		0.88	−0.30	
Offset Distance	$0.1058 \pm 2.61e-01$		pixels	$2.1933 \pm 4.61e+00$		arcseconds
Offset Distance/σ	0.40			0.48		



Difference image for target 356016119, planet candidate 1, sector 21, target pixel table 196. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 1; number of valid in-transit cadences = 37; number of in-transit cadence gaps = 0; number of valid out-of-transit cadences = 97; number of out-of-transit cadence gaps = 1. Difference image quality metric = 0.56 (not good).
Open `./planet-01/difference-image/0000000356016119-01-difference-image-21-196.fig`

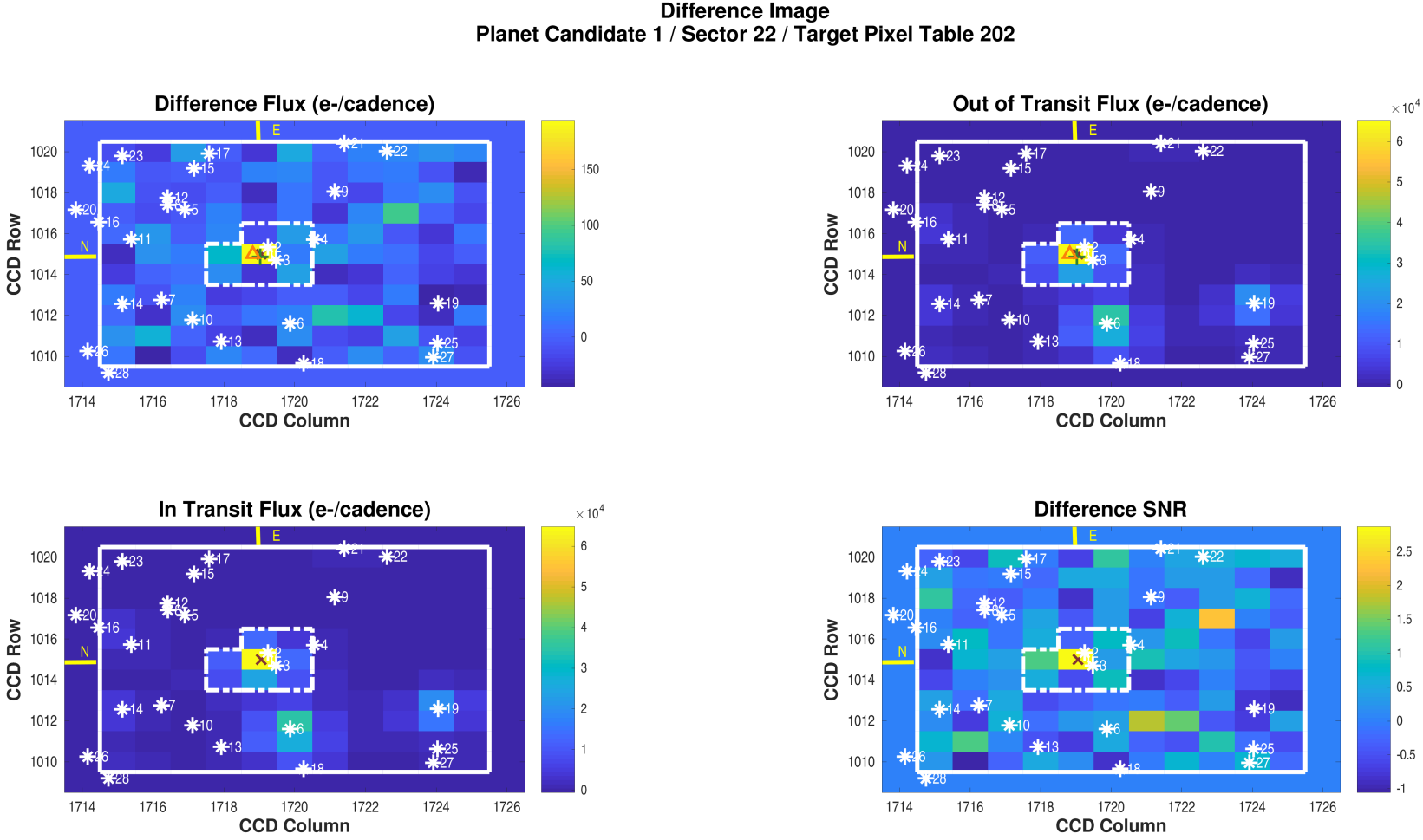
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$942.33 \pm 3.26e-04$	$134.90 \pm 3.07e-04$	pixels	$254.14031011 \pm 2.03e-06$	$70.02732689 \pm 2.07e-06$	degrees
Difference Image Centroid	$942.23 \pm 2.87e-01$	$134.99 \pm 2.91e-01$	pixels	$254.13803959 \pm 1.55e-03$	$70.02718158 \pm 1.75e-03$	degrees
Offset	$-0.1041 \pm 2.87e-01$	$0.0888 \pm 2.91e-01$	pixels	$-2.7920 \pm 1.91e+00$	$-0.5231 \pm 6.31e+00$	arcseconds
Offset/σ	-0.36	0.30		-1.47	-0.08	
Offset Distance	$0.1368 \pm 2.71e-01$		pixels	$2.8405 \pm 2.12e+00$		arcseconds
Offset Distance/σ	0.51			1.34		

Offset from the TIC RA and Dec converted to pixels via motion polynomials

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$942.44 \pm 1.80e-04$	$134.84 \pm 1.59e-04$	pixels	$254.14232684 \pm 0.00e+00$	$70.02731577 \pm 0.00e+00$	degrees
Difference Image Centroid	$942.23 \pm 2.87e-01$	$134.99 \pm 2.91e-01$	pixels	$254.13803959 \pm 1.55e-03$	$70.02718158 \pm 1.75e-03$	degrees
Offset	$-0.2087 \pm 2.87e-01$	$0.1470 \pm 2.91e-01$	pixels	$-5.2719 \pm 1.90e+00$	$-0.4831 \pm 6.31e+00$	arcseconds
Offset/σ	-0.73	0.50		-2.77	-0.08	
Offset Distance	$0.2553 \pm 2.71e-01$		pixels	$5.2939 \pm 1.94e+00$		arcseconds
Offset Distance/σ	0.94			2.74		



Difference image for target 356016119, planet candidate 1, sector 22, target pixel table 202. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 1; number of valid in-transit cadences = 37; number of in-transit cadence gaps = 1; number of valid out-of-transit cadences = 97; number of out-of-transit cadence gaps = 1. Difference image quality metric = 0.51 (not good).
Open `./planet-01/difference-image/0000000356016119-01-difference-image-22-202.fig`

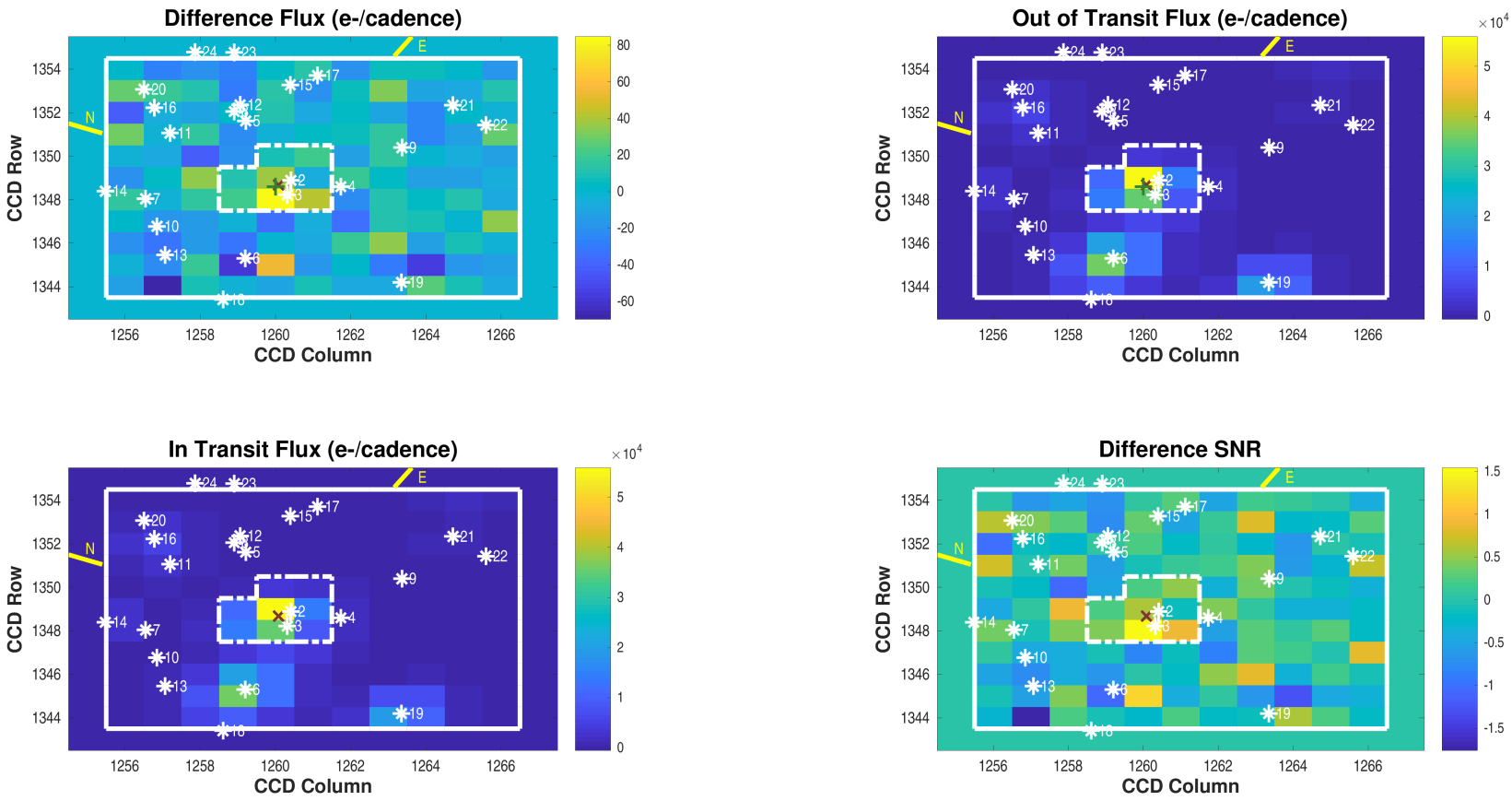
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$1014.86 \pm 4.13e-04$	$1719.02 \pm 4.19e-04$	pixels	$254.14009467 \pm 2.47e-06$	$70.02751058 \pm 2.47e-06$	degrees
Difference Image Centroid	$1015.00 \pm 3.09e-01$	$1718.82 \pm 2.44e-01$	pixels	$254.14254225 \pm 1.78e-03$	$70.02868209 \pm 1.39e-03$	degrees
Offset	$0.1402 \pm 3.09e-01$	$-0.2037 \pm 2.44e-01$	pixels	$3.0097 \pm 2.18e+00$	$4.2175 \pm 4.99e+00$	arcseconds
Offset/σ	0.45	−0.84		1.38	0.84	
Offset Distance	$0.2473 \pm 2.91e-01$		pixels	$5.1812 \pm 4.50e+00$		arcseconds
Offset Distance/σ	0.85			1.15		

Offset from the TIC RA and Dec converted to pixels via motion polynomials

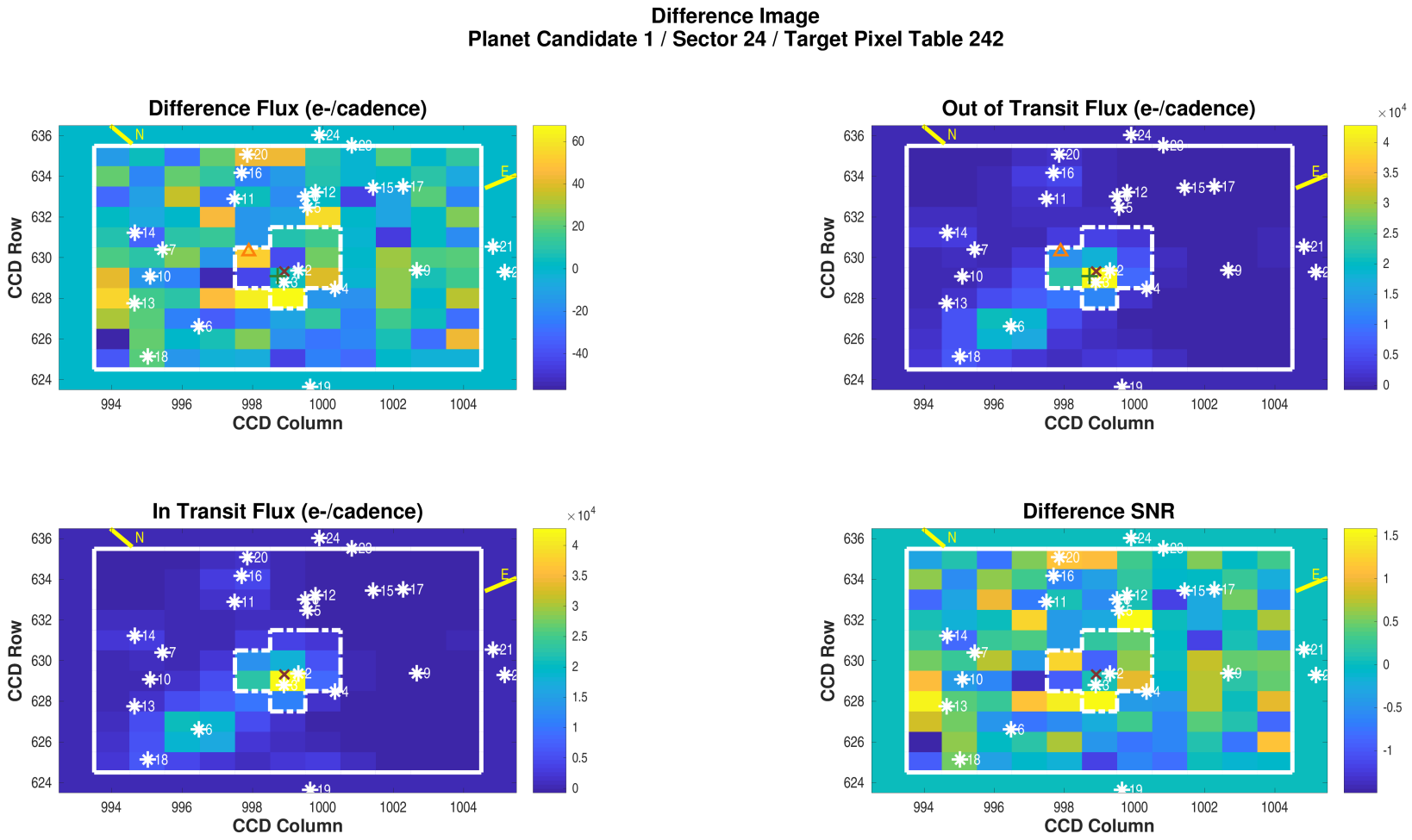
	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$1014.99 \pm 1.21e-04$	$1719.06 \pm 1.11e-04$	pixels	$254.14232329 \pm 0.00e+00$	$70.02731577 \pm 0.00e+00$	degrees
Difference Image Centroid	$1015.00 \pm 3.09e-01$	$1718.82 \pm 2.44e-01$	pixels	$254.14254225 \pm 1.78e-03$	$70.02868209 \pm 1.39e-03$	degrees
Offset	$0.0071 \pm 3.09e-01$	$-0.2352 \pm 2.44e-01$	pixels	$0.2692 \pm 2.18e+00$	$4.9188 \pm 4.99e+00$	arcseconds
Offset/σ	0.02	−0.97		0.12	0.99	
Offset Distance	$0.2353 \pm 2.46e-01$		pixels	$4.9261 \pm 5.01e+00$		arcseconds
Offset Distance/σ	0.96			0.98		



Difference image for target 356016119, planet candidate 1, sector 23, target pixel table 221. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 1; number of valid in-transit cadences = 37; number of in-transit cadence gaps = 0; number of valid out-of-transit cadences = 97; number of out-of-transit cadence gaps = 0. Difference image quality metric = N/A.
Open `./planet-01/difference-image/0000000356016119-01-difference-image-23-221.fig`

PRF Fit of the Difference Image

The out of transit image centroid and difference image centroid could not be calculated for target 356016119, planet candidate 1, in target table 221.



Difference image for target 356016119, planet candidate 1, sector 24, target pixel table 242. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 1; number of valid in-transit cadences = 36; number of in-transit cadence gaps = 1; number of valid out-of-transit cadences = 97; number of out-of-transit cadence gaps = 1. Difference image quality metric = 0.05 (not good).
Open `./planet-01/difference-image/0000000356016119-01-difference-image-24-242.fig`

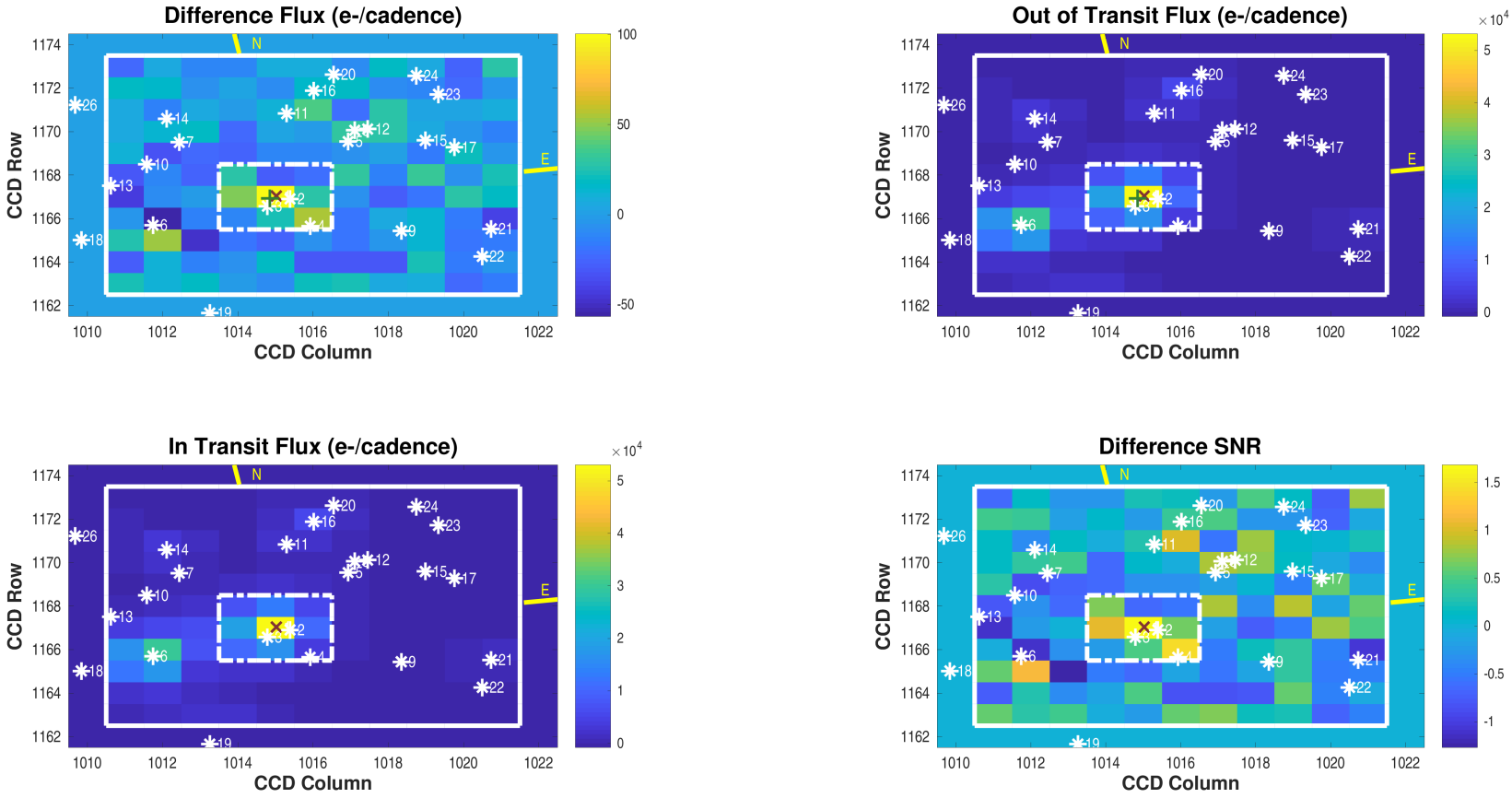
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$629.09 \pm 4.77e-04$	$998.72 \pm 4.32e-04$	pixels	$254.13761639 \pm 2.61e-06$	$70.02685992 \pm 2.86e-06$	degrees
Difference Image Centroid	$630.29 \pm 2.20e+00$	$997.89 \pm 2.76e+00$	pixels	$254.13772644 \pm 1.42e-02$	$70.03520014 \pm 1.45e-02$	degrees
Offset	$1.2061 \pm 2.20e+00$	$-0.8226 \pm 2.76e+00$	pixels	$0.1353 \pm 1.75e+01$	$30.0248 \pm 5.21e+01$	arcseconds
Offset/σ	0.55	−0.30		0.01	0.58	
Offset Distance	$1.4599 \pm 2.44e+00$		pixels	$30.0251 \pm 5.21e+01$		arcseconds
Offset Distance/σ	0.60			0.58		

Offset from the TIC RA and Dec converted to pixels via motion polynomials

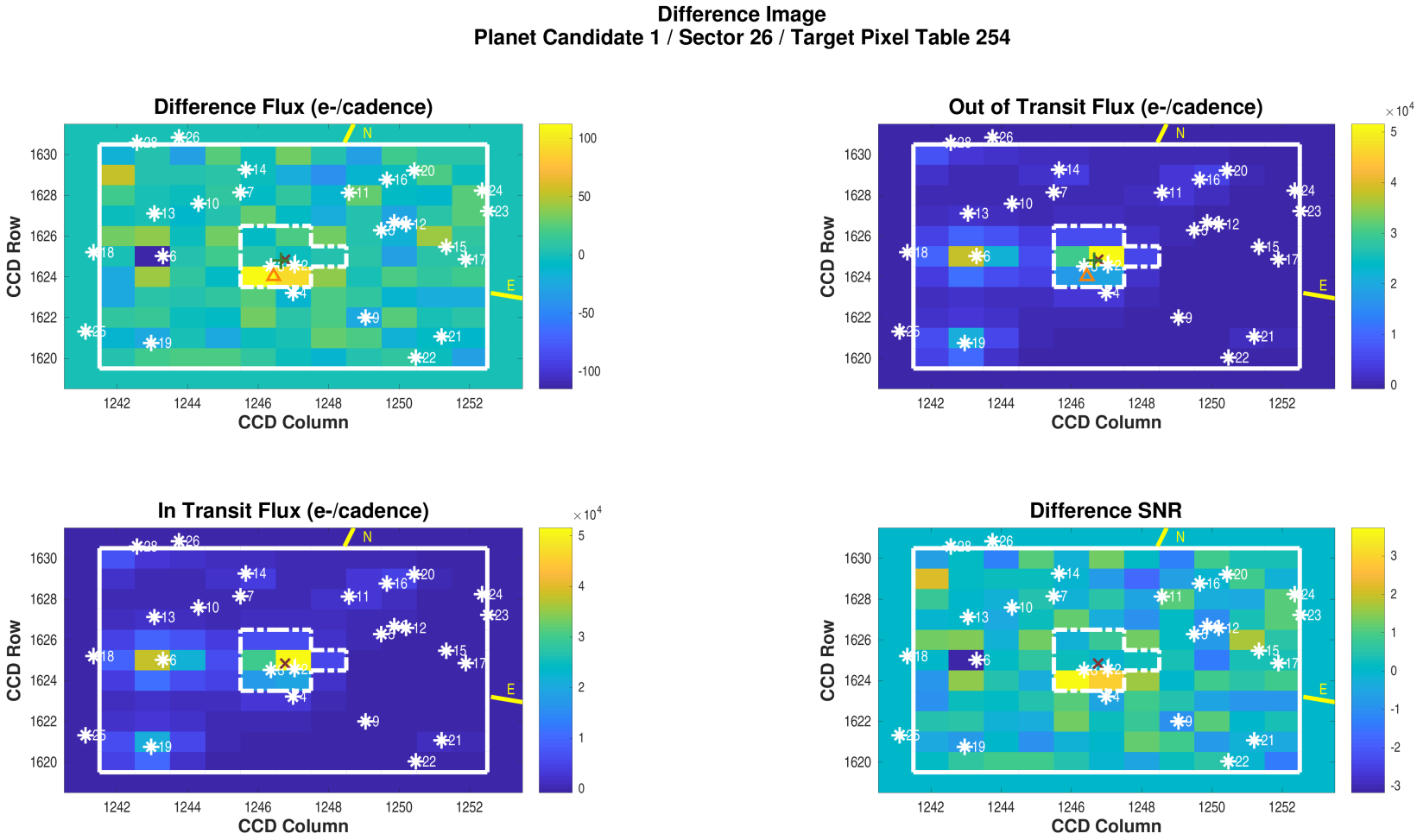
	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$629.32 \pm 1.44e-04$	$998.91 \pm 1.36e-04$	pixels	$254.14231639 \pm 0.00e+00$	$70.02731577 \pm 0.00e+00$	degrees
Difference Image Centroid	$630.29 \pm 2.20e+00$	$997.89 \pm 2.76e+00$	pixels	$254.13772644 \pm 1.42e-02$	$70.03520014 \pm 1.45e-02$	degrees
Offset	$0.9712 \pm 2.20e+00$	$-1.0126 \pm 2.76e+00$	pixels	$-5.6441 \pm 1.75e+01$	$28.3837 \pm 5.21e+01$	arcseconds
Offset/σ	0.44	−0.37		−0.32	0.54	
Offset Distance	$1.4031 \pm 2.56e+00$		pixels	$28.9395 \pm 5.20e+01$		arcseconds
Offset Distance/σ	0.55			0.56		



Difference image for target 356016119, planet candidate 1, sector 25, target pixel table 245. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 1; number of valid in-transit cadences = 37; number of in-transit cadence gaps = 0; number of valid out-of-transit cadences = 91; number of out-of-transit cadence gaps = 6. Difference image quality metric = N/A.
Open `./planet-01/difference-image/0000000356016119-01-difference-image-25-245.fig`

PRF Fit of the Difference Image

The out of transit image centroid and difference image centroid could not be calculated for target 356016119, planet candidate 1, in target table 245.



Difference image for target 356016119, planet candidate 1, sector 26, target pixel table 254. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 2; number of valid in-transit cadences = 76; number of in-transit cadence gaps = 0; number of valid out-of-transit cadences = 196; number of out-of-transit cadence gaps = 0. Difference image quality metric = 0.50 (not good).
Open `./planet-01/difference-image/0000000356016119-01-difference-image-26-254.fig`

PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$1624.80 \pm 2.36e-04$	$1246.65 \pm 2.12e-04$	pixels	$254.14062174 \pm 1.44e-06$	$70.02689987 \pm 1.45e-06$	degrees
Difference Image Centroid	$1624.02 \pm 2.75e-01$	$1246.44 \pm 1.55e-01$	pixels	$254.14089053 \pm 1.00e-03$	$70.02224171 \pm 1.50e-03$	degrees
Offset	$-0.7739 \pm 2.75e-01$	$-0.2096 \pm 1.55e-01$	pixels	$0.3305 \pm 1.23e+00$	$-16.7694 \pm 5.40e+00$	arcseconds
Offset/σ	-2.82	-1.35		0.27	-3.11	
Offset Distance	$0.8018 \pm 2.64e-01$		pixels	$16.7726 \pm 5.40e+00$		arcseconds
Offset Distance/σ	3.03			3.10		

Offset from the TIC RA and Dec converted to pixels via motion polynomials

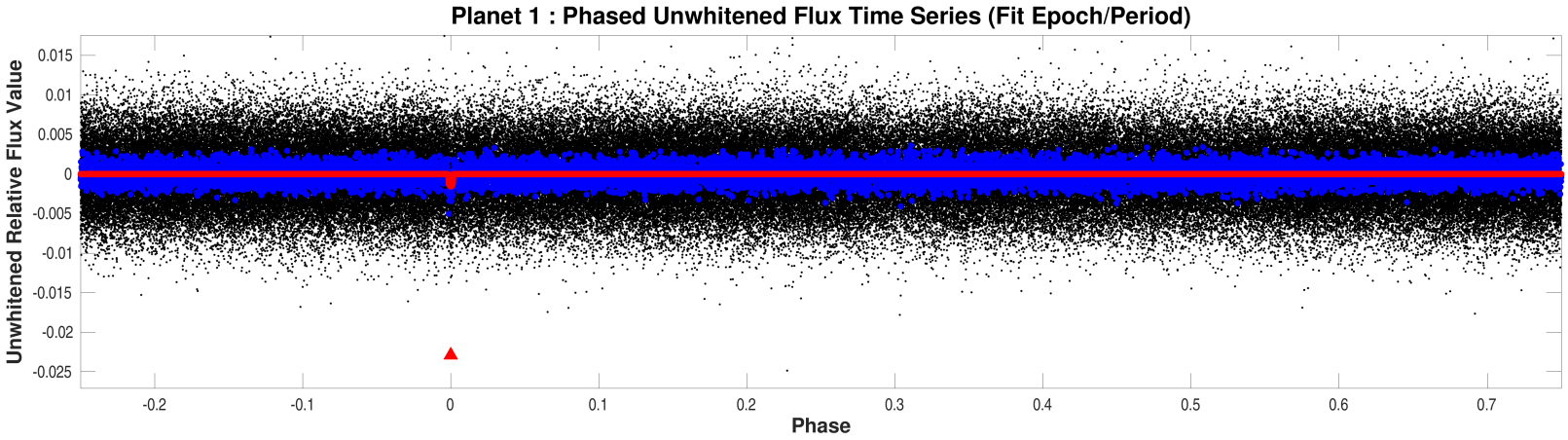
	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$1624.84 \pm 1.15e-04$	$1246.76 \pm 1.18e-04$	pixels	$254.14230978 \pm 0.00e+00$	$70.02731577 \pm 0.00e+00$	degrees
Difference Image Centroid	$1624.02 \pm 2.75e-01$	$1246.44 \pm 1.55e-01$	pixels	$254.14089053 \pm 1.00e-03$	$70.02224171 \pm 1.50e-03$	degrees
Offset	$-0.8158 \pm 2.75e-01$	$-0.3254 \pm 1.55e-01$	pixels	$-1.7452 \pm 1.23e+00$	$-18.2666 \pm 5.40e+00$	arcseconds
Offset/σ	-2.97	-2.10		-1.41	-3.39	
Offset Distance	$0.8783 \pm 2.56e-01$		pixels	$18.3498 \pm 5.33e+00$		arcseconds
Offset Distance/σ	3.43			3.45		

5.2 Difference Image TIC Key

Index	Catalog ID	Mag	RA (degrees)	Dec (degrees)	Distance (arcsec)
1	356016119	12.267	254.14232990	70.02731577	0.00
2	1271291869	20.475	254.14797358	70.02619842	8.02
3	356016117	16.309	254.13724925	70.02490070	10.71
4	1271291866	18.030	254.15370432	70.01856957	34.45
5	1271291870	20.730	254.17995837	70.03968575	64.22
6	356016115	12.732	254.08491572	70.02285539	72.40
7	1271291941	18.802	254.10584064	70.04384383	74.52
8	1271291871	19.830	254.18416056	70.04244730	74.92
9	1271291867	19.489	254.19307368	70.01499697	76.55
10	1271291940	19.942	254.08904810	70.03888679	77.64
11	356016129	15.913	254.15621038	70.04859349	78.48
12	356016125	17.896	254.18997100	70.04245767	80.02
13	311236108	17.735	254.07091776	70.03424379	91.29
14	356016134	14.941	254.10297944	70.05031034	95.89
15	1271291872	19.919	254.21392792	70.03799878	96.07
16	356016136	14.762	254.17068183	70.05385361	101.70
17	1271291868	20.601	254.22589220	70.03542998	106.82
18	356016113	14.641	254.05190956	70.02081369	113.62
19	356016101	13.361	254.09987244	69.99847895	116.20
20	1271291942	19.484	254.18128316	70.05754960	118.92
21	356016109	15.946	254.23263148	70.01317835	122.15
22	1271291854	19.865	254.22559512	70.00623091	127.46
23	356016132	17.257	254.22500449	70.04967713	129.67
24	1271291874	19.864	254.21741306	70.05509320	136.10
25	356016103	17.983	254.06684478	69.99875012	138.53
26	356016139	14.940	254.06442767	70.05620301	141.39
27	1271291864	18.292	254.05545132	69.99950425	146.41
28	1271291937	18.834	254.04626960	70.05284896	149.67

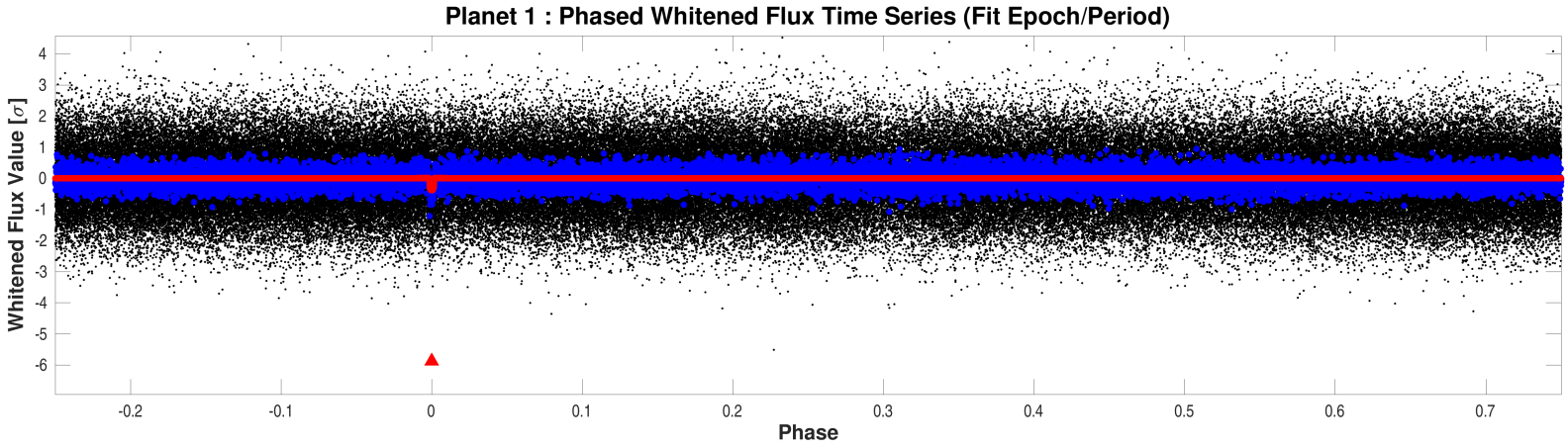
RA, Dec and Distances are corrected for proper motion. This table may not contain all of the objects shown.

6 Phased Light Curves

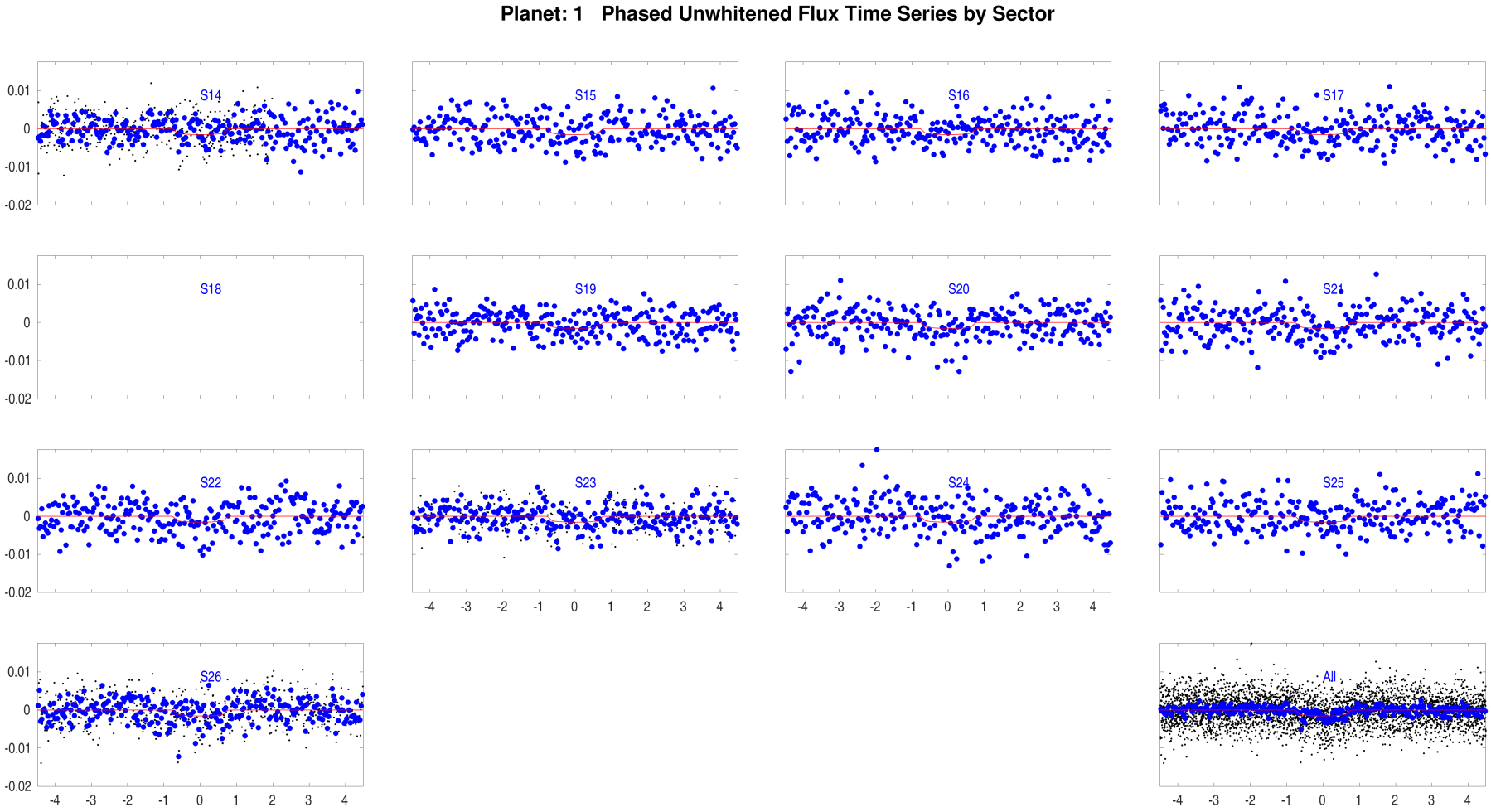


Phased unwhitened flux time series is plotted in black dots. When all transits fit completed with full or secondary convergence, the phase is determined with the fitted epoch and period; otherwise, the phase is determined with the TPS epoch and period. The values of the phased unwhitened flux time series averaged in one cadence wide bins are plotted in bigger blue dots. When all transits fit completes with full or secondary convergence, the averaged values of the phased unwhitened fitted model light curve are plotted in red dots. Transit event markers in different colors indicate the locations of the transits of all planet candidates. The transits of the same planet candidate are labeled with the markers of the same color, for example, blue markers for transits of plane candidate #1, red markers for transits of planet candidate #2, etc.

Open `./summary-plots/0000000356016119-01-phased-unwhitened-flux-time-series.fig`



Phased whitened flux time series is plotted in black dots. When all transits fit completed with full or secondary convergence, the phase is determined with the fitted epoch and period; otherwise, the phase is determined with the TPS epoch and period. The values of the phased whitened flux time series averaged in one cadence wide bins are plotted in bigger blue dots. When all transits fit completes with full or secondary convergence, the averaged values of the phased whitened fitted model light curve are plotted in red dots. Transit event markers in different colors indicate the locations of the transits of all planet candidates. The transits of the same planet candidate are labeled with the markers of the same color, for example, blue markers for transits of plane candidate #1, red markers for transits of planet candidate #2, etc.
Open `./summary-plots/00000003560161119-01-phased-whitened-flux-time-series.fig`



Phased unwhitened flux time series by sector for target 356016119, planet candidate 1. Period = 18.7917 days; transit epoch = 1691.3292 BTJD.
Open `./summary-plots/0000000356016119-01-phased-unwhitened-flux-time-series-by-sector.fig`

7 Planet Candidate 1

7.1 Model Fitter: All Transits

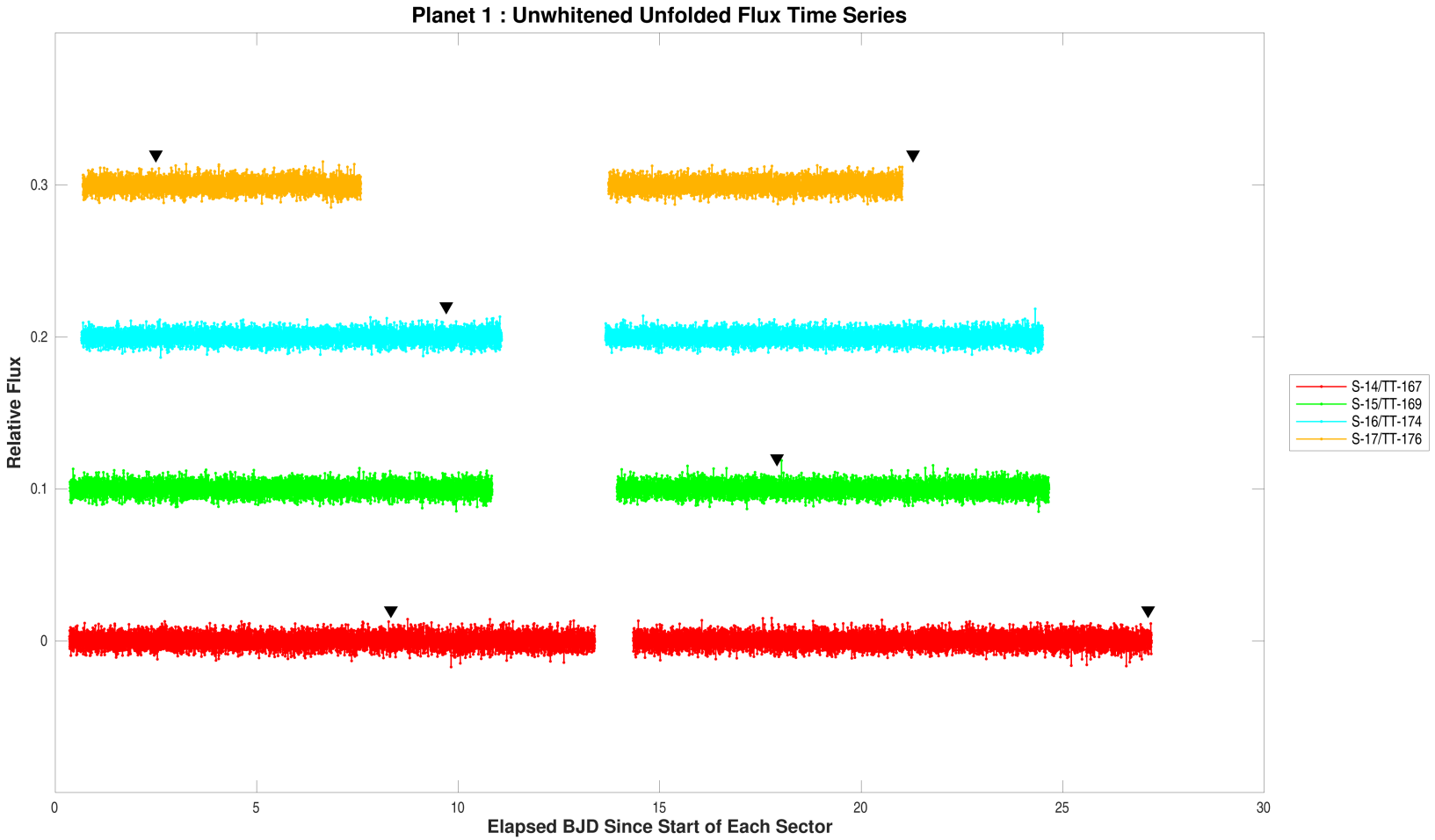
Model Characteristic	Name
Transit Model	mandel-agol_geometric_transit_model
Limb Darkening Model	claret_tess_nonlinear_limb_darkening_model

TCE Parameter	Value	Units
Trial Transit Pulse Duration	1.5	hours
Transit Epoch	1691.3316994	TJD
Orbital Period	18.7915783	days
Maximum SES	5.4	
Maximum MES	7.7	
Robust Statistic	7.0	
Chi Square Goodness of Fit Statistic (DoF)	491.7 (580)	
Chi Square2 Statistic (DoF)	14.2 (17.2)	
Threshold for Desired PFA		

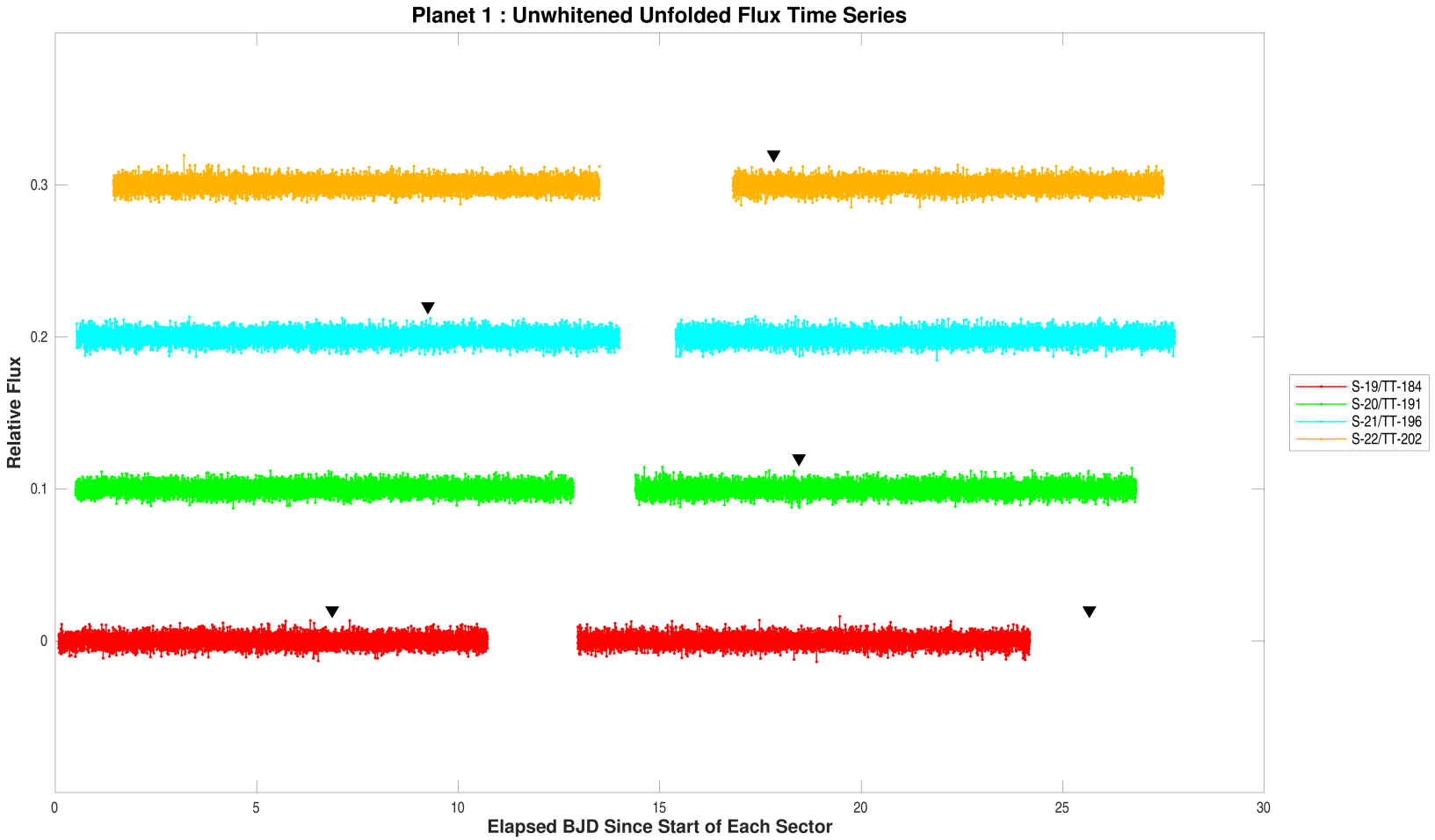
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	8.2		
Orbital Period	18.7917401	3.1155e-04	days
Transit Epoch	1691.3292168	3.2339e-03	BTJD
Impact Parameter	0.5558	4.3411e+00	
Planet Radius to Star Radius Ratio	0.0375060	2.4614e-02	
Semi-major Axis to Star Radius Ratio	84.1571	2.9269e+02	
Planet Radius	1.5427	1.0135e+00	Earth radii
Semi-major Axis	0.0989	1.9696e-03	AU
Effective Stellar Flux	1.8566	3.3931e-01	Goldilocks
Equilibrium Temperature	298	1.3603e+01	Kelvin
Stellar Density	22.6764	2.3660e+02	Solar density
Transit Depth	1551	2.0192e+02	ppm
Transit Duration	1.4945	5.5699e-01	hours
Transit Ingress Duration	0.0770	5.8811e-01	hours
Eccentricity	0.0000	0.0000e+00	
Peri Longitude	0.0000	0.0000e+00	degrees
Model Chi Square Statistic (DoF)	2579.5 (3203.5)		
Model Chi Square Goodness of Fit Statistic (DoF)	391.8 (720)		
Model Chi Square2 Statistic (DoF)	10.3 (14)		

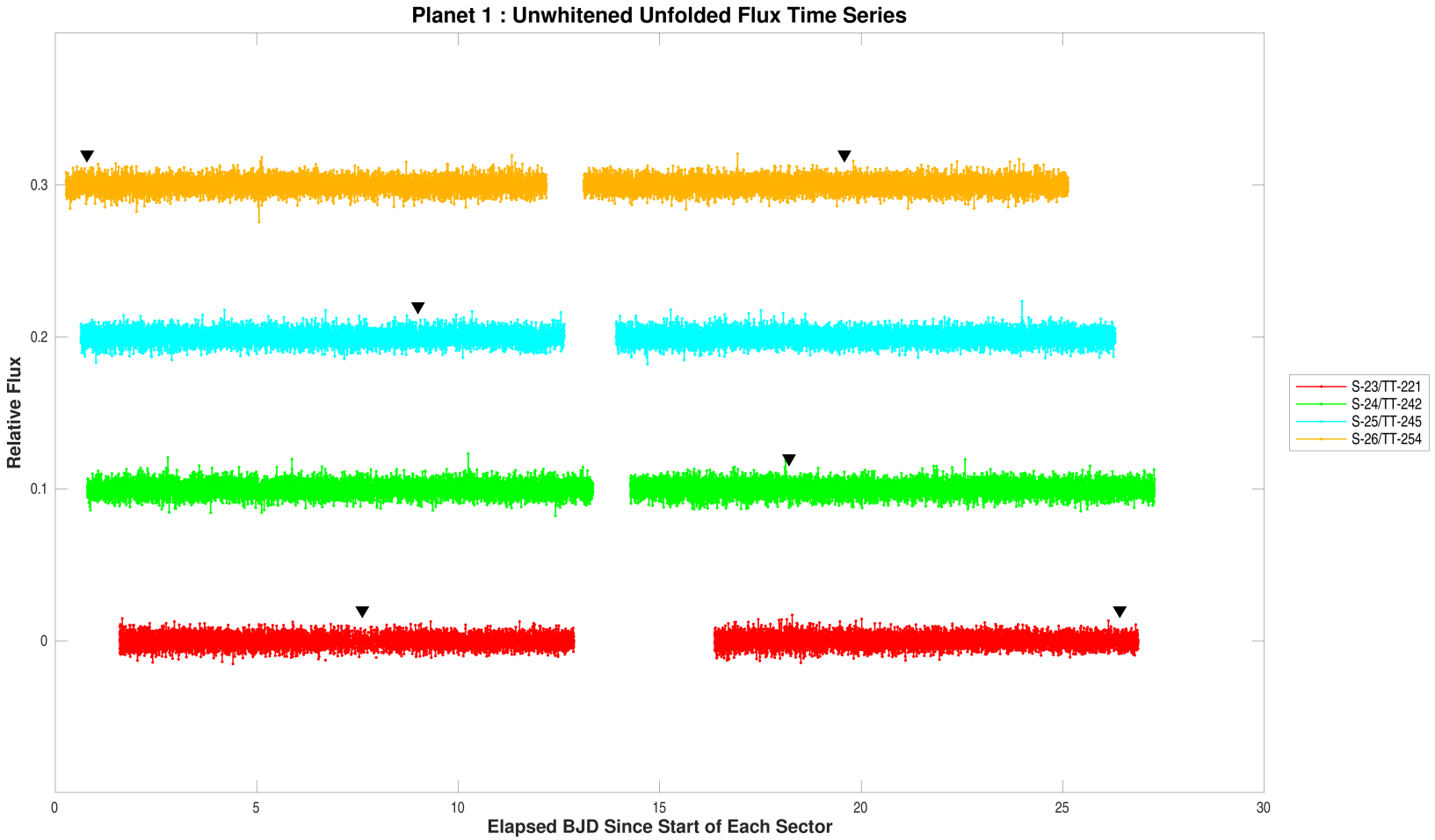
DoF: Degrees of Freedom



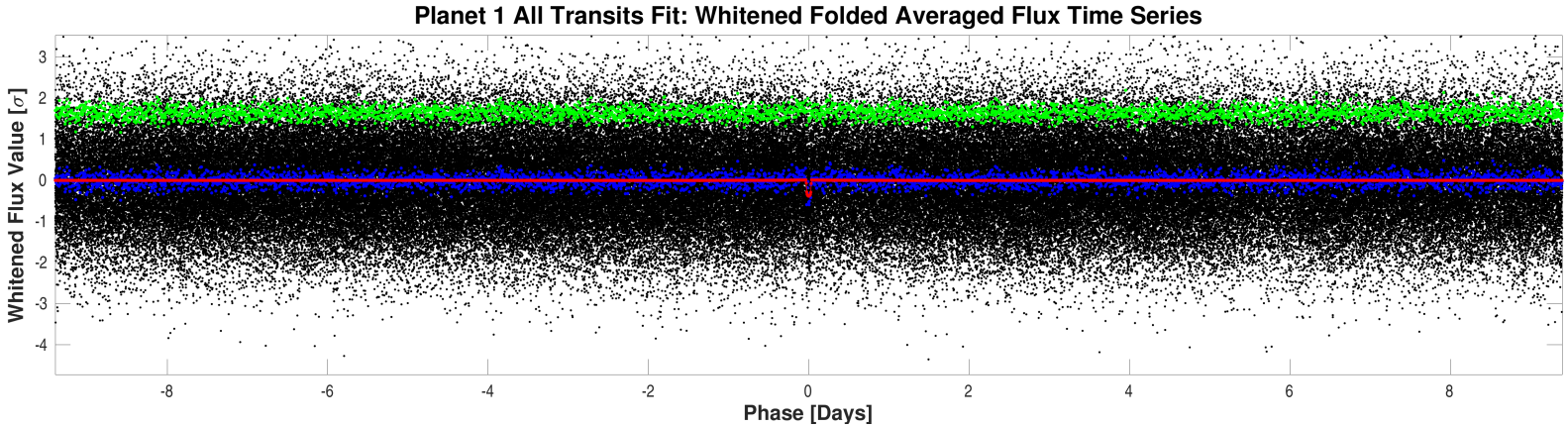
Flux time series for CatId 356016119, Planet candidate 1 in the unwhitened domain. For the data of Sector-14/TargetTableId-167, start BJD is 2458683 and the vertical offset is 0. For the data of Sector-15/TargetTableId-169, start BJD is 2458711 and the vertical offset is 0.1. For the data of Sector-16/TargetTableId-174, start BJD is 2458738 and the vertical offset is 0.2. For the data of Sector-17/TargetTableId-176, start BJD is 2458764 and the vertical offset is 0.3. Transit event markers indicate the location of transits of the given planet candidate. All transits fit completed with full convergence.
Open `./planet-01/planet-search-and-model-fitting-results/all-transits-fit/0000000356016119-01-all-unwhitened-14-167.fig`



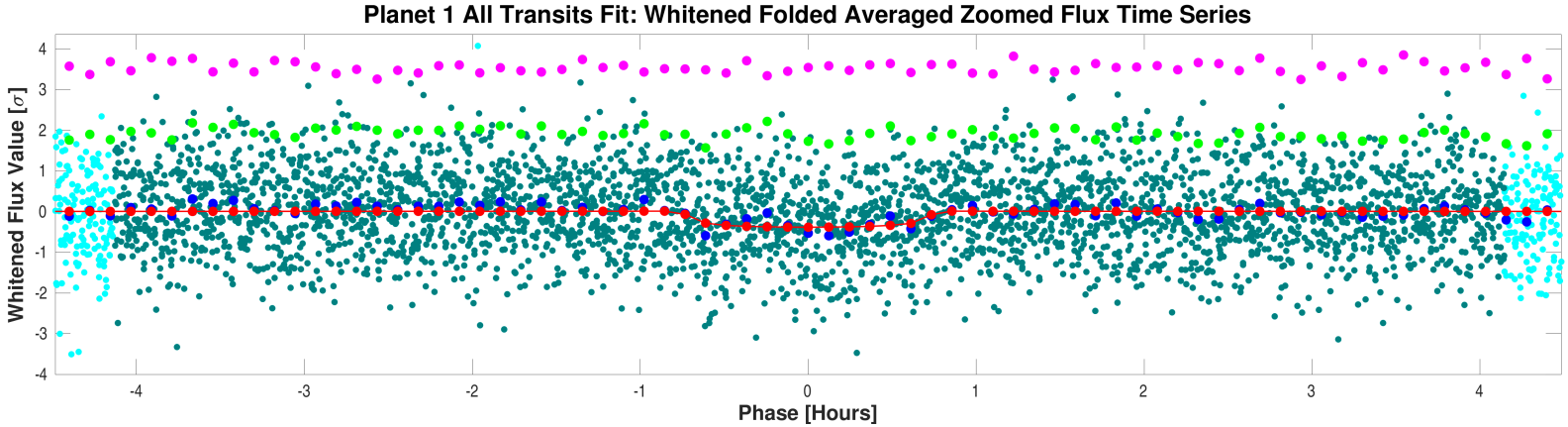
Flux time series for CatId 356016119, Planet candidate 1 in the unwhitened domain. For the data of Sector-19/TargetTableId-184, start BJD is 2458816 and the vertical offset is 0. For the data of Sector-20/TargetTableId-191, start BJD is 2458842 and the vertical offset is 0.1. For the data of Sector-21/TargetTableId-196, start BJD is 2458870 and the vertical offset is 0.2. For the data of Sector-22/TargetTableId-202, start BJD is 2458899 and the vertical offset is 0.3. Transit event markers indicate the location of transits of the given planet candidate. All transits fit completed with full convergence.
Open `./planet-01/planet-search-and-model-fitting-results/all-transits-fit/0000000356016119-01-all-unwhitened-19-184.fig`



Flux time series for CatId 356016119, Planet candidate 1 in the unwhitened domain. For the data of Sector-23/TargetTableId-221, start BJD is 2458928 and the vertical offset is 0. For the data of Sector-24/TargetTableId-242, start BJD is 2458955 and the vertical offset is 0.1. For the data of Sector-25/TargetTableId-245, start BJD is 2458983 and the vertical offset is 0.2. For the data of Sector-26/TargetTableId-254, start BJD is 2459010 and the vertical offset is 0.3. Transit event markers indicate the location of transits of the given planet candidate. All transits fit completed with full convergence.
Open `./planet-01/planet-search-and-model-fitting-results/all-transits-fit/0000000356016119-01-all-unwhitened-23-221.fig`



Folded flux time series for CatId 356016119, Planet candidate 1 in the whitened domain is plotted in black dots. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged values of the folded flux time series; the red dots represent the averaged values of the folded model light curve of the all transits fit; the green dots are the averaged folded fit residuals, vertically offset for clarity. All transits fit completed with full convergence.
Open `./planet-01/planet-search-and-model-fitting-results/all-transits-fit/0000000356016119-01-all-whitened.fig`

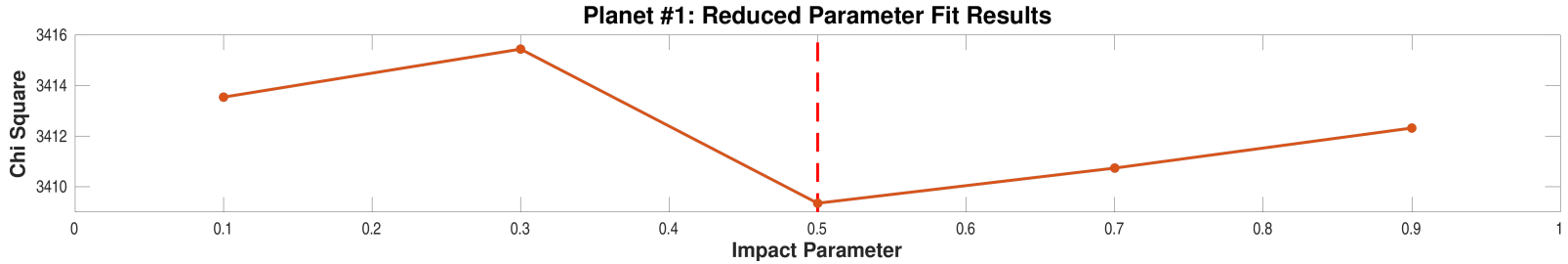


Folded flux time series for CatId 356016119, Planet candidate 1 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged values of the folded flux time series; the red dots represent the averaged values of the fitted model light curve of the all transits fit; the green dots are the averaged folded fit residuals, vertically offset for clarity. Magenta dots are the averaged values of the folded flux time series, with a phase shift of 0.5 relative to the blue dots, vertically offset for clarity. All transits fit completed with full convergence.
Open `./planet-01/planet-search-and-model-fitting-results/all-transits-fit/0000000356016119-01-all-whitened-zoomed.fig`

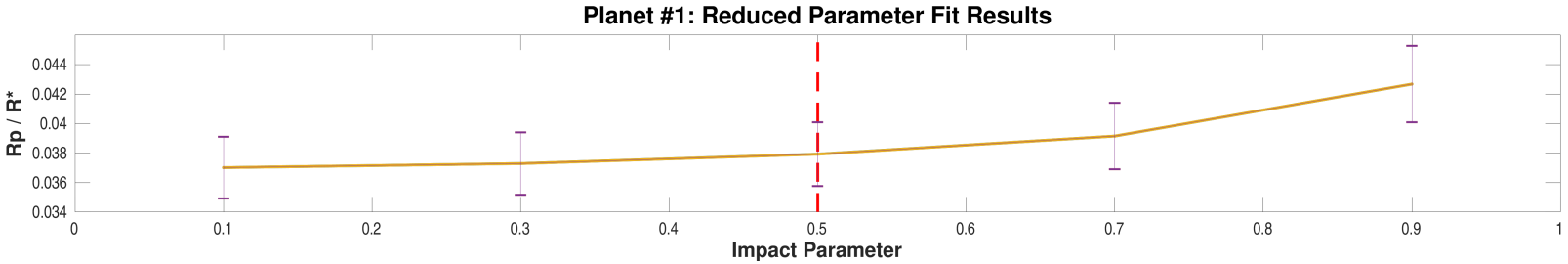
7.2 Model Fitter: Reduced Parameter Fit Results

Impact Parameter	SNR	Model Chi Square	Planet Radius to Star Radius	Uncert	Semi-major Axis to Star Radius	Uncert	Transit Depth (ppm)	Uncert	Transit Duration (hours)	Uncert
0.10	9.0	3413.5	0.0370114	2.0937e-03	100.4168	5.9687e+00	1613	1.8158e+02	1.4757	8.7004e-02
0.30	9.0	3415.4	0.0372848	2.1126e-03	96.1696	5.7248e+00	1612	1.8173e+02	1.4823	8.7467e-02
0.50	9.0	3409.3	0.0379258	2.1537e-03	87.1432	5.2651e+00	1610	1.8182e+02	1.4984	8.9591e-02
0.70	8.9	3410.7	0.0391467	2.2468e-03	71.0548	4.5160e+00	1597	1.8227e+02	1.5518	9.7200e-02
0.90	8.7	3412.3	0.0426697	2.5864e-03	44.0352	3.5588e+00	1582	1.8996e+02	1.7167	1.3407e-01

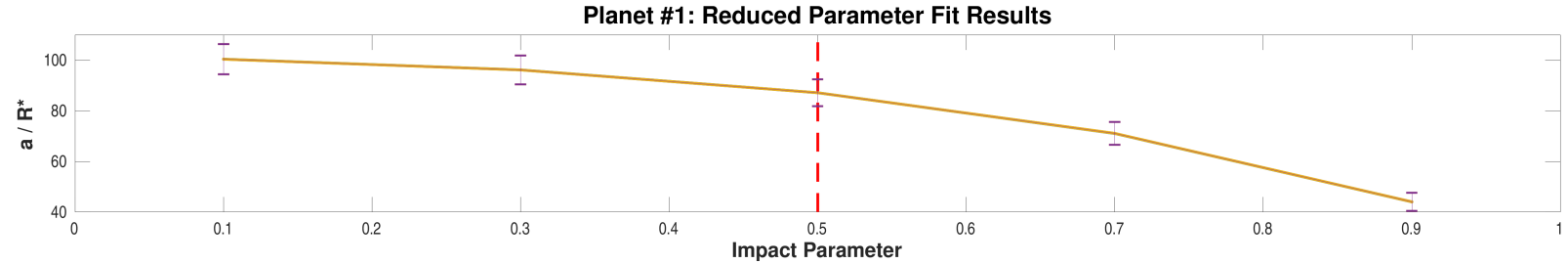
Highlighted row is the best reduced-parameter model fit.



Model chi squares of reduced parameter fits vs. impact parameter for CatId 356016119, Planet candidate 1. The fit result with the minimum chi square is marked with a dashed line in the plot.
Open `./planet-01/planet-search-and-model-fitting-results/reduced-parameter-fits/0000000356016119-01-reduced-fits-chi-square.fig`



Ratios of planet radius to star radius of reduced parameter fits vs. impact parameter for CatId 356016119, Planet candidate 1. The fit result with the minimum chi square is marked with a dashed line in the plot.
Open `./planet-01/planet-search-and-model-fitting-results/reduced-parameter-fits/0000000356016119-01-reduced-fits-rp-over-rstar.fig`



Ratios of semimajor axis to star radius of reduced parameter fits vs. impact parameter for CatId 356016119, Planet candidate 1. The fit result with the minimum chi square is marked with a dashed line in the plot.
Open `./planet-01/planet-search-and-model-fitting-results/reduced-parameter-fits/0000000356016119-01-reduced-fits-a-over-rstar.fig`

7.3 Model Fitter: Trapezoidal Fit Results

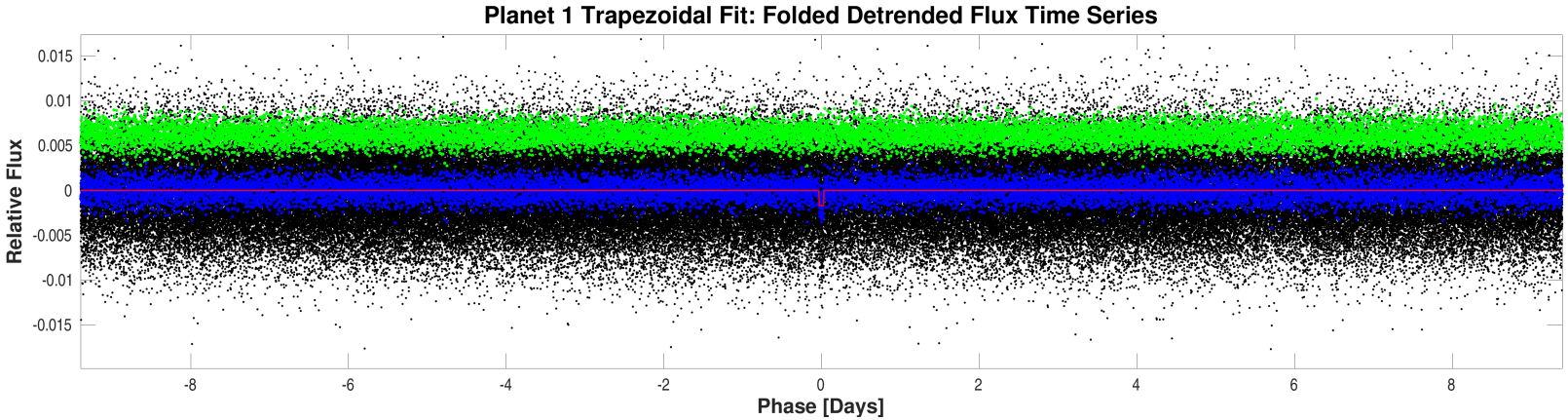
Model Characteristic	Name
Transit Model	trapezoidal_model
Limb Darkening Model	

TCE Parameter	Value	Units
Trial Transit Pulse Duration	1.5	hours
Transit Epoch	1691.3316994	TJD
Orbital Period	18.7915783	days
Maximum SES	5.4	
Maximum MES	7.7	
Robust Statistic	7.0	
Chi Square Goodness of Fit Statistic (DoF)	491.7 (580)	
Chi Square2 Statistic (DoF)	14.2 (17.2)	
Threshold for Desired PFA		

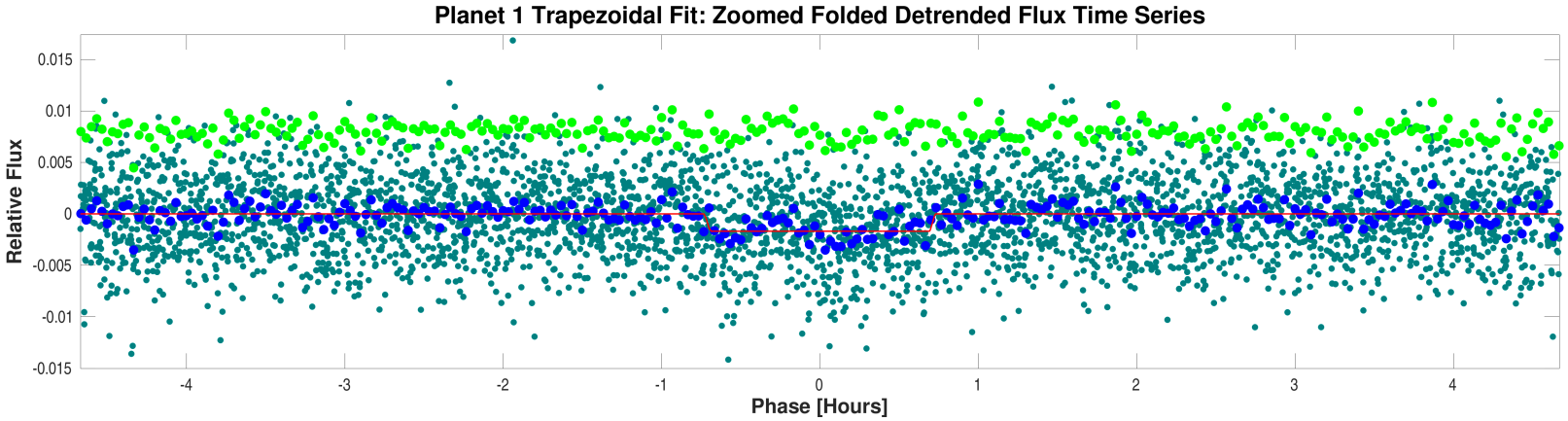
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	10.5		
Orbital Period	18.7915783		days
Transit Epoch	1691.3304819		BTJD
Transit Depth	1684		ppm
Transit Duration	1.5563		hours
Transit Ingress Duration	0.1347		hours
Model Chi Square Statistic (DoF)	195001.8 (5058)		

DoF: Degrees of Freedom



Folded detrended flux time series for CatId 356016119, Planet candidate 1 and folded trapezoidal model light curve.
Open `./planet-01/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000356016119-01-all-trapezoidal.fig`



Zoomed folded detrended flux time series for CatId 356016119, Planet candidate 1 and folded trapezoidal model light curve.
Open `./planet-01/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000356016119-01-all-trapezoidal-zoomed.fig`

7.4 Validation Tests

The Centroid Test and Eclipsing Binary Discrimination Test are chi-squared hypothesis tests. For these tests, a significance of 100% favors a planet, while 0% indicates an unlikely planet.

7.4.1 Weak Secondary Test

Result	Value	Uncertainty	Units	Statistic in Sigmas	Significance (%)
Orbital Period	18.7916		days		
Transit Duration	1.5		hours		
Maximum MES	7.7				
Secondary Phase	-0.79028		days		
Secondary MES	3.0				
Minimum Phase	-1.7958		days		
Minimum MES	-3.8				
Median MES	-0.0				
MAD MES	0.65141				
Robust Statistic	3.5				
Secondary Depth	667.4	1.7691e+02	ppm		
Geometric Albedo	1509.6	2.0216e+03		0.7462	22.78
Planet Effective Temperature	2869	9.6927e+02	Kelvin	2.6527	0.40

7.4.2 Eclipsing Binary Discrimination Test

Result	Value	Value in Sigmas	Significance (%)
Odd Even Transit Depth Comparison Statistic	2.7610e-01	0.5255	59.93

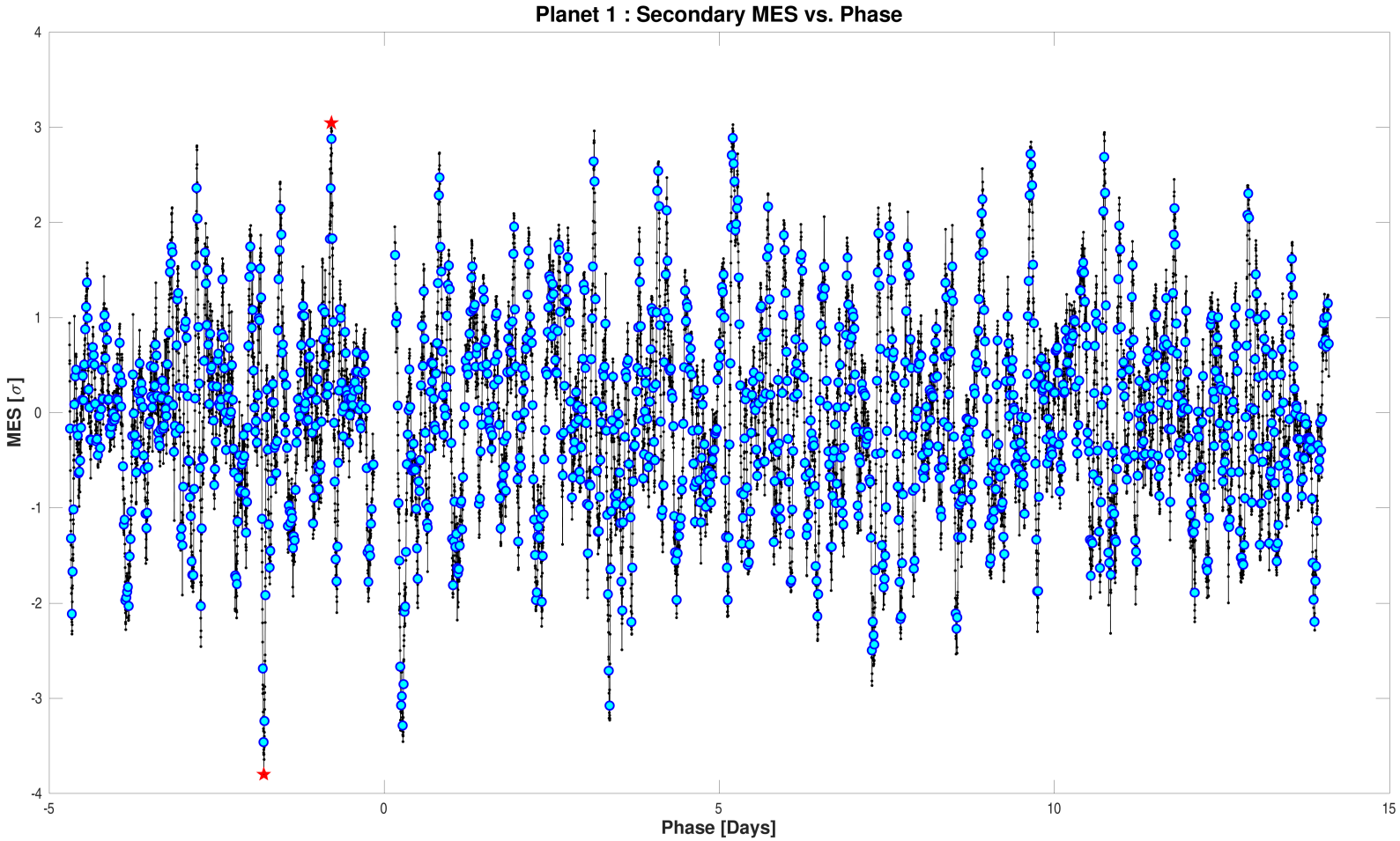
7.4.3 Bootstrap Test

Result	Value
False Alarm Probability	2.6619e-14
Bootstrap Threshold for Desired PFA	7.3
MES Mean	-0.34
MES Standard Deviation	1.07
Transit Count	19

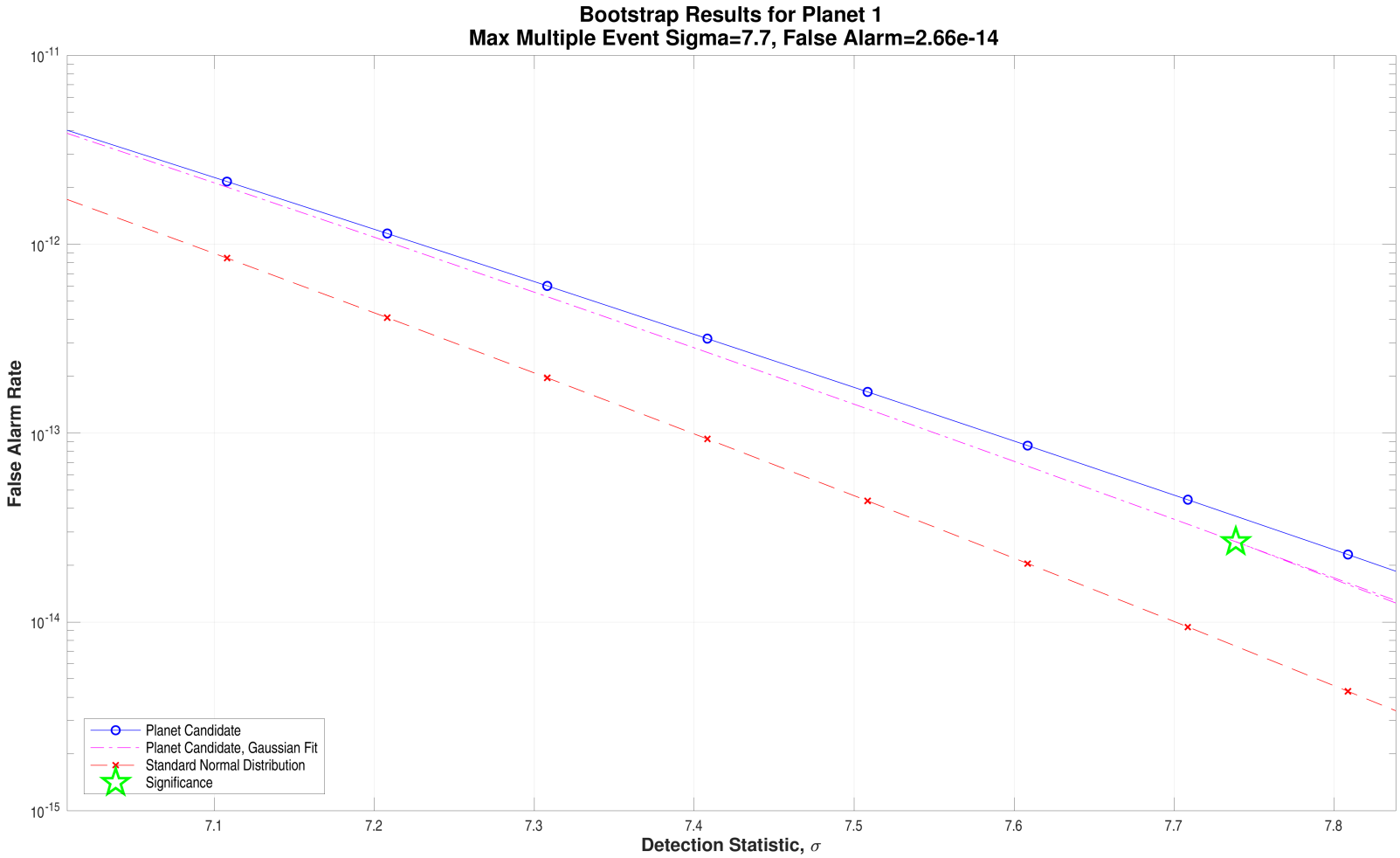
7.4.4 Ghost Diagnostic Test

Result	Value	Significance (%)
Maximum MES	7.7	
SNR	8.2	
Core Aperture Statistic	5.1723e+00	100.00
Halo Aperture Statistic	-3.8113e+00	0.01
Ratio of Core/Halo Aperture Statistics	-1.3571e+00	

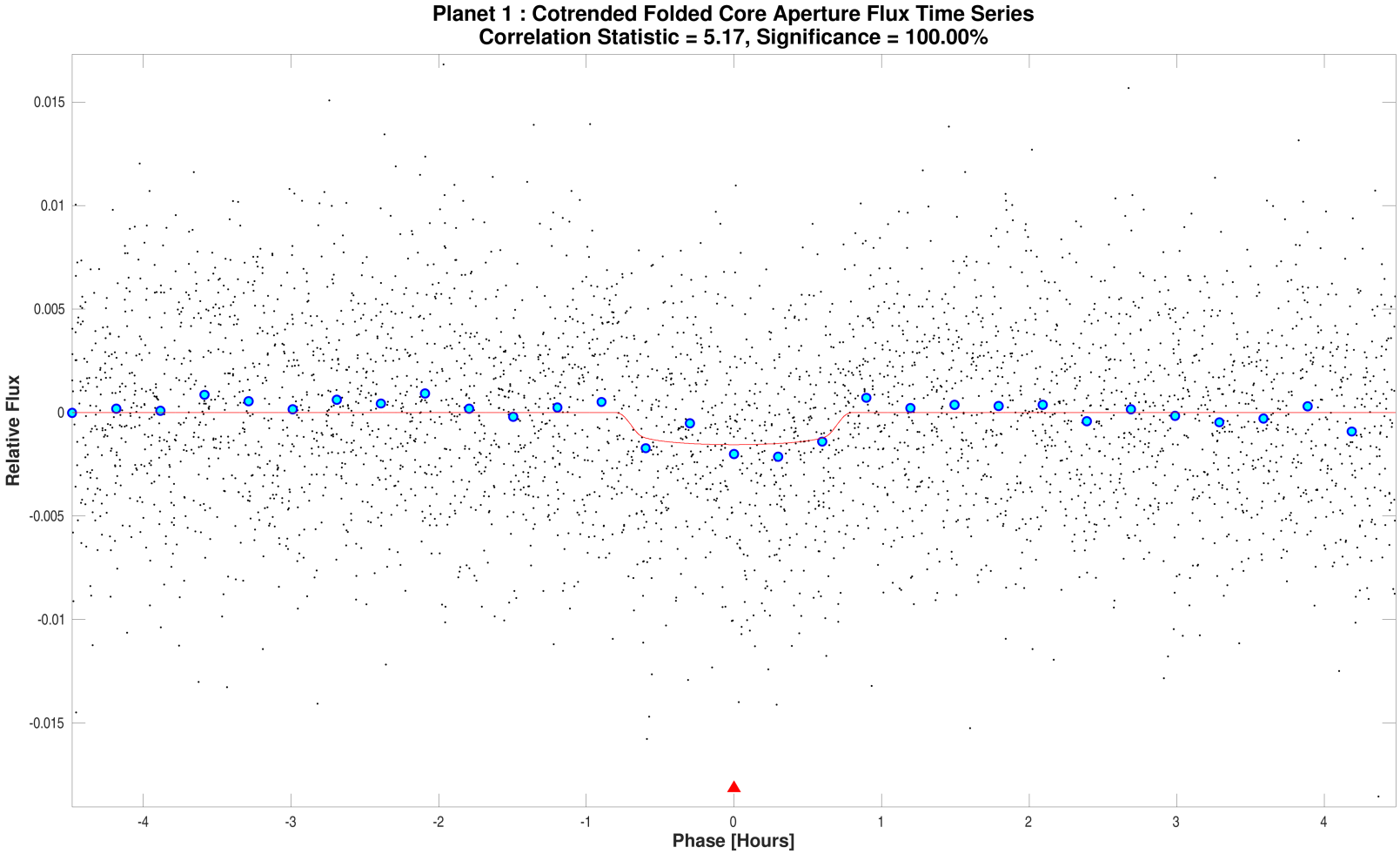
7.4.5 Validation Test Figures



The primary event has been set to zero and both the max and min of the resulting MES vs. Phase are marked with a red star. The best matched pulse duration in hours is 1.5. The maximum secondary MES and corresponding phase are 3.0474 and -0.79028 days respectively. The minimum secondary MES and corresponding phase are -3.7992 and -1.7958 days respectively.
Open `./planet-01/report-summary/0000000356016119-01-weak-secondary-diagnostic.fig`

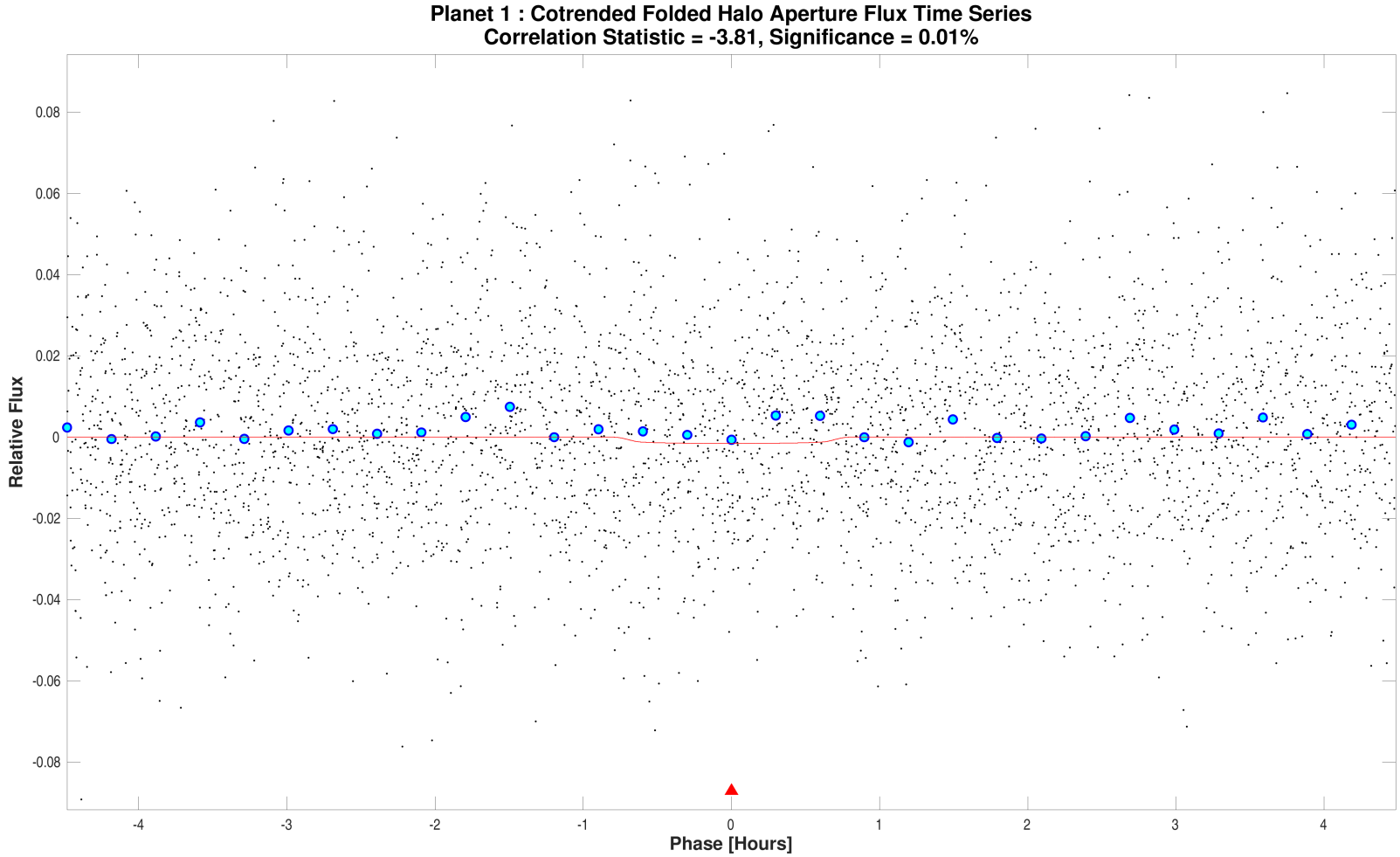


Bootstrap results for target 356016119, planet 1. Cumulative sum of the probabilities (derived from the histogram of counts) from upper tail to the search transit threshold; false alarm probability is indicated by the star. The Gaussian equivalent threshold for this false alarm probability is 7.5237. The threshold on this distribution that achieves the same false alarm rate as a 7.1 sigma threshold on a Gaussian distribution is 7.3042.
Open `./planet-01/bootstrap-results/0000000356016119-01-bootstrap-false-alarm.fig`



Optical ghost diagnostic core aperture flux time series for target 356016119, planet candidate 1. The unwhitened time series is phase folded at the orbital period associated with the planet candidate and centered on the epoch of the first transit. The time series was first cotrended against spacecraft engineering data, motion proxies, and/or cotrending basis vectors (CBVs) to remove systematic effects. Flux time series data represent the mean per pixel flux in the core or haloaperture; phase folded data points are shown in the figure with black dots. Binned and averaged phase folded flux values are marked with filled blue circles. The unwhitened transit model light curve is displayed in the figure with a red line. The value and significance of the core aperture correlation statistic are displayed in the figure title if the statistic was successfully computed.

Open `./planet-01/ghost-diagnostic-results/0000000356016119-01-core-unwhitened-cotrended-zoomed-model.fig`

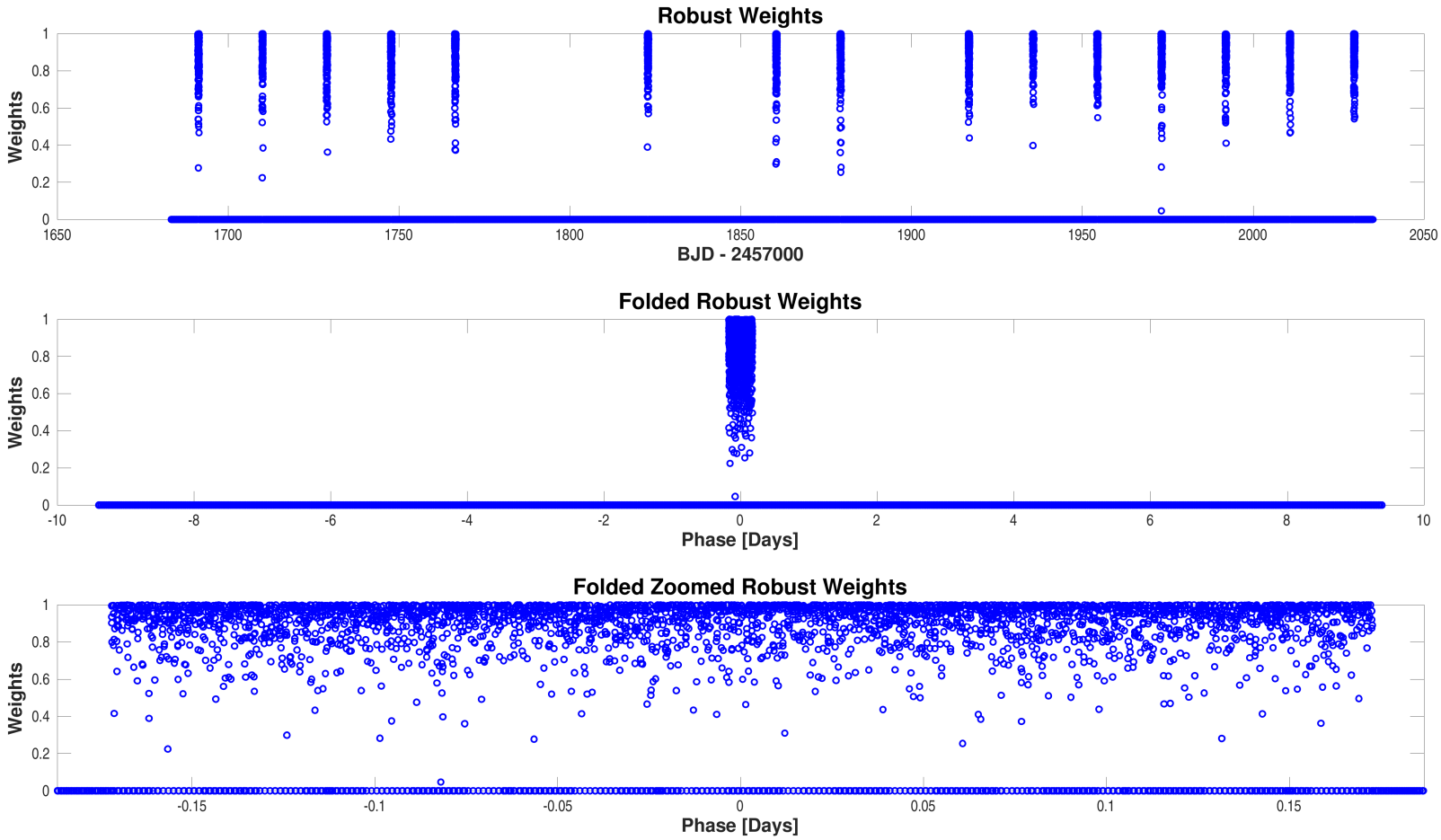


Optical ghost diagnostic halo aperture flux time series for target 356016119, planet candidate 1. The unwhitened time series is phase folded at the orbital period associated with the planet candidate and centered on the epoch of the first transit. The time series was first cotrended against spacecraft engineering data, motion proxies, and/or cotrending basis vectors (CBVs) to remove systematic effects. Flux time series data represent the mean per pixel flux in the core or haloaperture; phase folded data points are shown in the figure with black dots. Binned and averaged phase folded flux values are marked with filled blue circles. The unwhitened transit model light curve is displayed in the figure with a red line. The value and significance of the halo aperture correlation statistic are displayed in the figure title if the statistic was successfully computed.

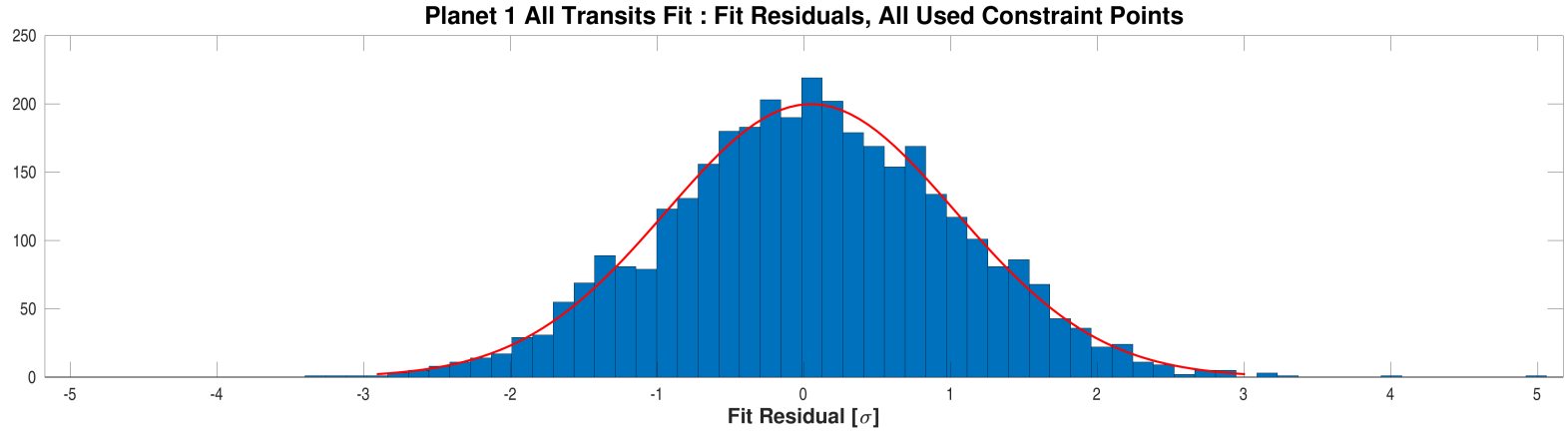
Open `./planet-01/ghost-diagnostic-results/0000000356016119-01-halo-unwhitened-cotrended-zoomed-model.fig`

Appendix A Planet Candidate 1

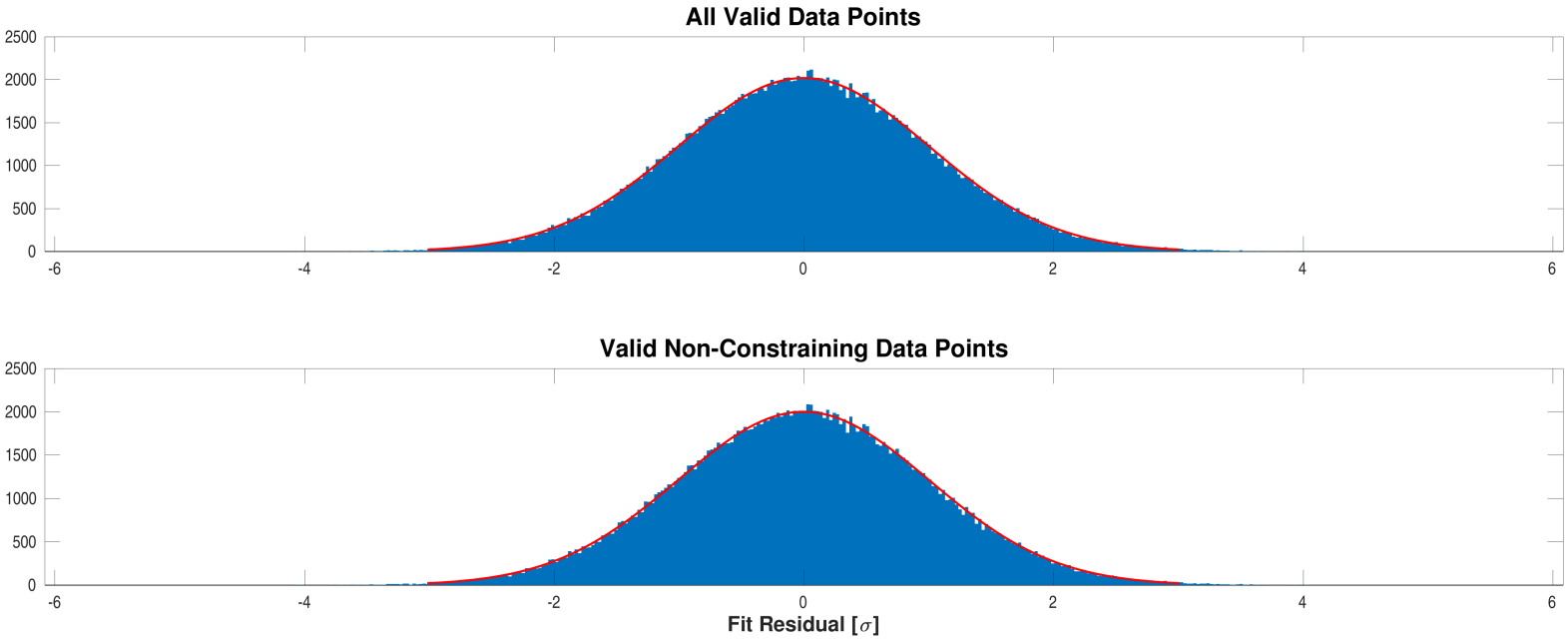
A.1 Model Fitter: All Transits



Robust weights distribution for CatId 356016119, Planet candidate 1. Top plot: all data points. Middle plot: all data points, folded per the fitted period and epoch. Bottom plot: all data points, folded and zoomed.
Open `./planet-01/planet-search-and-model-fitting-results/all-transits-fit/0000000356016119-01-all-robust-weights.fig`



Fit residuals distribution for CatId 356016119, Planet candidate 1. Only the valid data points used to constrain the fit are shown here. A Gaussian fit to the histogram is shown in red.
Open `./planet-01/planet-search-and-model-fitting-results/all-transits-fit/0000000356016119-01-all-histo-used.fig`

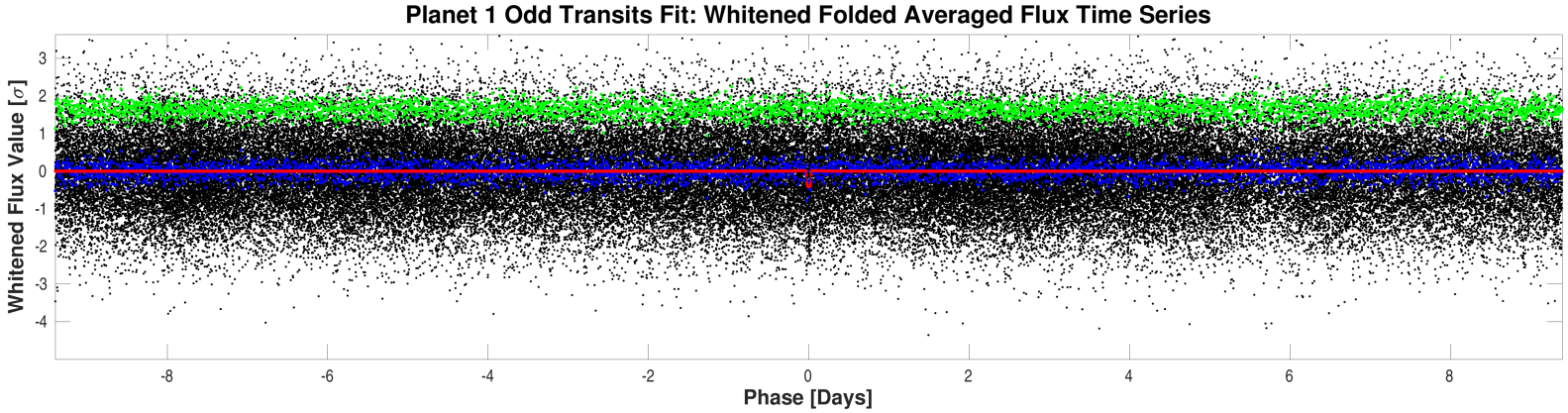


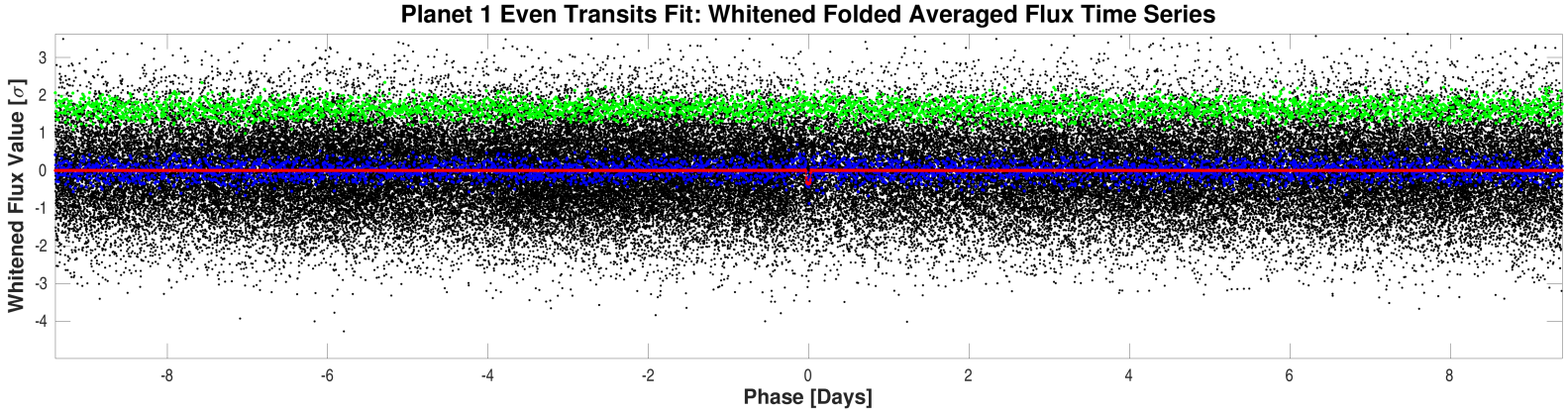
Fit residuals distribution for CatId 356016119, Planet candidate 1. Top plot: all valid data. Bottom plot: valid data not used to constrain fit (due to distance from a transit). Gaussian fits to the histograms are shown in red.
Open `./planet-01/planet-search-and-model-fitting-results/all-transits-fit/0000000356016119-01-all-histo-all-and-unused.fig`

A.2 Model Fitter: Odd & Even Transits

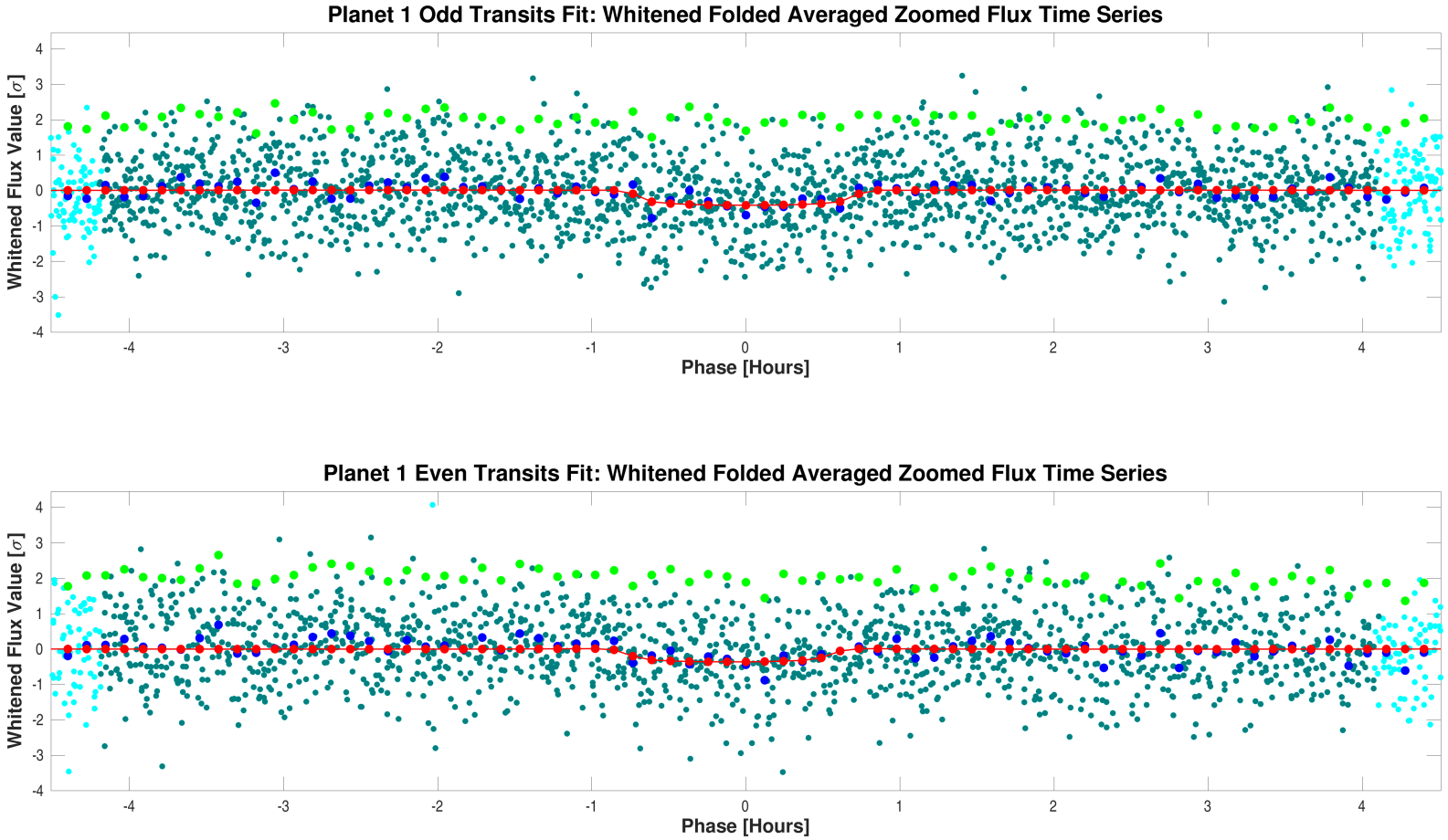
Parameter	Odd Transits Value	Odd Transits Uncertainty	Even Transits Value	Even Transits Uncertainty	Units	Difference / ‖Uncertainty‖
SNR	6.6		5.1			
Orbital Period	18.7918513	3.6500e-04	18.7916194	5.4170e-04	days	3.5513e-01
Transit Epoch	1691.3302981	3.9967e-03	1710.1194773	4.8218e-03	BTJD	4.0890e-01
Impact Parameter	0.5011	7.1072e+00	0.5533	7.9150e+00		4.9041e-03
Planet Radius to Star Radius Ratio	0.0386701	3.4498e-02	0.0363354	4.2994e-02		4.2355e-02
Semi-major Axis to Star Radius Ratio	86.8996	4.1155e+02	87.5806	5.5017e+02		9.9113e-04
Planet Radius	1.5906	1.4198e+00	1.4946	1.7690e+00	Earth radii	4.2338e-02
Semi-major Axis	0.0989	1.9696e-03	0.0989	1.9696e-03	AU	2.9225e-04
Effective Stellar Flux	1.8565	3.3931e-01	1.8566	3.3931e-01	Goldilocks	6.3678e-05
Equilibrium Temperature	298	1.3603e+01	298	1.3603e+01	Kelvin	6.3678e-05
Stellar Density	24.9661	3.5472e+02	25.5583	4.8166e+02	Solar density	9.8996e-04
Transit Depth	1673	2.7215e+02	1456	3.0958e+02	ppm	5.2546e-01
Transit Duration	1.5030	7.2612e-01	1.4364	9.2686e-01	hours	5.6590e-02
Transit Ingress Duration	0.0739	7.6785e-01	0.0715	9.8690e-01	hours	1.8524e-03
Eccentricity	0.0000	0.0000e+00	0.0000	0.0000e+00		
Peri Longitude	0.0000	0.0000e+00	0.0000	0.0000e+00	degrees	
Model Chi Square Statistic (DoF)	2598.7 (3203.7)		2598.7 (3203.7)			

DoF: Degrees of Freedom

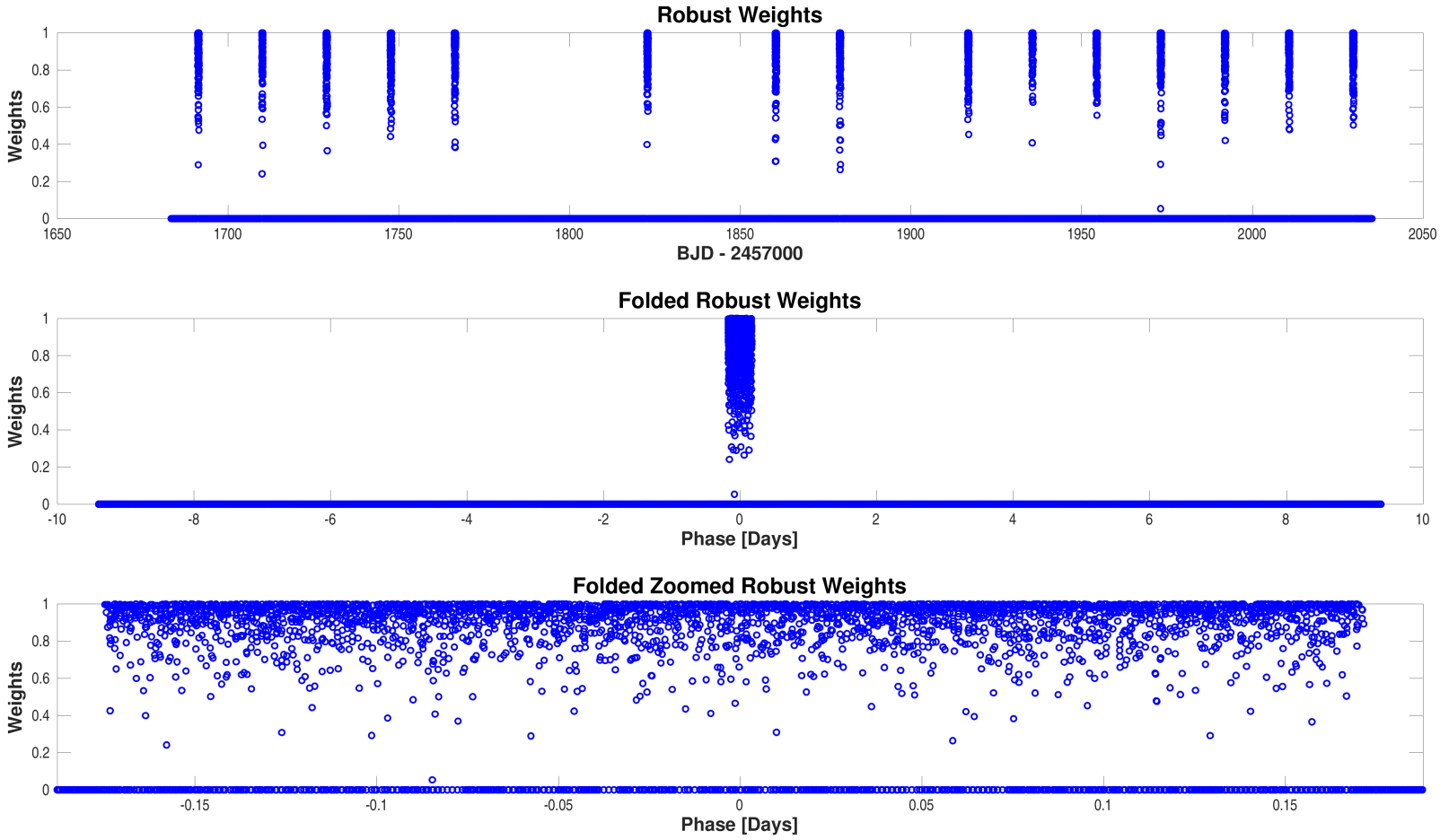




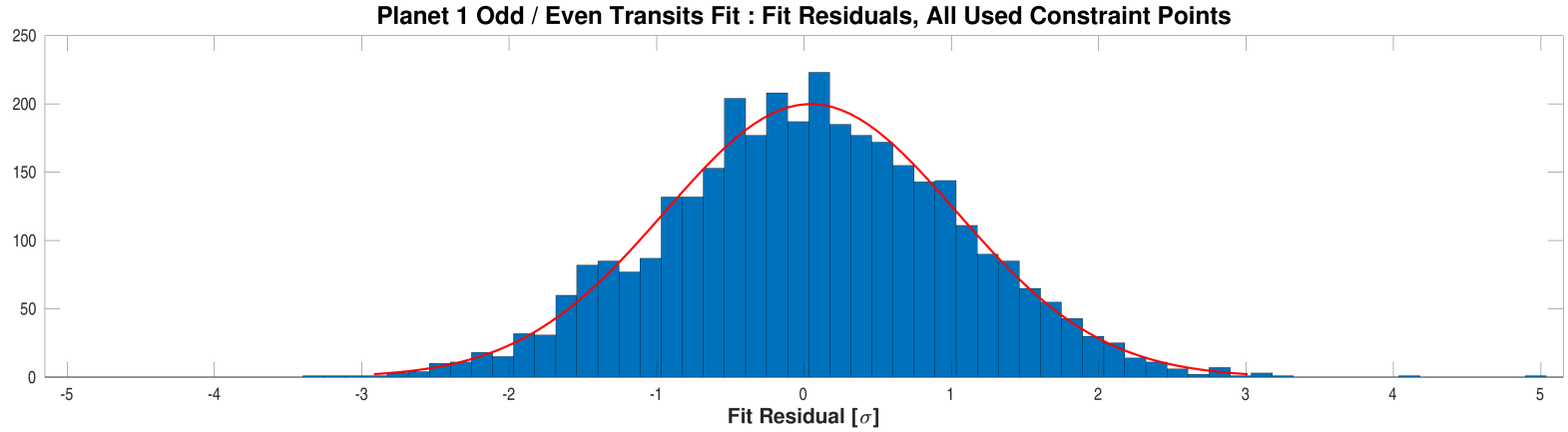
Folded flux time series for CatId 356016119, Planet candidate 1 in the whitened domain is plotted in black dots. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged values of the folded flux time series; the red dots represent the averaged values of the folded model light curve of the odd/even transits fit; the green dots are the averaged folded fit residuals, vertically offset for clarity. Odd-even transits fit completed with full convergence.
Open `./planet-01/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000356016119-01-odd-even-whitened.fig`



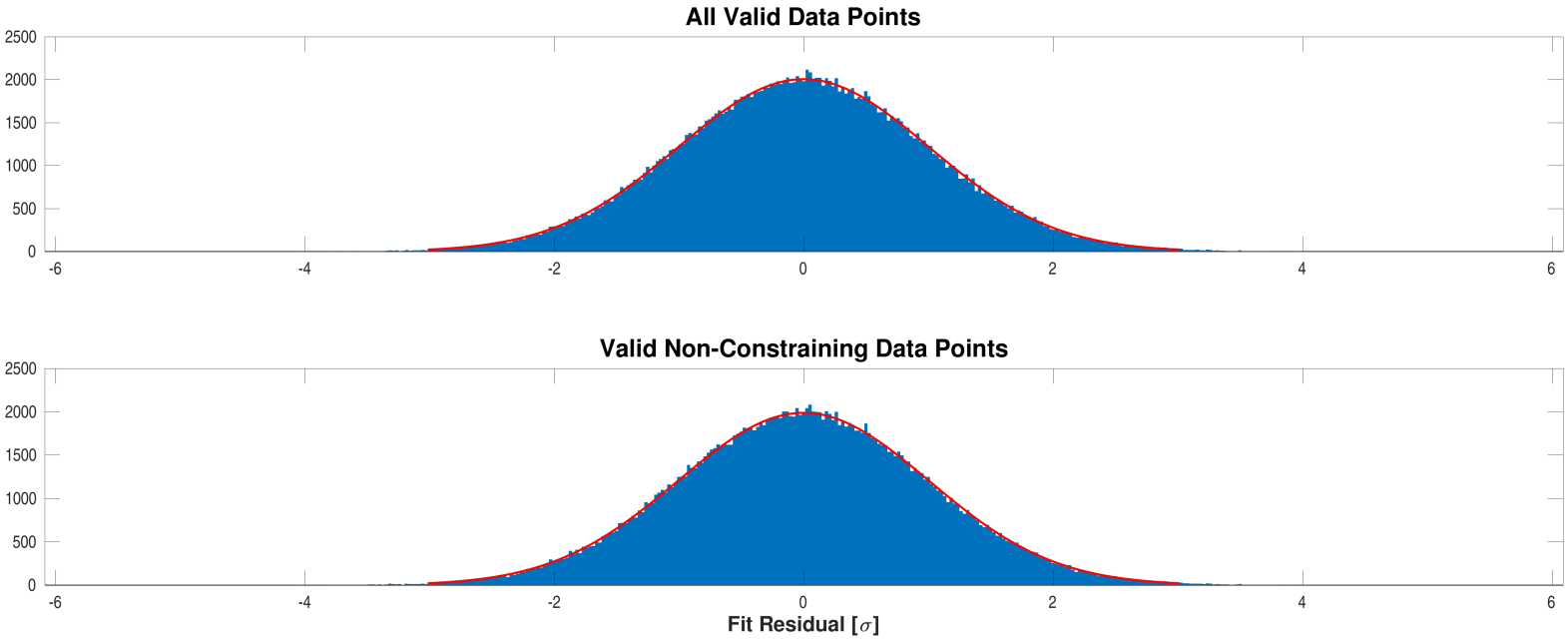
Folded flux time series for CatId 356016119, Planet candidate 1 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged values of the folded flux time series; the red dots represent the averaged values of the fitted model light curve of the odd/even transits fit; the green dots are the averaged folded fit residuals, vertically offset for clarity. Magenta dots are the averaged values of the folded flux time series, with a phase shift of 0.5 relative to the blue dots, vertically offset for clarity. Odd-even transits fit completed with full convergence.
Open `./planet-01/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000356016119-01-odd-even-whitened-zoomed.fig`



Robust weights distribution for CatId 356016119, Planet candidate 1. Top plot: all data points. Middle plot: all data points, folded per the fitted period and epoch. Bottom plot: all data points, folded and zoomed.
Open `./planet-01/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000356016119-01-odd-even-robust-weights.fig`

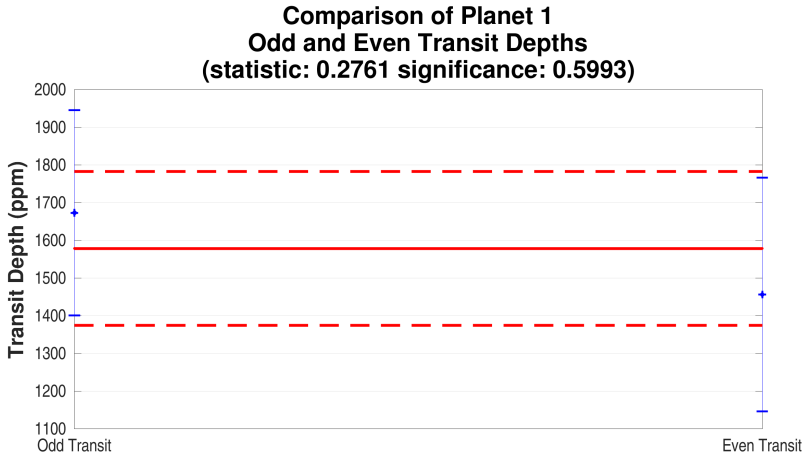


Fit residuals distribution for CatId 356016119, Planet candidate 1. Only the valid data points used to constrain the fit are shown here. A Gaussian fit to the histogram is shown in red.
Open `./planet-01/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000356016119-01-odd-even-histo-used.fig`



Fit residuals distribution for CatId 356016119, Planet candidate 1. Top plot: all valid data. Bottom plot: valid data not used to constrain fit (due to distance from a transit). Gaussian fits to the histograms are shown in red.
Open `./planet-01/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000356016119-01-odd-even-histo-all-and-unused.fig`

A.3 Eclipsing Binary Discrimination Test



Top-left: Diagnostic plot of Odd/Even Transit Depth Test for catId 356016119, planet 1. A significance level close to 1/0 favors a transiting planet/an eclipsing binary. Open `./planet-01/binary-discrimination-test-results/0000000356016119-01-eclipsing-binary-discrimination-tests.fig`

Appendix B Alerts

This target did not trigger any alerts.