Data Validation (DV) Report
for TESS ID 149603524
Sectors 1 - 9

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

05-May-2019 22:45:30 Z

Contents

1 Summary

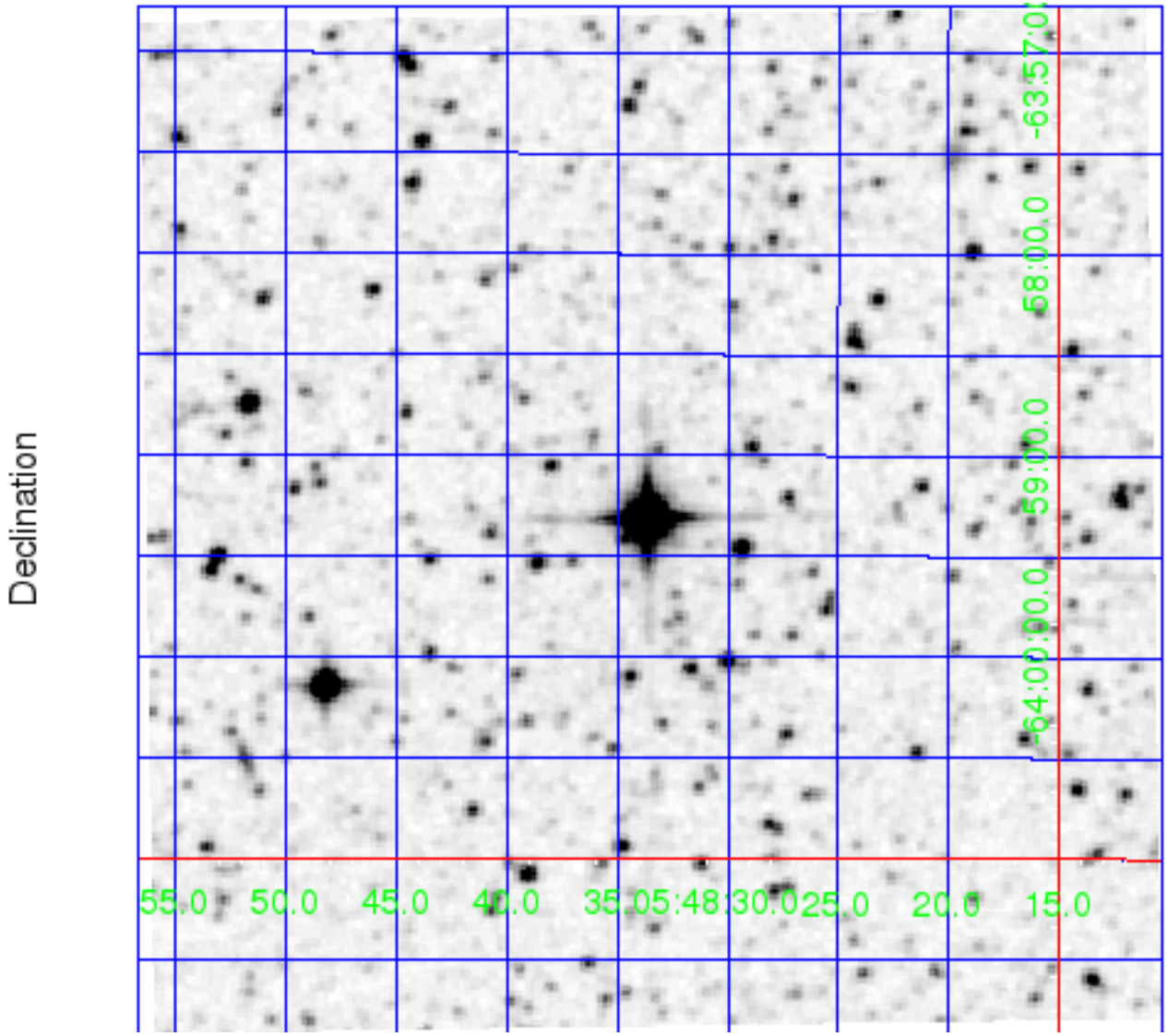
Target Properties	Value	Uncertainty	Units	Provenance
Catalog ID	149603524			
TOI ID	102			
TESS Name	-			
RA	87.13995600	0	degrees	TIC7
Dec	-63.98842700	0	degrees	TIC7
Magnitude	9.716	0.018		TIC7
Radius	1.280	0.000	Solar radii	TIC7
Effective Temperature	6280	0	Kelvin	TIC7
log(g)	4.321	0	cm/sec^2	TIC7
[M/H]	0.240	0.05	Solar metallicity	TIC7
Stellar Density	0.597	0.000	Solar density	TIC7-Derived
Limb Darkening Coefficient 1	0.54364			
Limb Darkening Coefficient 2	0.16949			
Limb Darkening Coefficient 3	-0.020442			
Limb Darkening Coefficient 4	-0.048058			
Number of Planet Candidates	4			
TOI Model	toi-plus-2019-05-01.csv			
TESS Names Model	-			
External TCE Model	-			
Software Revision	spoc-3.3.65-20190425			
Date Report Generated	05-May-2019 22:45:30 Z			

Sector	Target Table	Camera/ CCD	Crowding Metric	Flux Fraction
1	128	4:4	0.9903	0.8563
2	129	4:1	0.9876	0.8703
3	131	4:1	0.9875	0.8615
4	135	4:1	0.9859	0.8793
6	141	4:2	0.9886	0.8651
7	145	4:2	0.9882	0.8658
8	148	4:2	0.9879	0.8693
9	152	4:3	0.9887	0.8705

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	102.01	-	1.00	4.412	1.00	1326.079	0.06	15.4	708.8	1316	0.00e+00	false
2	-	-	-	55.559	12.59	1349.057	0.31	4.7	24.2	566	1.22e-11	false

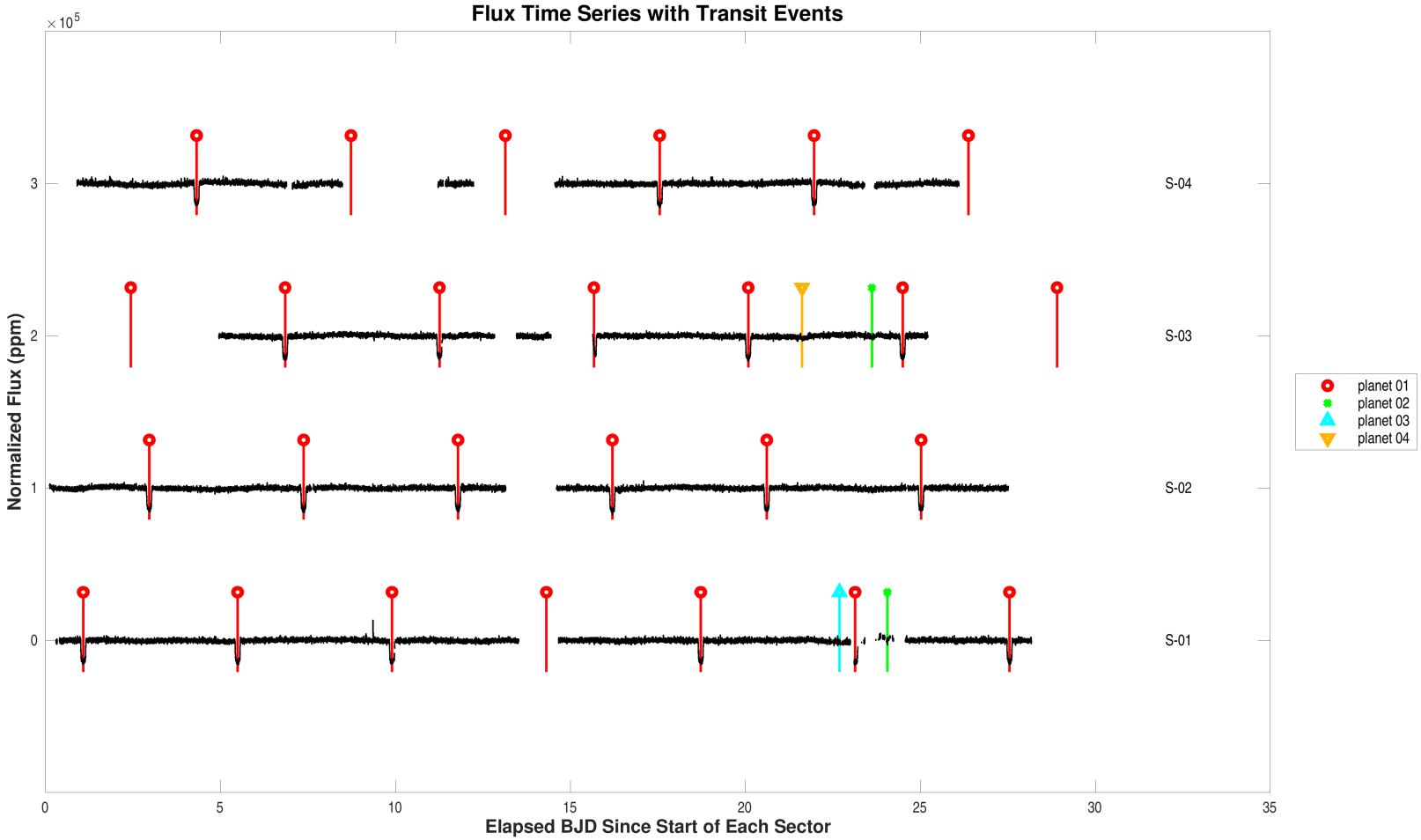
Planet Candidate	TOI ID	TESS Name	TOI Correlation	Period (days)	Period Ratio	Epoch (BTJD)	Semi-major Axis (AU)	Radius (Re)	Teq (K)	False Alarm	Suspected EB	
3	-	-	-	192.251	43.58	1347.690	0.70	4.2	4.6	374	2.83e-18	false
4	-	-	-	121.169	27.46	1402.619	0.52	3.9	8.6	436	2.27e-09	false

2 Survey Image

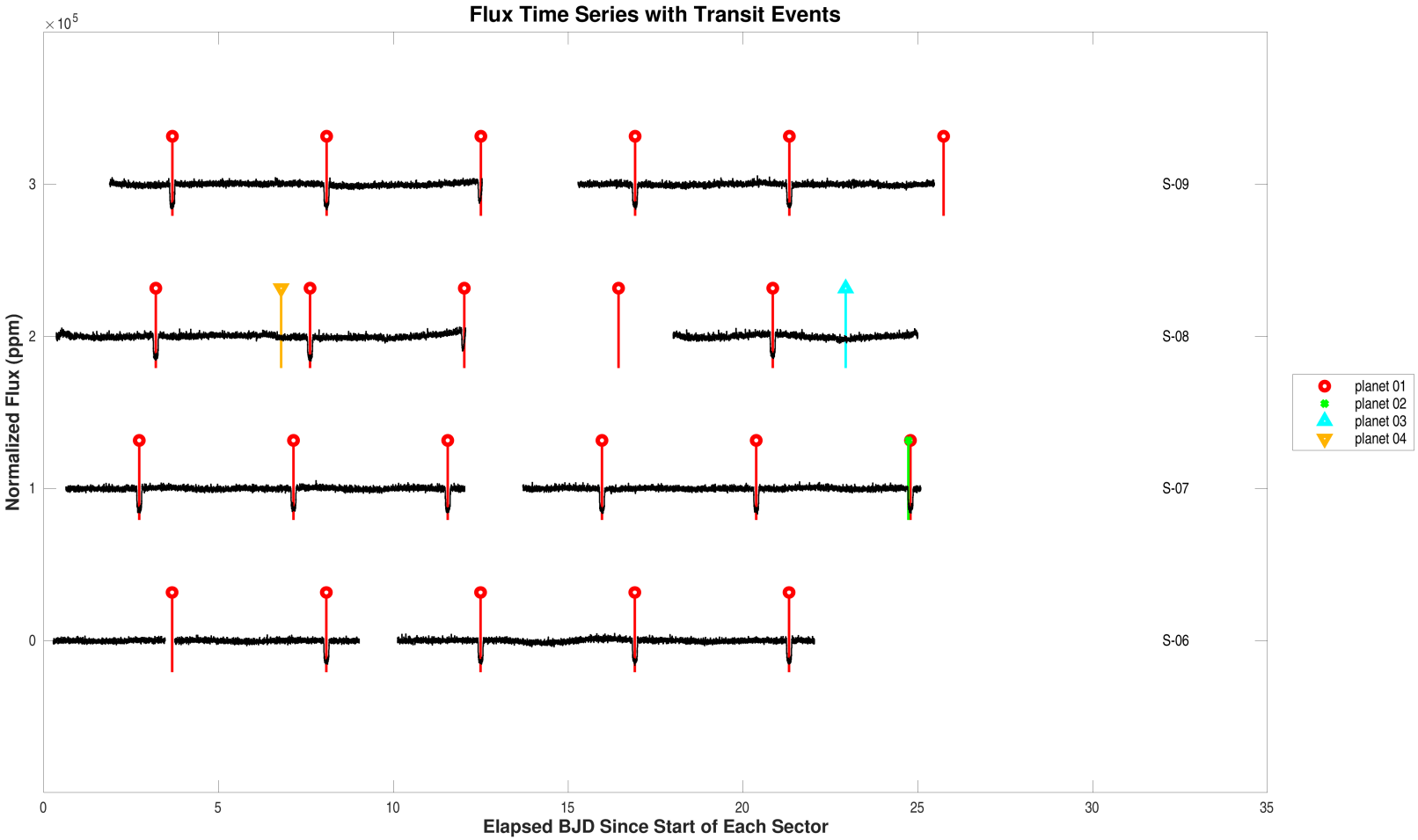


Digitized Sky Survey (DSS) red image. The 5' x 5' image is centered on the J2000 coordinates of target (149603524).

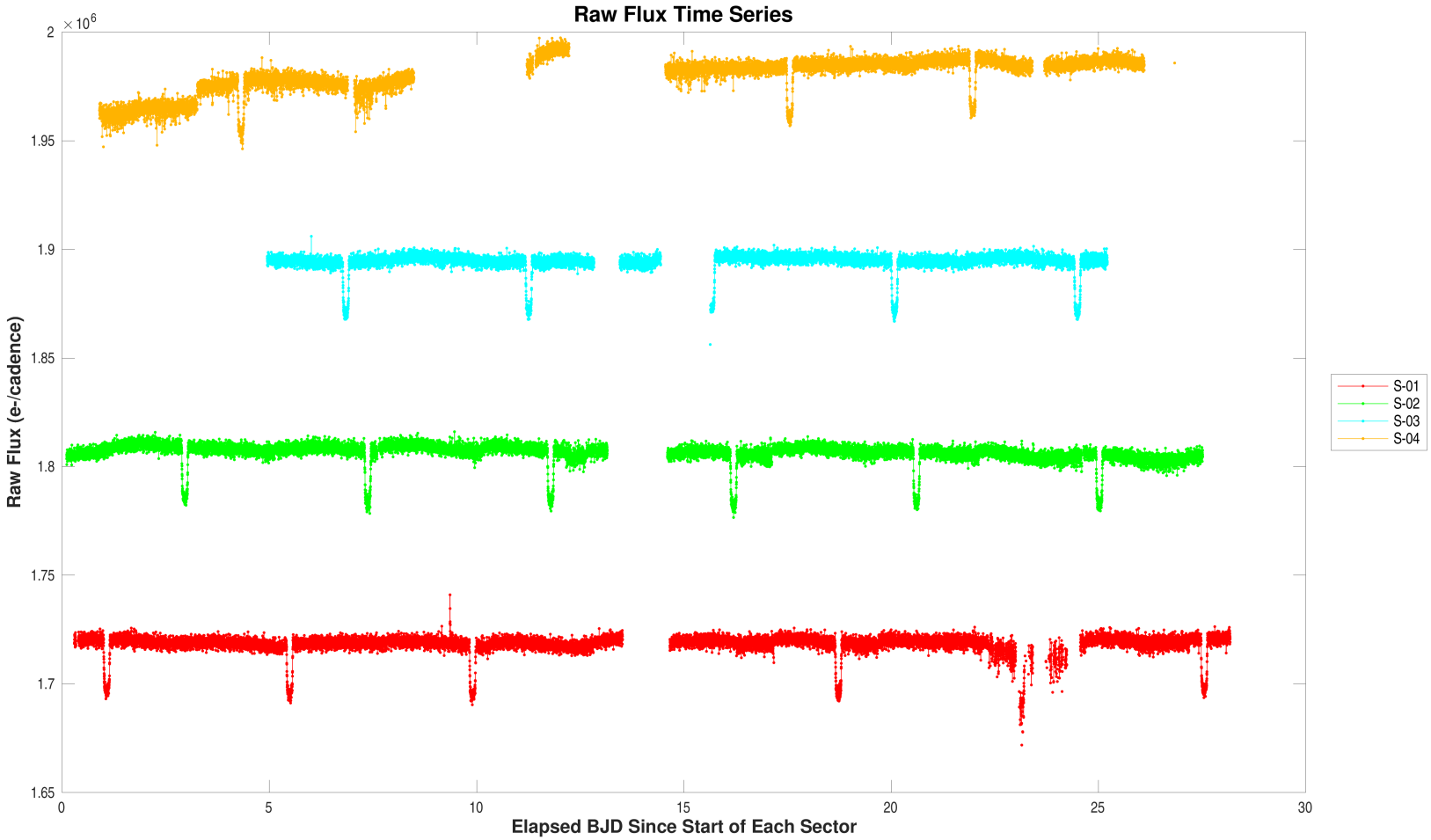
3 Flux Time Series



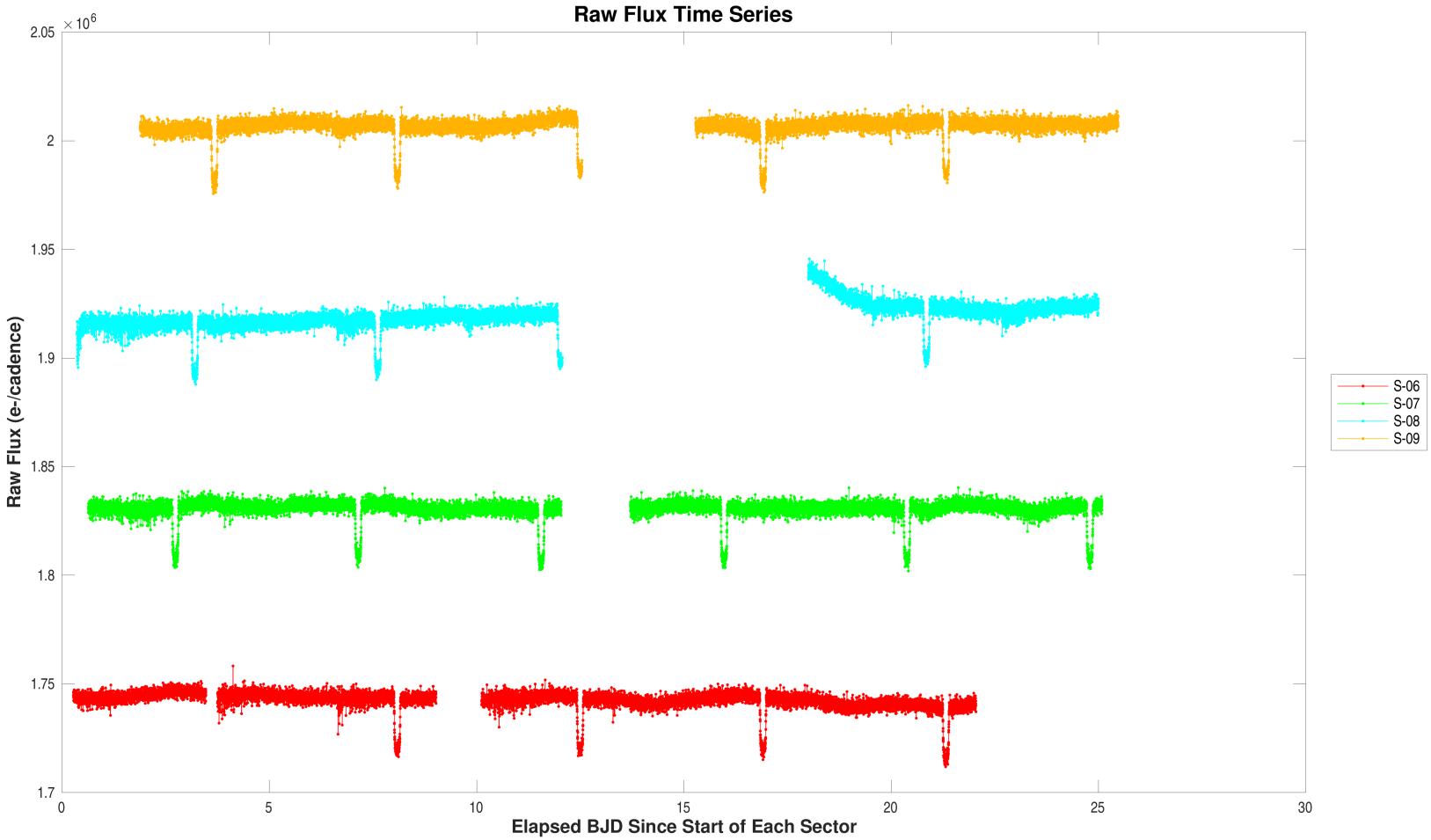
Summary plot of sector-stitched flux time series and transits for target 149603524, marked with DV fitted epoch/period (or TPS epoch/period if fit was not successful). Transits of identified planets are labeled with epoch BTJD and orbital period. For the data of sector 1, target table 128, start BJD is 2458325 and the vertical offset is 0 ppm. For the data of sector 2, target table 129, start BJD is 2458354 and the vertical offset is 100000 ppm. For the data of sector 3, target table 131, start BJD is 2458381 and the vertical offset is 200000 ppm. For the data of sector 4, target table 135, start BJD is 2458410 and the vertical offset is 300000 ppm.
Open `./summary-plots/0000000149603524-00-flux-dv-fit-01-128.fig`



Summary plot of sector-stitched flux time series and transits for target 149603524, 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 6, target table 141, start BJD is 2458468 and the vertical offset is 0 ppm. For the data of sector 7, target table 145, start BJD is 2458491 and the vertical offset is 100000 ppm. For the data of sector 8, target table 148, start BJD is 2458517 and the vertical offset is 200000 ppm. For the data of sector 9, target table 152, start BJD is 2458543 and the vertical offset is 300000 ppm.
Open `./summary-plots/0000000149603524-00-flux-dv-fit-06-141.fig`



Summary plot of raw flux time series. For the data of sector 1, target table 128, start BJD is 2458325 and the vertical offset is 0 electrons/cadence. For the data of sector 2, target table 129, start BJD is 2458354 and the vertical offset is 88000 electrons/cadence. For the data of sector 3, target table 131, start BJD is 2458381 and the vertical offset is 176000 electrons/cadence. For the data of sector 4, target table 135, start BJD is 2458410 and the vertical offset is 264000 electrons/cadence.
Open `./summary-plots/0000000149603524-00-raw-flux-01-128.fig`



Summary plot of raw flux time series. For the data of sector 6, target table 141, start BJD is 2458468 and the vertical offset is 0 electrons/cadence. For the data of sector 7, target table 145, start BJD is 2458491 and the vertical offset is 88000 electrons/cadence. For the data of sector 8, target table 148, start BJD is 2458517 and the vertical offset is 176000 electrons/cadence. For the data of sector 9, target table 152, start BJD is 2458543 and the vertical offset is 264000 electrons/cadence.
Open `./summary-plots/0000000149603524-00-raw-flux-06-141.fig`

4 Dashboards

Planet Candidate 1

<table>
<tr>
<td rowspan="2">Model Fitter</td>
<td colspan="2">Stellar Radius
1.3 ± 0.0 Solar units</td>
<td rowspan="2">Core Aperture Correlation Statistic
Value = 356.13
Significance = 100.00%
Halo Aperture Correlation Statistic
Value = 88.91
Significance = 100.00%
Core/Halo Ratio
Ratio = 4.01</td>
<td rowspan="2">Ghost Diagnostic Test</td>
</tr>
<tr>
<td colspan="2">Period = 4.4 ± 0.0 days
Depth = 13996 ± 25 ppm
Planet Radius = 15.4 ± 0.0 Earth radii
Semi-major Axis = 0.1 ± 0.0 AU
Effective Stellar Flux = 708.8 ± 0.0
Equilibrium Temperature = 1316 ± 0 Kelvin
Chi-squared/DoF = 0.9
SNR = 561.1</td>
</tr>
<tr>
<td rowspan="2">Eclipsing Binary Discrimination Test</td>
<td colspan="2">Odd-Even Depth Comparison Statistic
Value = 2.93e+00
Significance = 8.68%</td>
<td>Offsets Relative to Out of Transit Centroid
Source RA Offset = 1.23e-01 ± 2.50e+00 arcsec (0.05 σ)
Source Dec Offset = -9.34e-02 ± 2.50e+00 arcsec (-0.04 σ)
Source Offset Distance = 1.55e-01 ± 2.50e+00 arcsec (0.06 σ)
Offsets Relative to TIC Position
Source RA Offset = 4.81e-01 ± 2.51e+00 arcsec (0.19 σ)
Source Dec Offset = -8.71e-01 ± 2.53e+00 arcsec (-0.34 σ)
Source Offset Distance = 9.95e-01 ± 2.52e+00 arcsec (0.40 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 = 8.18e+04
Significance = 100.00%</td>
<td>False Alarm = 0.00e+00
Transit Count = 55
Max Multiple Event Statistic = 546.4</td>
<td>Bootstrap Test</td>
</tr>
</table>

Summary of model fitter results and validation test results for target 149603524, 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.

Planet Candidate 2

<table>
<tr><td rowspan="2">Model Fitter</td><td colspan="2">Stellar Radius
1.3 ± 0.0 Solar units</td><td rowspan="2">Core Aperture Correlation Statistic
Value = 0.94
Significance = 82.75%
Halo Aperture Correlation Statistic
Value = -0.99
Significance = 16.18%
Core/Halo Ratio
Ratio = -0.96</td><td rowspan="2">Ghost Diagnostic Test</td></tr>
<tr><td colspan="2">Period = 55.6 ± 0.0 days
Depth = 1292 ± 185 ppm
Planet Radius = 4.7 ± 3.3 Earth radii
Semi-major Axis = 0.3 ± 0.0 AU
Effective Stellar Flux = 24.2 ± 0.0
Equilibrium Temperature = 566 ± 0 Kelvin
Chi-squared/DoF = 1.0
SNR = 8.0</td></tr>
<tr><td rowspan="2">Eclipsing Binary Discrimination Test</td><td colspan="2">Odd-Even Depth Comparison Statistic
Value = 1.12e+01
Significance = 0.08%</td><td>Offsets Relative to Out of Transit Centroid
Source RA Offset = -1.52e-01 ± 5.76e+00 arcsec (-0.03 σ)
Source Dec Offset = -9.88e-01 ± 3.05e+00 arcsec (-0.32 σ)
Source Offset Distance = 9.99e-01 ± 3.14e+00 arcsec (0.32 σ)
Offsets Relative to TIC Position
Source RA Offset = 2.66e-02 ± 1.28e+01 arcsec (0.00 σ)
Source Dec Offset = -1.56e+00 ± 4.93e+00 arcsec (-0.32 σ)
Source Offset Distance = 1.56e+00 ± 5.12e+00 arcsec (0.30 σ)</td><td>Difference Image Centroid Offsets</td></tr>
<tr><td>Shorter Period Comparison Statistic
Value = 8.18e+04
Significance = 100.00%</td><td>Longer Period Comparison Statistic
Value = 3.77e+04
Significance = 100.00%</td><td>False Alarm = 1.22e-11
Transit Count = 4
Max Multiple Event Statistic = 8.7</td><td>Bootstrap Test</td></tr>
</table>

Summary of model fitter results and validation test results for target 149603524, planet candidate 2. 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.

Planet Candidate 3

<table>
<tr><td rowspan="2">Model Fitter</td><td colspan="2">Stellar Radius
1.3 ± 0.0 Solar units</td><td rowspan="2">Core Aperture Correlation Statistic
Value = 0.96
Significance = 83.26%
Halo Aperture Correlation Statistic
Value = 0.49
Significance = 68.65%
Core/Halo Ratio
Ratio = 1.99</td><td rowspan="2">Ghost Diagnostic Test</td></tr>
<tr><td colspan="2">Period = 192.3 ± 0.0 days
Depth = 1052 ± 157 ppm
Planet Radius = 4.2 ± 0.5 Earth radii
Semi-major Axis = 0.7 ± 0.0 AU
Effective Stellar Flux = 4.6 ± 0.0
Equilibrium Temperature = 374 ± 0 Kelvin
Chi-squared/DoF = 0.9
SNR = 6.8</td></tr>
<tr><td rowspan="2">Eclipsing Binary Discrimination Test</td><td colspan="2">Odd-Even Depth Comparison Statistic
Value = 1.75e+00
Significance = 18.54%</td><td>Offsets Relative to Out of Transit Centroid
Source RA Offset = -1.90e+01 ± 2.52e+00 arcsec (-7.54 σ)
Source Dec Offset = 6.65e+00 ± 2.51e+00 arcsec (2.65 σ)
Source Offset Distance = 2.01e+01 ± 2.52e+00 arcsec (7.99 σ)
Offsets Relative to TIC Position
Source RA Offset = -1.91e+01 ± 2.50e+00 arcsec (-7.63 σ)
Source Dec Offset = 6.34e+00 ± 2.51e+00 arcsec (2.53 σ)
Source Offset Distance = 2.01e+01 ± 2.50e+00 arcsec (8.03 σ)</td><td>Difference Image Centroid Offsets</td></tr>
<tr><td>Shorter Period Comparison Statistic
Value = 1.14e+04
Significance = 100.00%</td><td>Longer Period Comparison Statistic
Value = N/A
Significance = N/A</td><td>False Alarm = 2.83e-18
Transit Count = 2
Max Multiple Event Statistic = 8.7</td><td>Bootstrap Test</td></tr>
</table>

Summary of model fitter results and validation test results for target 149603524, planet candidate 3. 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.

Planet Candidate 4

<table>
<tr><td rowspan="2">Model Fitter</td><td colspan="2">Stellar Radius
1.3 ± 0.0 Solar units</td><td rowspan="2">Core Aperture Correlation Statistic
Value = 4.58
Significance = 100.00%
Halo Aperture Correlation Statistic
Value = -1.67
Significance = 4.79%
Core/Halo Ratio
Ratio = -2.75</td><td rowspan="2">Ghost Diagnostic Test</td></tr>
<tr><td colspan="2">Period = 121.2 ± 0.0 days
Depth = 874 ± 126 ppm
Planet Radius = 3.9 ± 0.7 Earth radii
Semi-major Axis = 0.5 ± 0.0 AU
Effective Stellar Flux = 8.6 ± 0.0
Equilibrium Temperature = 436 ± 0 Kelvin
Chi-squared/DoF = 0.8
SNR = 6.9</td></tr>
<tr><td rowspan="2">Eclipsing Binary Discrimination Test</td><td colspan="2">Odd-Even Depth Comparison Statistic
Value = 4.61e-01
Significance = 49.72%</td><td>Offsets Relative to Out of Transit Centroid
Source RA Offset = -1.23e+01 ± 2.31e+01 arcsec (-0.53 σ)
Source Dec Offset = 4.96e+00 ± 3.17e+00 arcsec (1.56 σ)
Source Offset Distance = 1.32e+01 ± 2.22e+01 arcsec (0.60 σ)
Offsets Relative to TIC Position
Source RA Offset = -1.73e+01 ± 1.41e+01 arcsec (-1.22 σ)
Source Dec Offset = 4.48e+00 ± 2.84e+00 arcsec (1.57 σ)
Source Offset Distance = 1.78e+01 ± 1.40e+01 arcsec (1.27 σ)</td><td>Difference Image Centroid Offsets</td></tr>
<tr><td>Shorter Period Comparison Statistic
Value = 3.77e+04
Significance = 100.00%</td><td>Longer Period Comparison Statistic
Value = 1.14e+04
Significance = 100.00%</td><td>False Alarm = 2.27e-09
Transit Count = 2
Max Multiple Event Statistic = 7.7</td><td>Bootstrap Test</td></tr>
</table>

Summary of model fitter results and validation test results for target 149603524, planet candidate 4. 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

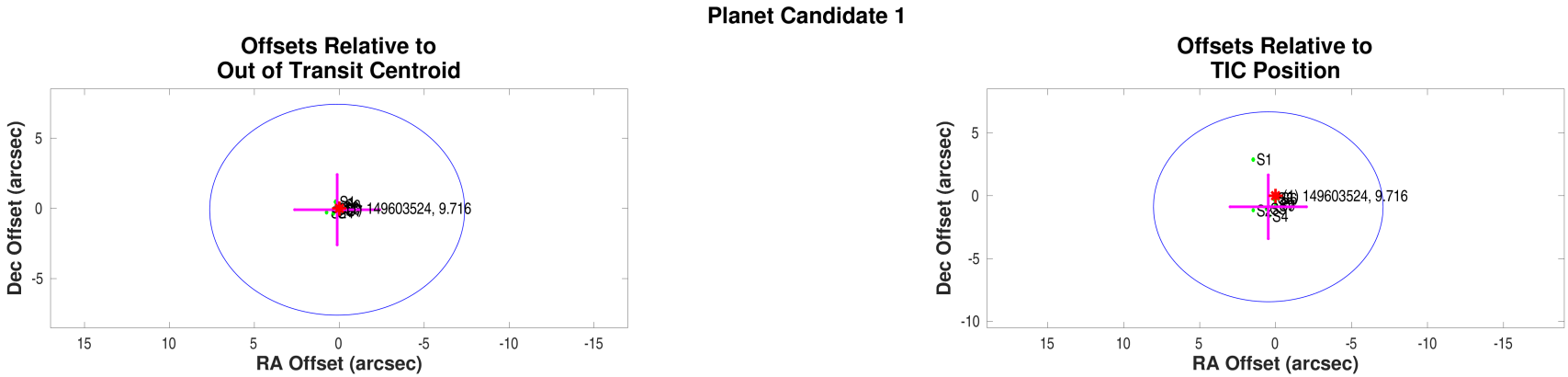
Multi-Sector Average PRF Fit of the Difference Images

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

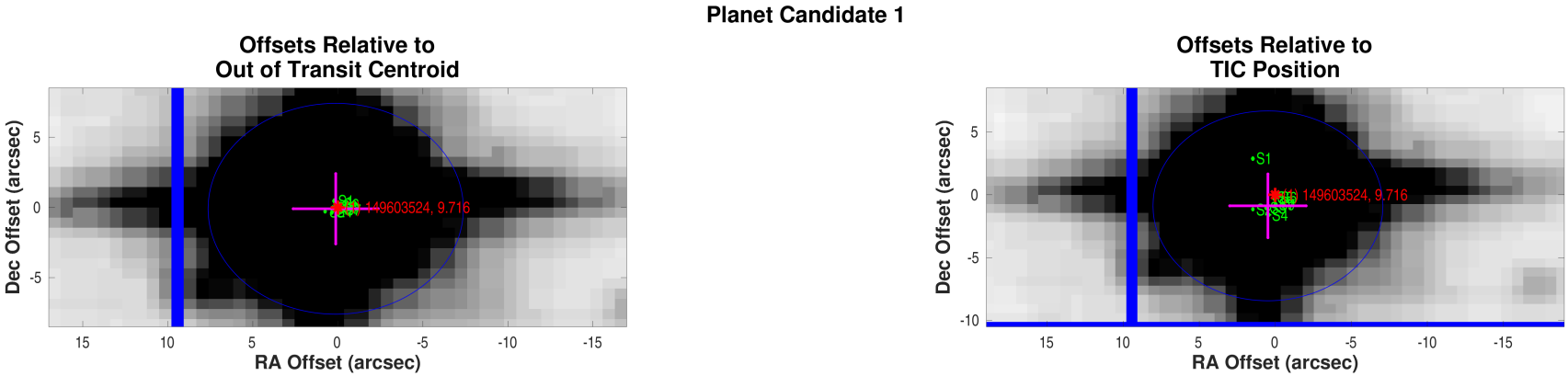
	RA	Dec	Units
Offset	$0.1233 \pm 2.50e+00$	$-0.0934 \pm 2.50e+00$	arcseconds
Offset/σ	0.05	-0.04	
Offset Distance	$0.1546 \pm 2.50e+00$		arcseconds
Offset Distance/σ	0.06		
3σ Radius	7.5081		arcseconds

Mean offset from the TIC RA and Dec

	RA	Dec	Units
Offset	$0.4810 \pm 2.51e+00$	$-0.8711 \pm 2.53e+00$	arcseconds
Offset/σ	0.19	-0.34	
Offset Distance	$0.9951 \pm 2.52e+00$		arcseconds
Offset Distance/σ	0.40		
3σ Radius	7.5562		arcseconds



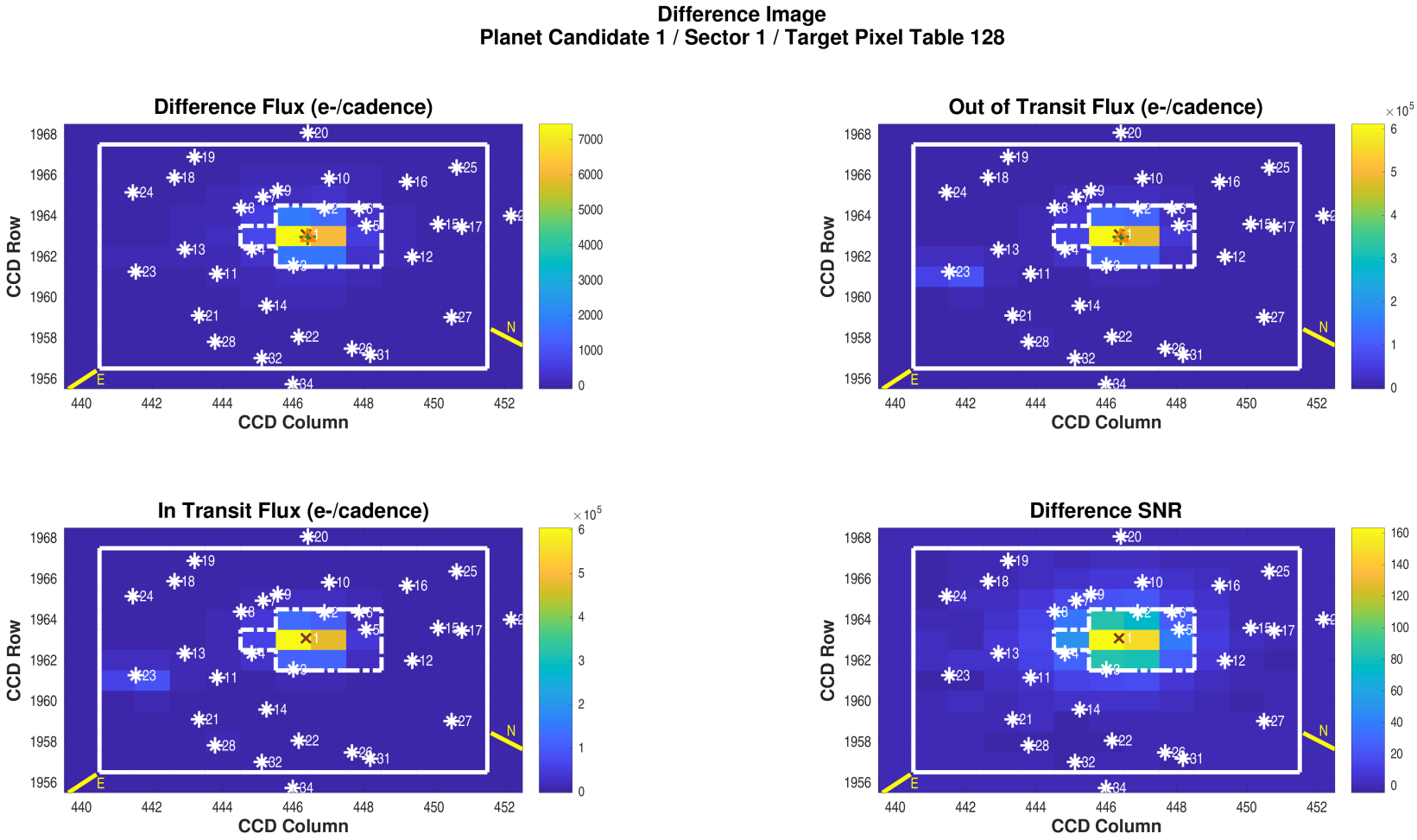
Difference image centroid offsets for target 149603524, planet candidate 1. Left: difference image PRF centroid offsets in RA and Dec with respect to the per sector out-of-transit centroids for the given target. Right: difference image PRF centroid offsets in RA and Dec with respect to the TC coordinates 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; 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/0000000149603524-01-difference-image-centroid-offsets.fig`



Difference image centroid offsets for target 149603524, 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; 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/0000000149603524-01-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
8	8	8	1.0000	0.70



Difference image for target 149603524, planet candidate 1, sector 1, target pixel table 128. 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 = 5; number of valid in-transit cadences = 453; number of in-transit cadence gaps = 1; number of valid out-of-transit cadences = 1129; number of out-of-transit cadence gaps = 43. Difference image quality metric = 1.00 (good).
Open `./planet-01/difference-image/0000000149603524-01-difference-image-01-128.fig`

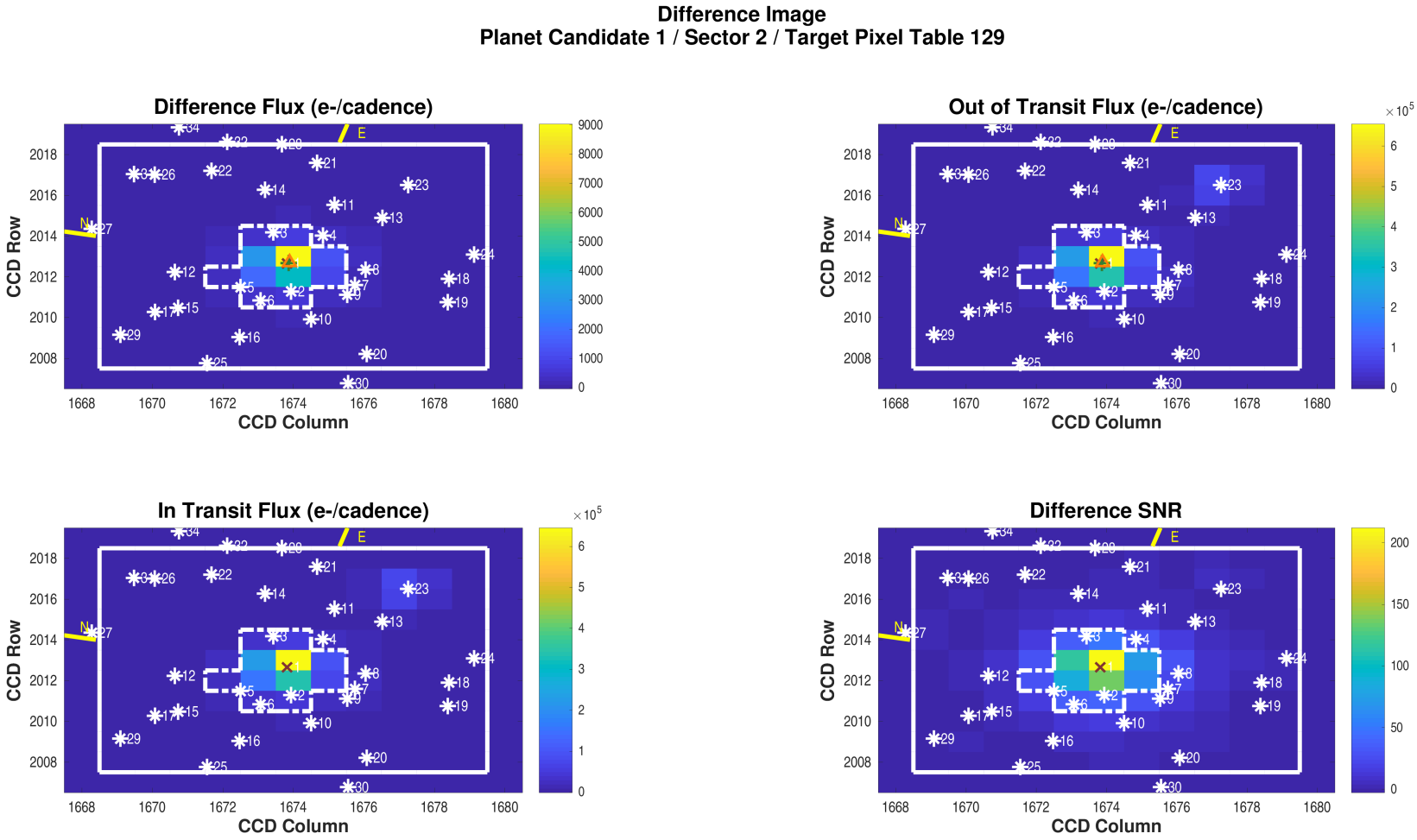
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$1962.96 \pm 1.93e-05$	$446.40 \pm 1.59e-05$	pixels	$87.14058190 \pm 1.32e-05$	$-63.98762439 \pm 1.29e-05$	degrees
Difference Image Centroid	$1962.94 \pm 2.80e-03$	$446.41 \pm 2.36e-03$	pixels	$87.14071377 \pm 2.02e-05$	$-63.98749572 \pm 1.92e-05$	degrees
Offset	$-0.0219 \pm 2.80e-03$	$0.0099 \pm 2.36e-03$	pixels	$0.2082 \pm 4.26e-02$	$0.4632 \pm 8.31e-02$	arcseconds
Offset/σ	-7.83	4.20		4.89	5.58	
Offset Distance	$0.0241 \pm 2.69e-03$		pixels	$0.5078 \pm 7.47e-02$		arcseconds
Offset Distance/σ	8.96			6.80		

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

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$1963.08 \pm 2.33e-03$	$446.36 \pm 2.24e-03$	pixels	$87.13978169 \pm 0.00e+00$	$-63.98829727 \pm 0.00e+00$	degrees
Difference Image Centroid	$1962.94 \pm 2.80e-03$	$446.41 \pm 2.36e-03$	pixels	$87.14071377 \pm 2.02e-05$	$-63.98749572 \pm 1.92e-05$	degrees
Offset	$-0.1428 \pm 3.64e-03$	$0.0561 \pm 3.25e-03$	pixels	$1.4716 \pm 3.19e-02$	$2.8856 \pm 6.90e-02$	arcseconds
Offset/σ	-39.20	17.28		46.07	41.83	
Offset Distance	$0.1535 \pm 3.56e-03$		pixels	$3.2391 \pm 6.47e-02$		arcseconds
Offset Distance/σ	43.08			50.05		



Difference image for target 149603524, planet candidate 1, sector 2, target pixel table 129. 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 = 6; number of valid in-transit cadences = 544; number of in-transit cadence gaps = 1; number of valid out-of-transit cadences = 1353; number of out-of-transit cadence gaps = 54. Difference image quality metric = 1.00 (good).
Open `./planet-01/difference-image/0000000149603524-01-difference-image-02-129.fig`

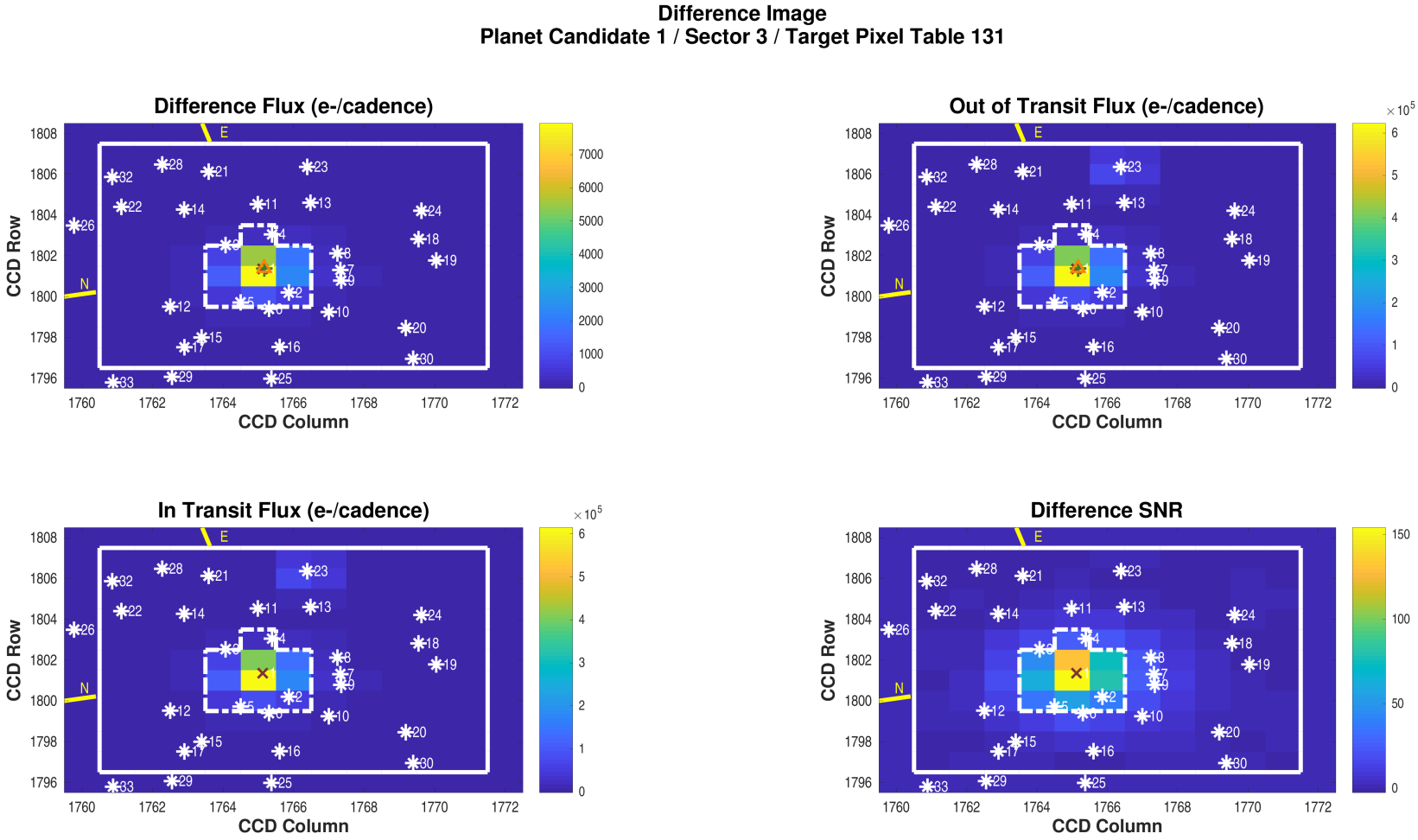
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$2012.68 \pm 1.41e-05$	$1673.87 \pm 1.69e-05$	pixels	$87.14023874 \pm 1.11e-06$	$-63.98853638 \pm 1.25e-06$	degrees
Difference Image Centroid	$2012.71 \pm 1.99e-03$	$1673.89 \pm 2.46e-03$	pixels	$87.14071260 \pm 1.14e-05$	$-63.98861471 \pm 1.41e-05$	degrees
Offset	$0.0311 \pm 1.99e-03$	$0.0216 \pm 2.46e-03$	pixels	$0.7481 \pm 1.94e-02$	$-0.2820 \pm 5.10e-02$	arcseconds
Offset/σ	15.63	8.77		38.59	−5.53	
Offset Distance	$0.0378 \pm 2.18e-03$		pixels	$0.7995 \pm 2.61e-02$		arcseconds
Offset Distance/σ	17.37			30.63		

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

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$2012.66 \pm 1.94e-04$	$1673.82 \pm 2.17e-04$	pixels	$87.13978096 \pm 0.00e+00$	$-63.98829672 \pm 0.00e+00$	degrees
Difference Image Centroid	$2012.71 \pm 1.99e-03$	$1673.89 \pm 2.46e-03$	pixels	$87.14071260 \pm 1.14e-05$	$-63.98861471 \pm 1.41e-05$	degrees
Offset	$0.0544 \pm 2.00e-03$	$0.0696 \pm 2.47e-03$	pixels	$1.4709 \pm 1.81e-02$	$-1.1447 \pm 5.08e-02$	arcseconds
Offset/σ	27.20	28.18		81.48	−22.55	
Offset Distance	$0.0883 \pm 2.33e-03$		pixels	$1.8638 \pm 3.45e-02$		arcseconds
Offset Distance/σ	37.95			54.06		



Difference image for target 149603524, planet candidate 1, sector 3, target pixel table 131. 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 = 4; number of valid in-transit cadences = 348; number of in-transit cadence gaps = 15; number of valid out-of-transit cadences = 930; number of out-of-transit cadence gaps = 8. Difference image quality metric = 1.00 (good).
Open `./planet-01/difference-image/0000000149603524-01-difference-image-03-131.fig`

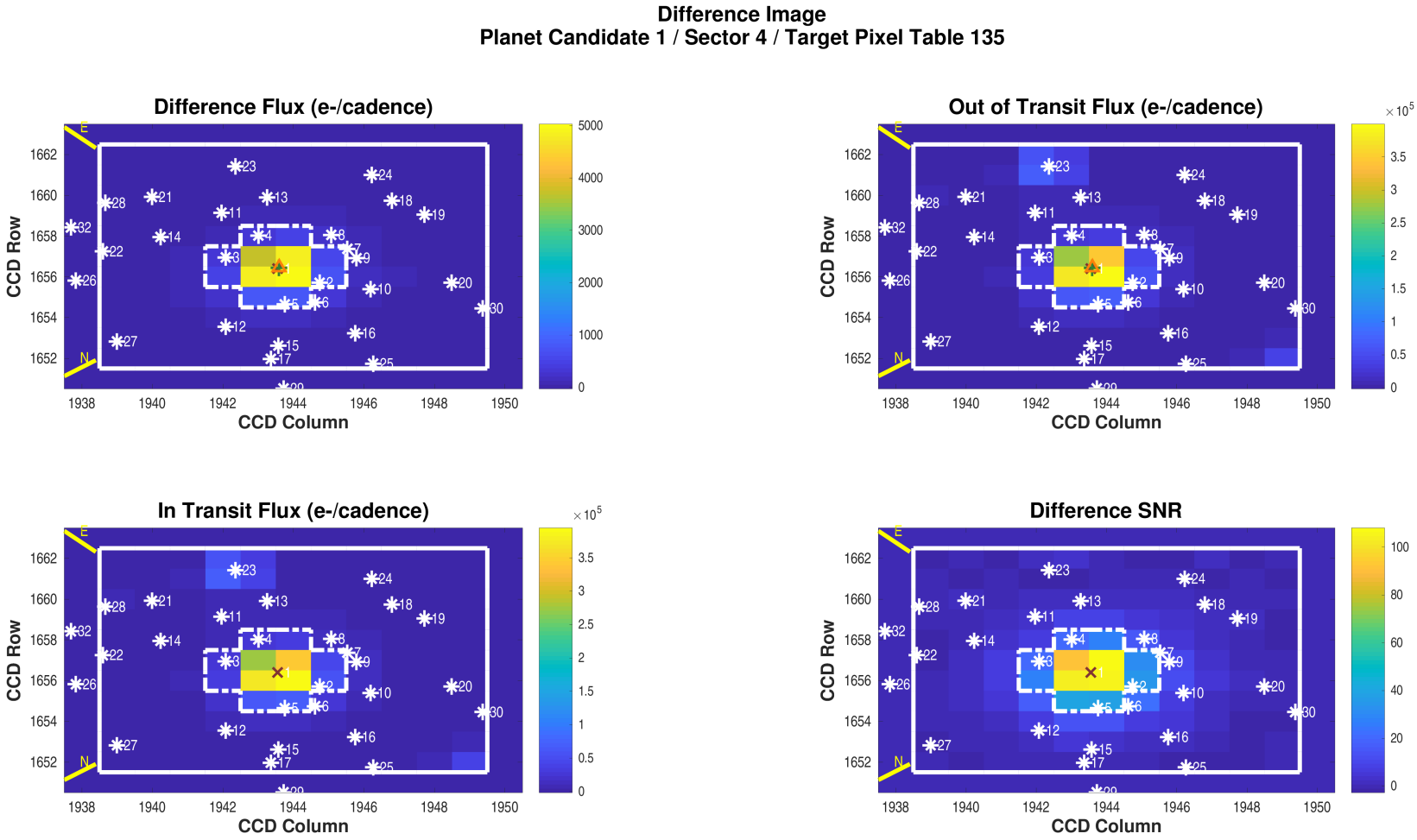
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$1801.39 \pm 1.64e-05$	$1765.17 \pm 1.89e-05$	pixels	$87.13997239 \pm 9.17e-07$	$-63.98858634 \pm 9.12e-07$	degrees
Difference Image Centroid	$1801.40 \pm 2.38e-03$	$1765.16 \pm 2.78e-03$	pixels	$87.14016136 \pm 1.44e-05$	$-63.98858738 \pm 1.52e-05$	degrees
Offset	$0.0138 \pm 2.38e-03$	$-0.0031 \pm 2.78e-03$	pixels	$0.2983 \pm 2.29e-02$	$-0.0037 \pm 5.48e-02$	arcseconds
Offset/σ	5.79	−1.12		13.05	−0.07	
Offset Distance	$0.0141 \pm 2.45e-03$		pixels	$0.2984 \pm 2.27e-02$		arcseconds
Offset Distance/σ	5.77			13.12		

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

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$1801.36 \pm 1.58e-04$	$1765.12 \pm 1.60e-04$	pixels	$87.13978025 \pm 0.00e+00$	$-63.98829619 \pm 0.00e+00$	degrees
Difference Image Centroid	$1801.40 \pm 2.38e-03$	$1765.16 \pm 2.78e-03$	pixels	$87.14016136 \pm 1.44e-05$	$-63.98858738 \pm 1.52e-05$	degrees
Offset	$0.0393 \pm 2.38e-03$	$0.0416 \pm 2.78e-03$	pixels	$0.6017 \pm 2.27e-02$	$-1.0483 \pm 5.47e-02$	arcseconds
Offset/σ	16.51	14.98		26.48	−19.16	
Offset Distance	$0.0573 \pm 2.50e-03$		pixels	$1.2087 \pm 4.68e-02$		arcseconds
Offset Distance/σ	22.95			25.83		



Difference image for target 149603524, planet candidate 1, sector 4, target pixel table 135. 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 = 3; number of valid in-transit cadences = 259; number of in-transit cadence gaps = 13; number of valid out-of-transit cadences = 702; number of out-of-transit cadence gaps = 3. Difference image quality metric = 1.00 (good).
Open `./planet-01/difference-image/0000000149603524-01-difference-image-04-135.fig`

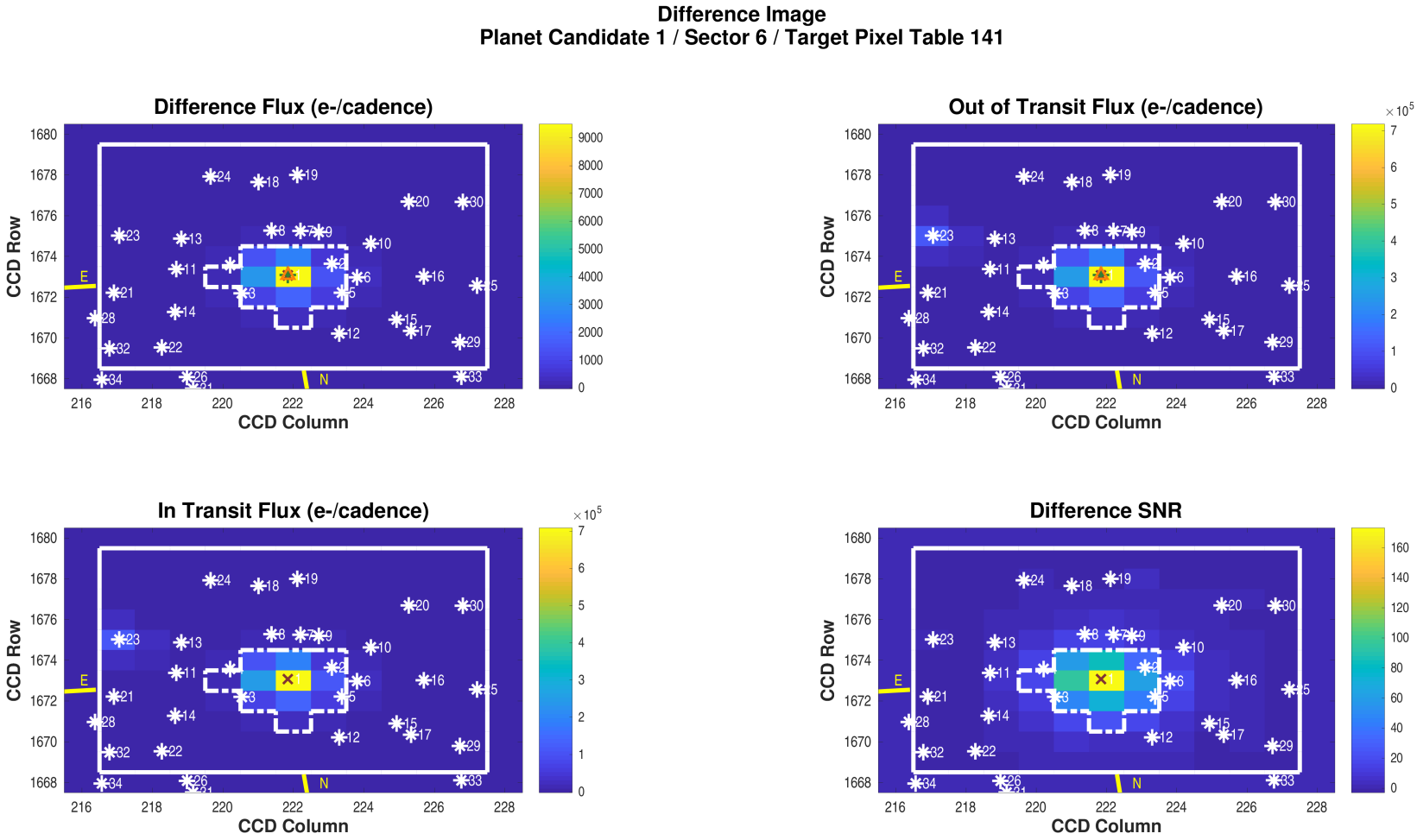
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$1656.44 \pm 2.02e-05$	$1943.59 \pm 1.83e-05$	pixels	$87.13982224 \pm 1.05e-06$	$-63.98863275 \pm 1.06e-06$	degrees
Difference Image Centroid	$1656.46 \pm 2.96e-03$	$1943.59 \pm 2.67e-03$	pixels	$87.14004867 \pm 1.68e-05$	$-63.98873621 \pm 1.54e-05$	degrees
Offset	$0.0244 \pm 2.96e-03$	$0.0022 \pm 2.67e-03$	pixels	$0.3575 \pm 2.67e-02$	$-0.3725 \pm 5.56e-02$	arcseconds
Offset/σ	8.24	0.82		13.40	−6.70	
Offset Distance	$0.0245 \pm 2.94e-03$		pixels	$0.5162 \pm 4.57e-02$		arcseconds
Offset Distance/σ	8.31			11.29		

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

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$1656.40 \pm 1.66e-04$	$1943.55 \pm 2.00e-04$	pixels	$87.13977952 \pm 0.00e+00$	$-63.98829565 \pm 0.00e+00$	degrees
Difference Image Centroid	$1656.46 \pm 2.96e-03$	$1943.59 \pm 2.67e-03$	pixels	$87.14004867 \pm 1.68e-05$	$-63.98873621 \pm 1.54e-05$	degrees
Offset	$0.0646 \pm 2.96e-03$	$0.0434 \pm 2.68e-03$	pixels	$0.4249 \pm 2.65e-02$	$-1.5860 \pm 5.55e-02$	arcseconds
Offset/σ	21.81	16.22		16.02	−28.59	
Offset Distance	$0.0778 \pm 2.82e-03$		pixels	$1.6420 \pm 5.46e-02$		arcseconds
Offset Distance/σ	27.62			30.06		



Difference image for target 149603524, planet candidate 1, sector 6, target pixel table 141. 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 = 4; number of valid in-transit cadences = 363; number of in-transit cadence gaps = 0; number of valid out-of-transit cadences = 938; number of out-of-transit cadence gaps = 0. Difference image quality metric = 1.00 (good).
Open `./planet-01/difference-image/0000000149603524-01-difference-image-06-141.fig`

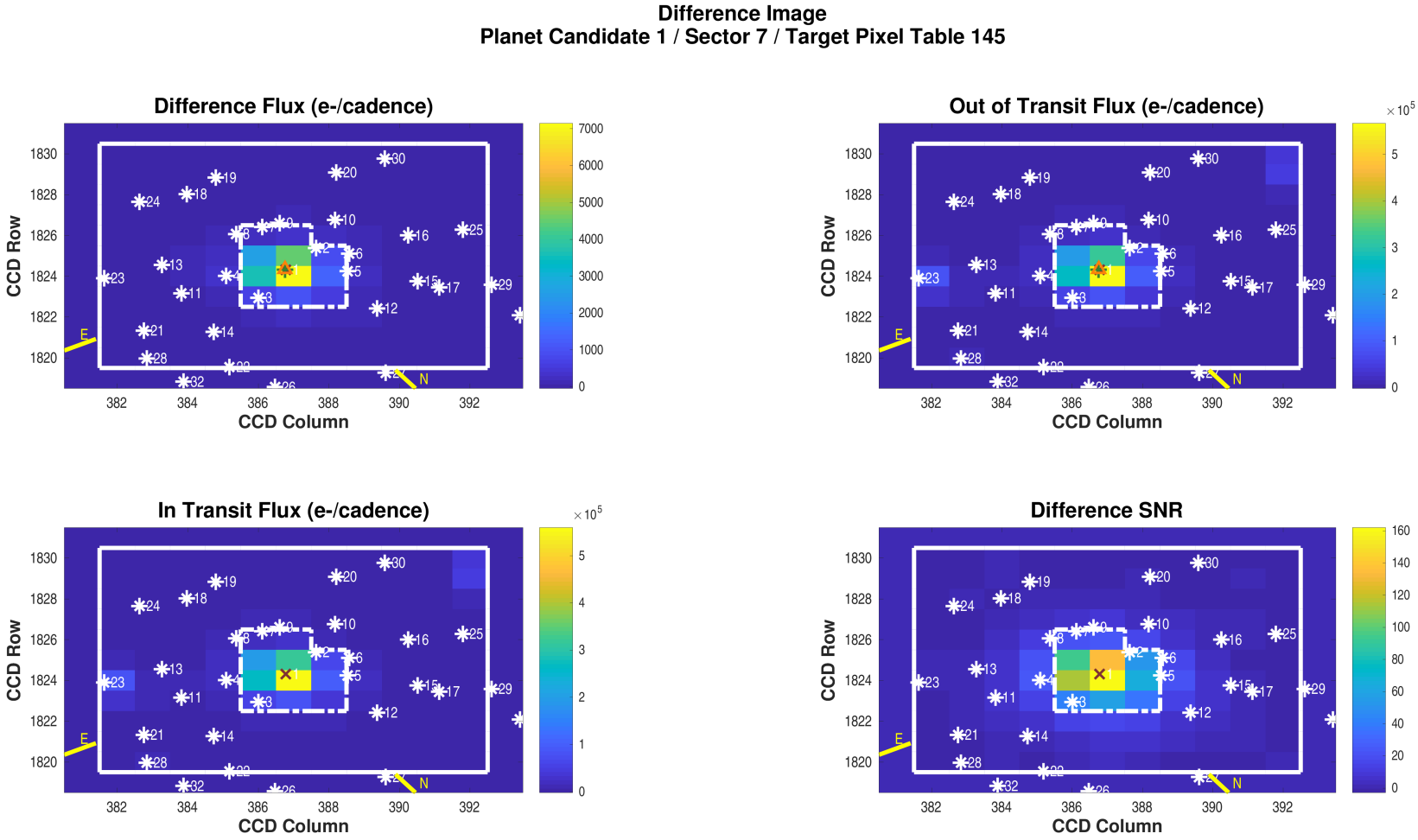
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$1673.09 \pm 2.02e-05$	$221.84 \pm 1.80e-05$	pixels	$87.13973945 \pm 1.12e-06$	$-63.98840187 \pm 1.24e-06$	degrees
Difference Image Centroid	$1673.08 \pm 2.95e-03$	$221.85 \pm 2.61e-03$	pixels	$87.13970295 \pm 1.53e-05$	$-63.98834392 \pm 1.66e-05$	degrees
Offset	$-0.0096 \pm 2.95e-03$	$0.0037 \pm 2.61e-03$	pixels	$-0.0576 \pm 2.43e-02$	$0.2086 \pm 5.97e-02$	arcseconds
Offset/σ	-3.24	1.41		-2.37	3.49	
Offset Distance	$0.0103 \pm 2.86e-03$		pixels	$0.2164 \pm 5.71e-02$		arcseconds
Offset Distance/σ	3.59			3.79		

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

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$1673.07 \pm 2.19e-04$	$221.84 \pm 1.93e-04$	pixels	$87.13977810 \pm 0.00e+00$	$-63.98829460 \pm 0.00e+00$	degrees
Difference Image Centroid	$1673.08 \pm 2.95e-03$	$221.85 \pm 2.61e-03$	pixels	$87.13970295 \pm 1.53e-05$	$-63.98834392 \pm 1.66e-05$	degrees
Offset	$0.0089 \pm 2.96e-03$	$0.0048 \pm 2.61e-03$	pixels	$-0.1187 \pm 2.42e-02$	$-0.1776 \pm 5.96e-02$	arcseconds
Offset/σ	3.01	1.83		-4.90	-2.98	
Offset Distance	$0.0101 \pm 2.95e-03$		pixels	$0.2136 \pm 5.29e-02$		arcseconds
Offset Distance/σ	3.43			4.03		



Difference image for target 149603524, planet candidate 1, sector 7, target pixel table 145. 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 = 5; number of valid in-transit cadences = 454; number of in-transit cadence gaps = 0; number of valid out-of-transit cadences = 1167; number of out-of-transit cadence gaps = 7. Difference image quality metric = 1.00 (good).
Open `./planet-01/difference-image/0000000149603524-01-difference-image-07-145.fig`

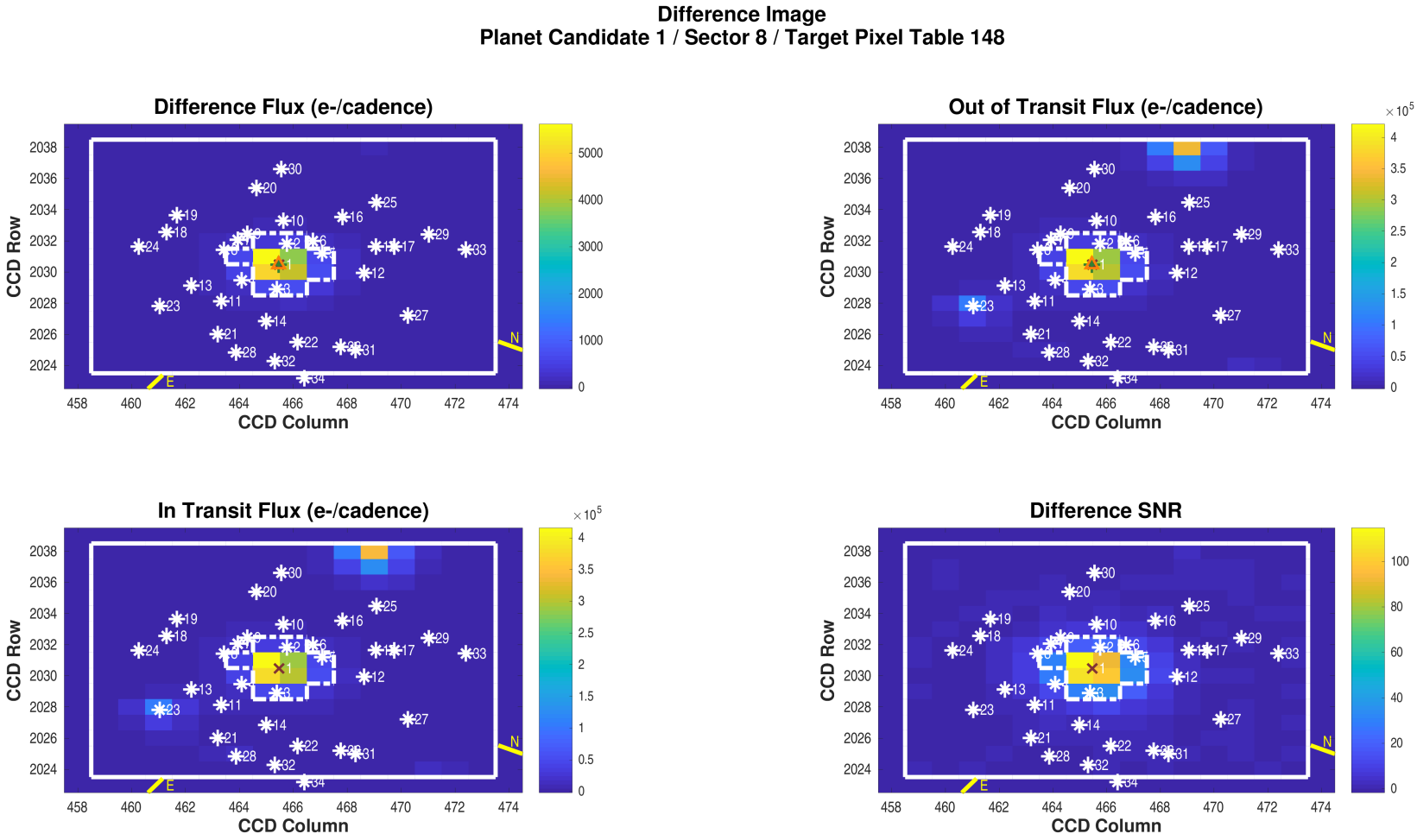
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$1824.33 \pm 1.52e-05$	$386.75 \pm 1.61e-05$	pixels	$87.13990787 \pm 1.15e-06$	$-63.98845443 \pm 1.01e-06$	degrees
Difference Image Centroid	$1824.34 \pm 2.16e-03$	$386.76 \pm 2.34e-03$	pixels	$87.13978185 \pm 1.34e-05$	$-63.98851502 \pm 1.24e-05$	degrees
Offset	$0.0138 \pm 2.16e-03$	$0.0024 \pm 2.34e-03$	pixels	$-0.1990 \pm 2.12e-02$	$-0.2181 \pm 4.49e-02$	arcseconds
Offset/σ	6.36	1.04		−9.38	−4.86	
Offset Distance	$0.0140 \pm 2.18e-03$		pixels	$0.2952 \pm 3.54e-02$		arcseconds
Offset Distance/σ	6.42			8.33		

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

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$1824.31 \pm 1.62e-04$	$386.78 \pm 2.12e-04$	pixels	$87.13977747 \pm 0.00e+00$	$-63.98829413 \pm 0.00e+00$	degrees
Difference Image Centroid	$1824.34 \pm 2.16e-03$	$386.76 \pm 2.34e-03$	pixels	$87.13978185 \pm 1.34e-05$	$-63.98851502 \pm 1.24e-05$	degrees
Offset	$0.0317 \pm 2.17e-03$	$-0.0204 \pm 2.35e-03$	pixels	$0.0069 \pm 2.11e-02$	$-0.7952 \pm 4.47e-02$	arcseconds
Offset/σ	14.61	−8.71		0.33	−17.79	
Offset Distance	$0.0377 \pm 2.20e-03$		pixels	$0.7952 \pm 4.47e-02$		arcseconds
Offset Distance/σ	17.15			17.78		



Difference image for target 149603524, planet candidate 1, sector 8, target pixel table 148. 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 = 3; number of valid in-transit cadences = 272; number of in-transit cadence gaps = 0; number of valid out-of-transit cadences = 704; number of out-of-transit cadence gaps = 0. Difference image quality metric = 1.00 (good).
Open `./planet-01/difference-image/0000000149603524-01-difference-image-08-148.fig`

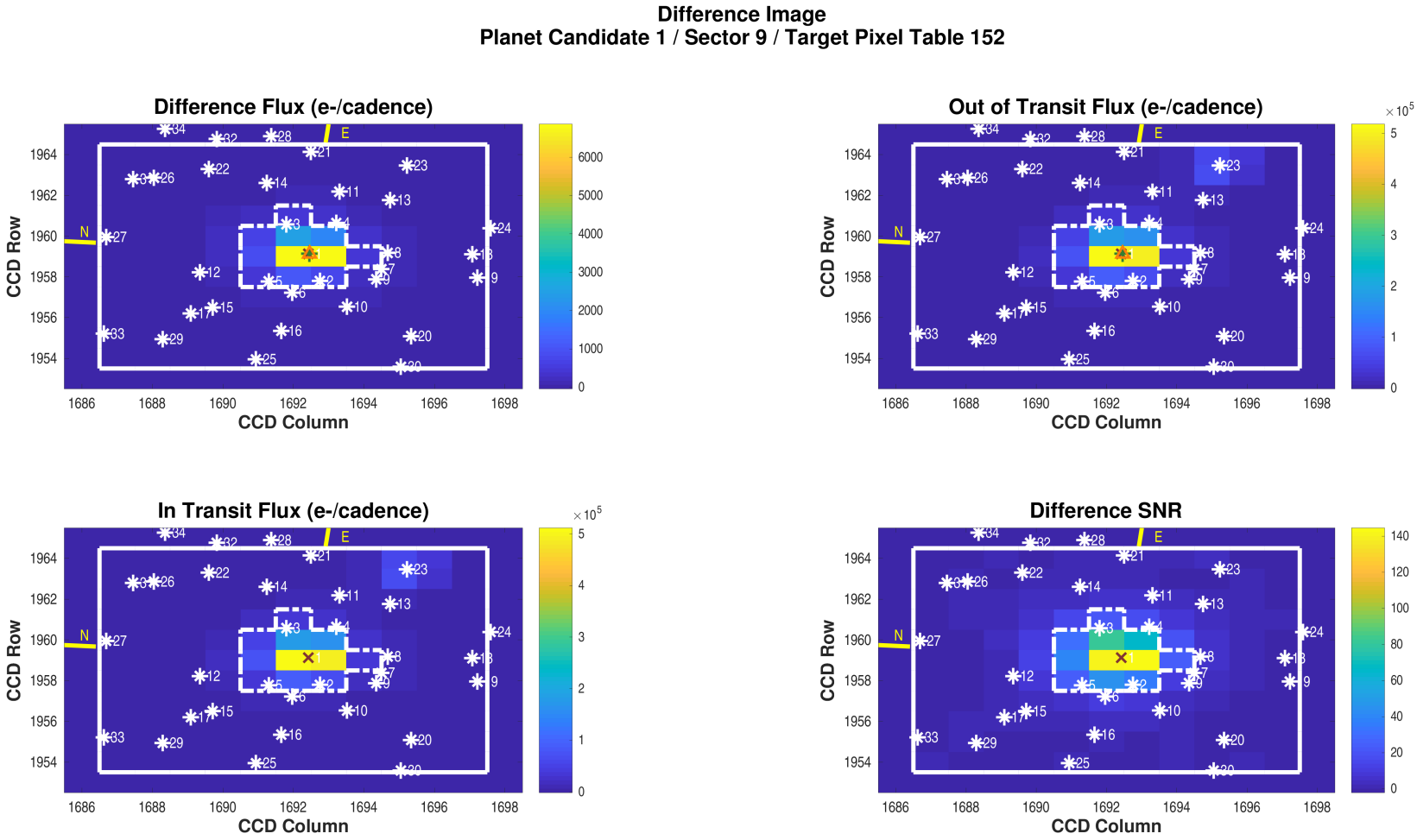
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$2030.48 \pm 1.89e-05$	$465.45 \pm 2.35e-05$	pixels	$87.13983042 \pm 1.90e-06$	$-63.98840193 \pm 2.04e-06$	degrees
Difference Image Centroid	$2030.48 \pm 2.69e-03$	$465.45 \pm 3.35e-03$	pixels	$87.13982290 \pm 1.68e-05$	$-63.98837381 \pm 1.81e-05$	degrees
Offset	$-0.0020 \pm 2.69e-03$	$0.0044 \pm 3.35e-03$	pixels	$-0.0119 \pm 2.67e-02$	$0.1012 \pm 6.55e-02$	arcseconds
Offset/σ	-0.75	1.31		-0.44	1.55	
Offset Distance	$0.0048 \pm 3.28e-03$		pixels	$0.1019 \pm 6.58e-02$		arcseconds
Offset Distance/σ	1.47			1.55		

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

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$2030.48 \pm 2.83e-04$	$465.46 \pm 3.97e-04$	pixels	$87.13977681 \pm 0.00e+00$	$-63.98829363 \pm 0.00e+00$	degrees
Difference Image Centroid	$2030.48 \pm 2.69e-03$	$465.45 \pm 3.35e-03$	pixels	$87.13982290 \pm 1.68e-05$	$-63.98837381 \pm 1.81e-05$	degrees
Offset	$0.0042 \pm 2.70e-03$	$-0.0135 \pm 3.37e-03$	pixels	$0.0728 \pm 2.65e-02$	$-0.2886 \pm 6.51e-02$	arcseconds
Offset/σ	1.54	-4.00		2.74	-4.44	
Offset Distance	$0.0141 \pm 3.35e-03$		pixels	$0.2977 \pm 6.48e-02$		arcseconds
Offset Distance/σ	4.21			4.60		



Difference image for target 149603524, planet candidate 1, sector 9, target pixel table 152. 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 = 4; number of valid in-transit cadences = 354; number of in-transit cadence gaps = 9; number of valid out-of-transit cadences = 938; number of out-of-transit cadence gaps = 0. Difference image quality metric = 1.00 (good).
Open `./planet-01/difference-image/0000000149603524-01-difference-image-09-152.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	$1959.13 \pm 2.26e-05$	$1692.45 \pm 1.68e-05$	pixels	$87.13984252 \pm 1.03e-06$	$-63.98848883 \pm 9.28e-07$	degrees
Difference Image Centroid	$1959.13 \pm 3.26e-03$	$1692.46 \pm 2.39e-03$	pixels	$87.13975157 \pm 1.87e-05$	$-63.98852021 \pm 1.36e-05$	degrees
Offset	$-0.0072 \pm 3.26e-03$	$0.0047 \pm 2.39e-03$	pixels	$-0.1436 \pm 2.96e-02$	$-0.1130 \pm 4.90e-02$	arcseconds
Offset/σ	−2.22	1.97		−4.85	−2.31	
Offset Distance	$0.0086 \pm 3.10e-03$		pixels	$0.1827 \pm 3.88e-02$		arcseconds
Offset Distance/σ	2.79			4.71		

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

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$1959.13 \pm 1.79e-04$	$1692.42 \pm 1.62e-04$	pixels	$87.13977614 \pm 0.00e+00$	$-63.98829313 \pm 0.00e+00$	degrees
Difference Image Centroid	$1959.13 \pm 3.26e-03$	$1692.46 \pm 2.39e-03$	pixels	$87.13975157 \pm 1.87e-05$	$-63.98852021 \pm 1.36e-05$	degrees
Offset	$-0.0053 \pm 3.26e-03$	$0.0384 \pm 2.39e-03$	pixels	$-0.0388 \pm 2.95e-02$	$-0.8175 \pm 4.89e-02$	arcseconds
Offset/σ	−1.61	16.05		−1.31	−16.73	
Offset Distance	$0.0388 \pm 2.44e-03$		pixels	$0.8184 \pm 4.89e-02$		arcseconds
Offset Distance/σ	15.90			16.75		

5.2 Planet Candidate 2

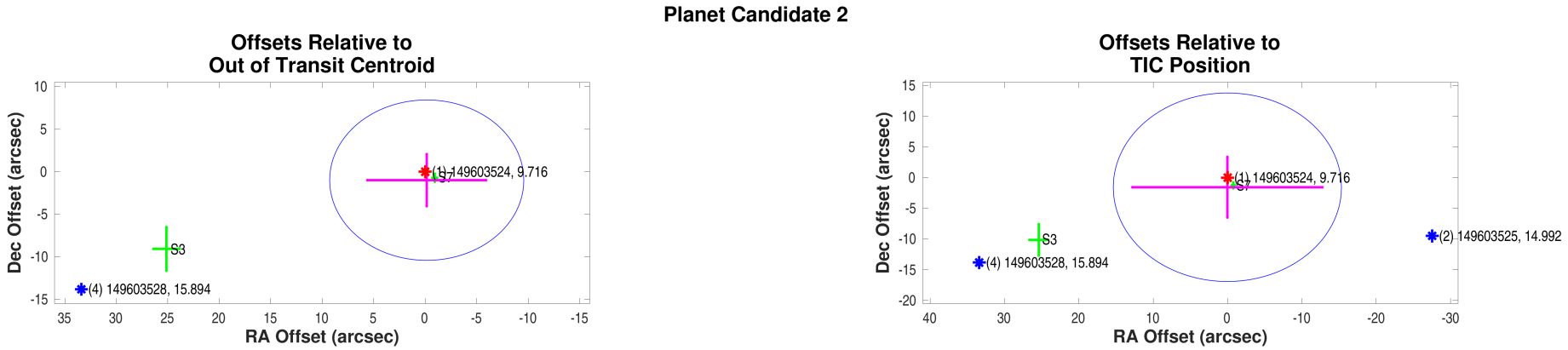
Multi-Sector Average PRF Fit of the Difference Images

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

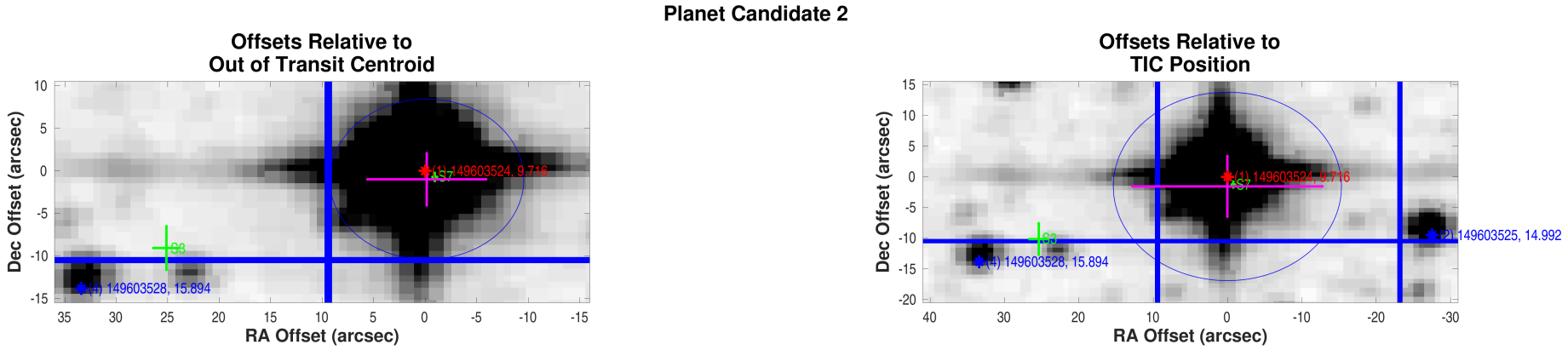
	RA	Dec	Units
Offset	$-0.1517 \pm 5.76e+00$	$-0.9878 \pm 3.05e+00$	arcseconds
Offset/σ	-0.03	-0.32	
Offset Distance	$0.9994 \pm 3.14e+00$		arcseconds
Offset Distance/σ	0.32		
3σ Radius	9.4293		arcseconds

Mean offset from the TIC RA and Dec

	RA	Dec	Units
Offset	$0.0266 \pm 1.28e+01$	$-1.5591 \pm 4.93e+00$	arcseconds
Offset/σ	0.00	-0.32	
Offset Distance	$1.5593 \pm 5.12e+00$		arcseconds
Offset Distance/σ	0.30		
3σ Radius	15.3455		arcseconds



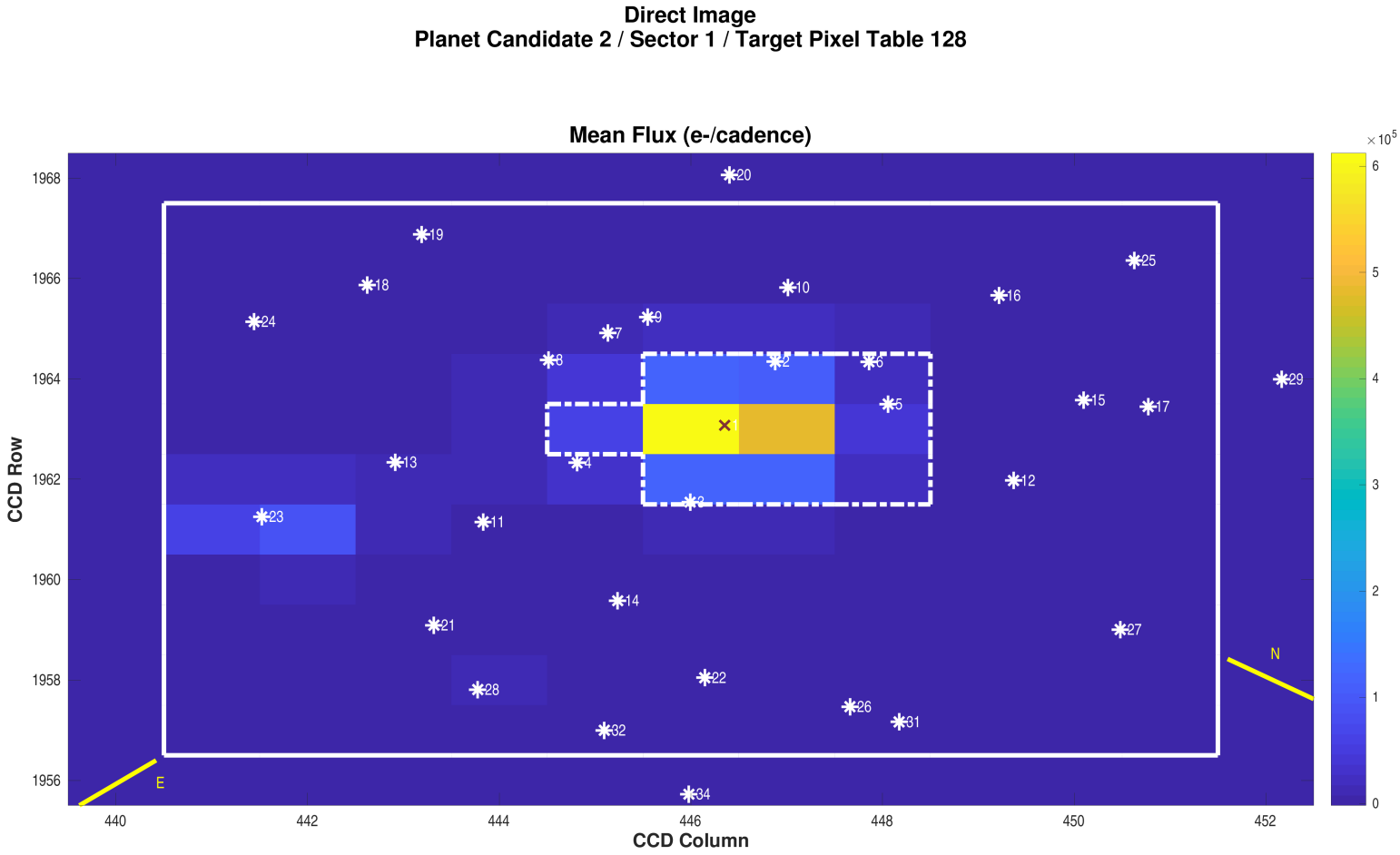
Difference image centroid offsets for target 149603524, planet candidate 2. Left: difference image PRF centroid offsets in RA and Dec with respect to the per sector out-of-transit centroids for the given target. Right: difference image PRF centroid offsets in RA and Dec with respect to the TC coordinates 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; 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-02/difference-image/0000000149603524-02-difference-image-centroid-offsets.fig`



Difference image centroid offsets for target 149603524, planet candidate 2, 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; 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-02/difference-image/0000000149603524-02-difference-image-centroid-offsets-survey.fig`

Difference Image Summary Metrics

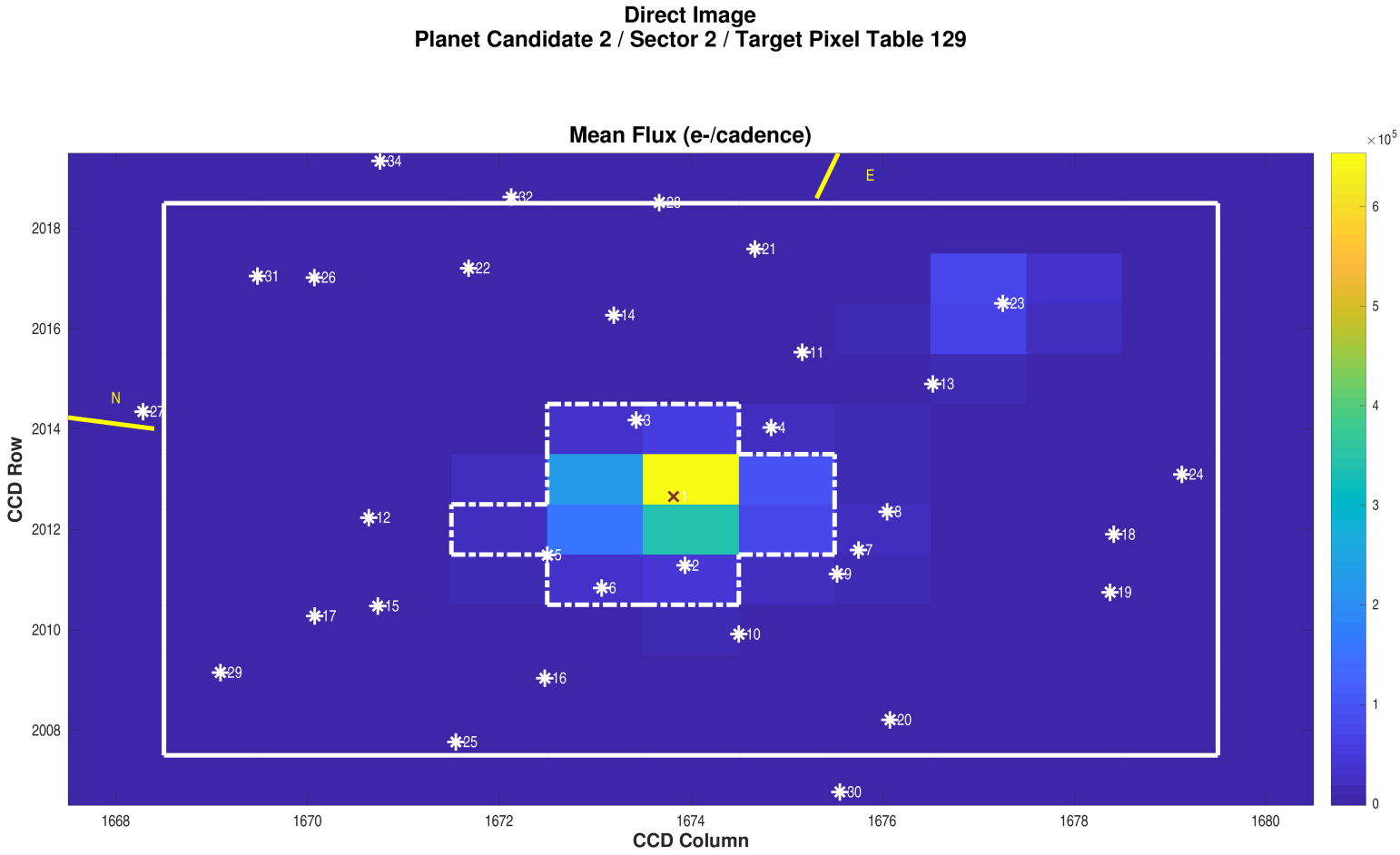
Number of Difference Images	Number of Metrics	Number of Good Metrics	Fraction of Good Metrics	Quality Threshold
2	2	1	0.5000	0.70



Direct image for target 149603524, planet candidate 2, sector 1, target pixel table 128. A difference image cannot be generated because there were no clean transits for this planet candidate and target pixel table. The mean flux over all cadences is shown in the figure. The optimal aperture is outlined with a white dash-dotted line 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.
Open `./planet-02/difference-image/0000000149603524-02-difference-image-01-128.fig`

PRF Fit of the Difference Image

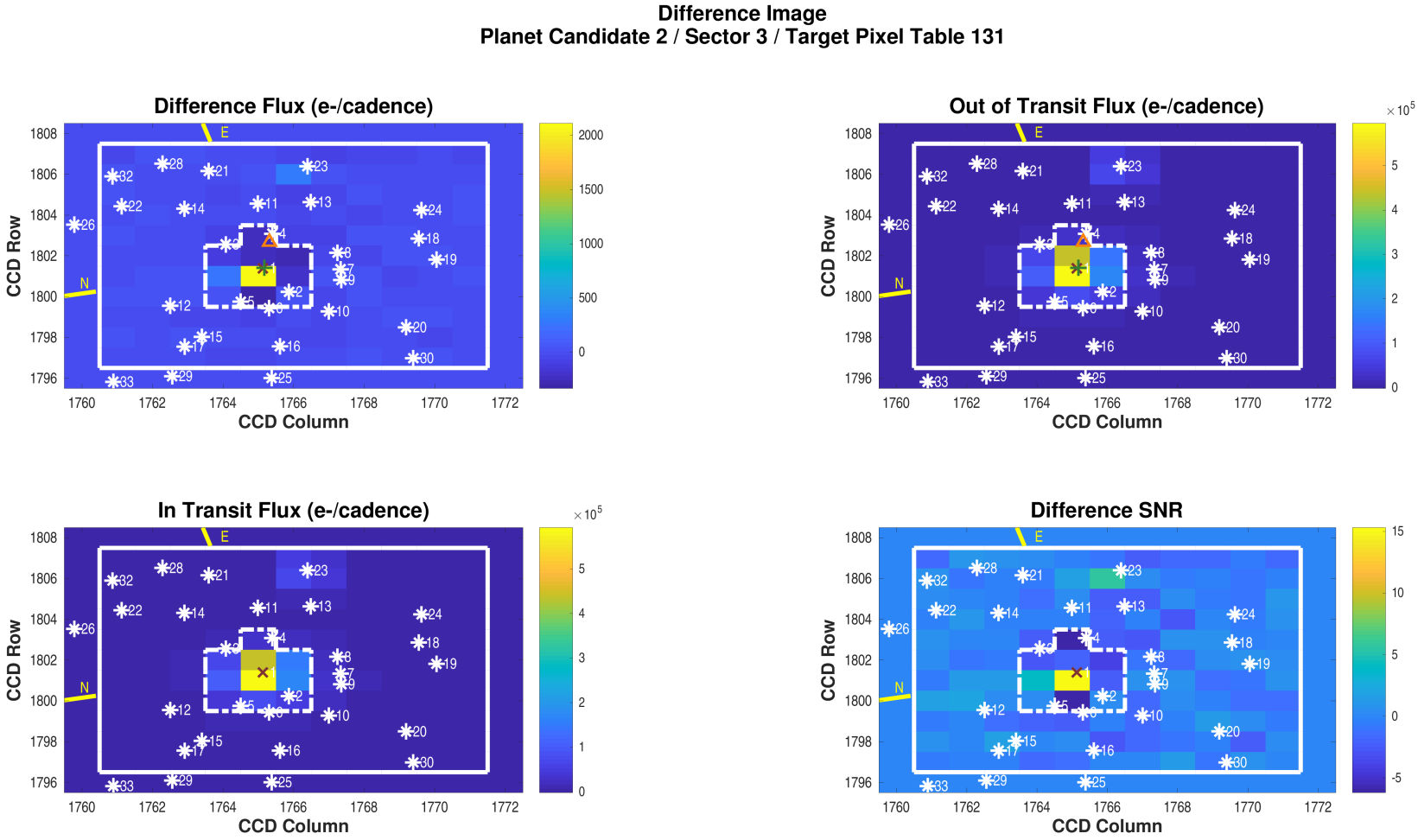
The out of transit image centroid and difference image centroid could not be calculated for target 149603524, planet candidate 2, in target table 128.



Direct image for target 149603524, planet candidate 2, sector 2, target pixel table 129. A difference image cannot be generated because there were no transits for this planet candidate and target pixel table. The mean flux over all cadences is shown in the figure. The optimal aperture is outlined with a white dash-dotted line 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.
Open `./planet-02/difference-image/0000000149603524-02-difference-image-02-129.fig`

PRF Fit of the Difference Image

The out of transit image centroid and difference image centroid could not be calculated for target 149603524, planet candidate 2, in target table 129.



Difference image for target 149603524, planet candidate 2, sector 3, target pixel table 131. 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 = 48; number of in-transit cadence gaps = 6; number of valid out-of-transit cadences = 116; number of out-of-transit cadence gaps = 14. Difference image quality metric = -0.13 (not good).
Open `./planet-02/difference-image/0000000149603524-02-difference-image-03-131.fig`

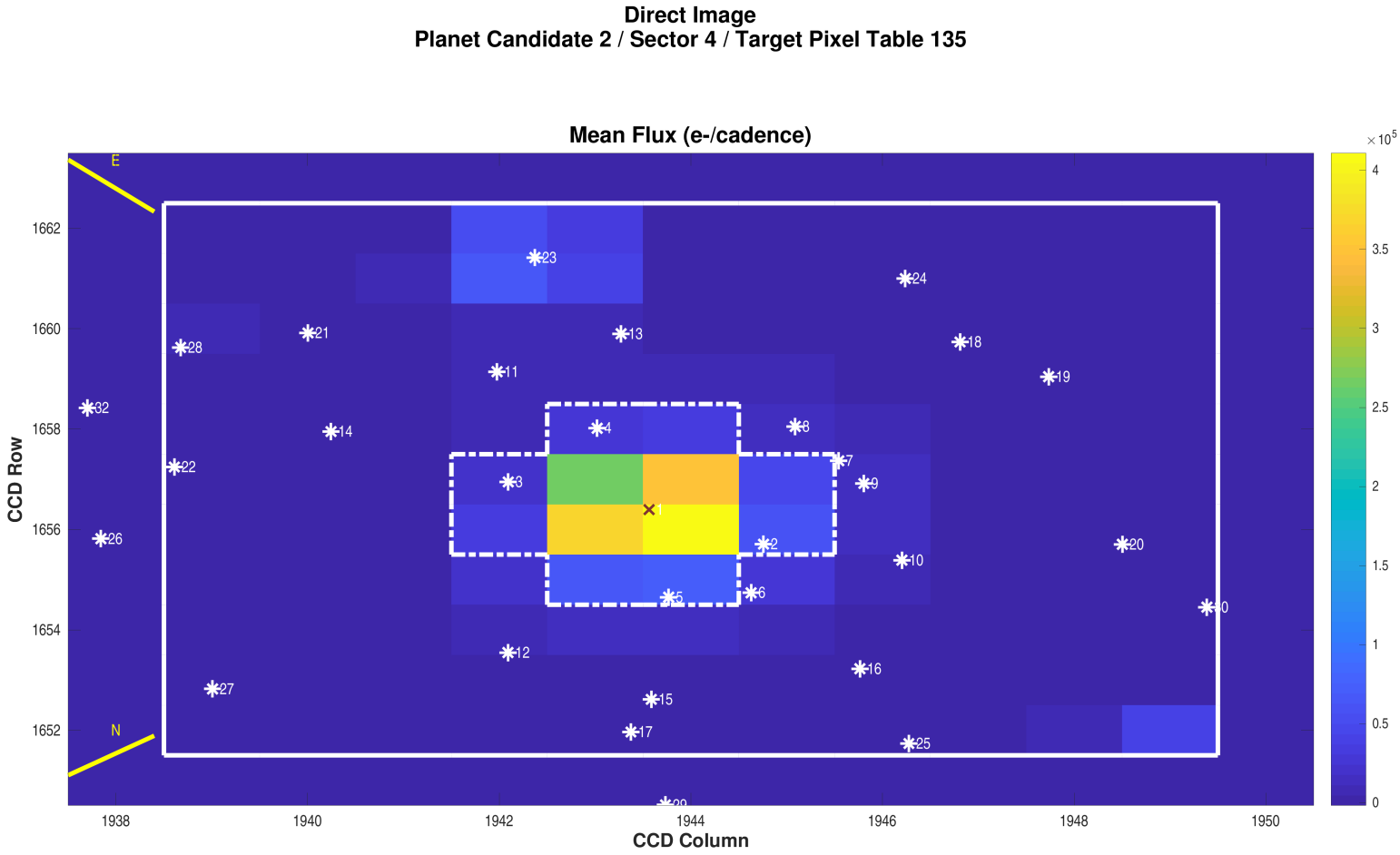
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$1801.42 \pm 4.59e-05$	$1765.17 \pm 5.35e-05$	pixels	$87.13994351 \pm 9.48e-07$	$-63.98859337 \pm 9.53e-07$	degrees
Difference Image Centroid	$1802.67 \pm 1.41e-01$	$1765.31 \pm 1.23e-01$	pixels	$87.15586455 \pm 7.98e-04$	$-63.99111291 \pm 7.10e-04$	degrees
Offset	$1.2570 \pm 1.41e-01$	$0.1409 \pm 1.23e-01$	pixels	$25.1358 \pm 1.27e+00$	$-9.0704 \pm 2.56e+00$	arcseconds
Offset/σ	8.92	1.15		19.76	−3.55	
Offset Distance	$1.2649 \pm 1.41e-01$		pixels	$26.7223 \pm 1.53e+00$		arcseconds
Offset Distance/σ	8.98			17.50		

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

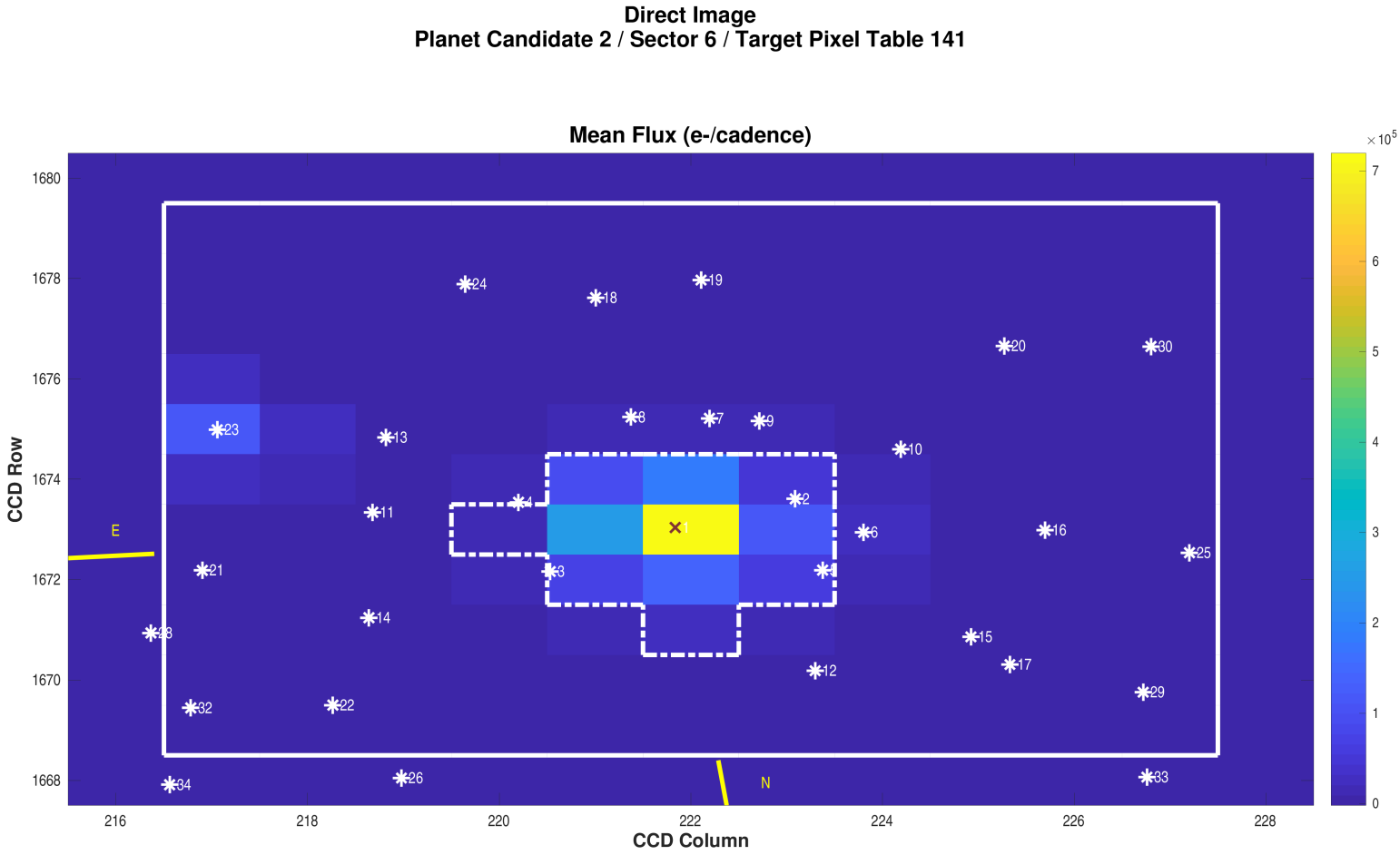
	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$1801.39 \pm 1.57e-04$	$1765.13 \pm 1.60e-04$	pixels	$87.13978025 \pm 0.00e+00$	$-63.98829619 \pm 0.00e+00$	degrees
Difference Image Centroid	$1802.67 \pm 1.41e-01$	$1765.31 \pm 1.23e-01$	pixels	$87.15586455 \pm 7.98e-04$	$-63.99111291 \pm 7.10e-04$	degrees
Offset	$1.2808 \pm 1.41e-01$	$0.1873 \pm 1.23e-01$	pixels	$25.3939 \pm 1.26e+00$	$-10.1402 \pm 2.56e+00$	arcseconds
Offset/σ	9.09	1.52		20.15	−3.97	
Offset Distance	$1.2944 \pm 1.41e-01$		pixels	$27.3436 \pm 1.56e+00$		arcseconds
Offset Distance/σ	9.20			17.55		



Direct image for target 149603524, planet candidate 2, sector 4, target pixel table 135. A difference image cannot be generated because there were no transits for this planet candidate and target pixel table. The mean flux over all cadences is shown in the figure. The optimal aperture is outlined with a white dash-dotted line 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.
Open `./planet-02/difference-image/0000000149603524-02-difference-image-04-135.fig`

PRF Fit of the Difference Image

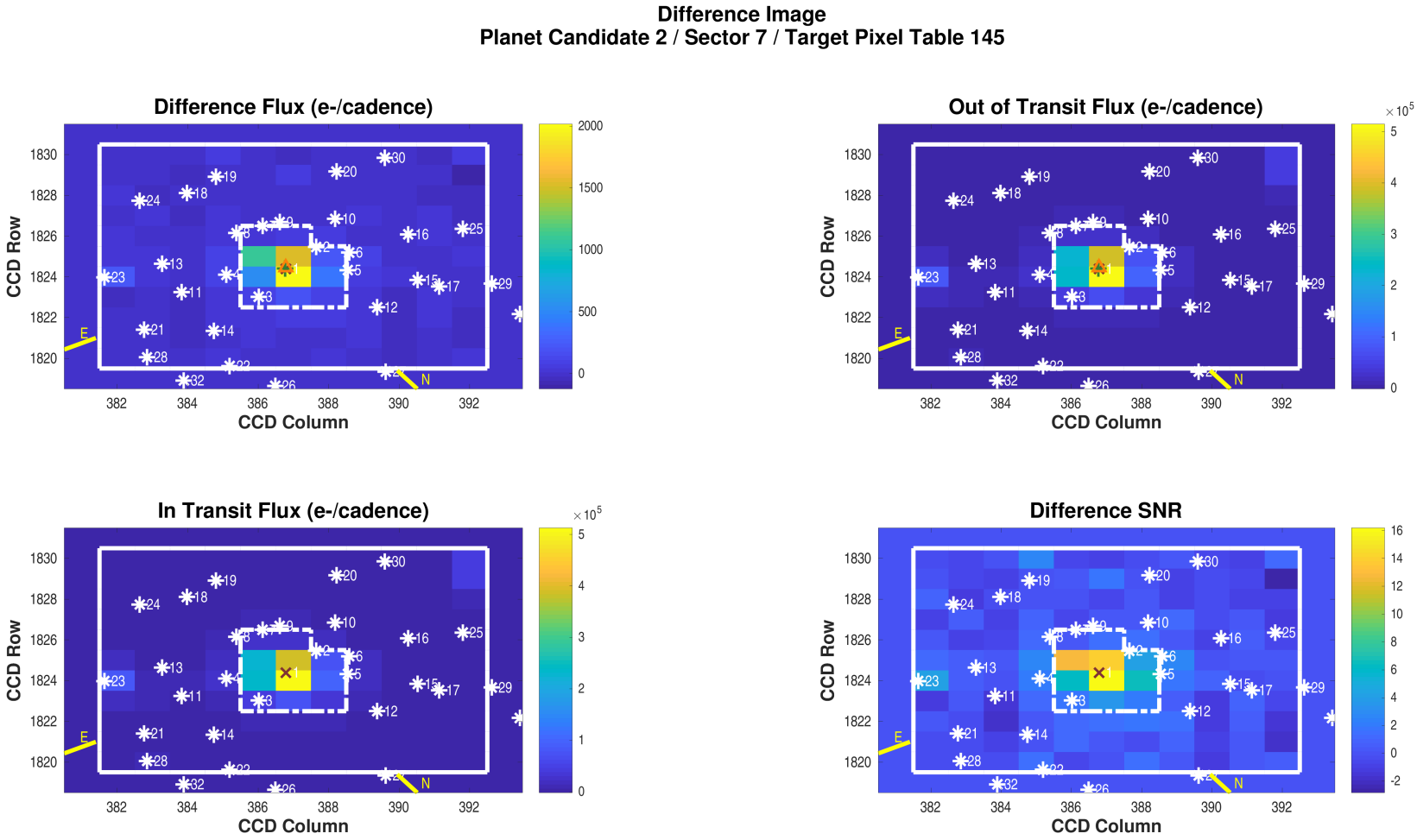
The out of transit image centroid and difference image centroid could not be calculated for target 149603524, planet candidate 2, in target table 135.



Direct image for target 149603524, planet candidate 2, sector 6, target pixel table 141. A difference image cannot be generated because there were no transits for this planet candidate and target pixel table. The mean flux over all cadences is shown in the figure. The optimal aperture is outlined with a white dash-dotted line 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.
Open `./planet-02/difference-image/0000000149603524-02-difference-image-06-141.fig`

PRF Fit of the Difference Image

The out of transit image centroid and difference image centroid could not be calculated for target 149603524, planet candidate 2, in target table 141.



Difference image for target 149603524, planet candidate 2, sector 7, target pixel table 145. 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 = 53; number of in-transit cadence gaps = 0; number of valid out-of-transit cadences = 130; number of out-of-transit cadence gaps = 0. Difference image quality metric = 0.98 (good). Transits used to compute this difference image are overlapped by those of other candidates on this target.
Open `./planet-02/difference-image/0000000149603524-02-difference-image-07-145.fig`

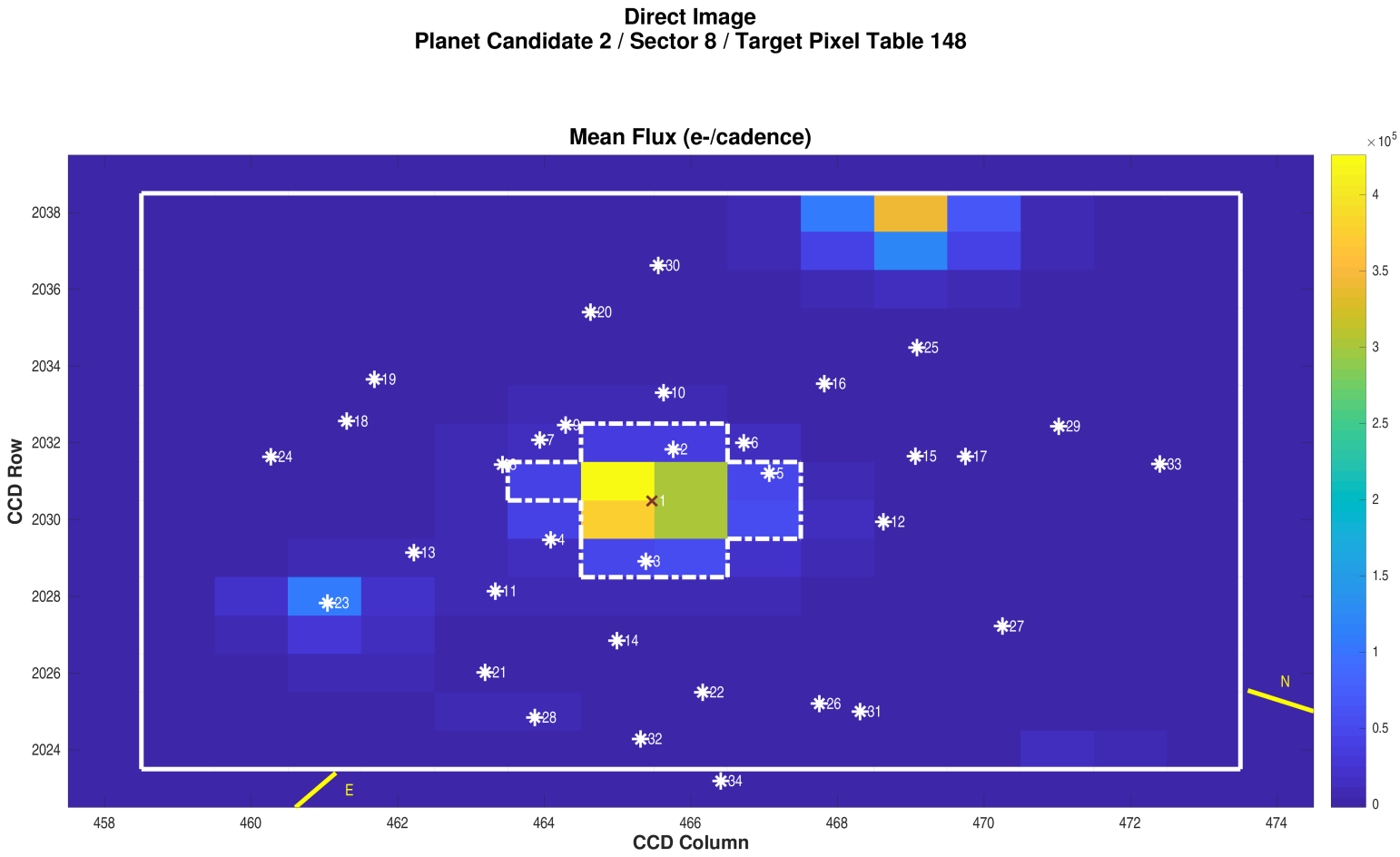
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$1824.41 \pm 4.57e-05$	$386.77 \pm 4.96e-05$	pixels	$87.13987957 \pm 1.17e-06$	$-63.98844804 \pm 1.04e-06$	degrees
Difference Image Centroid	$1824.46 \pm 2.32e-02$	$386.78 \pm 2.46e-02$	pixels	$87.13928921 \pm 1.42e-04$	$-63.98864493 \pm 1.32e-04$	degrees
Offset	$0.0519 \pm 2.32e-02$	$0.0193 \pm 2.46e-02$	pixels	$-0.9321 \pm 2.24e-01$	$-0.7088 \pm 4.75e-01$	arcseconds
Offset/σ	2.23	0.79		-4.17	-1.49	
Offset Distance	$0.0554 \pm 2.36e-02$		pixels	$1.1709 \pm 3.33e-01$		arcseconds
Offset Distance/σ	2.34			3.51		

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

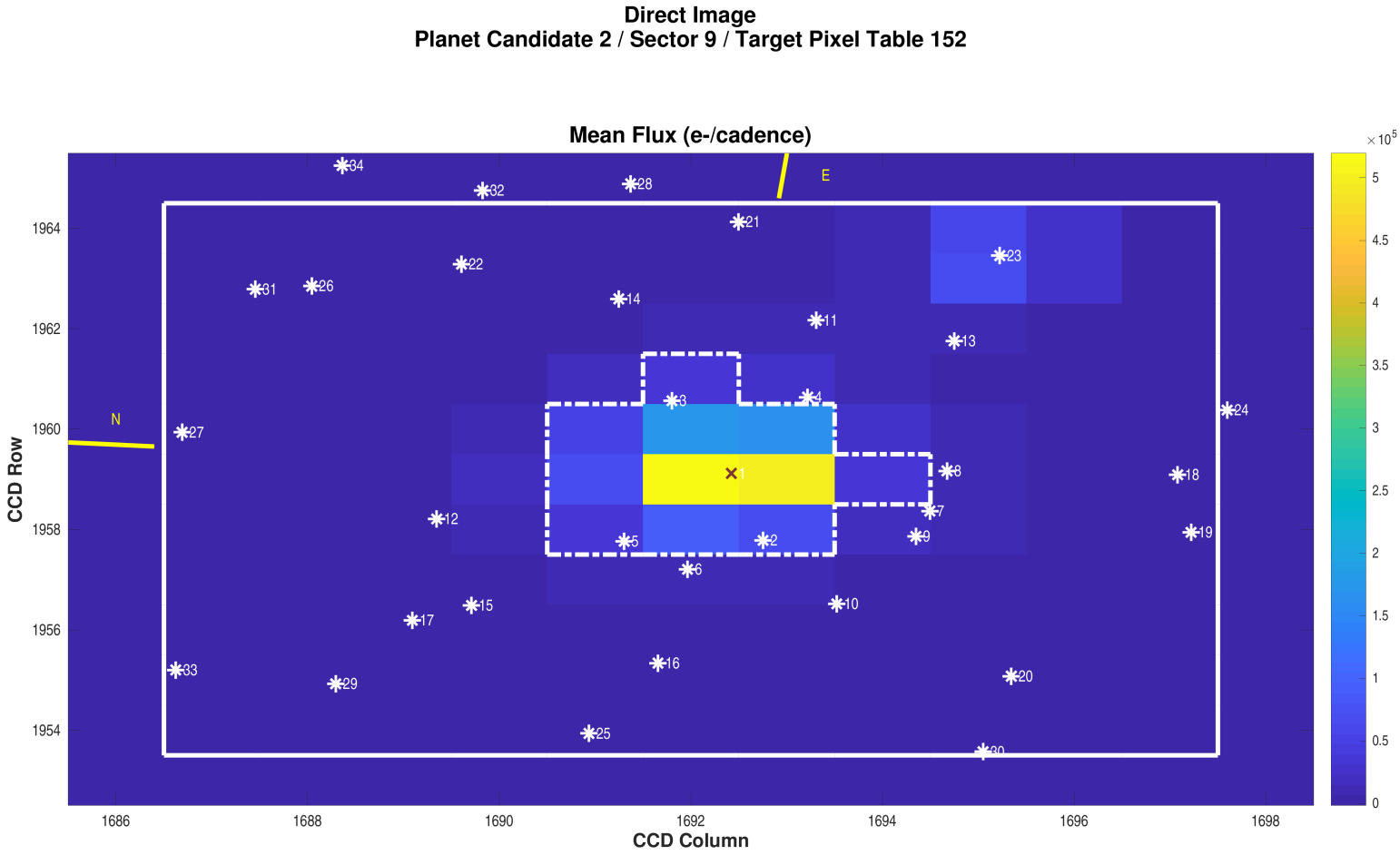
	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$1824.39 \pm 1.60e-04$	$386.79 \pm 2.11e-04$	pixels	$87.13977747 \pm 0.00e+00$	$-63.98829413 \pm 0.00e+00$	degrees
Difference Image Centroid	$1824.46 \pm 2.32e-02$	$386.78 \pm 2.46e-02$	pixels	$87.13928921 \pm 1.42e-04$	$-63.98864493 \pm 1.32e-04$	degrees
Offset	$0.0700 \pm 2.32e-02$	$-0.0012 \pm 2.46e-02$	pixels	$-0.7709 \pm 2.23e-01$	$-1.2629 \pm 4.75e-01$	arcseconds
Offset/σ	3.01	-0.05		-3.45	-2.66	
Offset Distance	$0.0700 \pm 2.32e-02$		pixels	$1.4796 \pm 4.18e-01$		arcseconds
Offset Distance/σ	3.01			3.54		



Direct image for target 149603524, planet candidate 2, sector 8, target pixel table 148. A difference image cannot be generated because there were no transits for this planet candidate and target pixel table. The mean flux over all cadences is shown in the figure. The optimal aperture is outlined with a white dash-dotted line 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.
Open `./planet-02/difference-image/0000000149603524-02-difference-image-08-148.fig`

PRF Fit of the Difference Image

The out of transit image centroid and difference image centroid could not be calculated for target 149603524, planet candidate 2, in target table 148.



Direct image for target 149603524, planet candidate 2, sector 9, target pixel table 152. A difference image cannot be generated because there were no transits for this planet candidate and target pixel table. The mean flux over all cadences is shown in the figure. The optimal aperture is outlined with a white dash-dotted line 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.
Open `./planet-02/difference-image/0000000149603524-02-difference-image-09-152.fig`

PRF Fit of the Difference Image

The out of transit image centroid and difference image centroid could not be calculated for target 149603524, planet candidate 2, in target table 152.

5.3 Planet Candidate 3

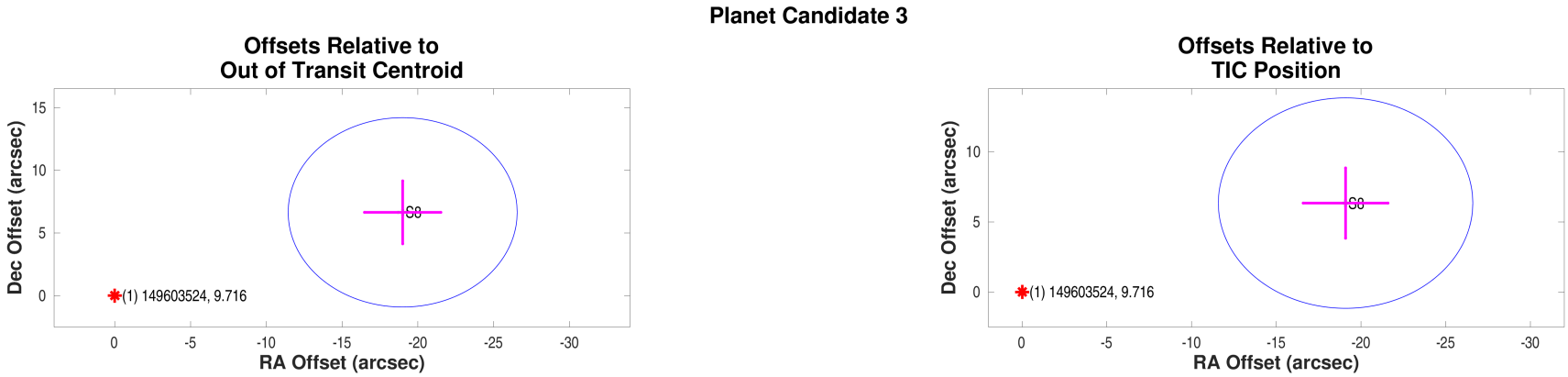
Multi-Sector Average PRF Fit of the Difference Images

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

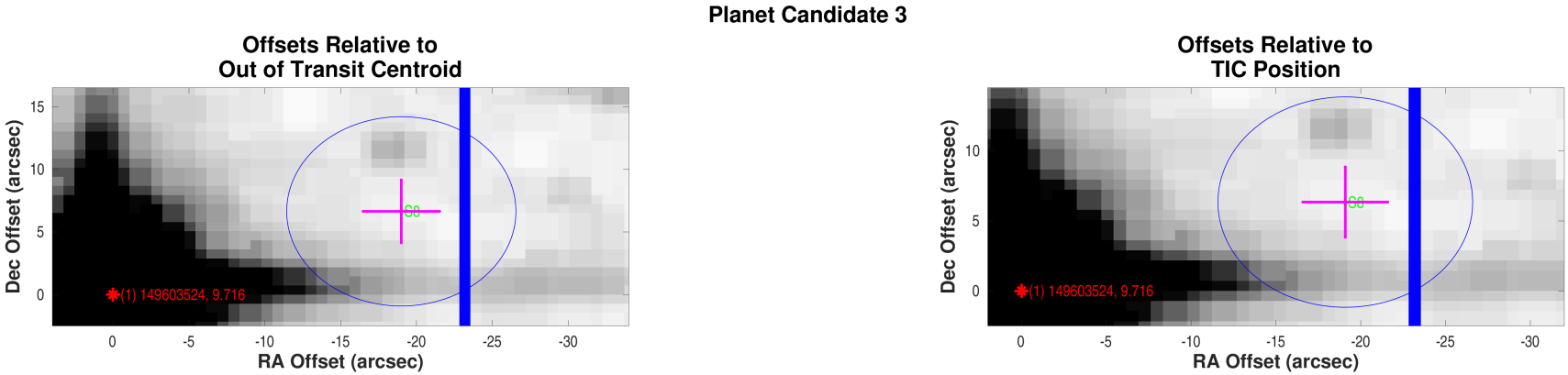
	RA	Dec	Units
Offset	$-18.9949 \pm 2.52e+00$	$6.6454 \pm 2.51e+00$	arcseconds
Offset/σ	-7.54	2.65	
Offset Distance	$20.1238 \pm 2.52e+00$		arcseconds
Offset Distance/σ	7.99		
3σ Radius	7.5541		arcseconds

Mean offset from the TIC RA and Dec

	RA	Dec	Units
Offset	$-19.0915 \pm 2.50e+00$	$6.3439 \pm 2.51e+00$	arcseconds
Offset/σ	-7.63	2.53	
Offset Distance	$20.1179 \pm 2.50e+00$		arcseconds
Offset Distance/σ	8.03		
3σ Radius	7.5116		arcseconds



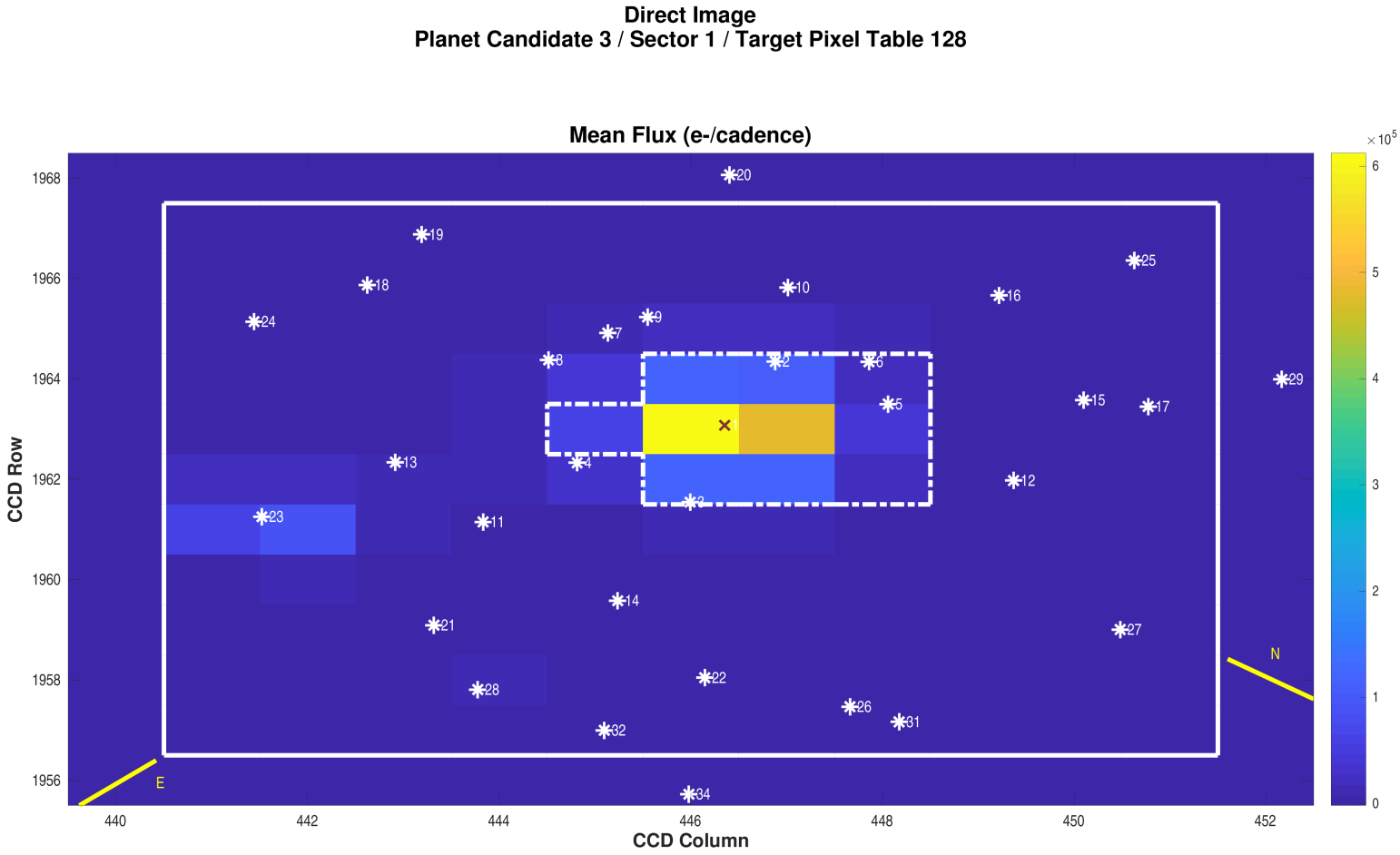
Difference image centroid offsets for target 149603524, planet candidate 3. Left: difference image PRF centroid offsets in RA and Dec with respect to the per sector out-of-transit centroids for the given target. Right: difference image PRF centroid offsets in RA and Dec with respect to the TC coordinates 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; 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-03/difference-image/0000000149603524-03-difference-image-centroid-offsets.fig`



Difference image centroid offsets for target 149603524, planet candidate 3, 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; 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-03/difference-image/0000000149603524-03-difference-image-centroid-offsets-survey.fig`

Difference Image Summary Metrics

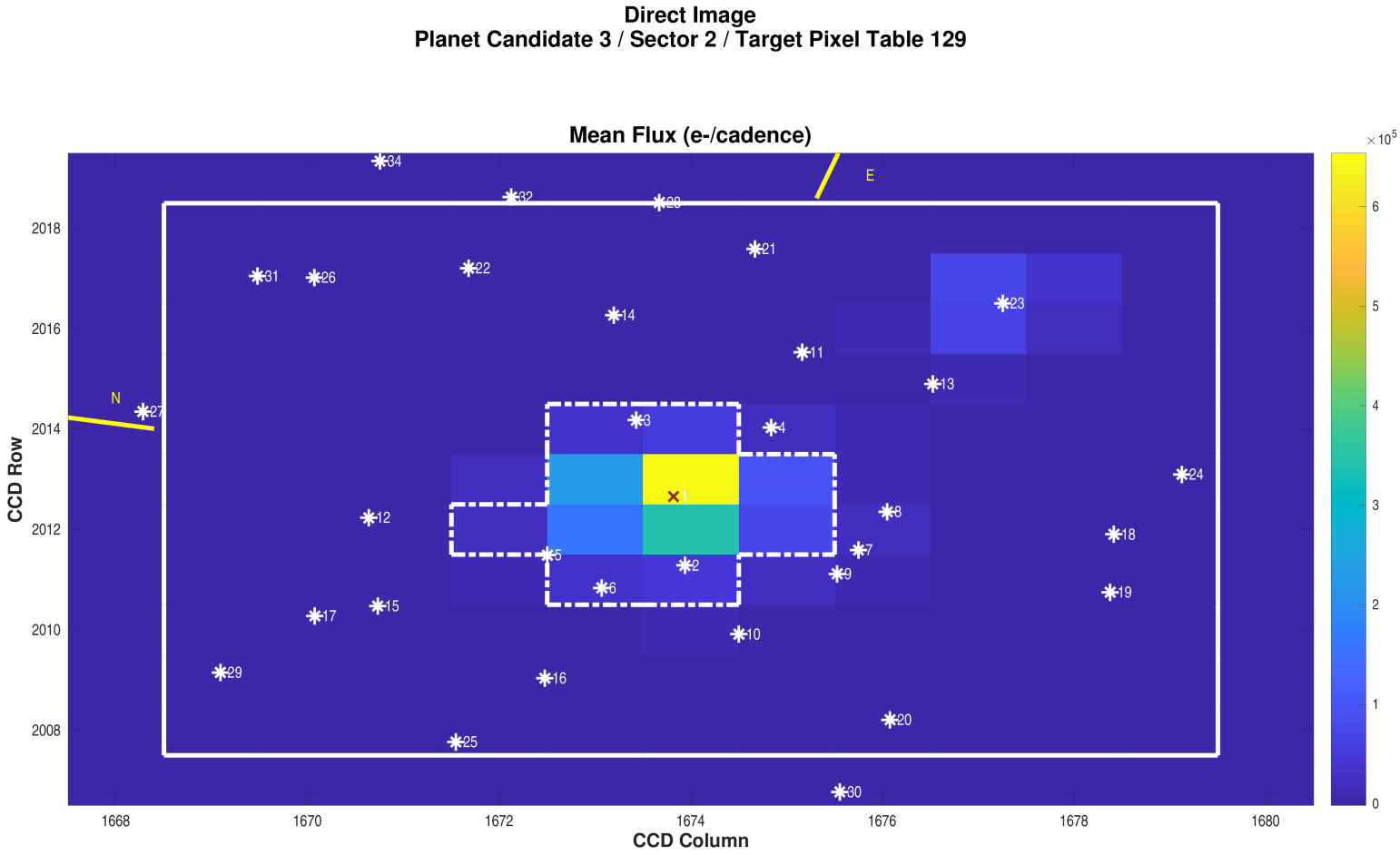
Number of Difference Images	Number of Metrics	Number of Good Metrics	Fraction of Good Metrics	Quality Threshold
1	1	0	0.0000	0.70



Direct image for target 149603524, planet candidate 3, sector 1, target pixel table 128. A difference image cannot be generated because there were no clean transits for this planet candidate and target pixel table. The mean flux over all cadences is shown in the figure. The optimal aperture is outlined with a white dash-dotted line 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.
Open `./planet-03/difference-image/0000000149603524-03-difference-image-01-128.fig`

PRF Fit of the Difference Image

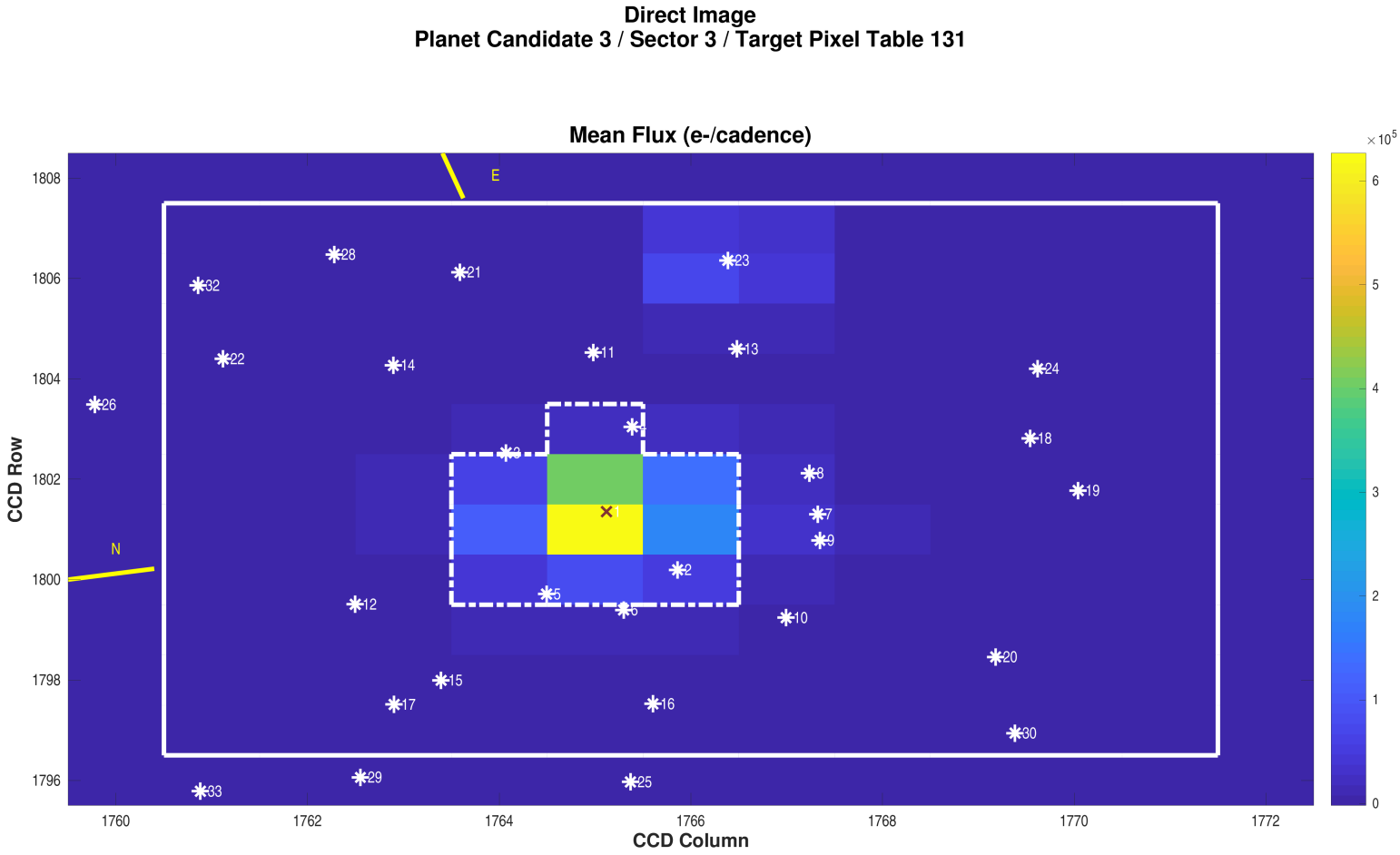
The out of transit image centroid and difference image centroid could not be calculated for target 149603524, planet candidate 3, in target table 128.



Direct image for target 149603524, planet candidate 3, sector 2, target pixel table 129. A difference image cannot be generated because there were no transits for this planet candidate and target pixel table. The mean flux over all cadences is shown in the figure. The optimal aperture is outlined with a white dash-dotted line 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.
Open `./planet-03/difference-image/0000000149603524-03-difference-image-02-129.fig`

PRF Fit of the Difference Image

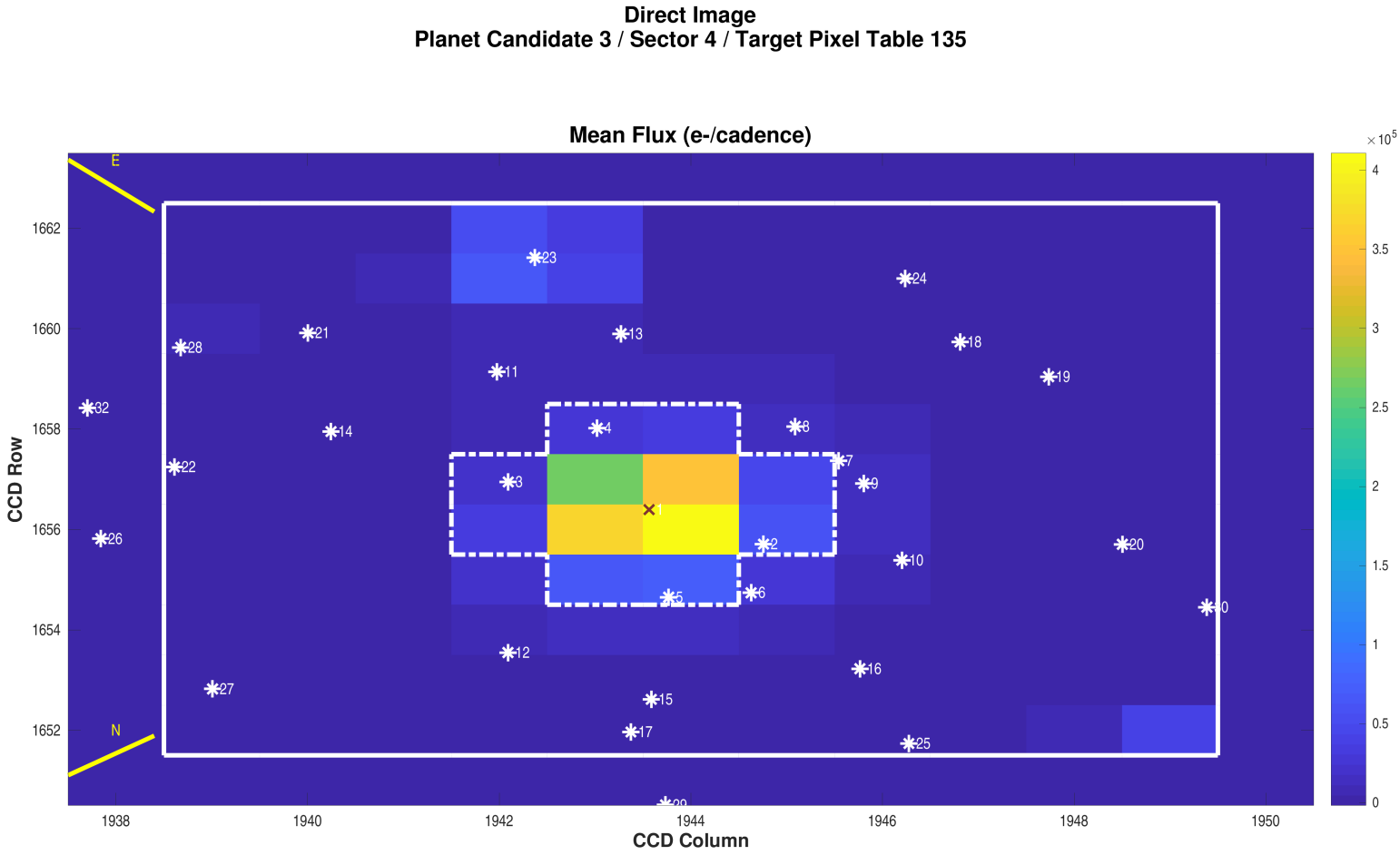
The out of transit image centroid and difference image centroid could not be calculated for target 149603524, planet candidate 3, in target table 129.



Direct image for target 149603524, planet candidate 3, sector 3, target pixel table 131. A difference image cannot be generated because there were no transits for this planet candidate and target pixel table. The mean flux over all cadences is shown in the figure. The optimal aperture is outlined with a white dash-dotted line 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.
Open `./planet-03/difference-image/0000000149603524-03-difference-image-03-131.fig`

PRF Fit of the Difference Image

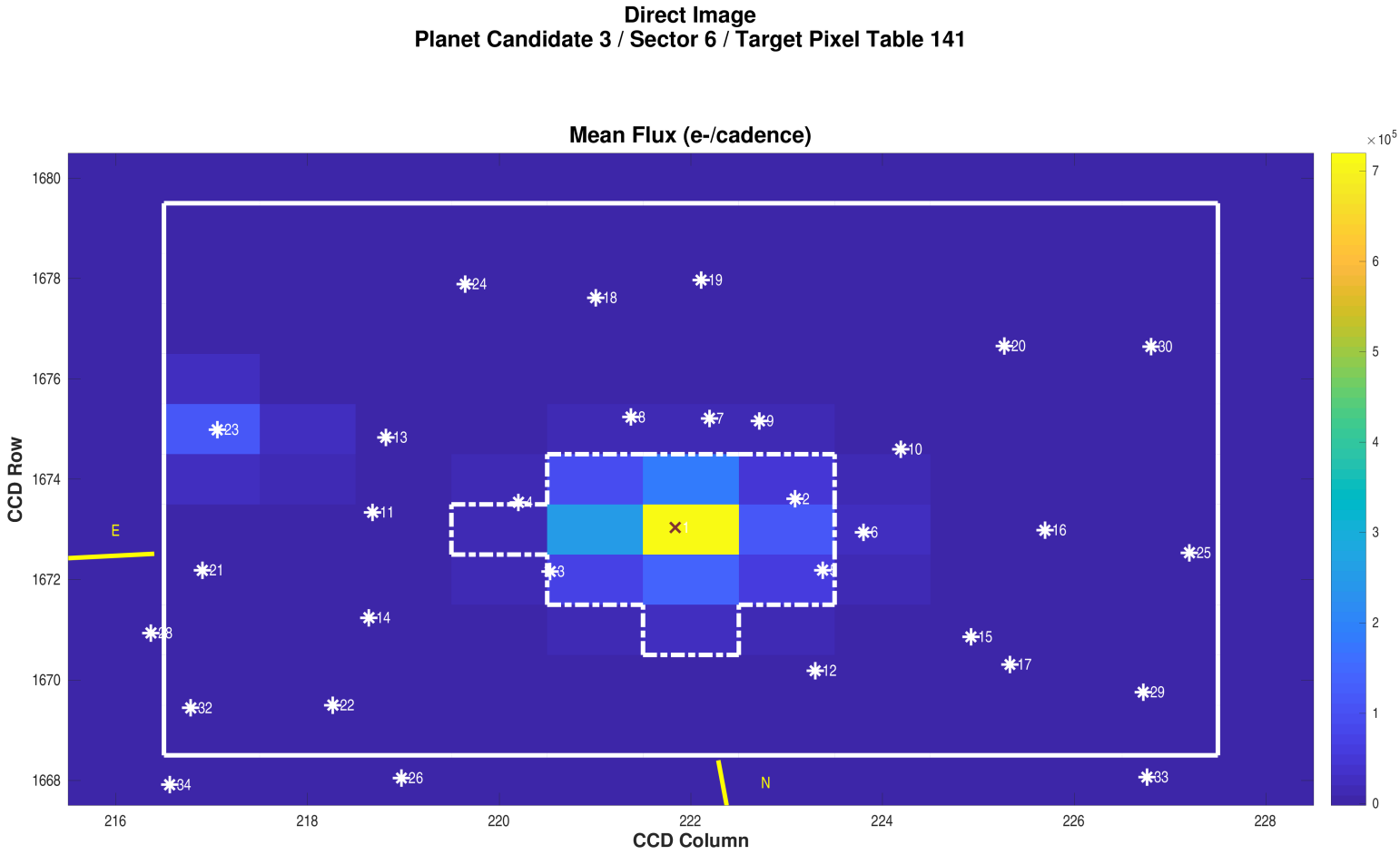
The out of transit image centroid and difference image centroid could not be calculated for target 149603524, planet candidate 3, in target table 131.



Direct image for target 149603524, planet candidate 3, sector 4, target pixel table 135. A difference image cannot be generated because there were no transits for this planet candidate and target pixel table. The mean flux over all cadences is shown in the figure. The optimal aperture is outlined with a white dash-dotted line 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.
Open `./planet-03/difference-image/0000000149603524-03-difference-image-04-135.fig`

PRF Fit of the Difference Image

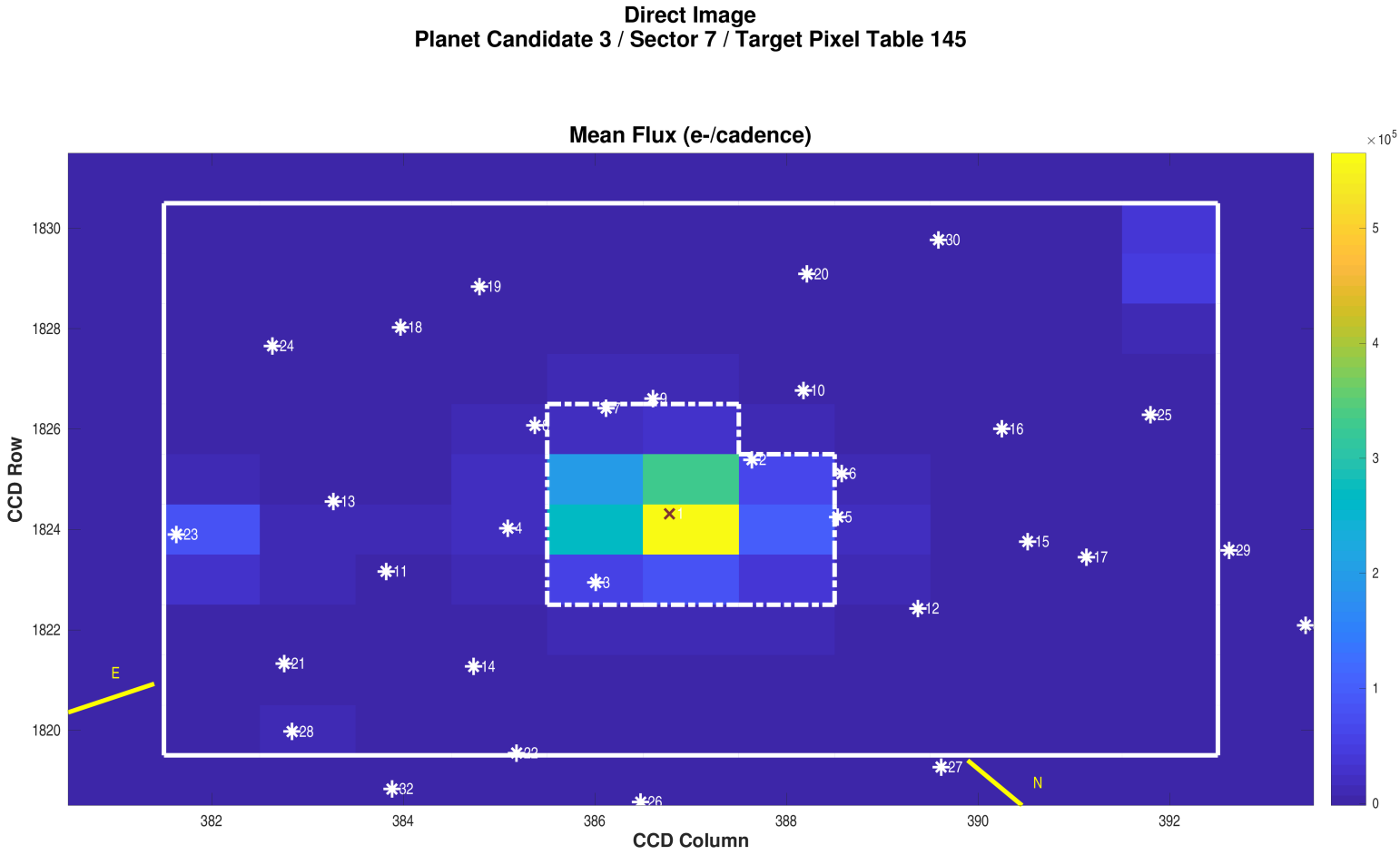
The out of transit image centroid and difference image centroid could not be calculated for target 149603524, planet candidate 3, in target table 135.



Direct image for target 149603524, planet candidate 3, sector 6, target pixel table 141. A difference image cannot be generated because there were no transits for this planet candidate and target pixel table. The mean flux over all cadences is shown in the figure. The optimal aperture is outlined with a white dash-dotted line 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.
Open `./planet-03/difference-image/0000000149603524-03-difference-image-06-141.fig`

PRF Fit of the Difference Image

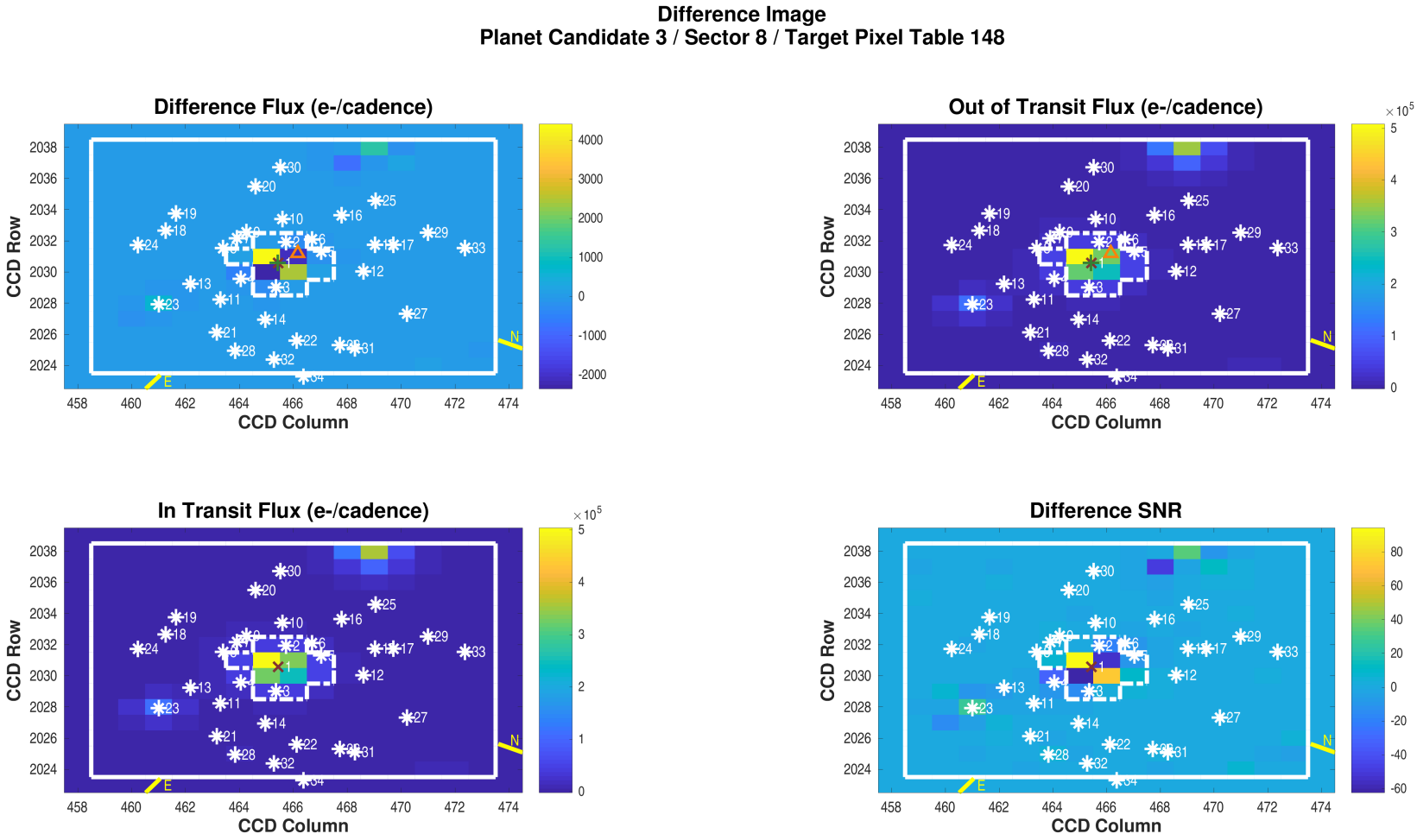
The out of transit image centroid and difference image centroid could not be calculated for target 149603524, planet candidate 3, in target table 141.



Direct image for target 149603524, planet candidate 3, sector 7, target pixel table 145. A difference image cannot be generated because there were no transits for this planet candidate and target pixel table. The mean flux over all cadences is shown in the figure. The optimal aperture is outlined with a white dash-dotted line 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.
Open `./planet-03/difference-image/0000000149603524-03-difference-image-07-145.fig`

PRF Fit of the Difference Image

The out of transit image centroid and difference image centroid could not be calculated for target 149603524, planet candidate 3, in target table 145.



Difference image for target 149603524, planet candidate 3, sector 8, target pixel table 148. 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 = 371; number of in-transit cadence gaps = 0; number of valid out-of-transit cadences = 842; number of out-of-transit cadence gaps = 0. Difference image quality metric = -0.19 (not good).
Open `./planet-03/difference-image/0000000149603524-03-difference-image-08-148.fig`

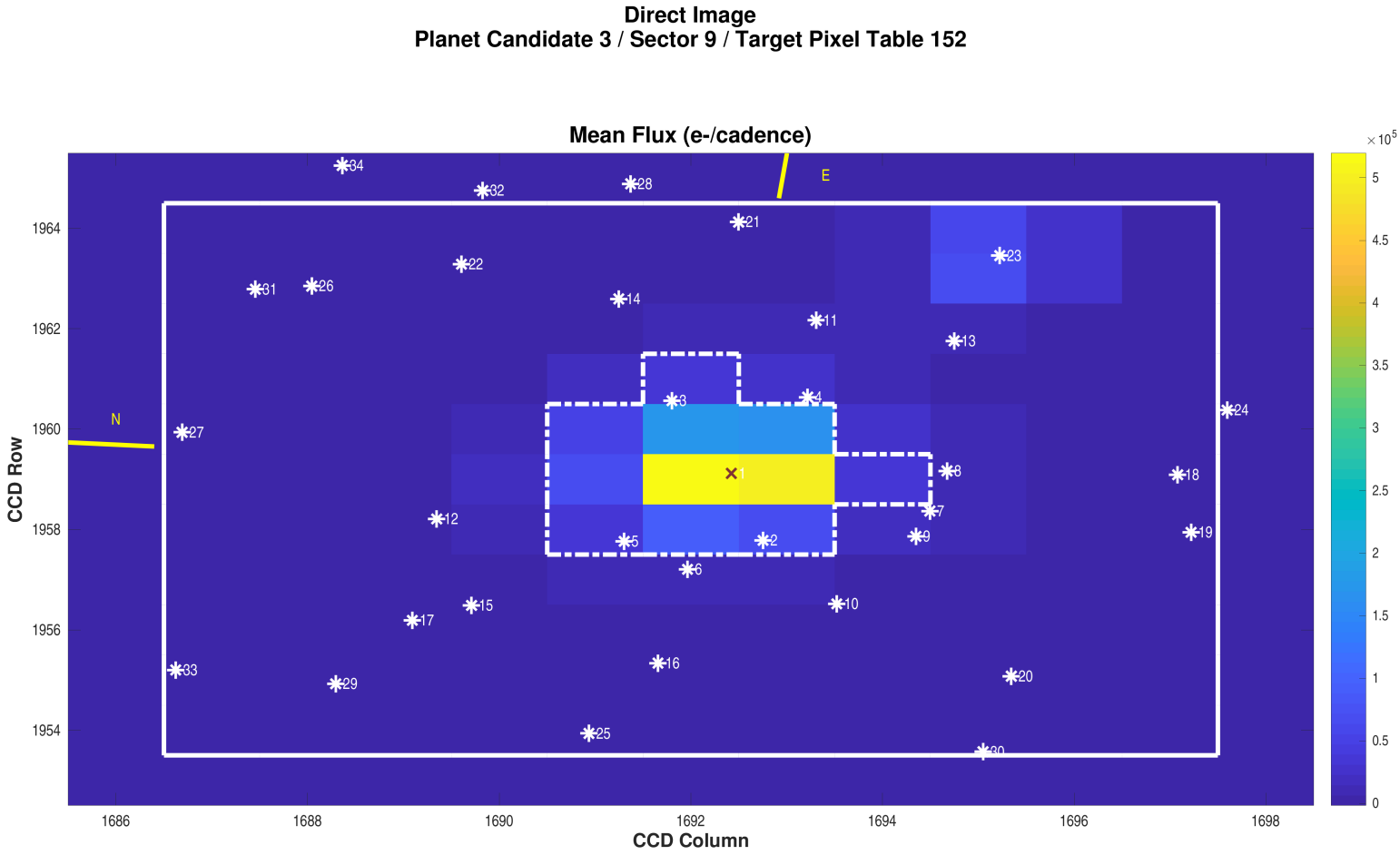
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$2030.59 \pm 1.96e-05$	$465.42 \pm 2.07e-05$	pixels	$87.13971564 \pm 1.86e-06$	$-63.98837739 \pm 2.02e-06$	degrees
Difference Image Centroid	$2031.20 \pm 1.25e-02$	$466.16 \pm 1.21e-02$	pixels	$87.12768435 \pm 8.27e-05$	$-63.98653144 \pm 5.60e-05$	degrees
Offset	$0.6043 \pm 1.25e-02$	$0.7366 \pm 1.21e-02$	pixels	$-18.9949 \pm 3.11e-01$	$6.6454 \pm 2.02e-01$	arcseconds
Offset/σ	48.23	61.01		-61.10	32.94	
Offset Distance	$0.9527 \pm 1.43e-02$		pixels	$20.1238 \pm 3.01e-01$		arcseconds
Offset Distance/σ	66.83			66.87		

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

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$2030.58 \pm 2.72e-04$	$465.43 \pm 3.96e-04$	pixels	$87.13977681 \pm 0.00e+00$	$-63.98829363 \pm 0.00e+00$	degrees
Difference Image Centroid	$2031.20 \pm 1.25e-02$	$466.16 \pm 1.21e-02$	pixels	$87.12768435 \pm 8.27e-05$	$-63.98653144 \pm 5.60e-05$	degrees
Offset	$0.6156 \pm 1.25e-02$	$0.7267 \pm 1.21e-02$	pixels	$-19.0915 \pm 1.31e-01$	$6.3439 \pm 2.02e-01$	arcseconds
Offset/σ	49.12	60.17		-146.15	31.47	
Offset Distance	$0.9524 \pm 1.43e-02$		pixels	$20.1179 \pm 1.44e-01$		arcseconds
Offset Distance/σ	66.71			140.02		



Direct image for target 149603524, planet candidate 3, sector 9, target pixel table 152. A difference image cannot be generated because there were no transits for this planet candidate and target pixel table. The mean flux over all cadences is shown in the figure. The optimal aperture is outlined with a white dash-dotted line 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.
Open `./planet-03/difference-image/0000000149603524-03-difference-image-09-152.fig`

PRF Fit of the Difference Image

The out of transit image centroid and difference image centroid could not be calculated for target 149603524, planet candidate 3, in target table 152.

5.4 Planet Candidate 4

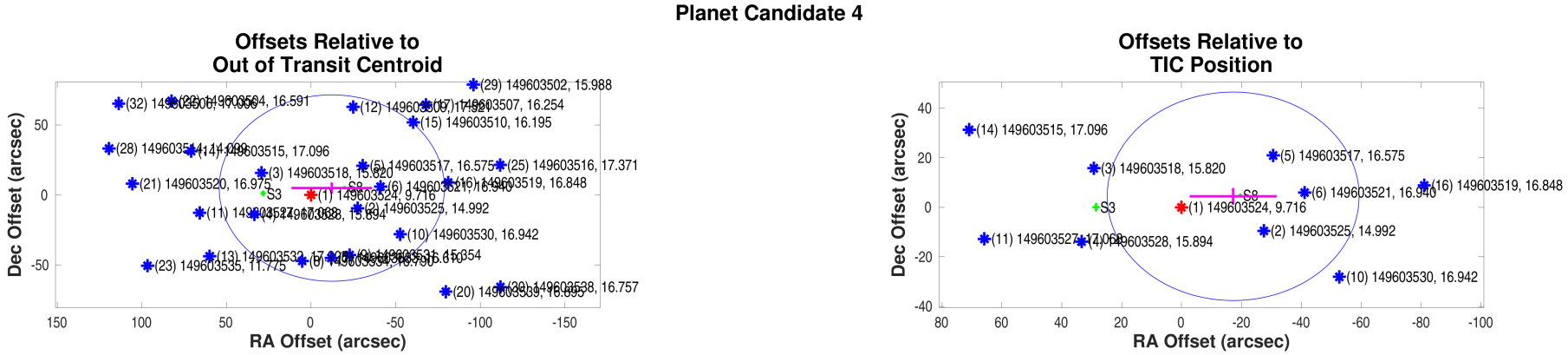
Multi-Sector Average PRF Fit of the Difference Images

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

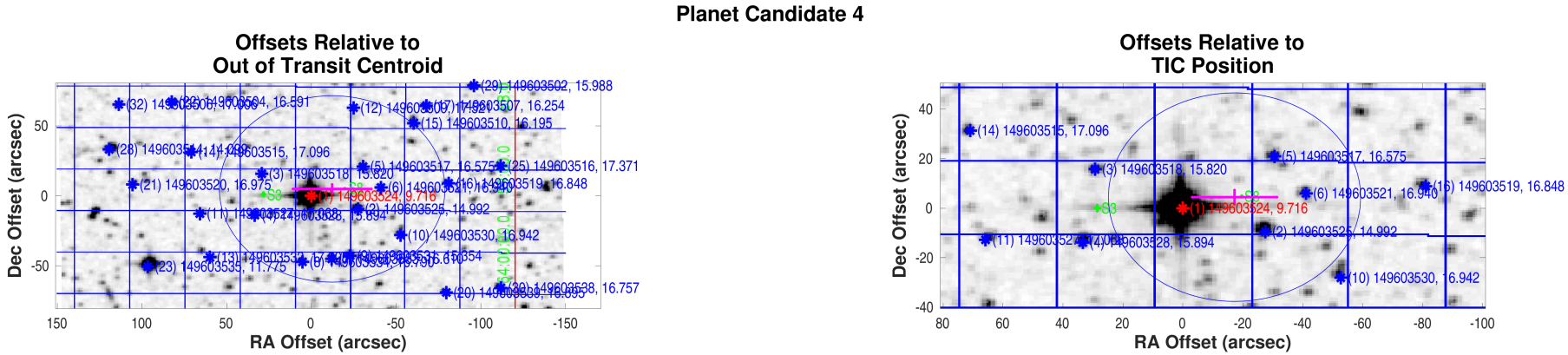
	RA	Dec	Units
Offset	$-12.2818 \pm 2.31e+01$	$4.9578 \pm 3.17e+00$	arcseconds
Offset/σ	-0.53	1.56	
Offset Distance	$13.2447 \pm 2.22e+01$		arcseconds
Offset Distance/σ	0.60		
3σ Radius	66.5821		arcseconds

Mean offset from the TIC RA and Dec

	RA	Dec	Units
Offset	$-17.2540 \pm 1.41e+01$	$4.4774 \pm 2.84e+00$	arcseconds
Offset/σ	-1.22	1.57	
Offset Distance	$17.8255 \pm 1.40e+01$		arcseconds
Offset Distance/σ	1.27		
3σ Radius	42.0877		arcseconds



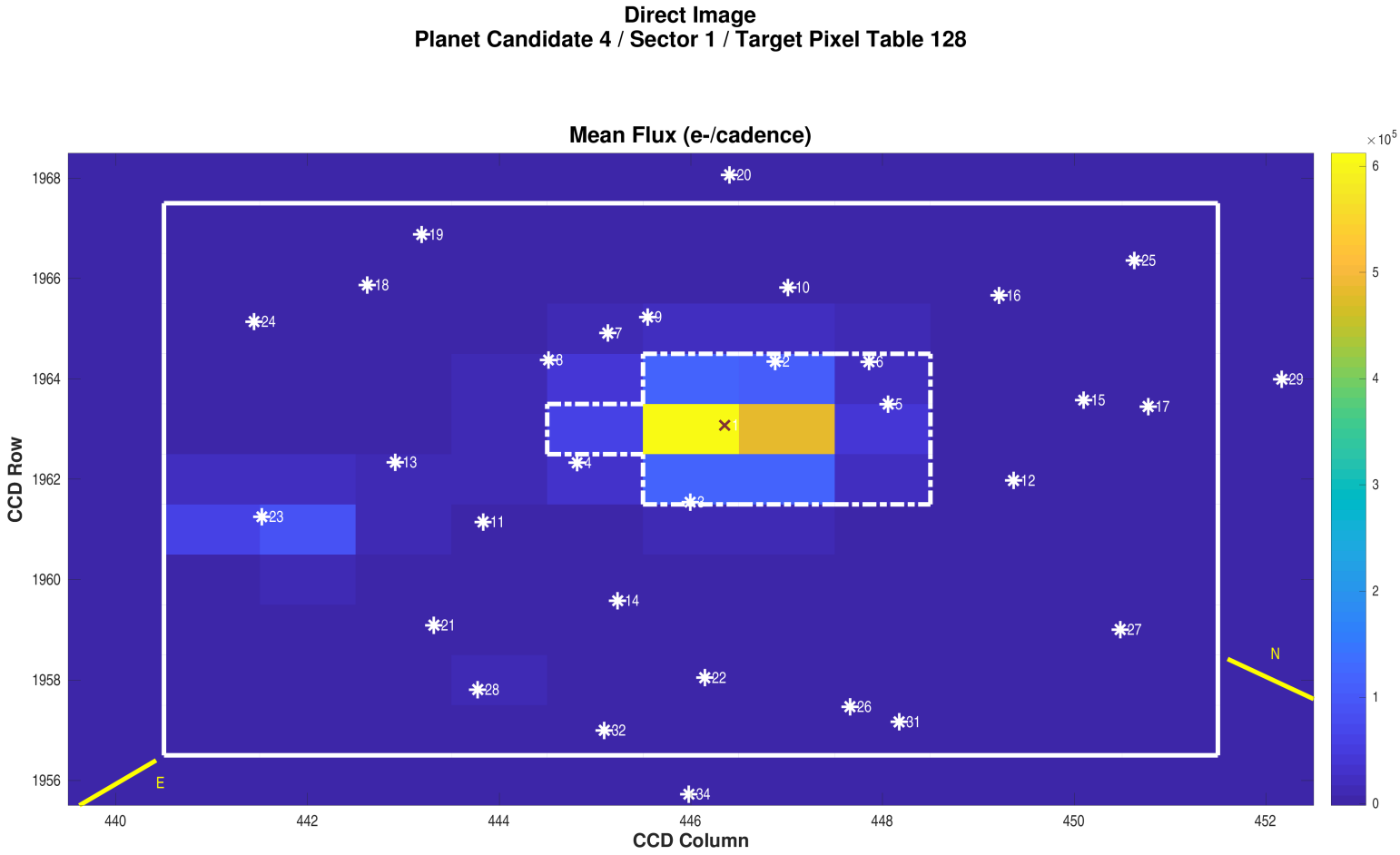
Difference image centroid offsets for target 149603524, planet candidate 4. Left: difference image PRF centroid offsets in RA and Dec with respect to the per sector out-of-transit centroids for the given target. Right: difference image PRF centroid offsets in RA and Dec with respect to the TC coordinates 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; 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-04/difference-image/0000000149603524-04-difference-image-centroid-offsets.fig`



Difference image centroid offsets for target 149603524, planet candidate 4, 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; 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-04/difference-image/0000000149603524-04-difference-image-centroid-offsets-survey.fig`

Difference Image Summary Metrics

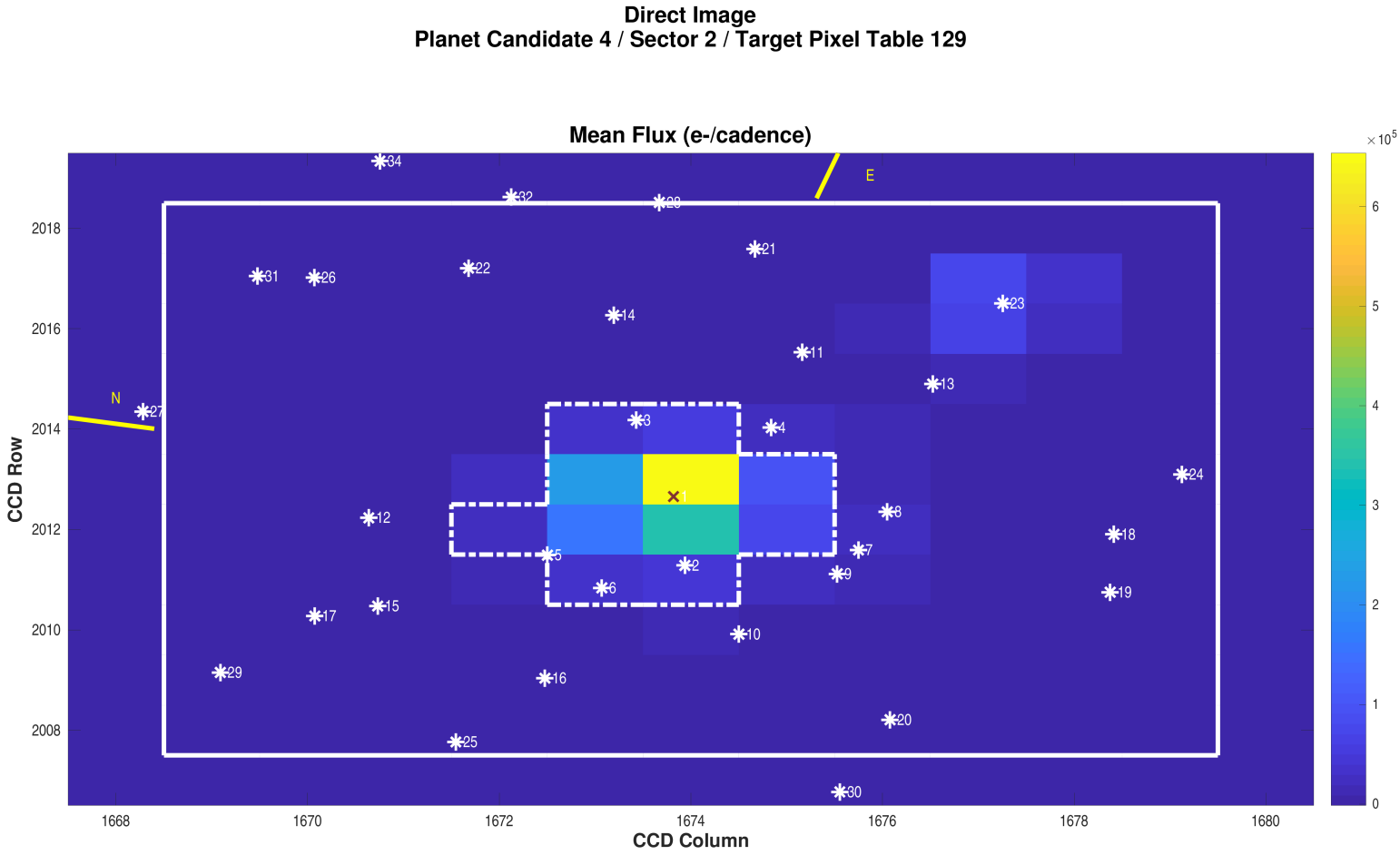
Number of Difference Images	Number of Metrics	Number of Good Metrics	Fraction of Good Metrics	Quality Threshold
2	2	0	0.0000	0.70



Direct image for target 149603524, planet candidate 4, sector 1, target pixel table 128. A difference image cannot be generated because there were no transits for this planet candidate and target pixel table. The mean flux over all cadences is shown in the figure. The optimal aperture is outlined with a white dash-dotted line 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.
Open `./planet-04/difference-image/0000000149603524-04-difference-image-01-128.fig`

PRF Fit of the Difference Image

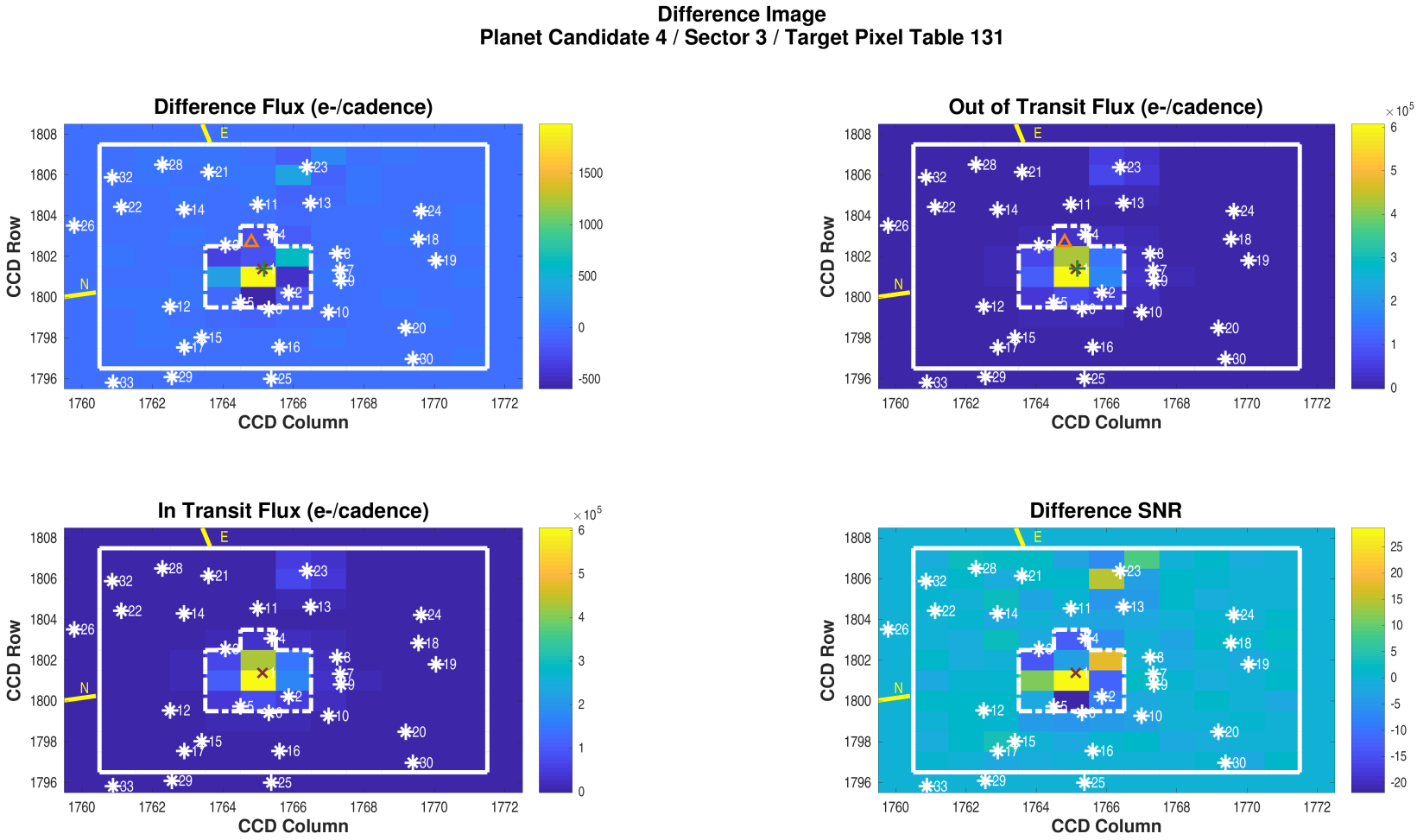
The out of transit image centroid and difference image centroid could not be calculated for target 149603524, planet candidate 4, in target table 128.



Direct image for target 149603524, planet candidate 4, sector 2, target pixel table 129. A difference image cannot be generated because there were no transits for this planet candidate and target pixel table. The mean flux over all cadences is shown in the figure. The optimal aperture is outlined with a white dash-dotted line 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.
Open `./planet-04/difference-image/0000000149603524-04-difference-image-02-129.fig`

PRF Fit of the Difference Image

The out of transit image centroid and difference image centroid could not be calculated for target 149603524, planet candidate 4, in target table 129.



Difference image for target 149603524, planet candidate 4, sector 3, target pixel table 131. 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 = 194; number of in-transit cadence gaps = 16; number of valid out-of-transit cadences = 476; number of out-of-transit cadence gaps = 2. Difference image quality metric = -0.10 (not good).
Open `./planet-04/difference-image/0000000149603524-04-difference-image-03-131.fig`

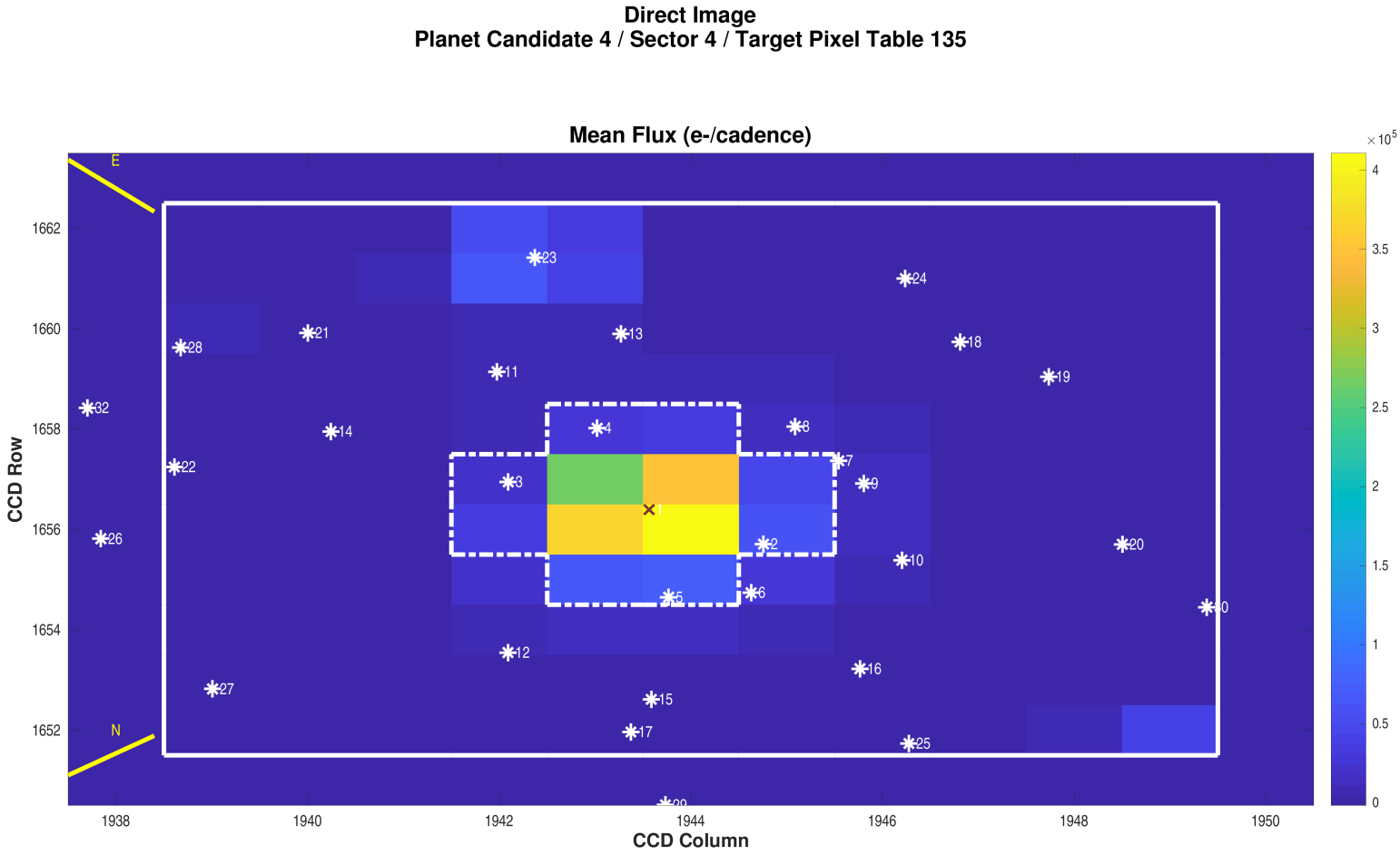
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$1801.40 \pm 2.28e-05$	$1765.17 \pm 2.64e-05$	pixels	$87.13995457 \pm 9.18e-07$	$-63.98859291 \pm 9.16e-07$	degrees
Difference Image Centroid	$1802.69 \pm 8.38e-02$	$1764.81 \pm 6.42e-02$	pixels	$87.15786168 \pm 5.01e-04$	$-63.98828068 \pm 3.37e-04$	degrees
Offset	$1.2880 \pm 8.38e-02$	$-0.3632 \pm 6.42e-02$	pixels	$28.2714 \pm 8.14e-01$	$1.1240 \pm 1.21e+00$	arcseconds
Offset/σ	15.38	−5.66		34.71	0.93	
Offset Distance	$1.3383 \pm 8.69e-02$		pixels	$28.2937 \pm 8.18e-01$		arcseconds
Offset Distance/σ	15.40			34.58		

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

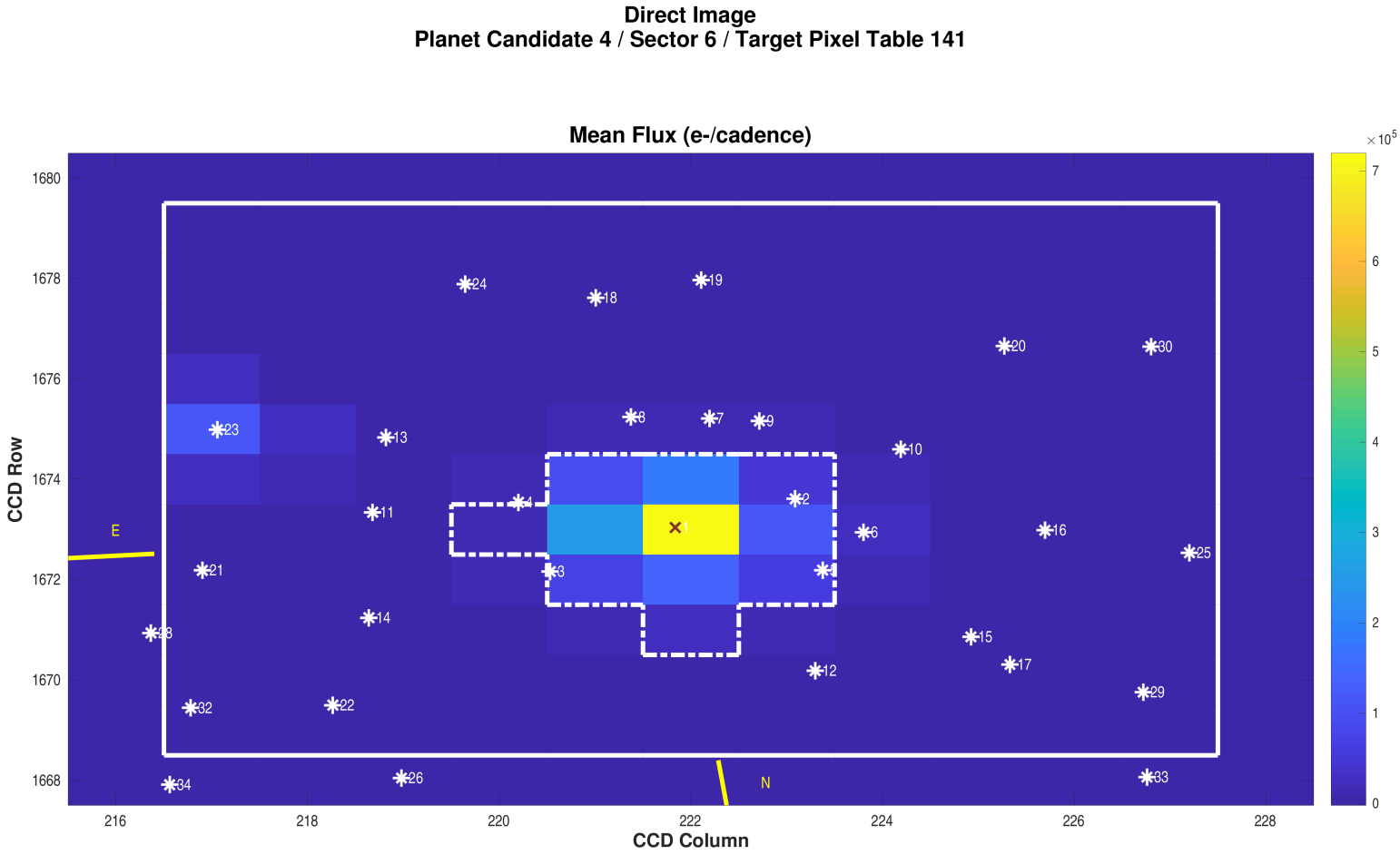
	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$1801.38 \pm 1.58e-04$	$1765.12 \pm 1.60e-04$	pixels	$87.13978025 \pm 0.00e+00$	$-63.98829619 \pm 0.00e+00$	degrees
Difference Image Centroid	$1802.69 \pm 8.38e-02$	$1764.81 \pm 6.42e-02$	pixels	$87.15786168 \pm 5.01e-04$	$-63.98828068 \pm 3.37e-04$	degrees
Offset	$1.3126 \pm 8.38e-02$	$-0.3170 \pm 6.42e-02$	pixels	$28.5469 \pm 7.92e-01$	$0.0559 \pm 1.21e+00$	arcseconds
Offset/σ	15.67	−4.94		36.05	0.05	
Offset Distance	$1.3503 \pm 8.67e-02$		pixels	$28.5470 \pm 7.92e-01$		arcseconds
Offset Distance/σ	15.58			36.05		



Direct image for target 149603524, planet candidate 4, sector 4, target pixel table 135. A difference image cannot be generated because there were no transits for this planet candidate and target pixel table. The mean flux over all cadences is shown in the figure. The optimal aperture is outlined with a white dash-dotted line 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.
Open `./planet-04/difference-image/0000000149603524-04-difference-image-04-135.fig`

PRF Fit of the Difference Image

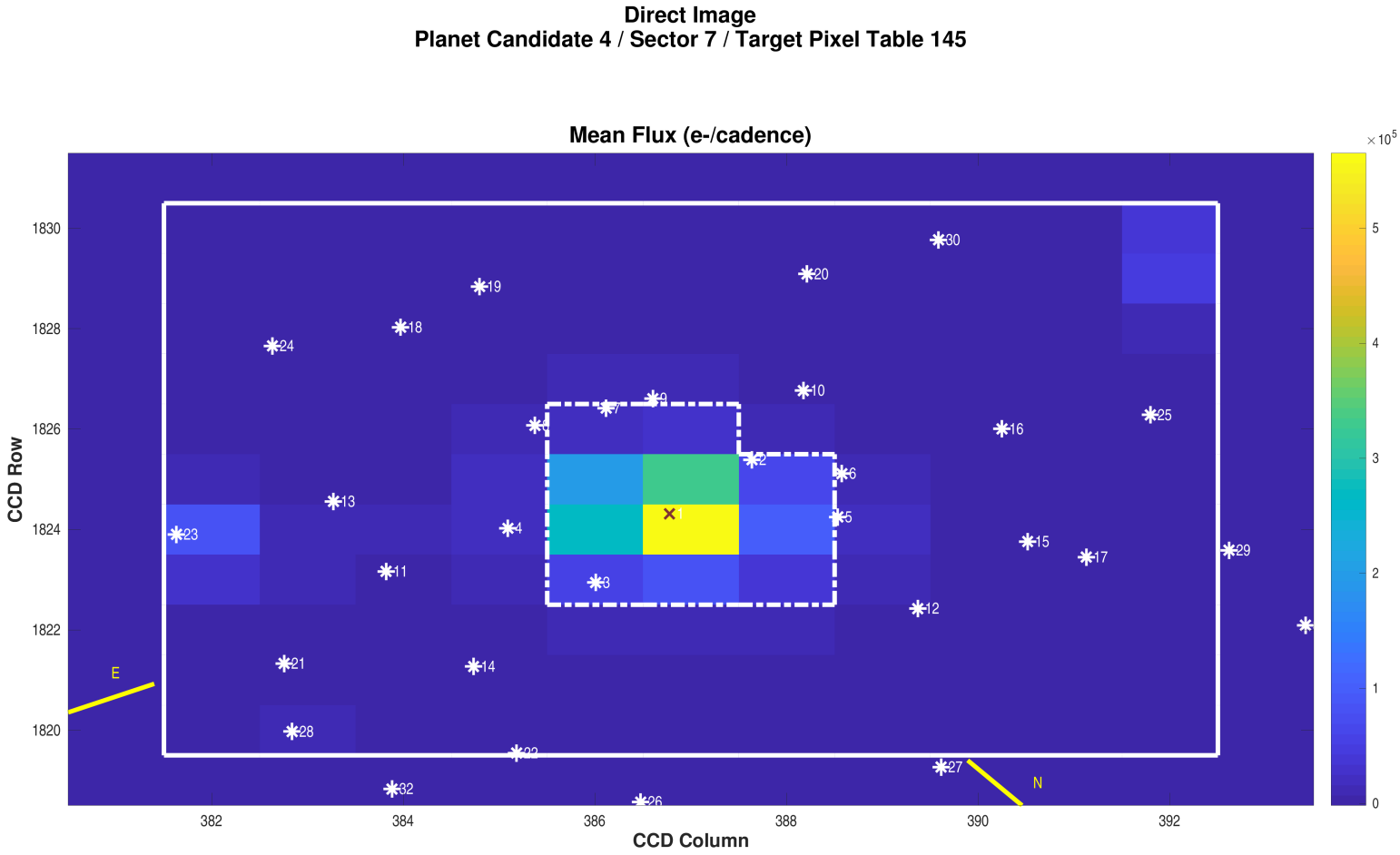
The out of transit image centroid and difference image centroid could not be calculated for target 149603524, planet candidate 4, in target table 135.



Direct image for target 149603524, planet candidate 4, sector 6, target pixel table 141. A difference image cannot be generated because there were no transits for this planet candidate and target pixel table. The mean flux over all cadences is shown in the figure. The optimal aperture is outlined with a white dash-dotted line 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.
Open `./planet-04/difference-image/0000000149603524-04-difference-image-06-141.fig`

PRF Fit of the Difference Image

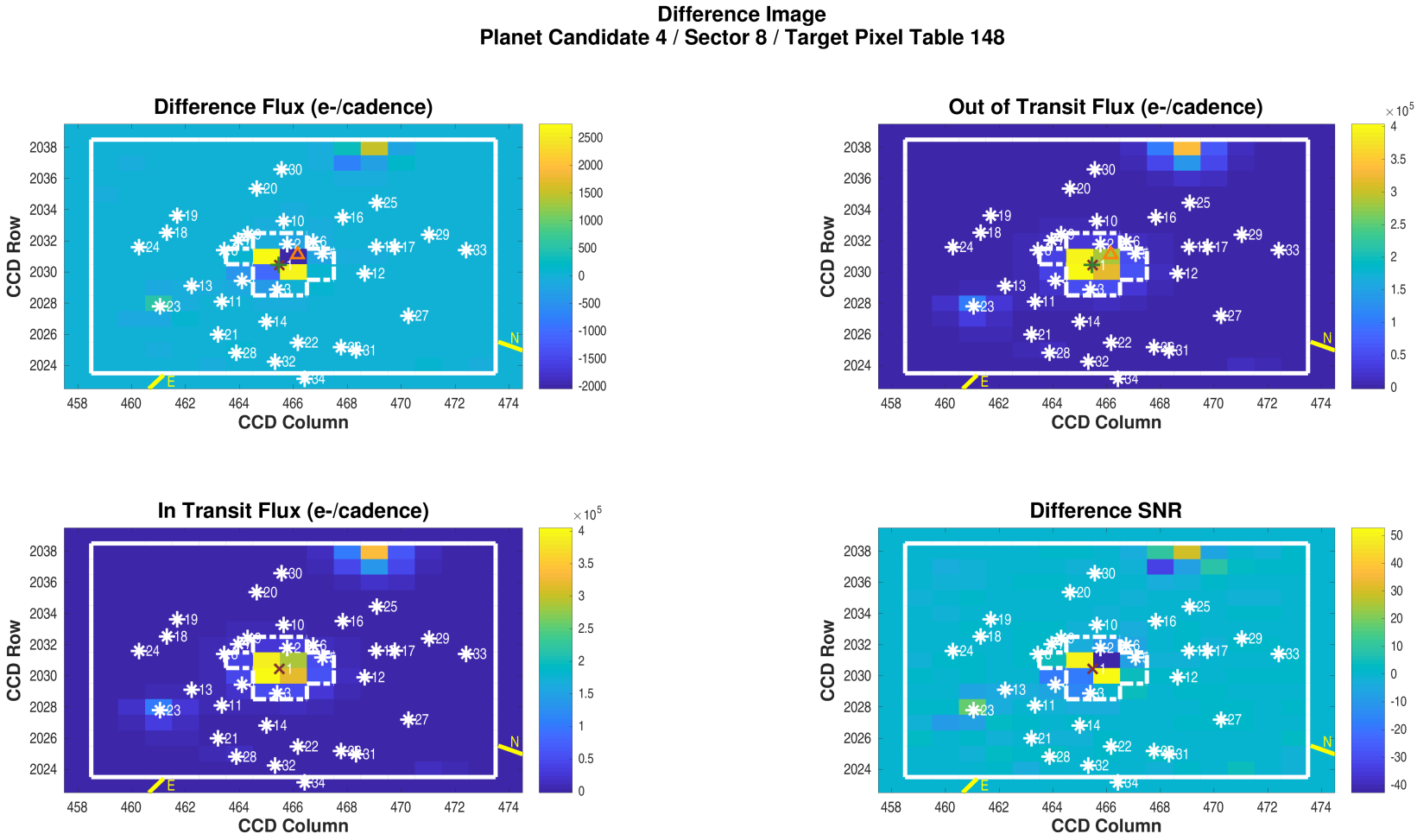
The out of transit image centroid and difference image centroid could not be calculated for target 149603524, planet candidate 4, in target table 141.



Direct image for target 149603524, planet candidate 4, sector 7, target pixel table 145. A difference image cannot be generated because there were no transits for this planet candidate and target pixel table. The mean flux over all cadences is shown in the figure. The optimal aperture is outlined with a white dash-dotted line 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.
Open `./planet-04/difference-image/0000000149603524-04-difference-image-07-145.fig`

PRF Fit of the Difference Image

The out of transit image centroid and difference image centroid could not be calculated for target 149603524, planet candidate 4, in target table 145.



Difference image for target 149603524, planet candidate 4, sector 8, target pixel table 148. 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 = 210; number of in-transit cadence gaps = 0; number of valid out-of-transit cadences = 479; number of out-of-transit cadence gaps = 0. Difference image quality metric = -0.26 (not good).
Open `./planet-04/difference-image/0000000149603524-04-difference-image-08-148.fig`

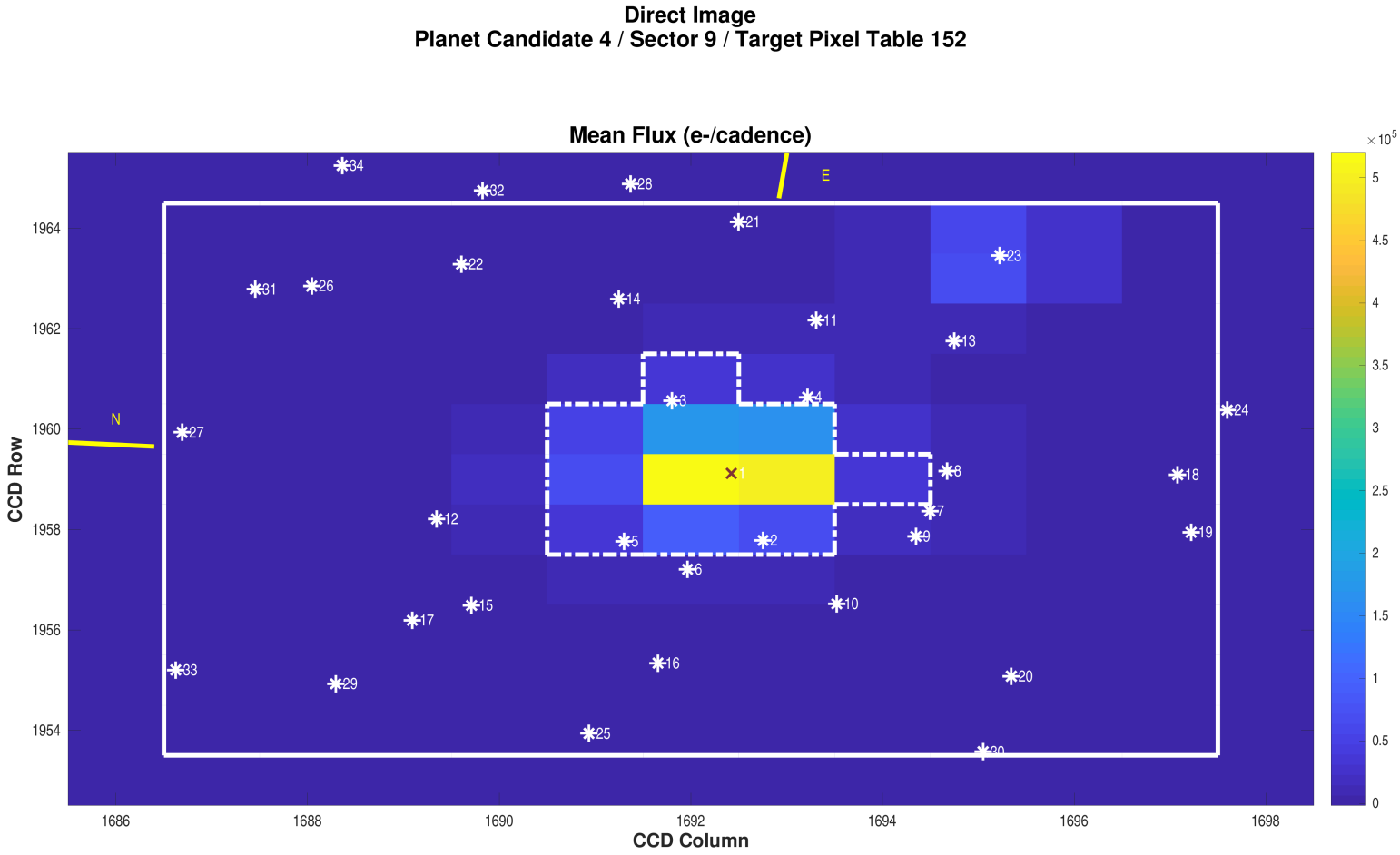
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$2030.45 \pm 2.25e-05$	$465.46 \pm 2.85e-05$	pixels	$87.13985571 \pm 1.92e-06$	$-63.98841708 \pm 2.06e-06$	degrees
Difference Image Centroid	$2031.12 \pm 1.65e-02$	$466.15 \pm 1.84e-02$	pixels	$87.12733707 \pm 1.14e-04$	$-63.98697437 \pm 8.37e-05$	degrees
Offset	$0.6710 \pm 1.65e-02$	$0.6968 \pm 1.84e-02$	pixels	$-19.7643 \pm 3.50e-01$	$5.1937 \pm 3.01e-01$	arcseconds
Offset/σ	40.67	37.89		-56.49	17.23	
Offset Distance	$0.9674 \pm 2.02e-02$		pixels	$20.4353 \pm 3.53e-01$		arcseconds
Offset Distance/σ	47.98			57.81		

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

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$2030.45 \pm 2.86e-04$	$465.48 \pm 4.00e-04$	pixels	$87.13977681 \pm 0.00e+00$	$-63.98829363 \pm 0.00e+00$	degrees
Difference Image Centroid	$2031.12 \pm 1.65e-02$	$466.15 \pm 1.84e-02$	pixels	$87.12733707 \pm 1.14e-04$	$-63.98697437 \pm 8.37e-05$	degrees
Offset	$0.6769 \pm 1.65e-02$	$0.6757 \pm 1.84e-02$	pixels	$-19.6398 \pm 1.81e-01$	$4.7493 \pm 3.01e-01$	arcseconds
Offset/σ	41.02	36.74		-108.68	15.76	
Offset Distance	$0.9565 \pm 2.01e-02$		pixels	$20.2059 \pm 2.03e-01$		arcseconds
Offset Distance/σ	47.51			99.61		



Direct image for target 149603524, planet candidate 4, sector 9, target pixel table 152. A difference image cannot be generated because there were no transits for this planet candidate and target pixel table. The mean flux over all cadences is shown in the figure. The optimal aperture is outlined with a white dash-dotted line 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.
Open `./planet-04/difference-image/0000000149603524-04-difference-image-09-152.fig`

PRF Fit of the Difference Image

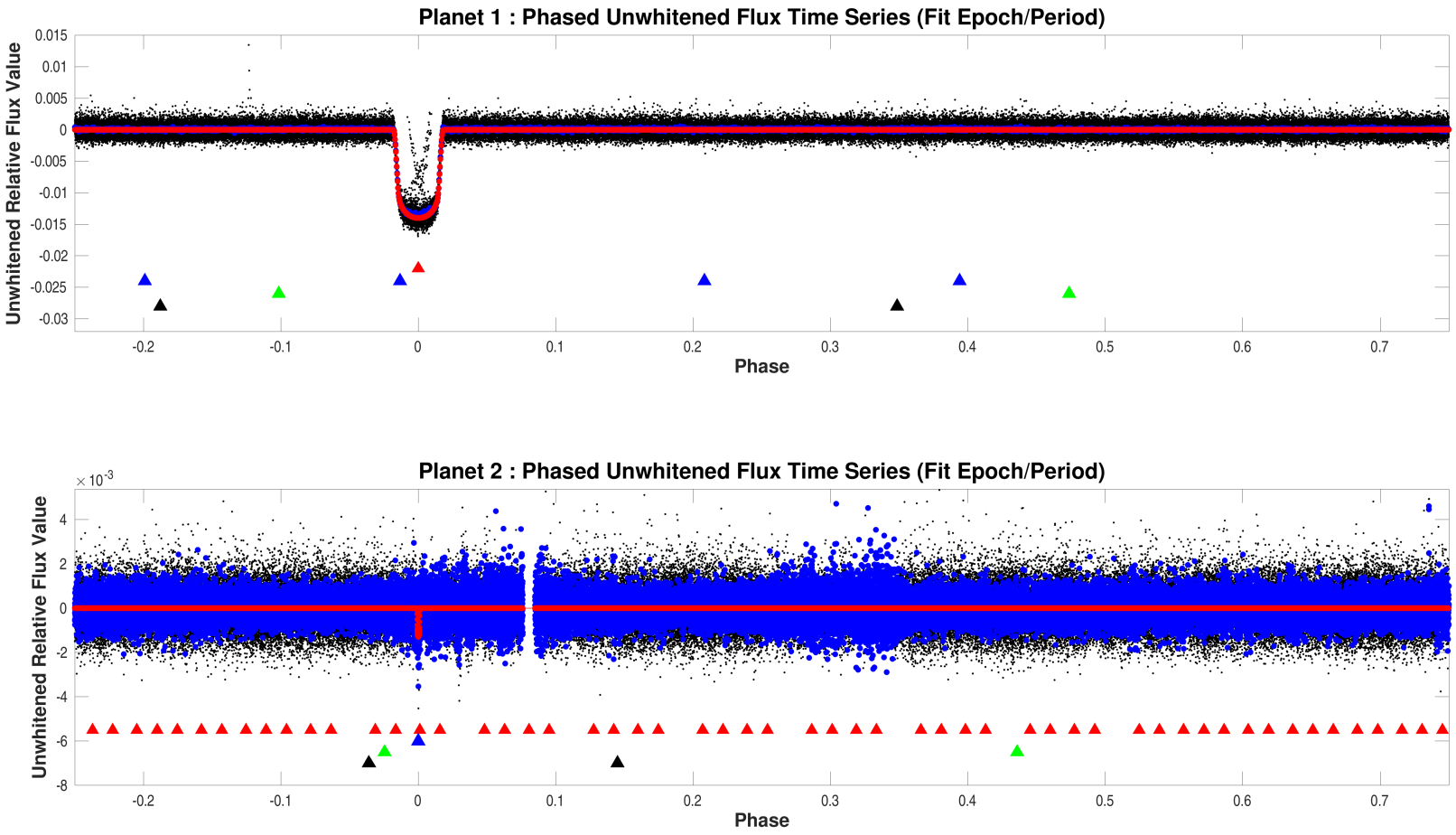
The out of transit image centroid and difference image centroid could not be calculated for target 149603524, planet candidate 4, in target table 152.

5.5 Difference Image TIC Key

Index	Catalog ID	Mag	RA (degrees)	Dec (degrees)	Distance (arcsec)
1	149603524	9.716	87.13977893	-63.98829521	0.00
2	149603525	14.992	87.12234500	-63.99093200	29.12
3	149603518	15.820	87.15830836	-63.98390899	33.24
4	149603528	15.894	87.16093592	-63.99213381	36.15
5	149603517	16.575	87.12037702	-63.98247641	37.11
6	149603521	16.940	87.11370742	-63.98663358	41.59
7	149603533	16.610	87.13218986	-64.00079426	46.56
8	149603534	16.790	87.14307484	-64.00140864	47.49
9	149603531	15.354	87.12530508	-64.00020949	48.60
10	149603530	16.942	87.10638090	-63.99608878	59.73
11	149603527	17.068	87.18148360	-63.99183240	67.06
12	149603509	17.521	87.12401137	-63.97081705	67.67
13	149603532	17.805	87.17771834	-64.00046946	74.22
14	149603515	17.096	87.18469905	-63.97958347	77.54
15	149603510	16.195	87.10147800	-63.97385000	79.75
16	149603519	16.848	87.08841763	-63.98581965	81.58
17	149603507	16.254	87.09678262	-63.97039894	93.59
18	149603543	16.057	87.14491758	-64.01550280	98.28
19	149603546	17.150	87.12977435	-64.01693307	104.30
20	149603539	16.895	87.08929200	-64.00748400	105.48
21	149603520	16.975	87.20664412	-63.98606630	105.87
22	149603504	16.591	87.19194768	-63.96962869	106.30
23	149603535	11.775	87.20098256	-64.00233495	109.05
24	149603547	15.712	87.16273663	-64.01783659	112.36
25	149603516	17.371	87.06891829	-63.98234687	113.91
26	149603500	16.390	87.18428495	-63.96074493	121.55
27	149603494	16.631	87.14386467	-63.95439516	122.21
28	149603514	14.099	87.21539487	-63.97907177	123.91
29	149603502	15.988	87.07898177	-63.96640088	124.20
30	149603538	16.757	87.06888484	-64.00655613	129.81
31	149603498	15.548	87.18273700	-63.95733075	130.48
32	149603506	17.006	87.21177300	-63.97013500	131.12
33	149603496	17.227	87.08067341	-63.95650195	147.68
34	149603501	17.789	87.21665050	-63.96131171	155.45

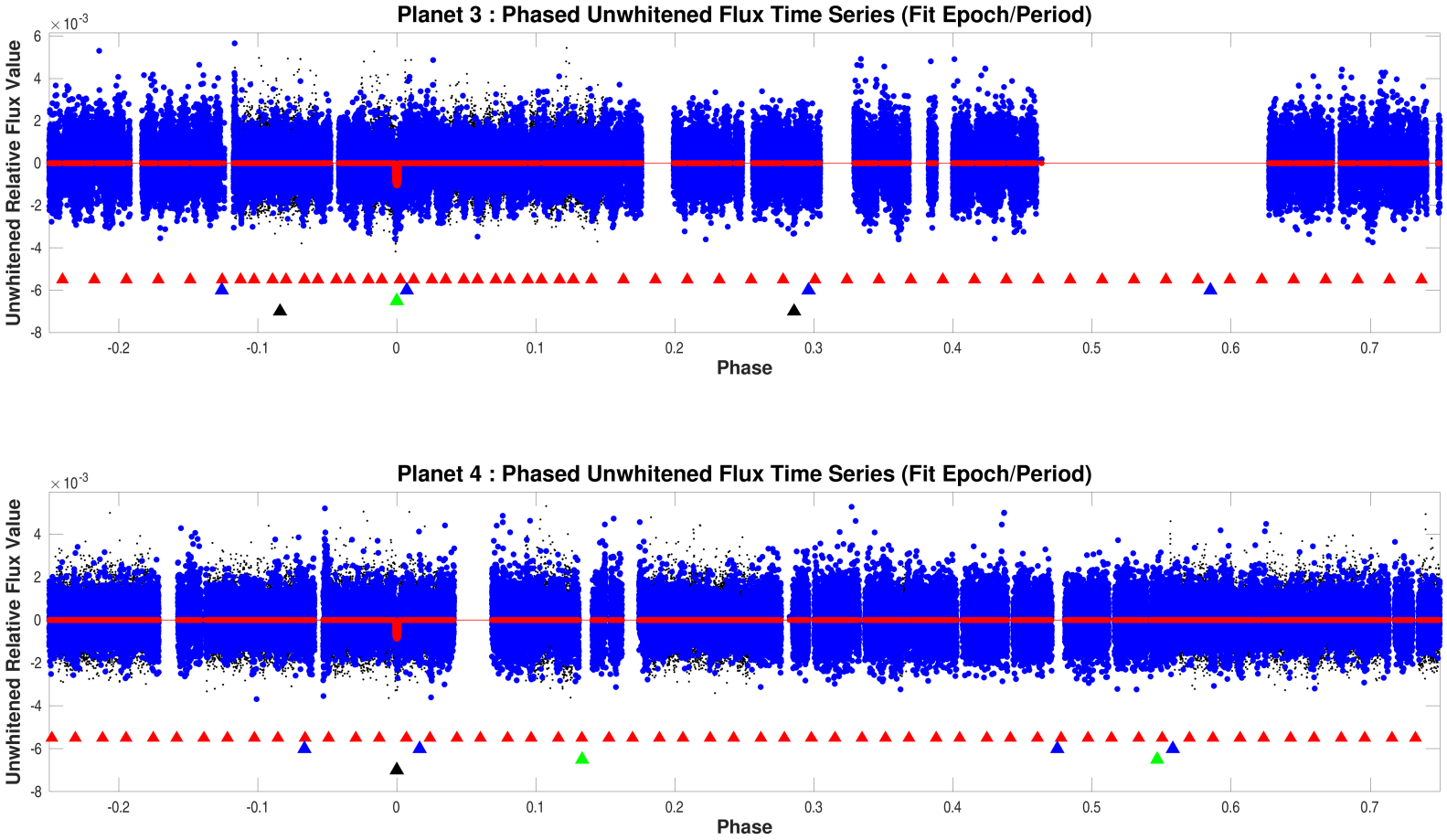
RA, Dec and Distances are corrected for proper motion. This table may not contain all of the objects shown.

6 Phased Light Curves



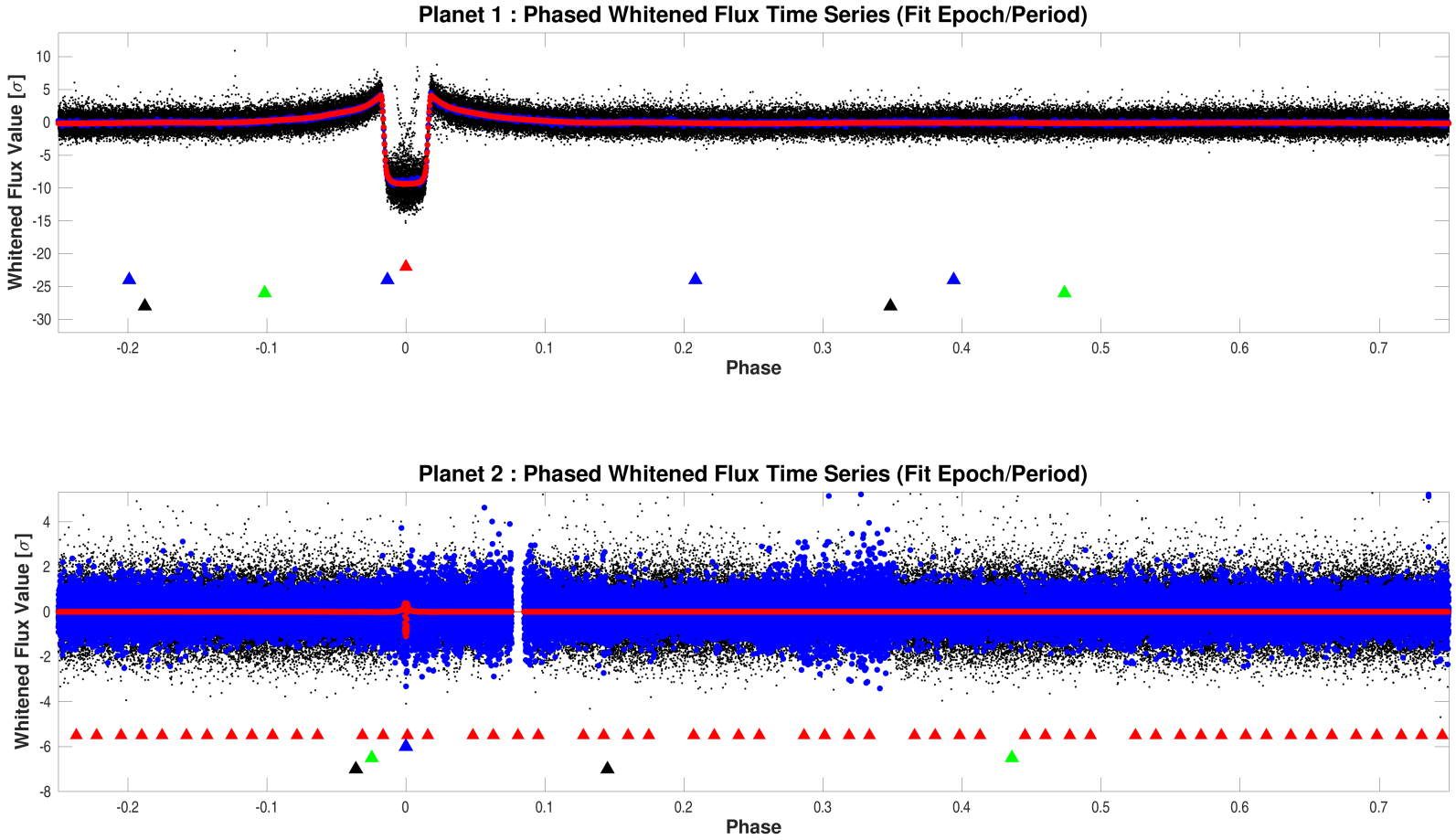
Phased unwhitened flux time series is plotted in black dots. When all transits fit completed with full or secondary convergence, the phase is determined with the fitted epoch and period; otherwise, the phase is determined with the TPS epoch and period. The values of the phased unwhitened flux time series 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/0000000149603524-01-phased-unwhitened-flux-time-series.fig`

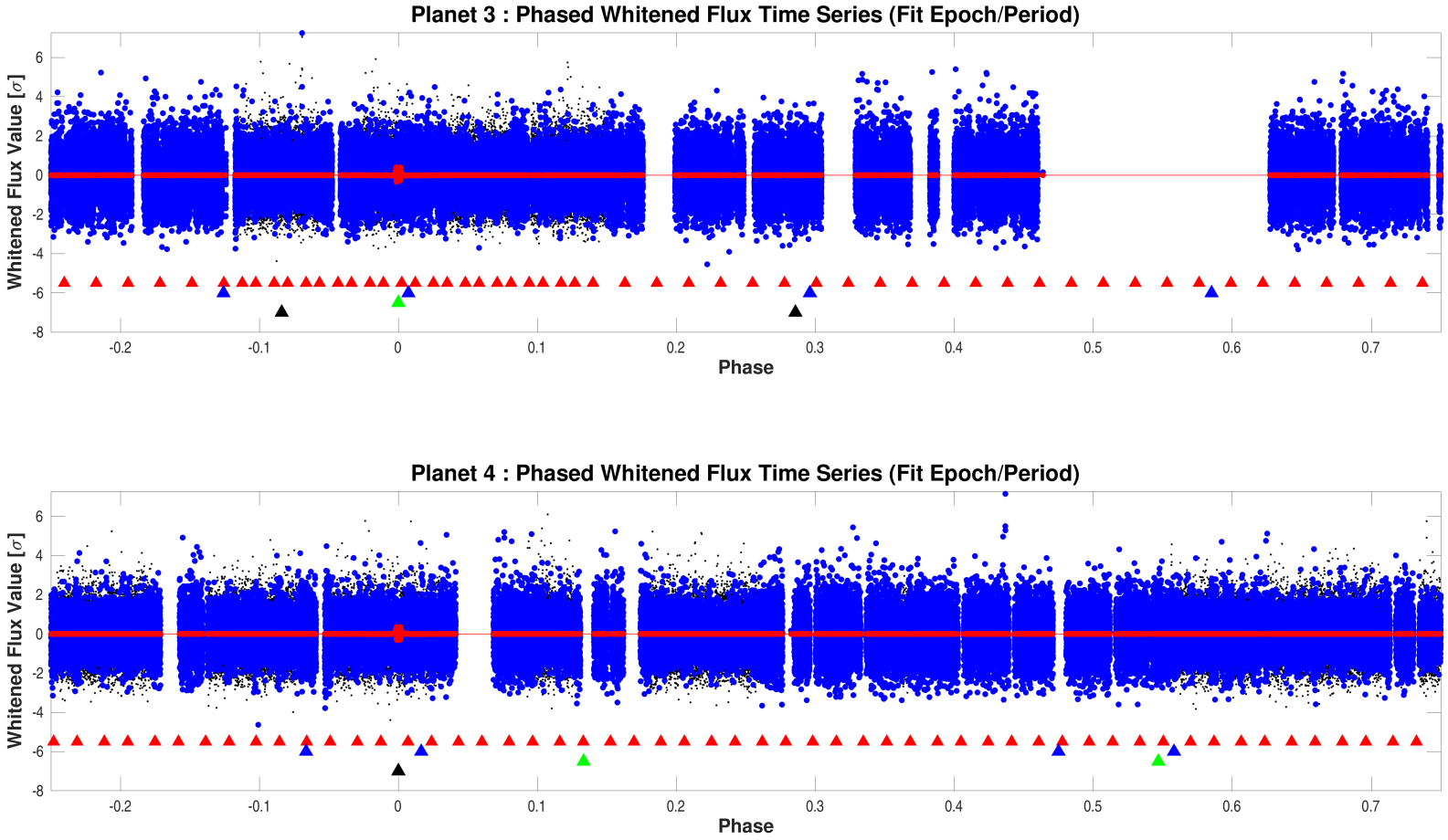


Phased unwhitened flux time series is plotted in black dots. When all transits fit completed with full or secondary convergence, the phase is determined with the fitted epoch and period; otherwise, the phase is determined with the TPS epoch and period. The values of the phased unwhitened flux time series 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.

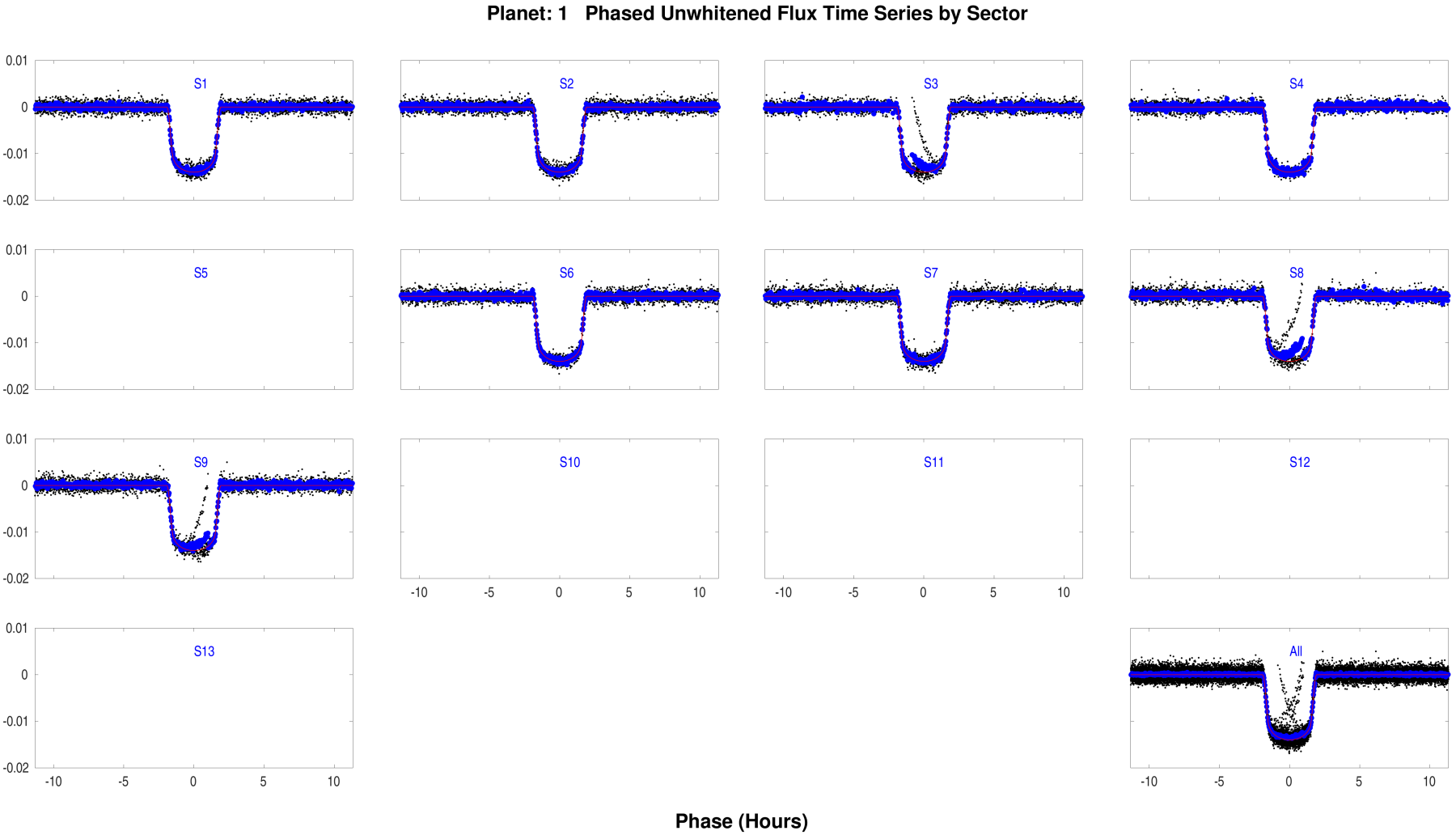
Open `./summary-plots/0000000149603524-03-phased-unwhitened-flux-time-series.fig`



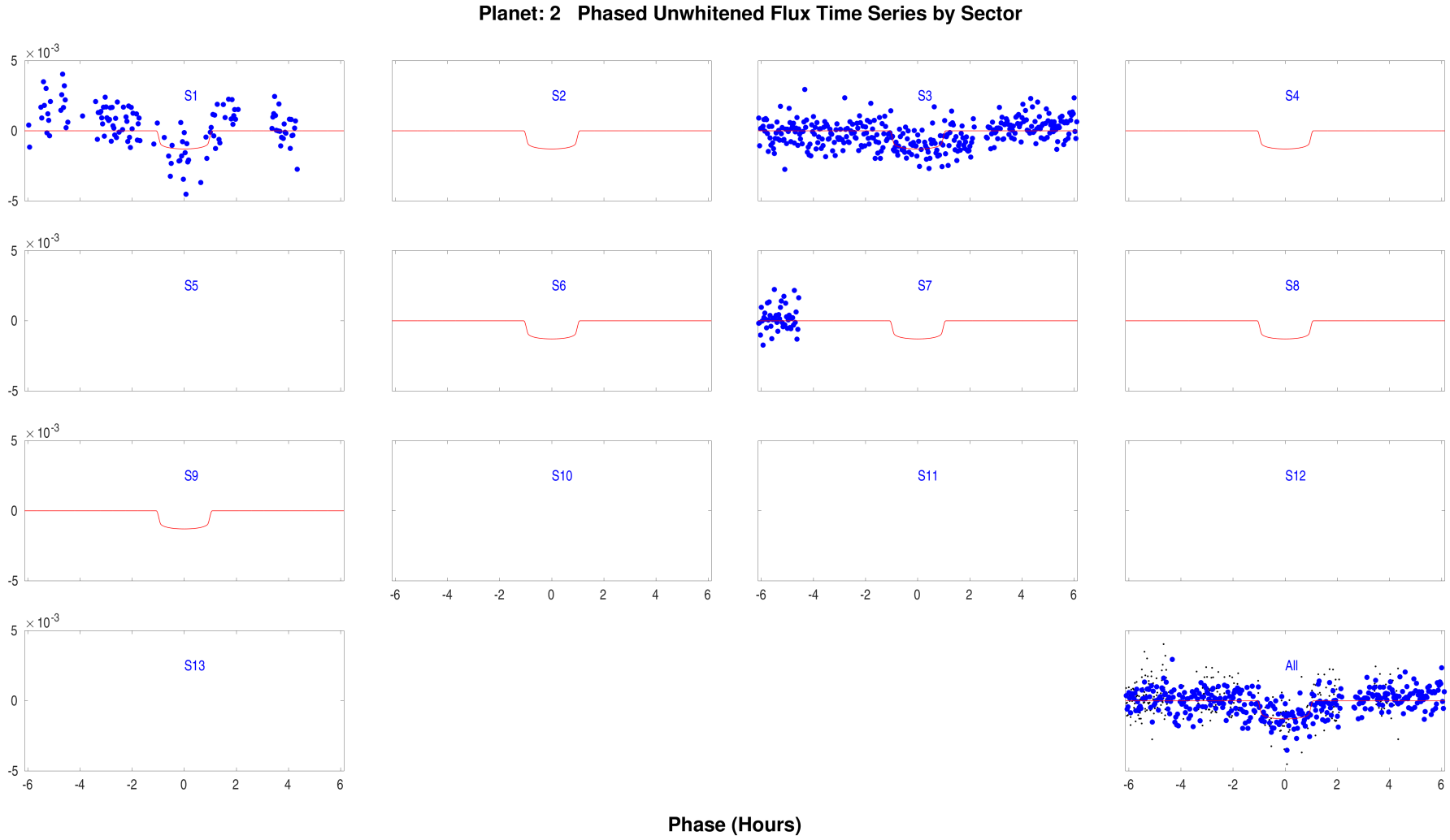
Phased whitened flux time series is plotted in black dots. When all transits fit completed with full or secondary convergence, the phase is determined with the fitted epoch and period; otherwise, the phase is determined with the TPS epoch and period. The values of the phased whitened flux time series 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/0000000149603524-01-phased-whitened-flux-time-series.fig`



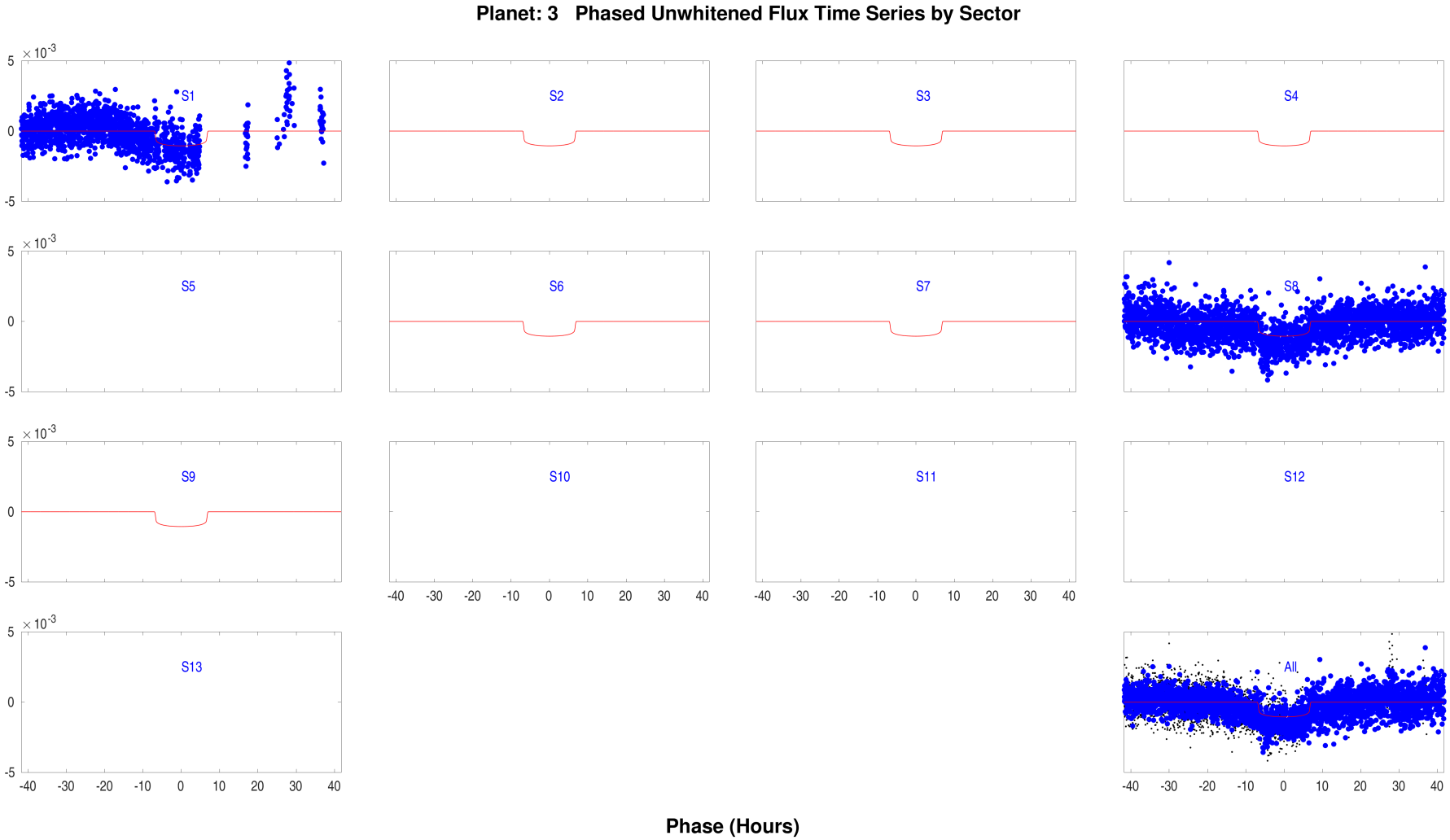
Phased whitened flux time series is plotted in black dots. When all transits fit completed with full or secondary convergence, the phase is determined with the fitted epoch and period; otherwise, the phase is determined with the TPS epoch and period. The values of the phased whitened flux time series 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/0000000149603524-03-phased-whitened-flux-time-series.fig`



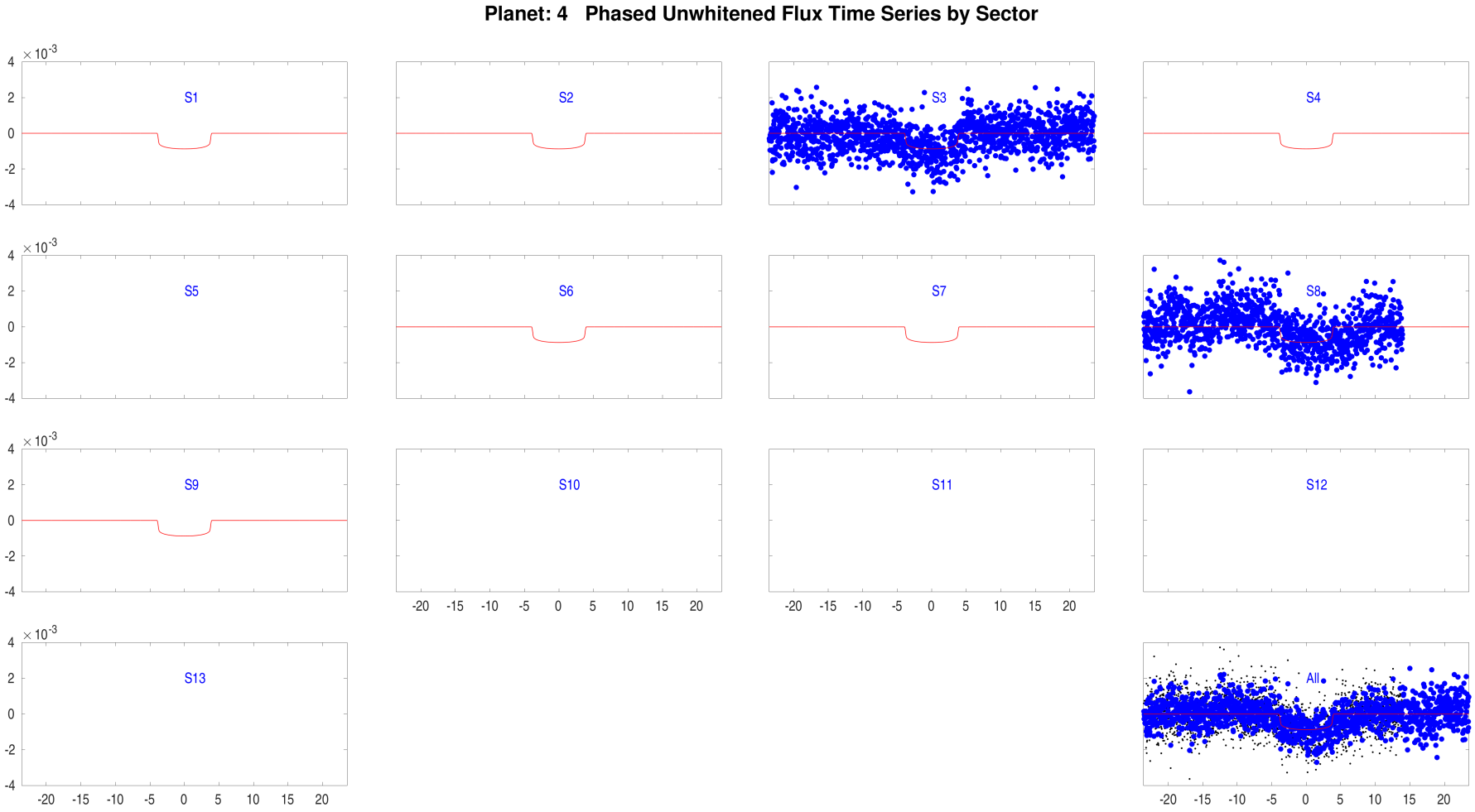
Phased unwhitened flux time series by sector for target 149603524, planet candidate 1. Period = 4.4119 days; transit epoch = 1326.0788 BTJD.
Open `./summary-plots/0000000149603524-01-phased-unwhitened-flux-time-series-by-sector.fig`



Phased unwhitened flux time series by sector for target 149603524, planet candidate 2. Period = 55.5588 days; transit epoch = 1349.0568 BTJD.
Open `./summary-plots/0000000149603524-02-phased-unwhitened-flux-time-series-by-sector.fig`



Phased unwhitened flux time series by sector for target 149603524, planet candidate 3. Period = 192.251 days; transit epoch = 1347.6905 BTJD.
Open `./summary-plots/0000000149603524-03-phased-unwhitened-flux-time-series-by-sector.fig`



Phased unwhitened flux time series by sector for target 149603524, planet candidate 4. Period = 121.1689 days; transit epoch = 1402.6188 BTJD.
Open `./summary-plots/0000000149603524-04-phased-unwhitened-flux-time-series-by-sector.fig`

7 Planet Candidate 1

7.1 Model Fitter: All Transits

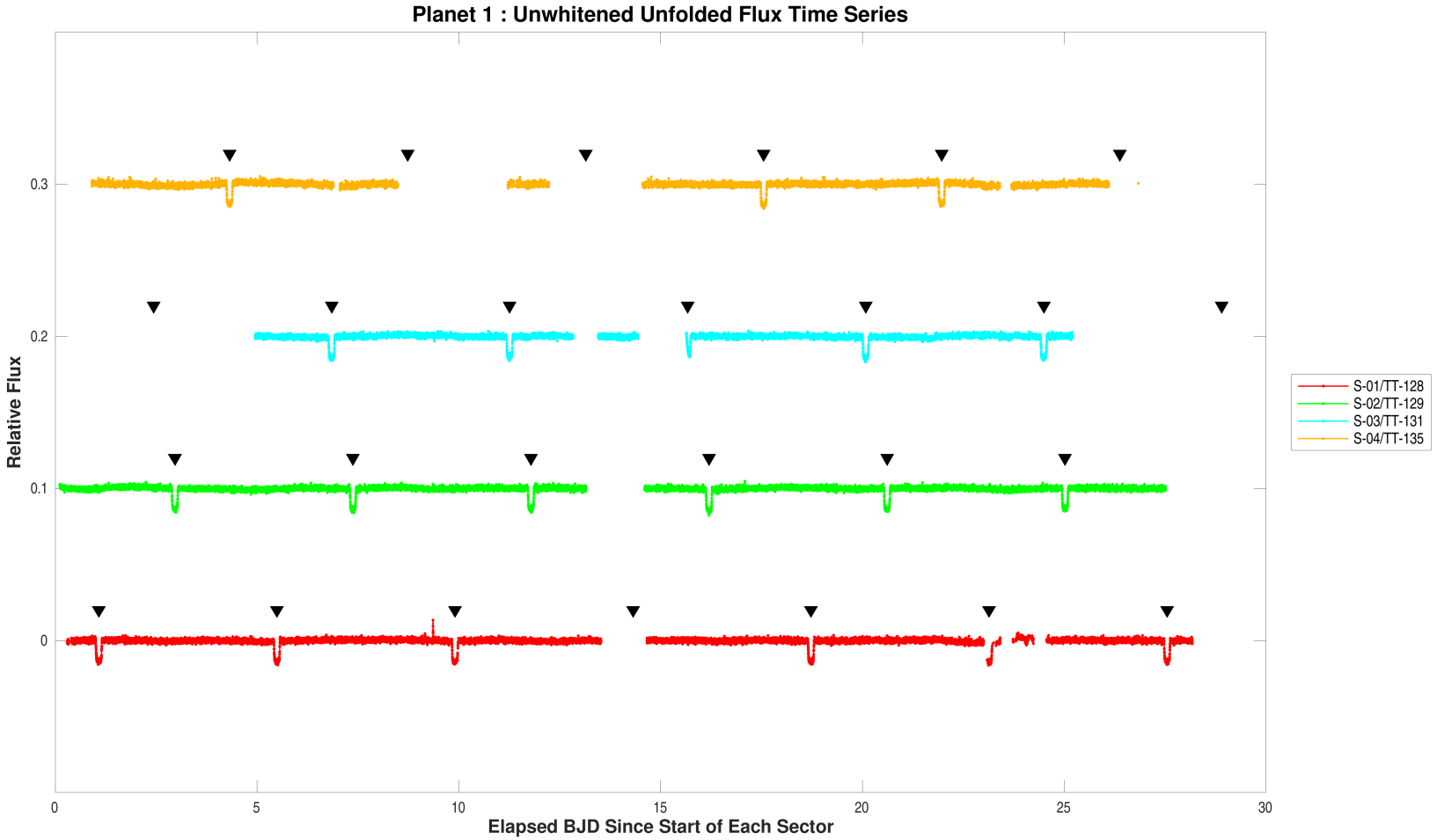
Model Characteristic	Name
Transit Model	mandel-agol_geometric_transit_model
Limb Darkening Model	claret_tess_nonlinear_limb_darkening_model

TCE Parameter	Value	Units
Trial Transit Pulse Duration	3.5	hours
Transit Epoch	1326.0735171	TJD
Orbital Period	4.4121528	days
Maximum SES	119.3	
Maximum MES	546.4	
Robust Statistic	487.4	
Chi Square Goodness of Fit Statistic (DoF)	18737.7 (3923)	
Chi Square2 Statistic (DoF)	8756.4 (20924.2)	
Threshold for Desired PFA		

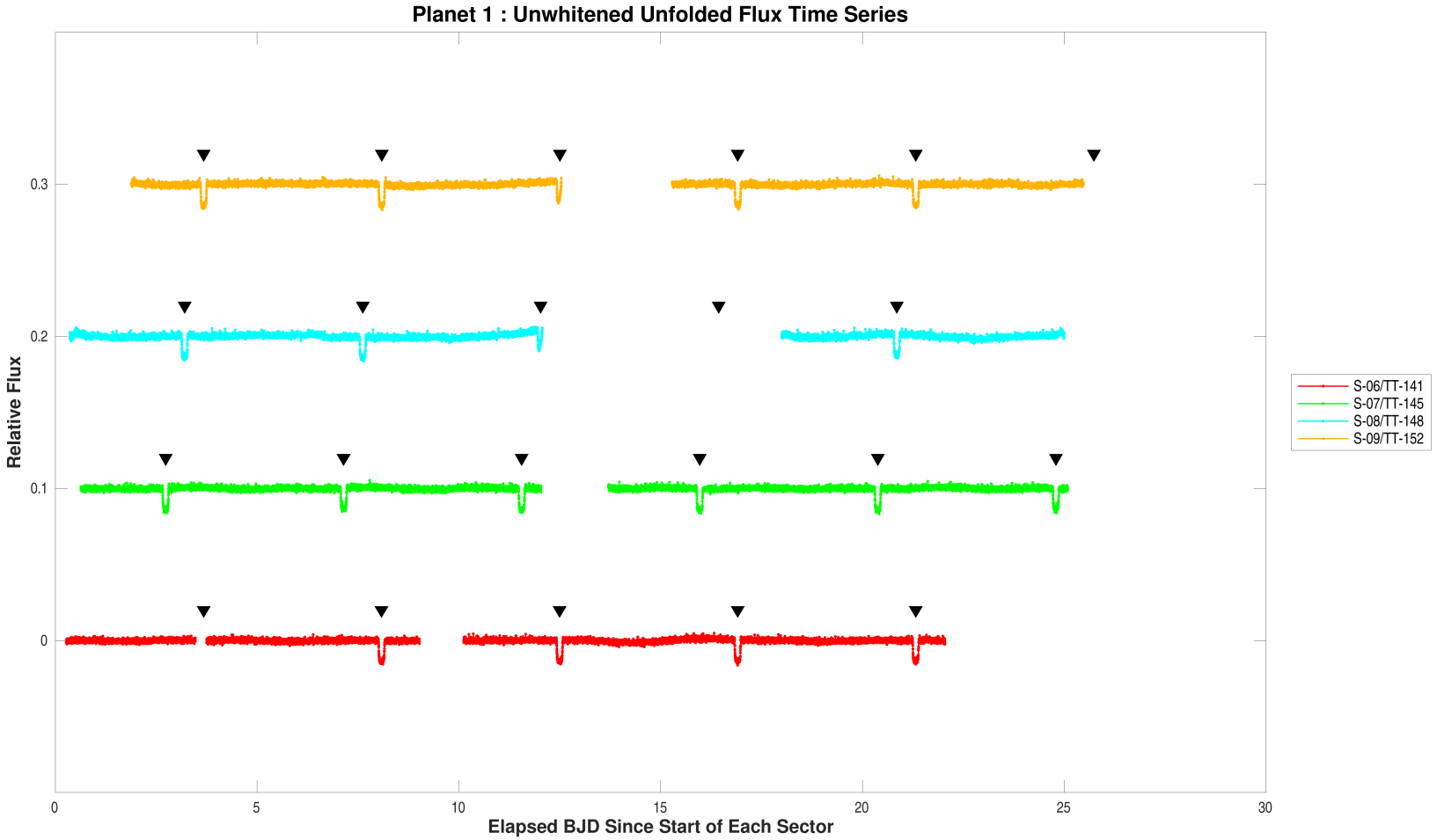
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	561.1		
Orbital Period	4.4119377	2.7416e-06	days
Transit Epoch	1326.0787503	8.2122e-05	BTJD
Impact Parameter	0.0111	7.5177e-01	
Planet Radius to Star Radius Ratio	0.1102524	1.8841e-04	
Semi-major Axis to Star Radius Ratio	9.9318	8.1833e-02	
Planet Radius	15.4064	2.6328e-02	Earth radii
Semi-major Axis	0.0568	2.3513e-08	AU
Effective Stellar Flux	708.7682	5.8725e-04	Goldilocks
Equilibrium Temperature	1316	2.7259e-04	Kelvin
Stellar Density	0.6762	1.6714e-02	Solar density
Transit Depth	13996	2.5198e+01	ppm
Transit Duration	3.7755	6.8878e-03	hours
Transit Ingress Duration	0.3761	6.8525e-03	hours
Eccentricity	0.0000	0.0000e+00	
Peri Longitude	0.0000	0.0000e+00	degrees
Model Chi Square Statistic (DoF)	17457.7 (20467.6)		
Model Chi Square Goodness of Fit Statistic (DoF)	2550.4 (4664)		
Model Chi Square2 Statistic (DoF)	34.6 (39)		

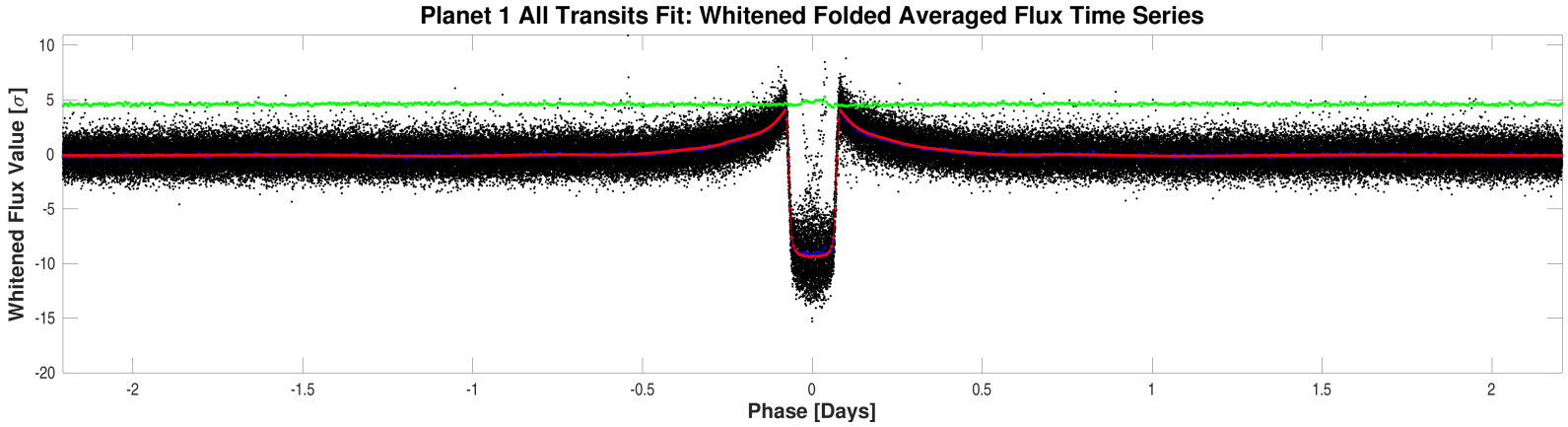
DoF: Degrees of Freedom



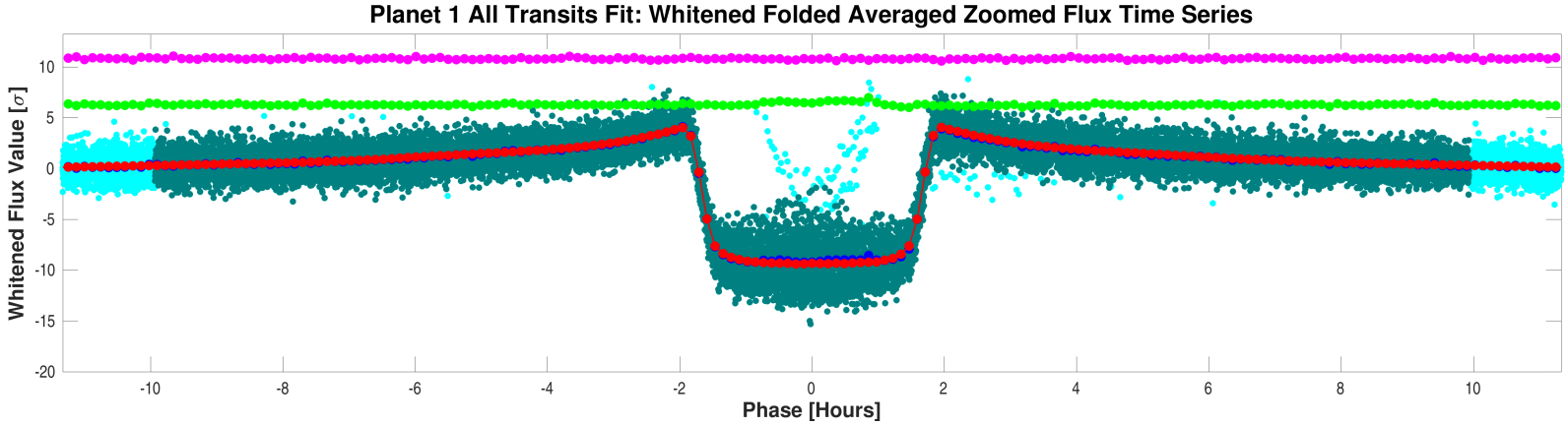
Flux time series for CatId 149603524, Planet candidate 1 in the unwhitened domain. For the data of Sector-01/TargetTableId-128, start BJD is 2458325 and the vertical offset is 0. For the data of Sector-02/TargetTableId-129, start BJD is 2458354 and the vertical offset is 0.1. For the data of Sector-03/TargetTableId-131, start BJD is 2458381 and the vertical offset is 0.2. For the data of Sector-04/TargetTableId-135, start BJD is 2458410 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/0000000149603524-01-all-unwhitened-01-128.fig`



Flux time series for CatId 149603524, Planet candidate 1 in the unwhitened domain. For the data of Sector-06/TargetTableId-141, start BJD is 2458468 and the vertical offset is 0. For the data of Sector-07/TargetTableId-145, start BJD is 2458491 and the vertical offset is 0.1. For the data of Sector-08/TargetTableId-148, start BJD is 2458517 and the vertical offset is 0.2. For the data of Sector-09/TargetTableId-152, start BJD is 2458543 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/0000000149603524-01-all-unwhitened-06-141.fig`



Folded flux time series for CatId 149603524, 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/0000000149603524-01-all-whitened.fig`

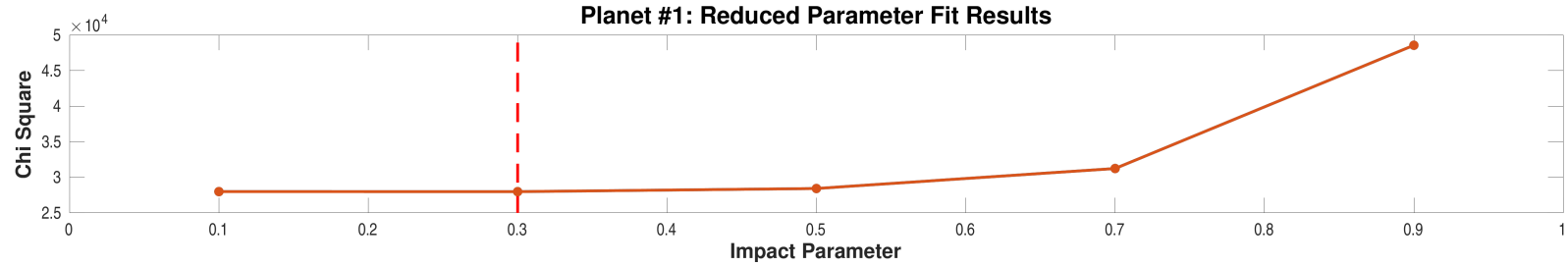


Folded flux time series for CatId 149603524, Planet candidate 1 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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/0000000149603524-01-all-whitened-zoomed.fig`

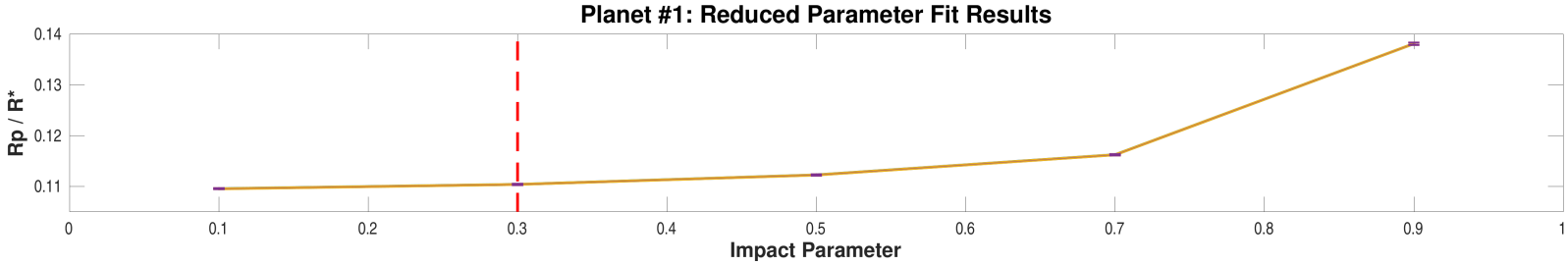
7.2 Model Fitter: Reduced Parameter Fit Results

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	573.4	27992.5	0.1095645	1.1217e-04	9.8698	7.7390e-03	13801	2.8089e+01	3.7818	2.9794e-03
0.30	573.1	27983.8	0.1104116	1.1328e-04	9.4700	7.6941e-03	13827	2.8198e+01	3.8151	3.1177e-03
0.50	570.0	28426.3	0.1122761	1.1722e-04	8.6108	7.7248e-03	13859	2.8745e+01	3.9043	3.5313e-03
0.70	562.4	31238.2	0.1162515	1.3077e-04	7.1454	8.2527e-03	13949	3.1104e+01	4.1315	4.8323e-03
0.90	541.2	48560.3	0.1381047	2.4247e-04	5.0018	1.1703e-02	15236	4.4553e+01	4.7881	1.1087e-02

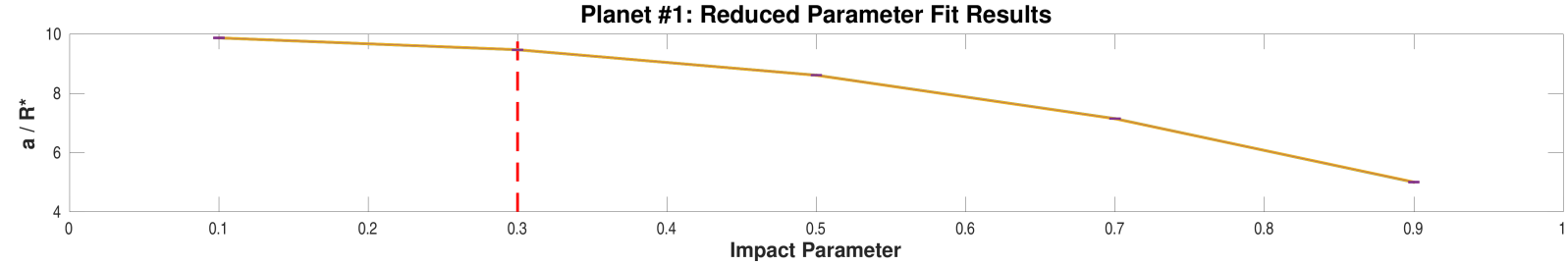
Highlighted row is the best reduced-parameter model fit.



Model chi squares of reduced parameter fits vs. impact parameter for CatId 149603524, 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/0000000149603524-01-reduced-fits-chi-square.fig`



Ratios of planet radius to star radius of reduced parameter fits vs. impact parameter for CatId 149603524, 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/0000000149603524-01-reduced-fits-rp-over-rstar.fig`



Ratios of semimajor axis to star radius of reduced parameter fits vs. impact parameter for CatId 149603524, 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/0000000149603524-01-reduced-fits-a-over-rstar.fig`

7.3 Model Fitter: Trapezoidal Fit Results

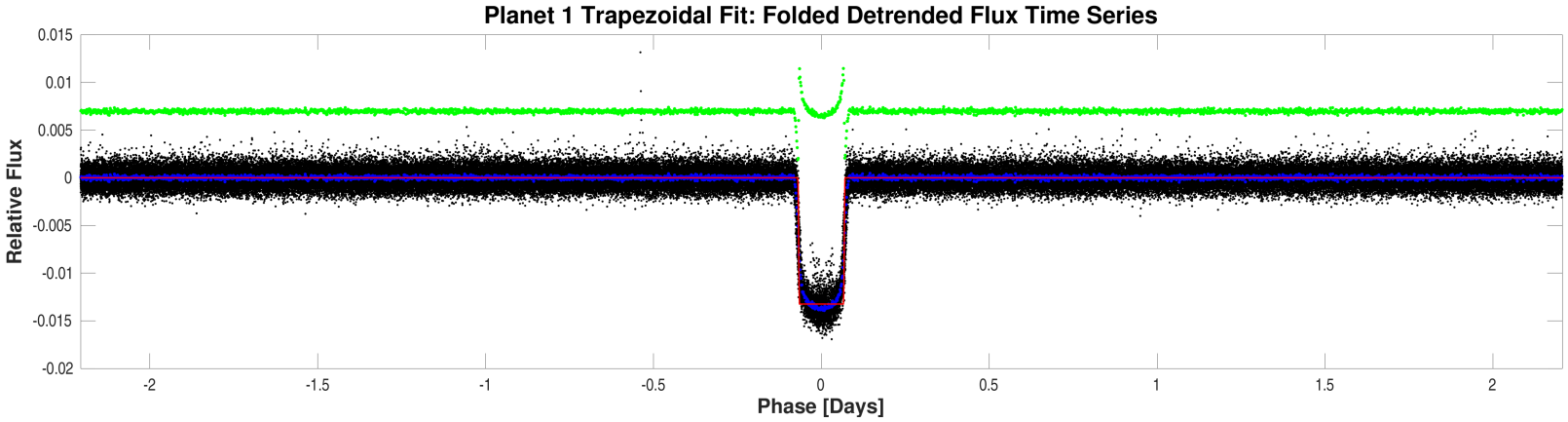
Model Characteristic	Name
Transit Model	trapezoidal_model
Limb Darkening Model	

TCE Parameter	Value	Units
Trial Transit Pulse Duration	3.5	hours
Transit Epoch	1326.0735171	TJD
Orbital Period	4.4121528	days
Maximum SES	119.3	
Maximum MES	546.4	
Robust Statistic	487.4	
Chi Square Goodness of Fit Statistic (DoF)	18737.7 (3923)	
Chi Square2 Statistic (DoF)	8756.4 (20924.2)	
Threshold for Desired PFA		

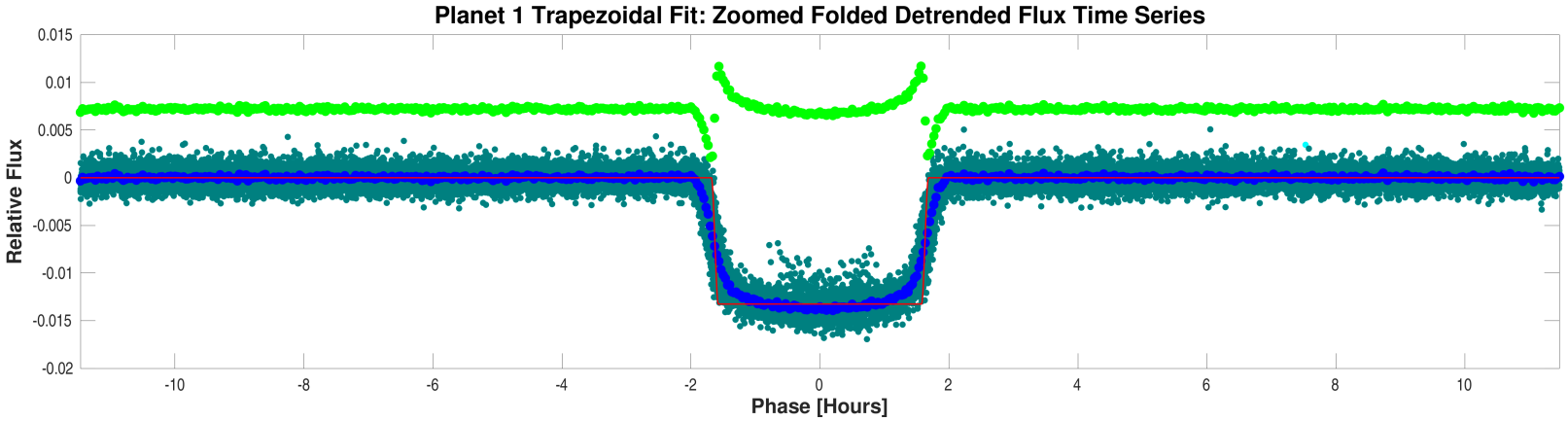
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	876.0		
Orbital Period	4.4121528		days
Transit Epoch	1326.0730885		BTJD
Transit Depth	13249		ppm
Transit Duration	3.8215		hours
Transit Ingress Duration	0.5631		hours
Model Chi Square Statistic (DoF)	141006.1 (32025)		

DoF: Degrees of Freedom



Folded detrended flux time series for CatId 149603524, Planet candidate 1 and folded trapezoidal model light curve.
Open `./planet-01/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000149603524-01-all-trapezoidal.fig`



Zoomed folded detrended flux time series for CatId 149603524, Planet candidate 1 and folded trapezoidal model light curve.
Open `./planet-01/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000149603524-01-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	4.4122		days		
Transit Duration	3.5		hours		
Maximum MES	546.4				
Secondary Phase	0.63333		days		
Secondary MES	8.0				
Minimum Phase	-0.425		days		
Minimum MES	-3.9				
Median MES	-0.0				
MAD MES	0.81071				
Robust Statistic	8.0				
Secondary Depth	433.7	4.9932e+01	ppm		
Geometric Albedo	3.2	3.7298e-01		6.0011	0.00
Planet Effective Temperature	2729	7.8591e+01	Kelvin	17.9845	0.00

7.4.2 Eclipsing Binary Discrimination Test

Result	Value	Value in Sigmas	Significance (%)
Odd Even Transit Depth Comparison Statistic	2.9321e+00	1.7123	8.68
Longer Period Comparison Statistic	8.1800e+04	286.0077	100.00

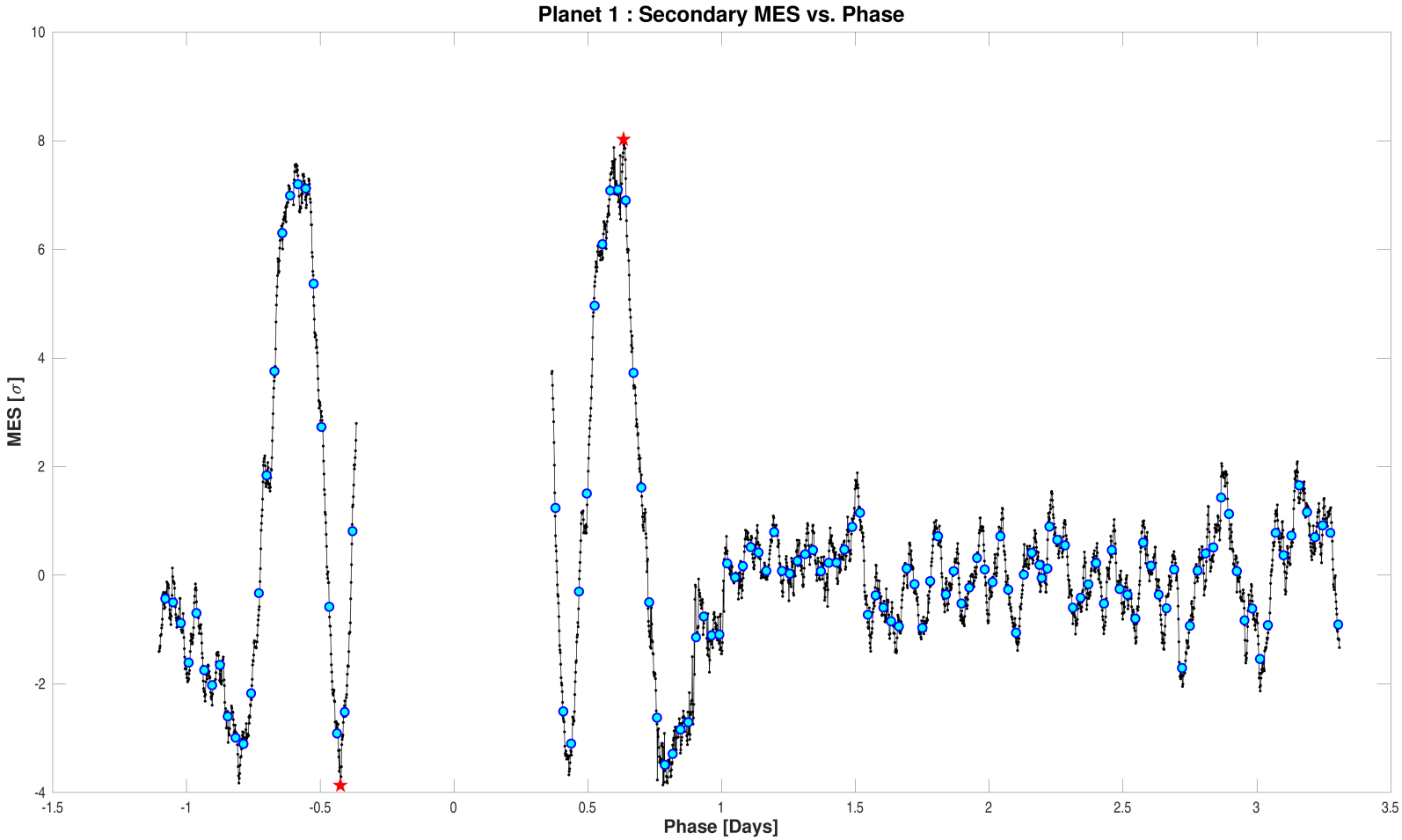
7.4.3 Bootstrap Test

Result	Value
False Alarm Probability	0.0000e+00
Bootstrap Threshold for Desired PFA	7.6
MES Mean	-0.28
MES Standard Deviation	1.10
Transit Count	55

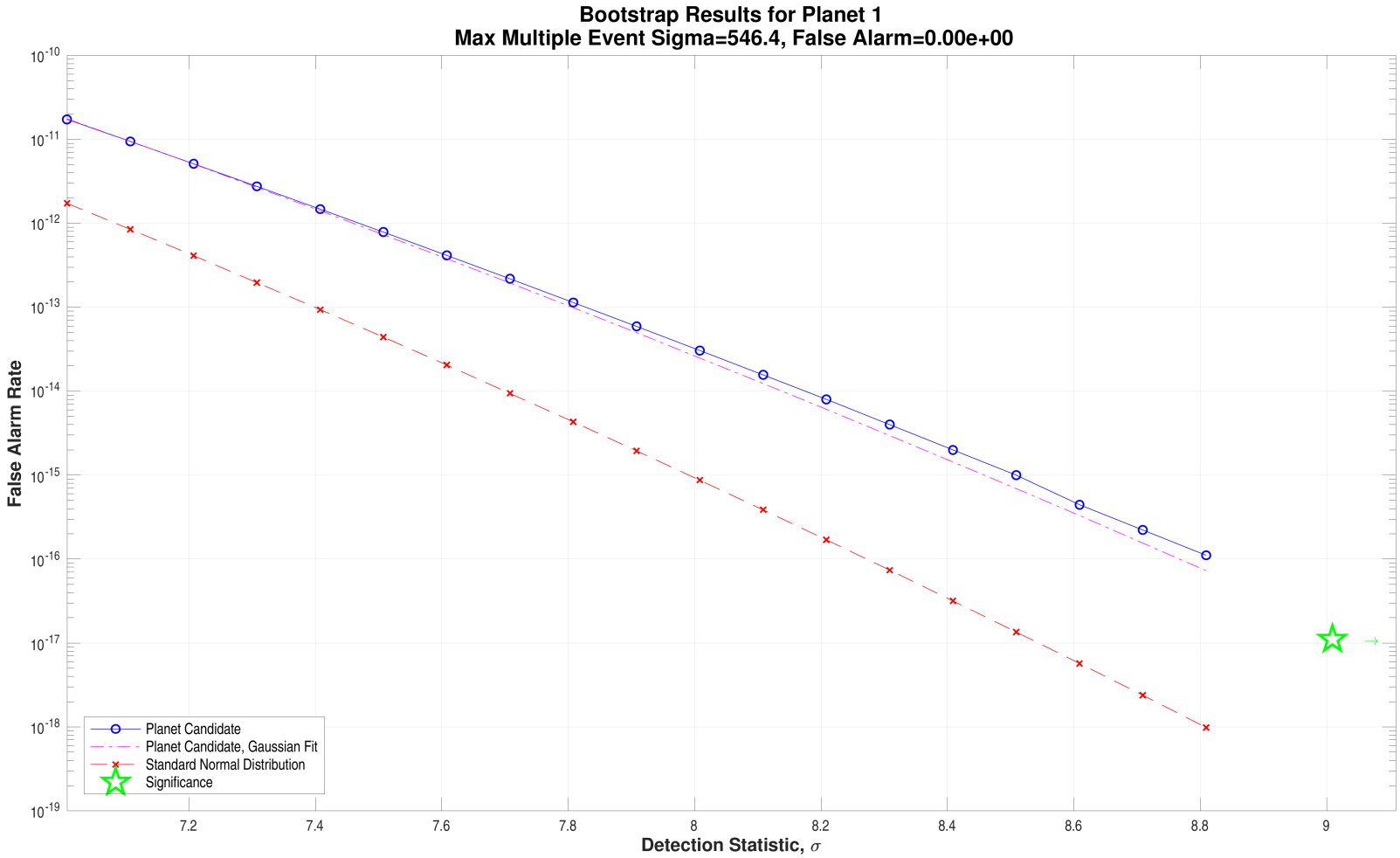
7.4.4 Ghost Diagnostic Test

Result	Value	Significance (%)
Maximum MES	546.4	
SNR	561.1	
Core Aperture Statistic	3.5613e+02	100.00
Halo Aperture Statistic	8.8914e+01	100.00
Ratio of Core/Halo Aperture Statistics	4.0053e+00	

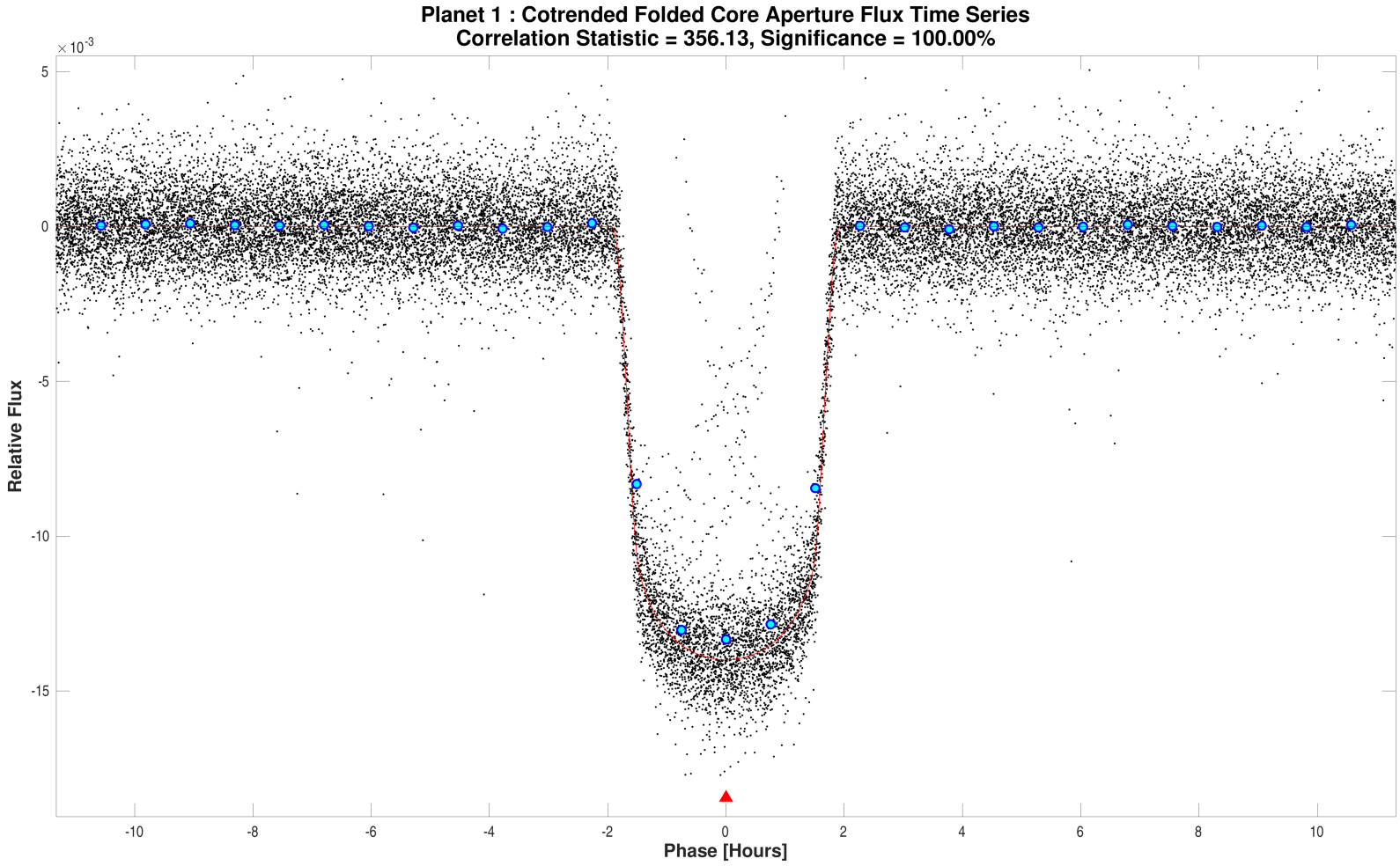
7.4.5 Validation Test Figures



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 3.5. The maximum secondary MES and corresponding phase are 8.0254 and 0.63333 days respectively. The minimum secondary MES and corresponding phase are -3.8671 and -0.425 days respectively.
Open `./planet-01/report-summary/0000000149603524-01-weak-secondary-diagnostic.fig`

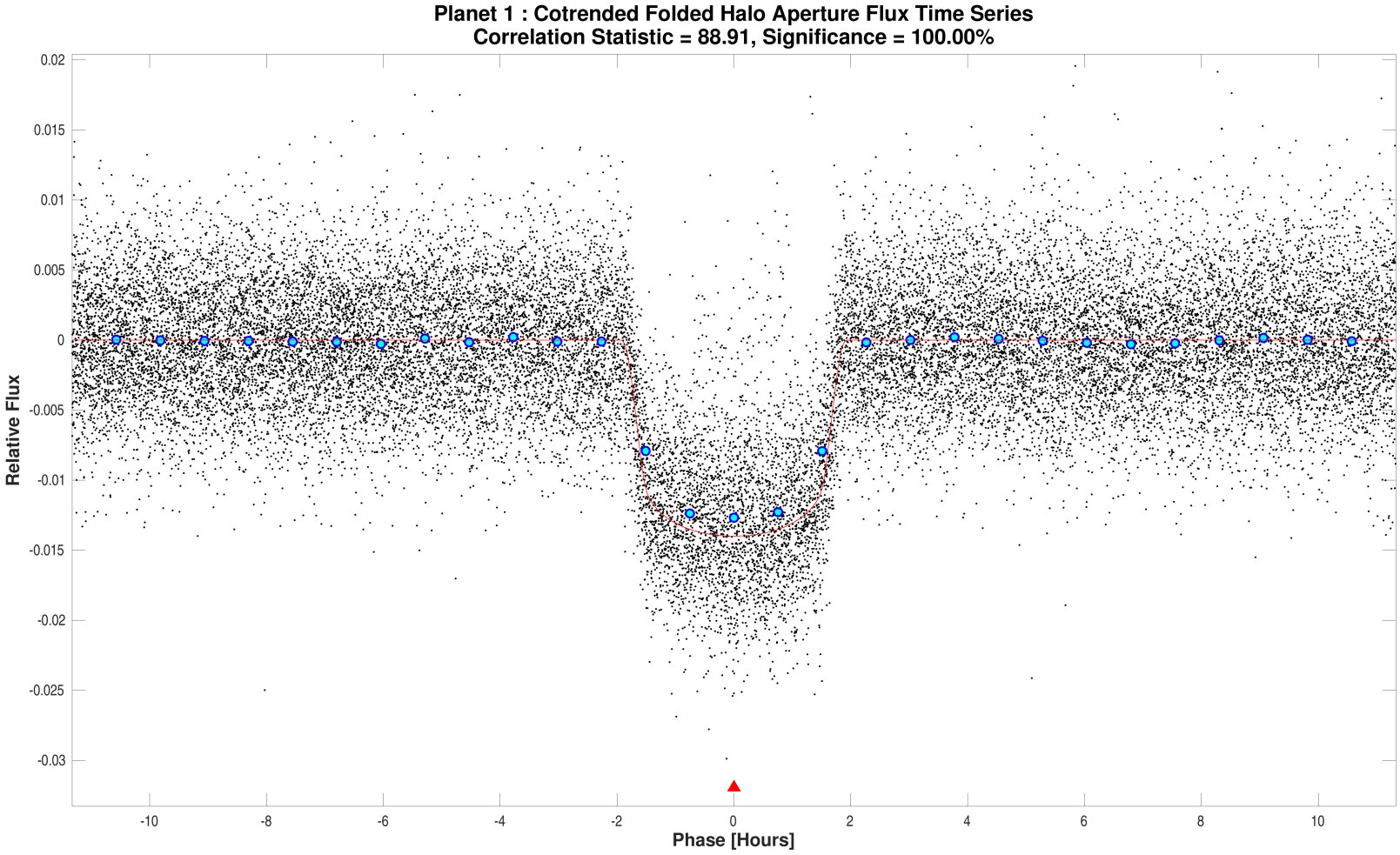


Bootstrap results for target 149603524, planet 1. Cumulative sum of the probabilities (derived from the histogram of counts) from upper tail to the search transit threshold; false alarm probability is indicated by the star. The Gaussian equivalent threshold for this false alarm probability is Inf. The threshold on this distribution that achieves the same false alarm rate as a 7.1 sigma threshold on a Gaussian distribution is 7.5516.
Open `./planet-01/bootstrap-results/0000000149603524-01-bootstrap-false-alarm.fig`



Optical ghost diagnostic core aperture flux time series for target 149603524, 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/0000000149603524-01-core-unwhitened-cotrended-zoomed-model.fig`



Optical ghost diagnostic halo aperture flux time series for target 149603524, 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/0000000149603524-01-halo-unwhitened-cotrended-zoomed-model.fig`

8 Planet Candidate 2

8.1 Model Fitter: All Transits

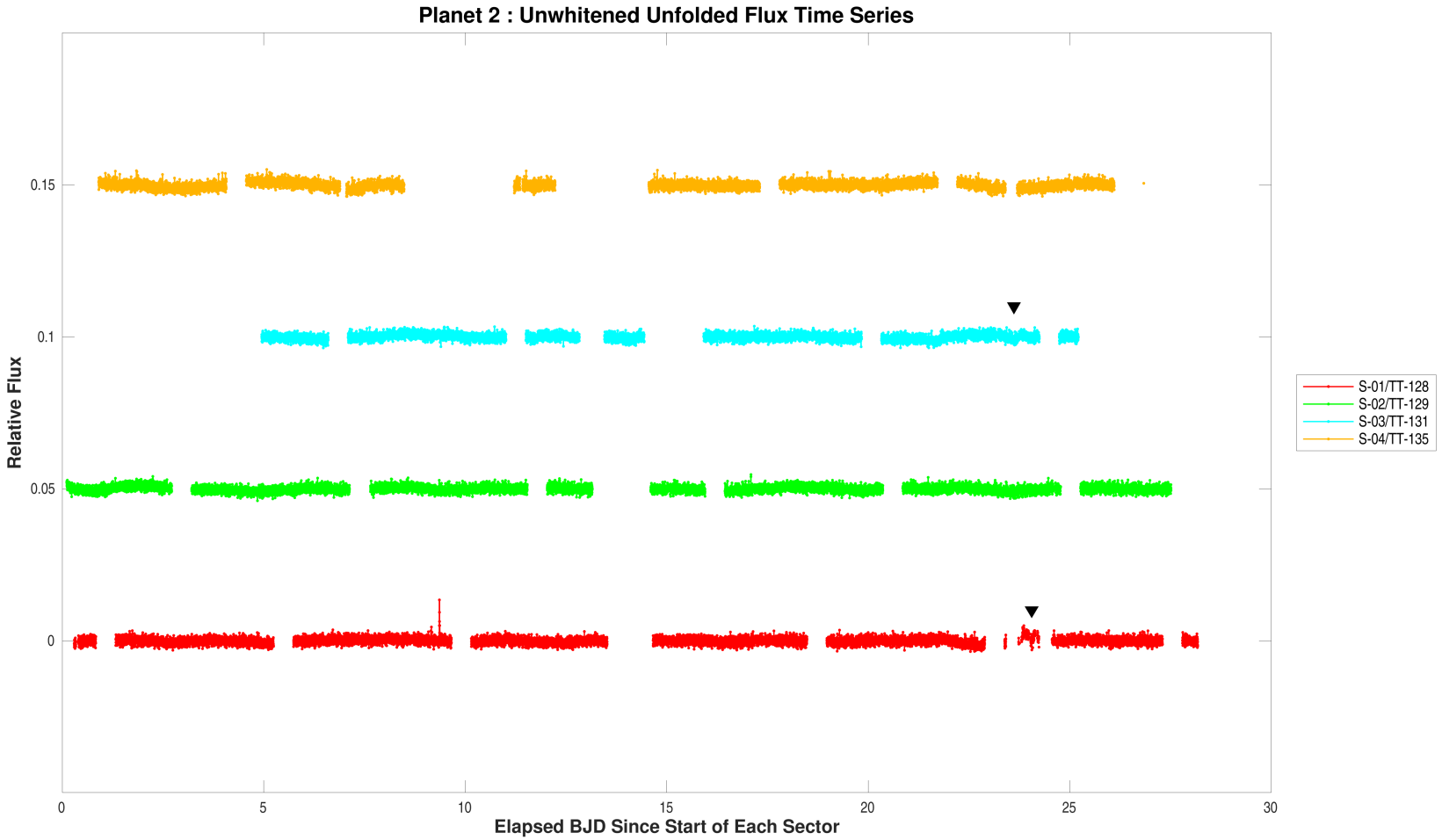
Model Characteristic	Name
Transit Model	mandel-agol_geometric_transit_model
Limb Darkening Model	claret_tess_nonlinear_limb_darkening_model

TCE Parameter	Value	Units
Trial Transit Pulse Duration	2.0	hours
Transit Epoch	1349.0547614	TJD
Orbital Period	55.5569308	days
Maximum SES	8.9	
Maximum MES	8.7	
Robust Statistic	6.8	
Chi Square Goodness of Fit Statistic (DoF)	92.2 (74)	
Chi Square2 Statistic (DoF)	3.5 (5.4)	
Threshold for Desired PFA		

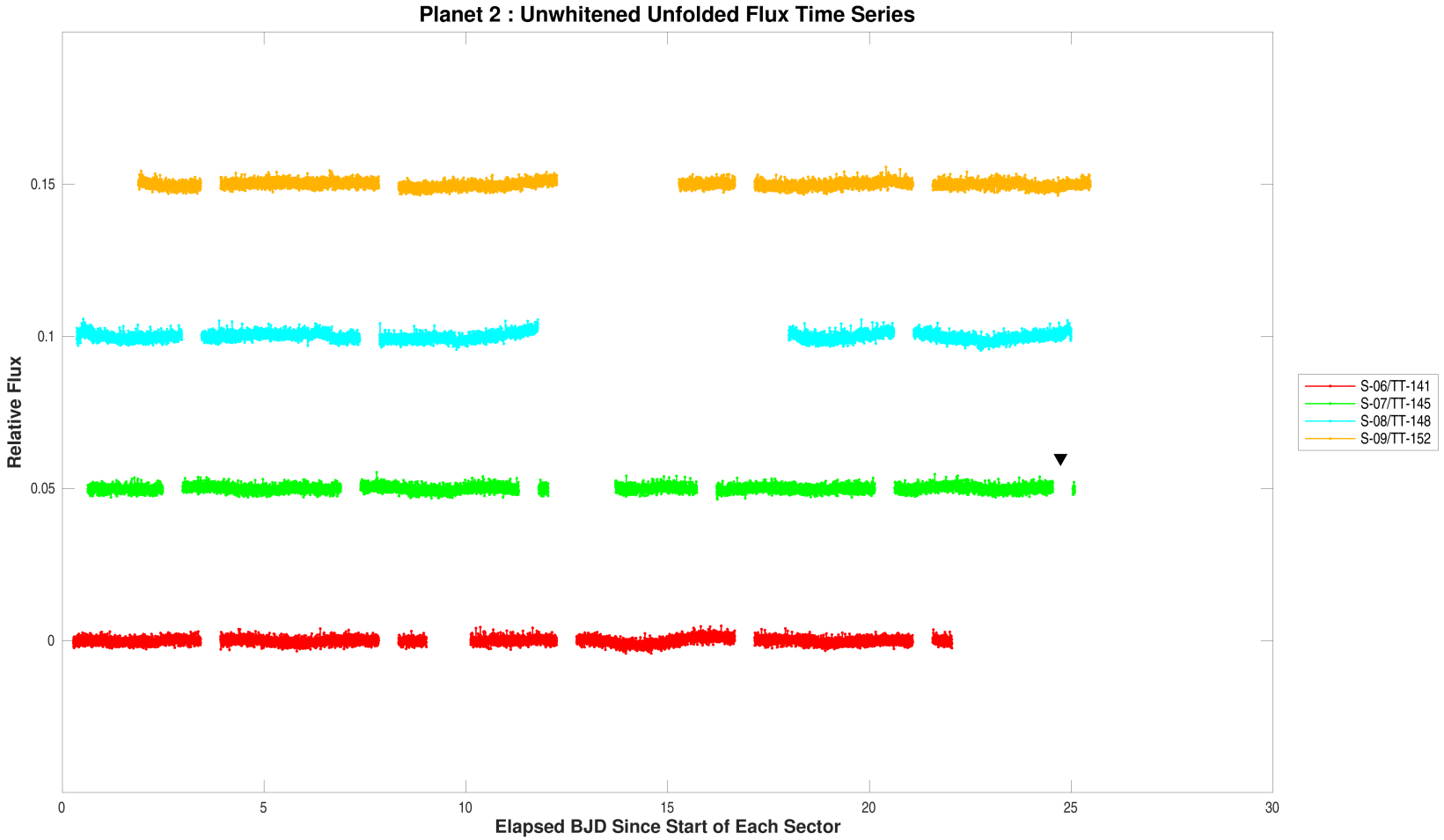
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	8.0		
Orbital Period	55.5588377	4.9902e-03	days
Transit Epoch	1349.0568478	4.5063e-03	BTJD
Impact Parameter	0.2672	1.4921e+01	
Planet Radius to Star Radius Ratio	0.0336864	2.3301e-02	
Semi-major Axis to Star Radius Ratio	207.6368	8.8640e+02	
Planet Radius	4.7072	3.2560e+00	Earth radii
Semi-major Axis	0.3072	1.8395e-05	AU
Effective Stellar Flux	24.1920	2.8972e-03	Goldilocks
Equilibrium Temperature	566	1.6935e-02	Kelvin
Stellar Density	38.9622	4.9899e+02	Solar density
Transit Depth	1292	1.8462e+02	ppm
Transit Duration	2.0412	6.0883e-01	hours
Transit Ingress Duration	0.0715	6.6156e-01	hours
Eccentricity	0.0000	0.0000e+00	
Peri Longitude	0.0000	0.0000e+00	degrees
Model Chi Square Statistic (DoF)	427.6 (418.7)		
Model Chi Square Goodness of Fit Statistic (DoF)	51.7 (129)		
Model Chi Square2 Statistic (DoF)	1.3 (1)		

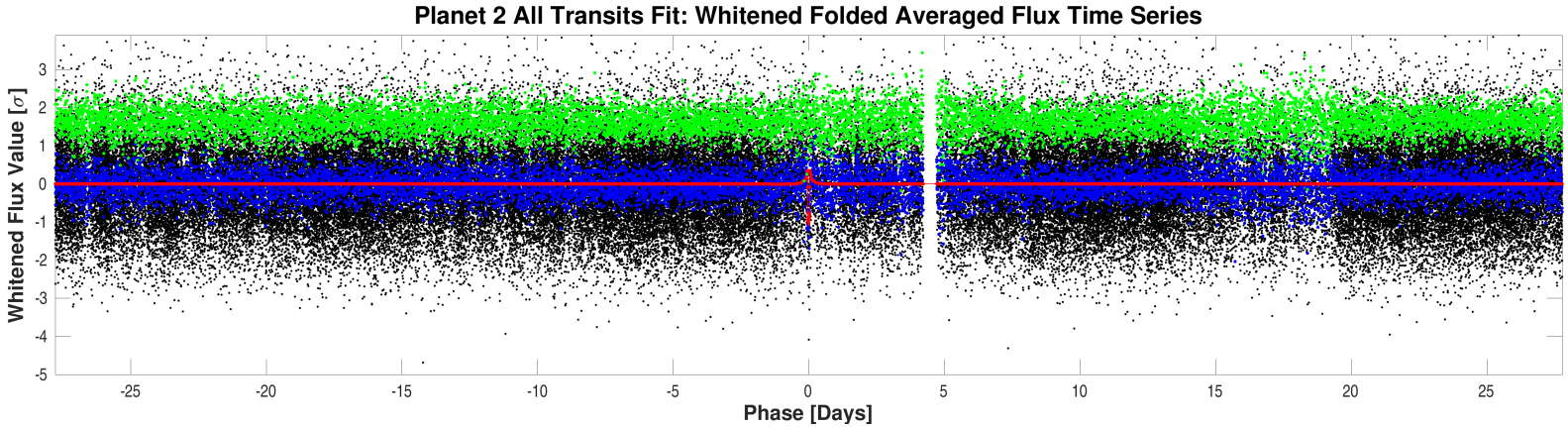
DoF: Degrees of Freedom



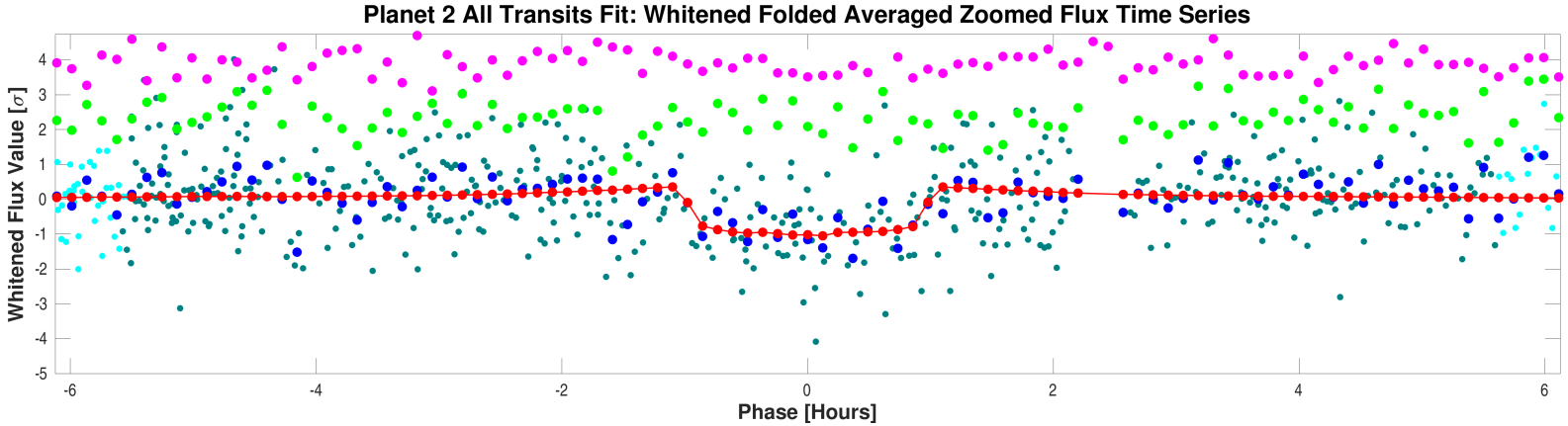
Flux time series for CatId 149603524, Planet candidate 2 in the unwhitened domain. For the data of Sector-01/TargetTableId-128, start BJD is 2458325 and the vertical offset is 0. For the data of Sector-02/TargetTableId-129, start BJD is 2458354 and the vertical offset is 0.05. For the data of Sector-03/TargetTableId-131, start BJD is 2458381 and the vertical offset is 0.1. For the data of Sector-04/TargetTableId-135, start BJD is 2458410 and the vertical offset is 0.15. Transit event markers indicate the location of transits of the given planet candidate. All transits fit completed with full convergence.
Open `./planet-02/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-02-all-unwhitened-01-128.fig`



Flux time series for CatId 149603524, Planet candidate 2 in the unwhitened domain. For the data of Sector-06/TargetTableId-141, start BJD is 2458468 and the vertical offset is 0. For the data of Sector-07/TargetTableId-145, start BJD is 2458491 and the vertical offset is 0.05. For the data of Sector-08/TargetTableId-148, start BJD is 2458517 and the vertical offset is 0.1. For the data of Sector-09/TargetTableId-152, start BJD is 2458543 and the vertical offset is 0.15. Transit event markers indicate the location of transits of the given planet candidate. All transits fit completed with full convergence.
Open `./planet-02/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-02-all-unwhitened-06-141.fig`



Folded flux time series for CatId 149603524, Planet candidate 2 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-02/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-02-all-whitened.fig`

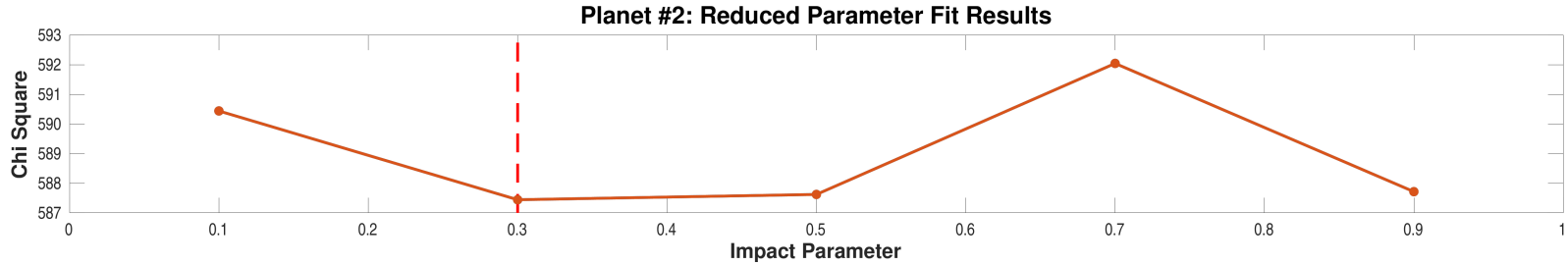


Folded flux time series for CatId 149603524, Planet candidate 2 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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-02/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-02-all-whitened-zoomed.fig`

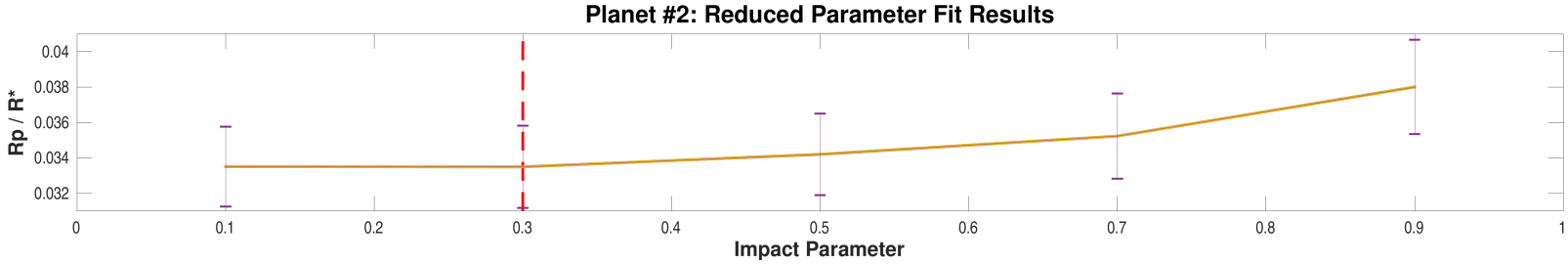
8.2 Model Fitter: Reduced Parameter Fit Results

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	8.4	590.4	0.0335072	2.2571e-03	213.2151	1.0653e+01	1292	1.7314e+02	2.0477	1.0189e-01
0.30	8.4	587.4	0.0334995	2.3284e-03	201.7340	1.1366e+01	1274	1.7622e+02	2.0809	1.1572e-01
0.50	8.4	587.6	0.0342015	2.3054e-03	185.3003	9.1104e+00	1288	1.7275e+02	2.0737	1.0090e-01
0.70	8.4	592.0	0.0352327	2.3972e-03	152.5317	8.0096e+00	1286	1.7406e+02	2.1223	1.0987e-01
0.90	8.3	587.7	0.0380068	2.6557e-03	87.0318	6.3064e+00	1284	1.7864e+02	2.5225	1.8315e-01

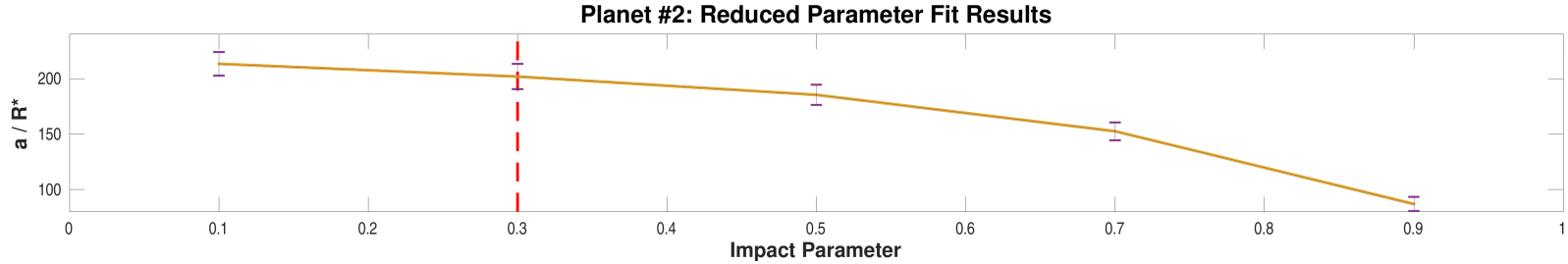
Highlighted row is the best reduced-parameter model fit.



Model chi squares of reduced parameter fits vs. impact parameter for CatId 149603524, Planet candidate 2. The fit result with the minimum chi square is marked with a dashed line in the plot.
Open `./planet-02/planet-search-and-model-fitting-results/reduced-parameter-fits/0000000149603524-02-reduced-fits-chi-square.fig`



Ratios of planet radius to star radius of reduced parameter fits vs. impact parameter for CatId 149603524, Planet candidate 2. The fit result with the minimum chi square is marked with a dashed line in the plot.
Open `./planet-02/planet-search-and-model-fitting-results/reduced-parameter-fits/0000000149603524-02-reduced-fits-rp-over-rstar.fig`



Ratios of semimajor axis to star radius of reduced parameter fits vs. impact parameter for CatId 149603524, Planet candidate 2. The fit result with the minimum chi square is marked with a dashed line in the plot.
Open `./planet-02/planet-search-and-model-fitting-results/reduced-parameter-fits/0000000149603524-02-reduced-fits-a-over-rstar.fig`

8.3 Model Fitter: Trapezoidal Fit Results

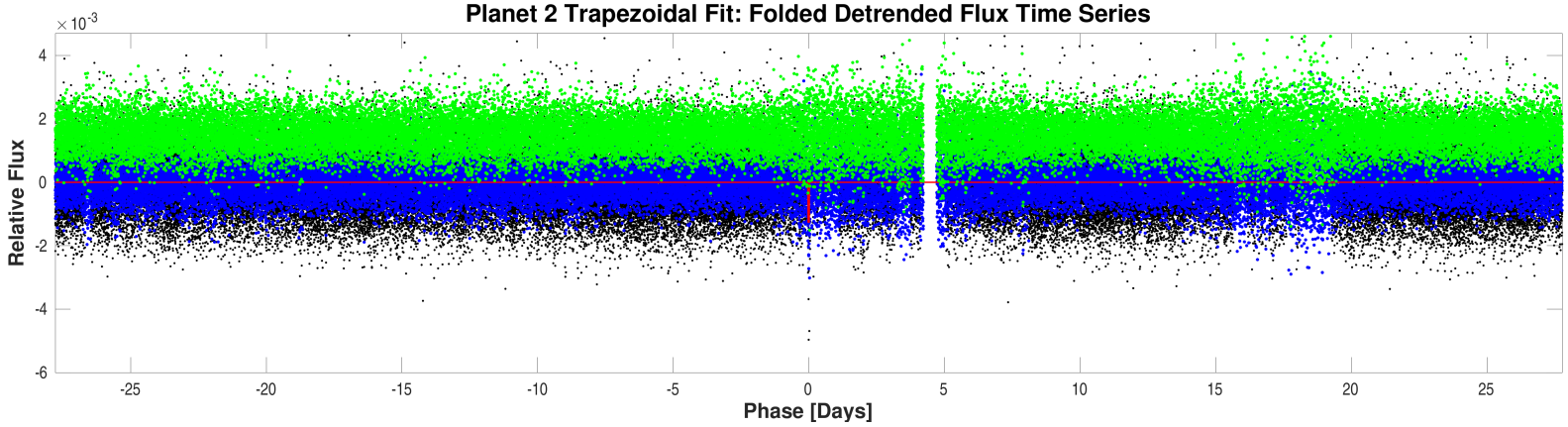
Model Characteristic	Name
Transit Model	trapezoidal_model
Limb Darkening Model	

TCE Parameter	Value	Units
Trial Transit Pulse Duration	2.0	hours
Transit Epoch	1349.0547614	TJD
Orbital Period	55.5569308	days
Maximum SES	8.9	
Maximum MES	8.7	
Robust Statistic	6.8	
Chi Square Goodness of Fit Statistic (DoF)	92.2 (74)	
Chi Square2 Statistic (DoF)	3.5 (5.4)	
Threshold for Desired PFA		

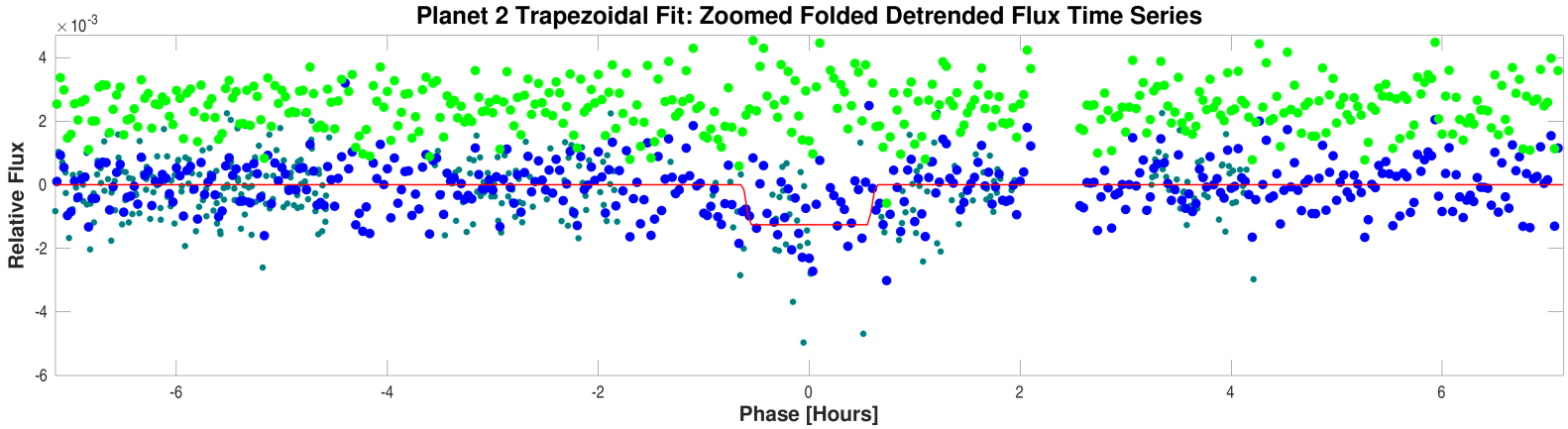
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	7.5		
Orbital Period	55.5569308		days
Transit Epoch	1349.0618705		BTJD
Transit Depth	1259		ppm
Transit Duration	2.3827		hours
Transit Ingress Duration	1.1901		hours
Model Chi Square Statistic (DoF)	115260.3 (708)		

DoF: Degrees of Freedom



Folded detrended flux time series for CatId 149603524, Planet candidate 2 and folded trapezoidal model light curve.
Open `./planet-02/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000149603524-02-all-trapezoidal.fig`



Zoomed folded detrended flux time series for CatId 149603524, Planet candidate 2 and folded trapezoidal model light curve.
Open `./planet-02/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000149603524-02-all-trapezoidal-zoomed.fig`

8.4 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.

8.4.1 Weak Secondary Test

Result	Value	Uncertainty	Units	Statistic in Sigmas	Significance (%)
Orbital Period	55.5569		days		
Transit Duration	2		hours		
Maximum MES	8.7				
Secondary Phase	-1.9444		days		
Secondary MES	3.2				
Minimum Phase	-0.21667		days		
Minimum MES	-4.8				
Median MES	-0.0				
MAD MES	0.63615				
Robust Statistic	3.3				
Secondary Depth	354.7	1.1623e+02	ppm		
Geometric Albedo	831.0	1.1815e+03		0.7025	24.12
Planet Effective Temperature	4696	1.6689e+03	Kelvin	2.4746	0.67

8.4.2 Eclipsing Binary Discrimination Test

Result	Value	Value in Sigmas	Significance (%)
Odd Even Transit Depth Comparison Statistic	1.1213e+01	3.3485	0.08
Shorter Period Comparison Statistic	8.1800e+04	286.0077	100.00
Longer Period Comparison Statistic	3.7663e+04	194.0702	100.00

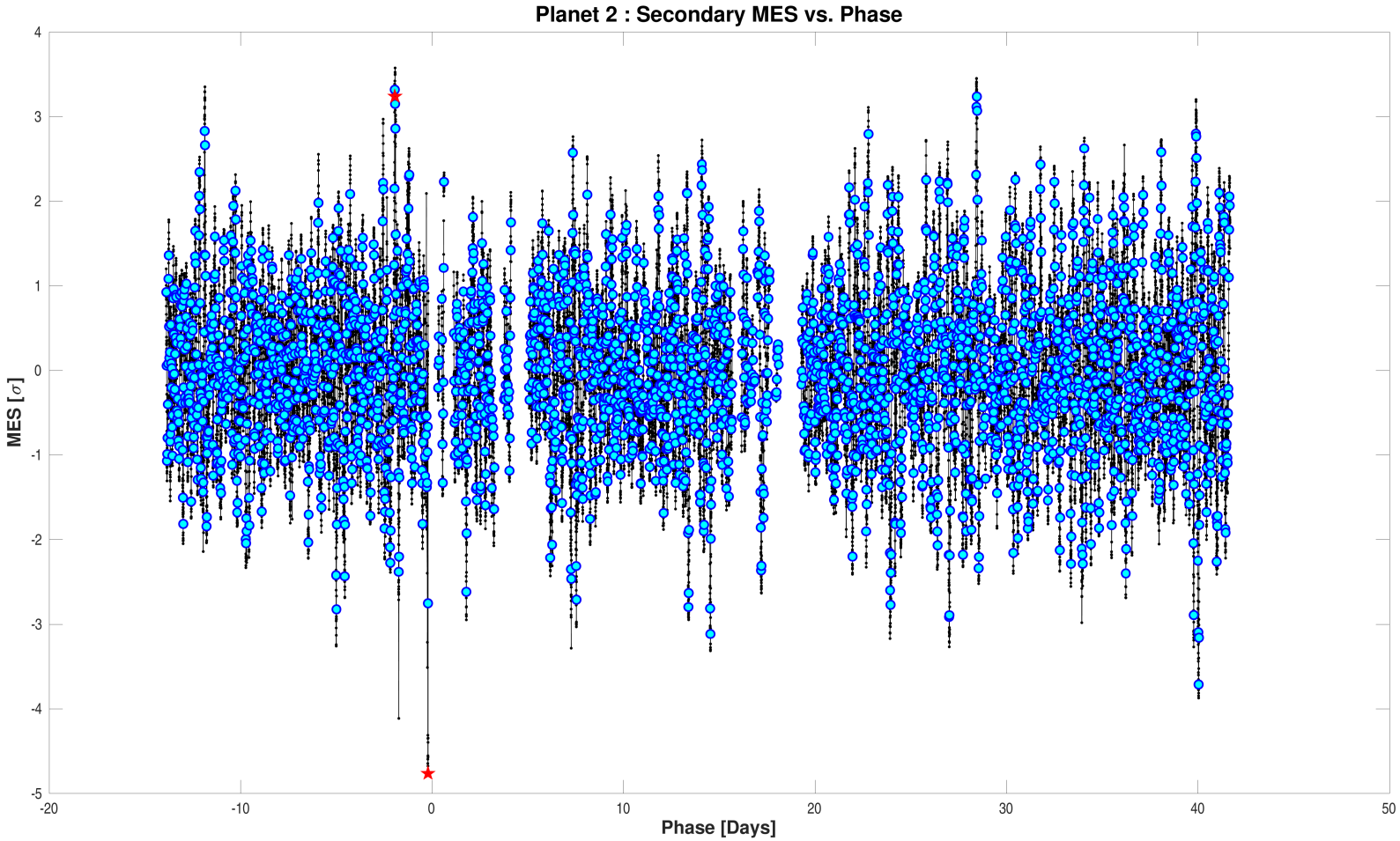
8.4.3 Bootstrap Test

Result	Value
False Alarm Probability	1.2236e-11
Bootstrap Threshold for Desired PFA	9.5
MES Mean	-2.61
MES Standard Deviation	1.69
Transit Count	4

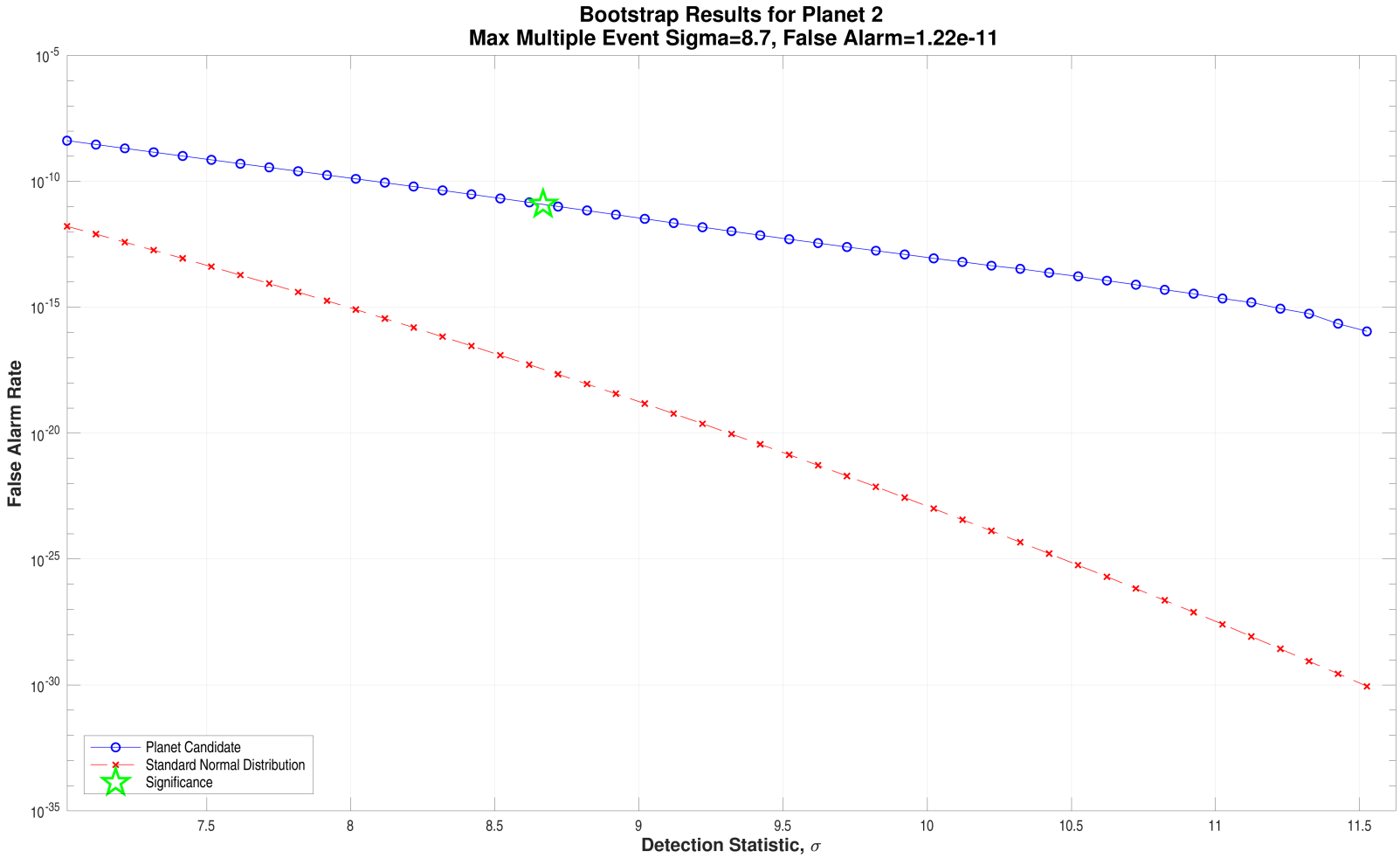
8.4.4 Ghost Diagnostic Test

Result	Value	Significance (%)
Maximum MES	8.7	
SNR	8.0	
Core Aperture Statistic	9.4452e-01	82.75
Halo Aperture Statistic	-9.8700e-01	16.18
Ratio of Core/Halo Aperture Statistics	-9.5696e-01	

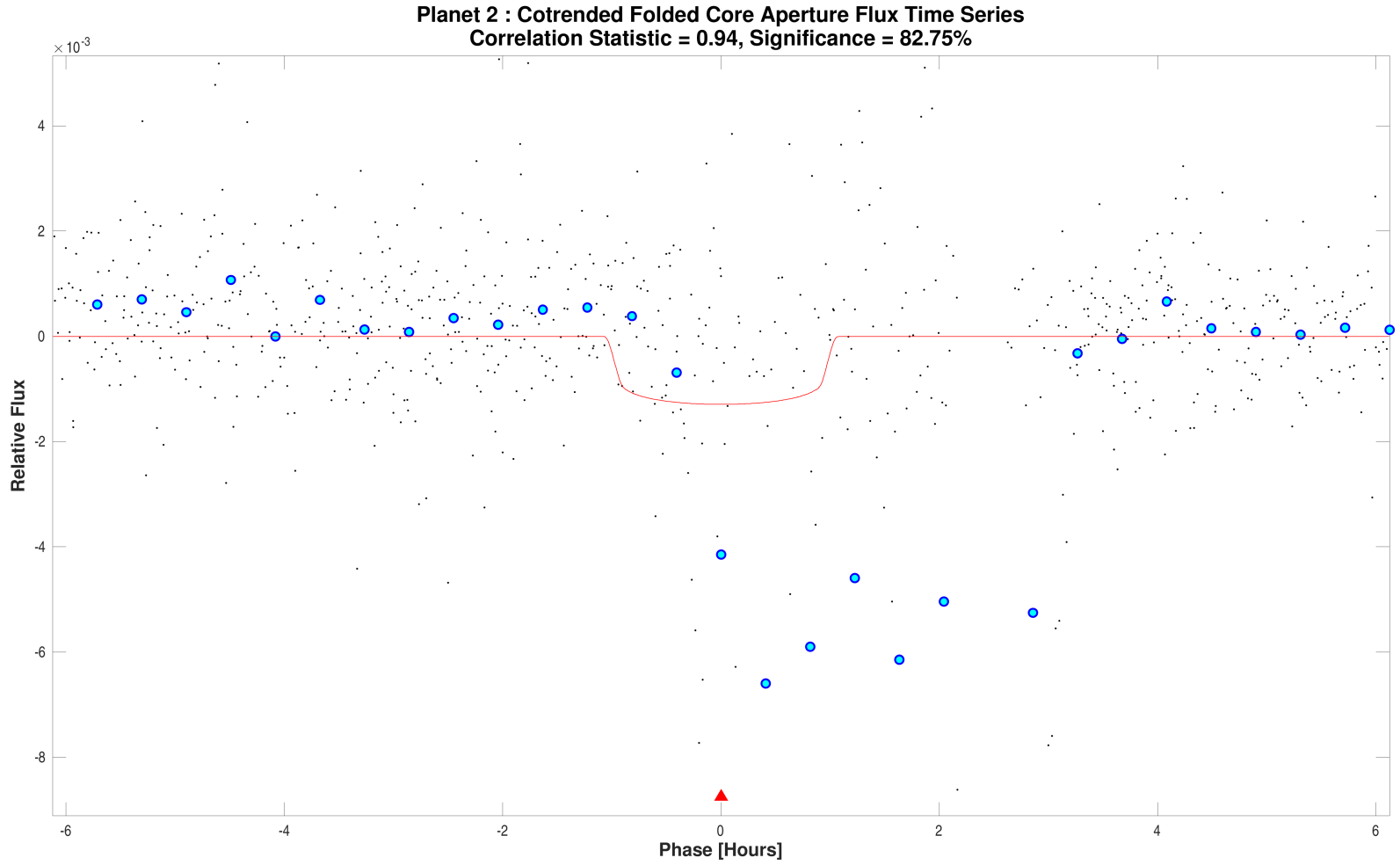
8.4.5 Validation Test Figures



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 2. The maximum secondary MES and corresponding phase are 3.2404 and -1.9444 days respectively. The minimum secondary MES and corresponding phase are -4.764 and -0.21667 days respectively.
Open `./planet-02/report-summary/0000000149603524-02-weak-secondary-diagnostic.fig`

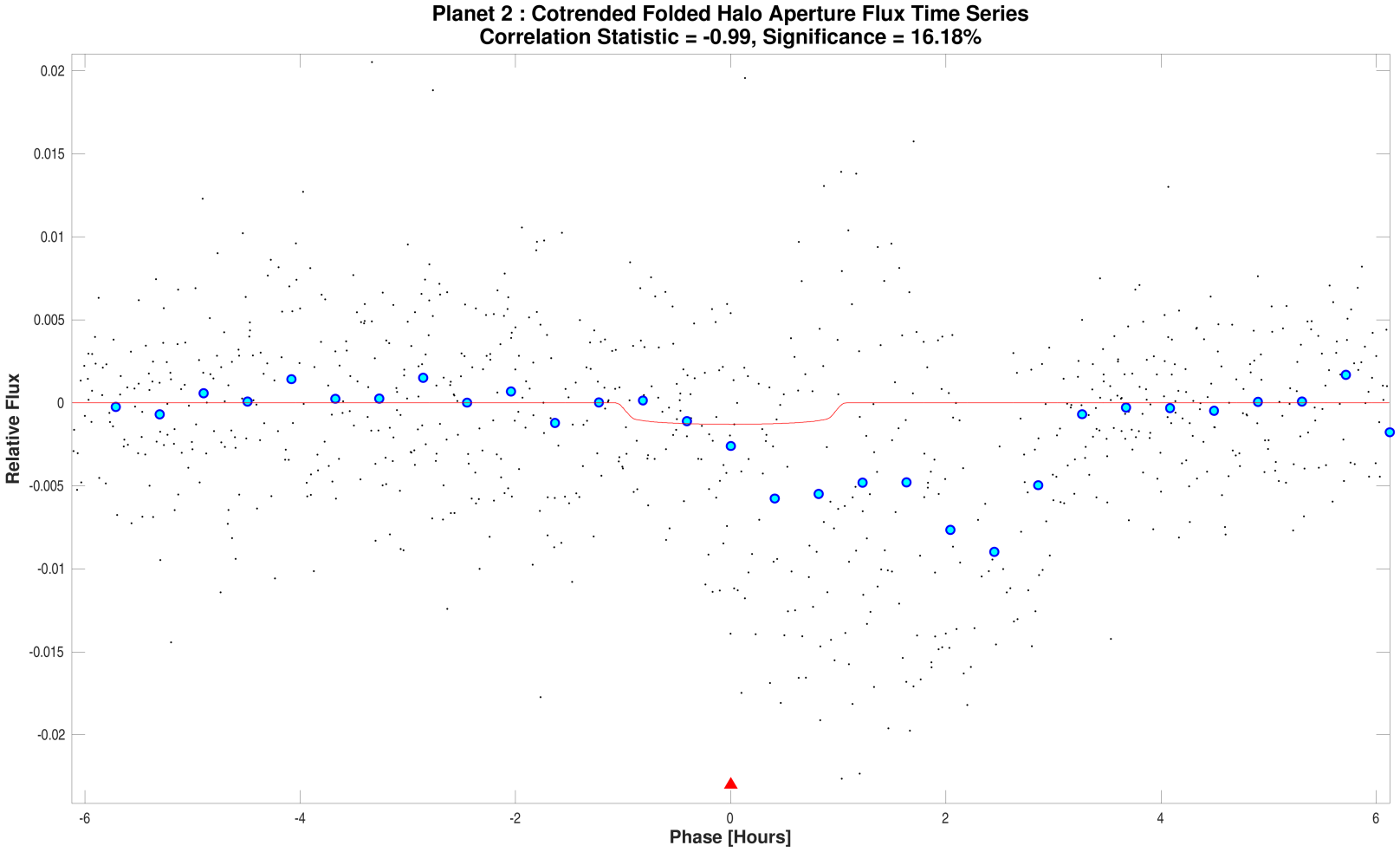


Bootstrap results for target 149603524, planet 2. Cumulative sum of the probabilities (derived from the histogram of counts) from upper tail to the search transit threshold; false alarm probability is indicated by the star. The Gaussian equivalent threshold for this false alarm probability is 6.6765. The threshold on this distribution that achieves the same false alarm rate as a 7.1 sigma threshold on a Gaussian distribution is 9.467.
Open `./planet-02/bootstrap-results/0000000149603524-02-bootstrap-false-alarm.fig`



Optical ghost diagnostic core aperture flux time series for target 149603524, planet candidate 2. 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-02/ghost-diagnostic-results/0000000149603524-02-core-unwhitened-cotrended-zoomed-model.fig`



Optical ghost diagnostic halo aperture flux time series for target 149603524, planet candidate 2. 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-02/ghost-diagnostic-results/0000000149603524-02-halo-unwhitened-cotrended-zoomed-model.fig`

9 Planet Candidate 3

9.1 Model Fitter: All Transits

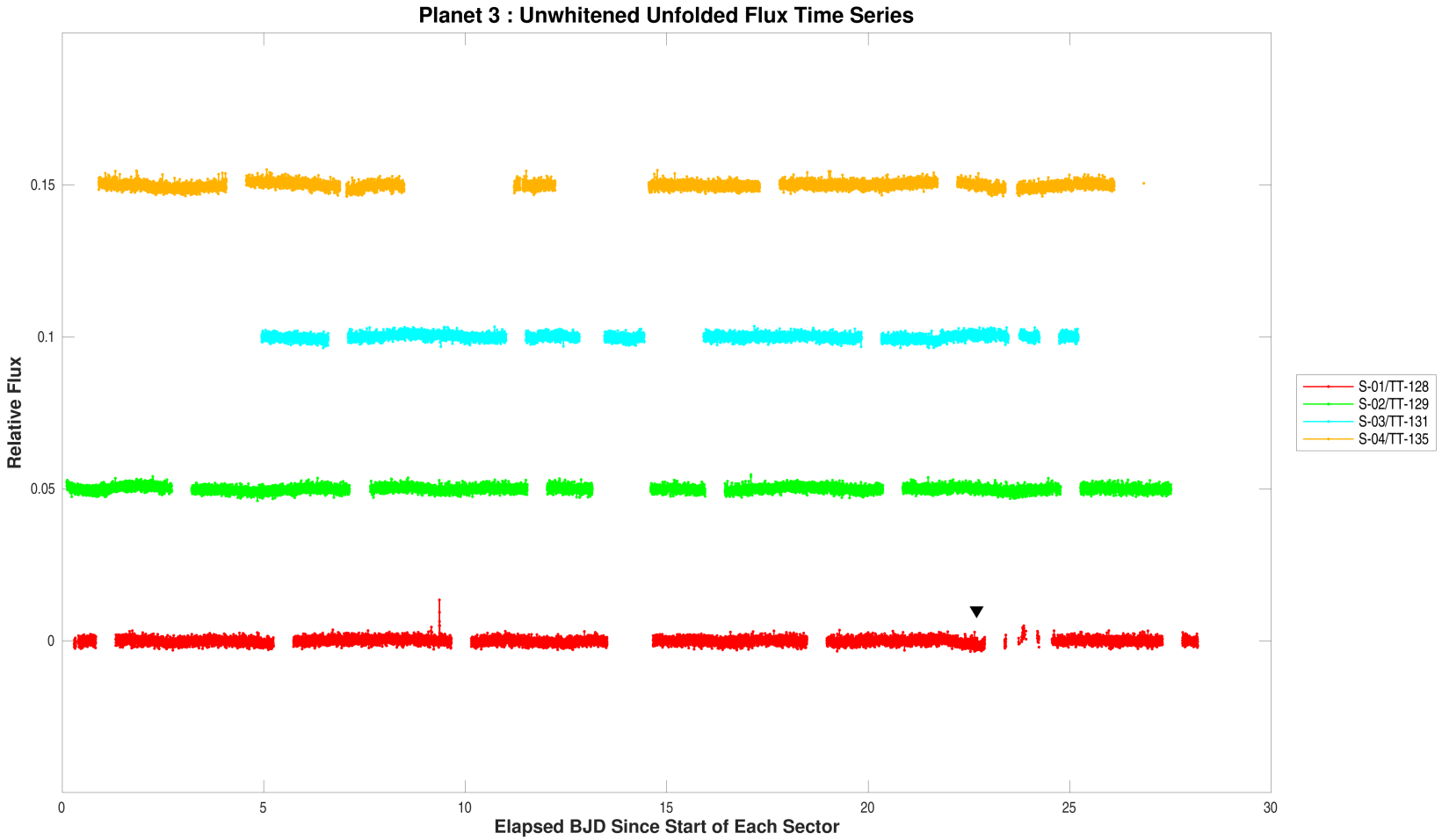
Model Characteristic	Name
Transit Model	mandel-agol_geometric_transit_model
Limb Darkening Model	claret_tess_nonlinear_limb_darkening_model

TCE Parameter	Value	Units
Trial Transit Pulse Duration	12.5	hours
Transit Epoch	1347.6874007	TJD
Orbital Period	192.2443973	days
Maximum SES	10.0	
Maximum MES	8.7	
Robust Statistic	7.4	
Chi Square Goodness of Fit Statistic (DoF)	671.6 (607)	
Chi Square2 Statistic (DoF)	0.1 (5.1)	
Threshold for Desired PFA		

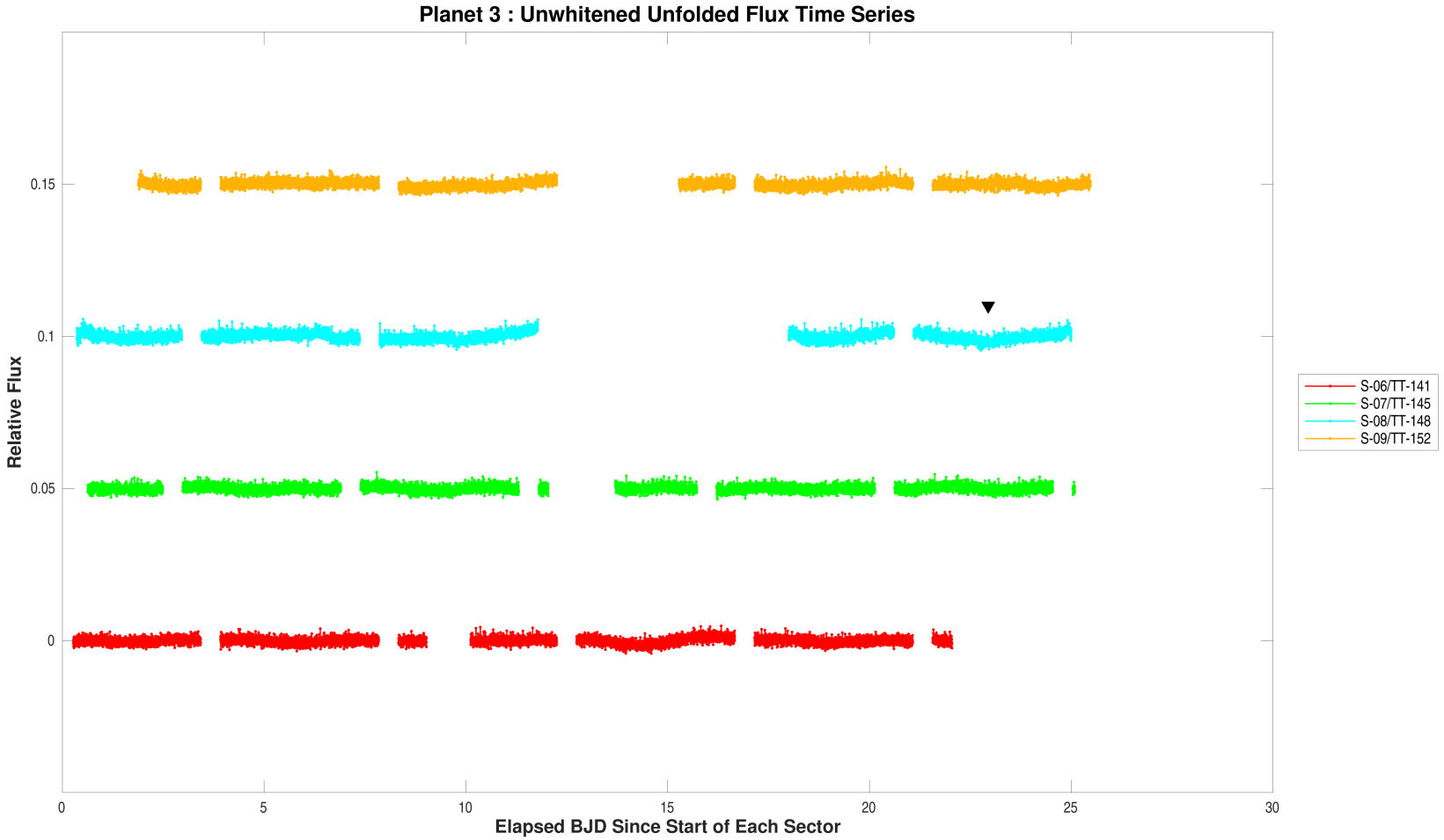
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	6.8		
Orbital Period	192.2510109	1.0401e-02	days
Transit Epoch	1347.6904787	8.8973e-03	BTJD
Impact Parameter	0.1469	4.0947e+00	
Planet Radius to Star Radius Ratio	0.0302585	3.9096e-03	
Semi-major Axis to Star Radius Ratio	107.7617	6.6109e+01	
Planet Radius	4.2282	5.4632e-01	Earth radii
Semi-major Axis	0.7028	2.5349e-05	AU
Effective Stellar Flux	4.6222	3.3343e-04	Goldilocks
Equilibrium Temperature	374	6.7441e-03	Kelvin
Stellar Density	0.4549	8.3717e-01	Solar density
Transit Depth	1052	1.5721e+02	ppm
Transit Duration	13.8982	5.8995e-01	hours
Transit Ingress Duration	0.4169	5.5730e-01	hours
Eccentricity	0.0000	0.0000e+00	
Peri Longitude	0.0000	0.0000e+00	degrees
Model Chi Square Statistic (DoF)	2573.7 (2931.5)		
Model Chi Square Goodness of Fit Statistic (DoF)	420.0 (840)		
Model Chi Square2 Statistic (DoF)	0.0 (1)		

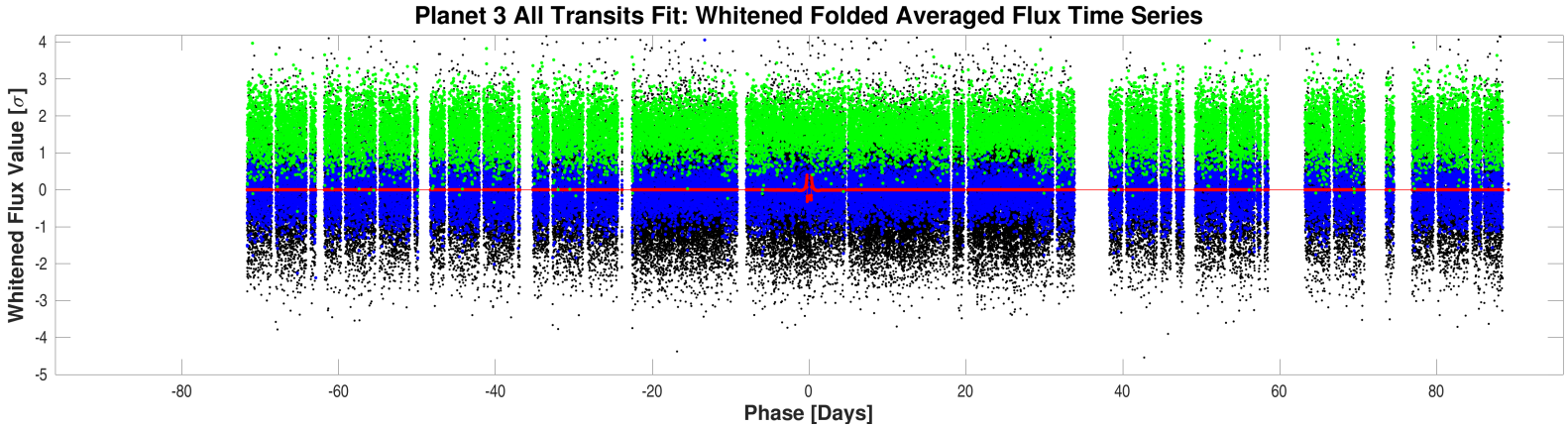
DoF: Degrees of Freedom



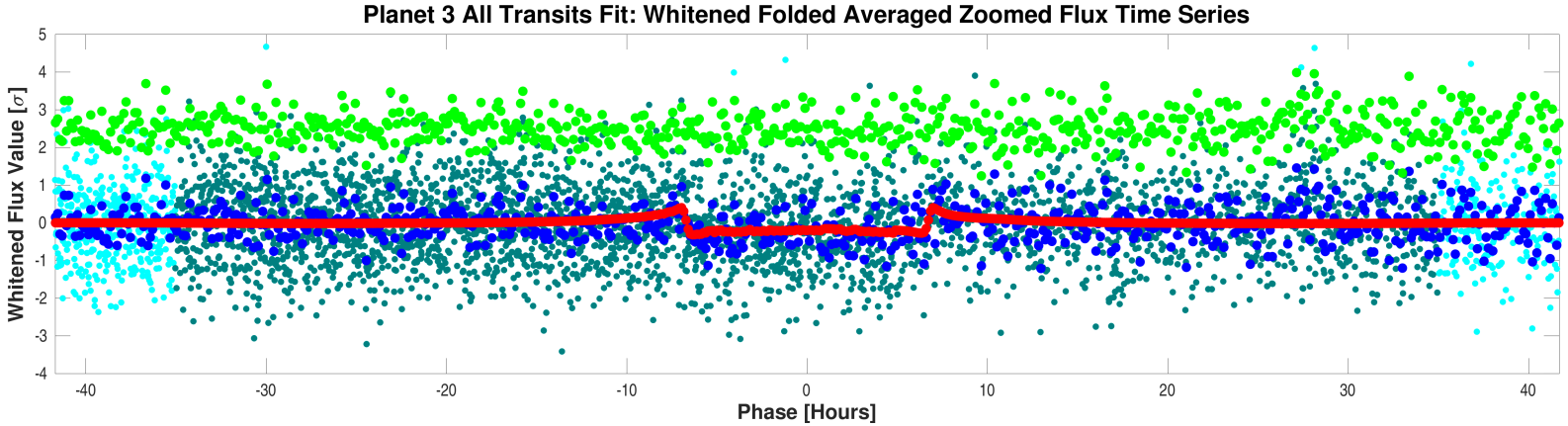
Flux time series for CatId 149603524, Planet candidate 3 in the unwhitened domain. For the data of Sector-01/TargetTableId-128, start BJD is 2458325 and the vertical offset is 0. For the data of Sector-02/TargetTableId-129, start BJD is 2458354 and the vertical offset is 0.05. For the data of Sector-03/TargetTableId-131, start BJD is 2458381 and the vertical offset is 0.1. For the data of Sector-04/TargetTableId-135, start BJD is 2458410 and the vertical offset is 0.15. Transit event markers indicate the location of transits of the given planet candidate. All transits fit completed with full convergence.
Open `./planet-03/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-03-all-unwhitened-01-128.fig`



Flux time series for CatId 149603524, Planet candidate 3 in the unwhitened domain. For the data of Sector-06/TargetTableId-141, start BJD is 2458468 and the vertical offset is 0. For the data of Sector-07/TargetTableId-145, start BJD is 2458491 and the vertical offset is 0.05. For the data of Sector-08/TargetTableId-148, start BJD is 2458517 and the vertical offset is 0.1. For the data of Sector-09/TargetTableId-152, start BJD is 2458543 and the vertical offset is 0.15. Transit event markers indicate the location of transits of the given planet candidate. All transits fit completed with full convergence.
Open `./planet-03/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-03-all-unwhitened-06-141.fig`



Folded flux time series for CatId 149603524, Planet candidate 3 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-03/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-03-all-whitened.fig`

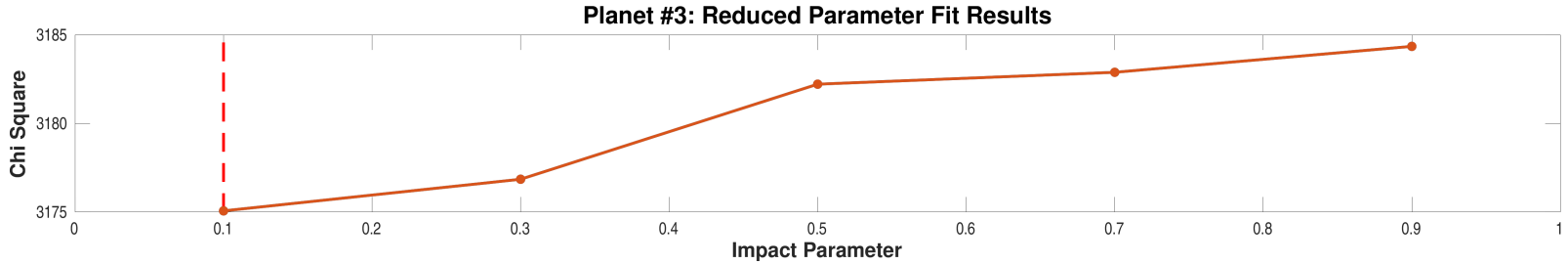


Folded flux time series for CatId 149603524, Planet candidate 3 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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-03/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-03-all-whitened-zoomed.fig`

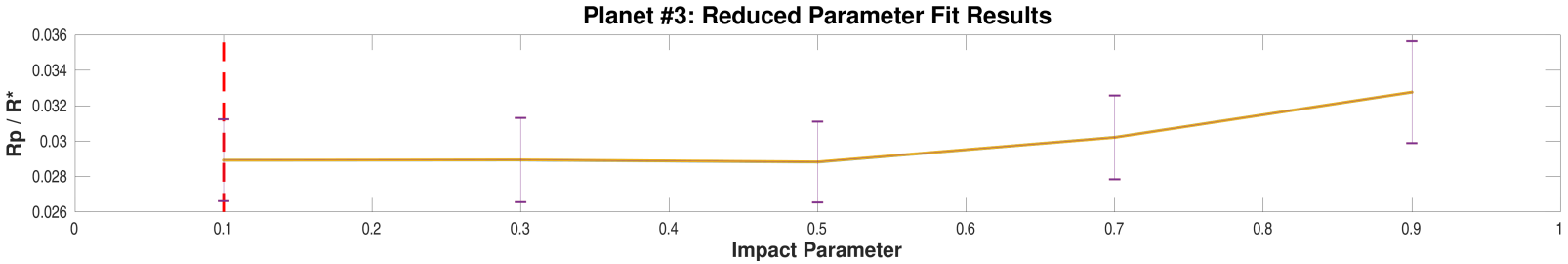
9.2 Model Fitter: Reduced Parameter Fit Results

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	6.6	3175.1	0.0289263	2.3136e-03	108.6085	2.1457e+00	963	1.5327e+02	13.8482	2.8545e-01
0.30	6.5	3176.9	0.0289366	2.3706e-03	102.8325	2.2655e+00	951	1.5508e+02	14.0574	3.4380e-01
0.50	6.3	3182.2	0.0288224	2.2829e-03	96.1875	2.0576e+00	915	1.4435e+02	13.7293	3.6289e-01
0.70	6.5	3182.9	0.0302180	2.3683e-03	80.8255	2.1029e+00	946	1.4814e+02	13.7362	5.3359e-01
0.90	6.4	3184.4	0.0327688	2.8841e-03	48.8620	2.4289e+00	955	1.7244e+02	15.2332	1.8548e+00

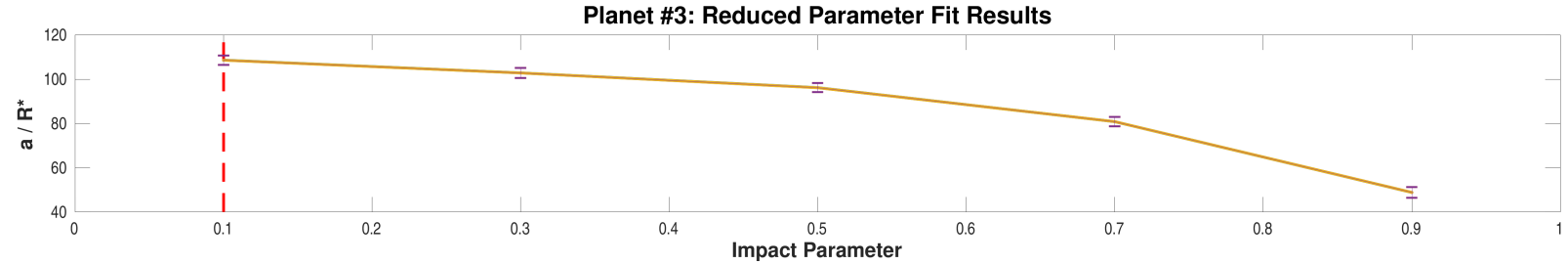
Highlighted row is the best reduced-parameter model fit.



Model chi squares of reduced parameter fits vs. impact parameter for CatId 149603524, Planet candidate 3. The fit result with the minimum chi square is marked with a dashed line in the plot.
Open `./planet-03/planet-search-and-model-fitting-results/reduced-parameter-fits/0000000149603524-03-reduced-fits-chi-square.fig`



Ratios of planet radius to star radius of reduced parameter fits vs. impact parameter for CatId 149603524, Planet candidate 3. The fit result with the minimum chi square is marked with a dashed line in the plot.
Open `./planet-03/planet-search-and-model-fitting-results/reduced-parameter-fits/0000000149603524-03-reduced-fits-rp-over-rstar.fig`



Ratios of semimajor axis to star radius of reduced parameter fits vs. impact parameter for CatId 149603524, Planet candidate 3. The fit result with the minimum chi square is marked with a dashed line in the plot.
Open `./planet-03/planet-search-and-model-fitting-results/reduced-parameter-fits/0000000149603524-03-reduced-fits-a-over-rstar.fig`

9.3 Model Fitter: Trapezoidal Fit Results

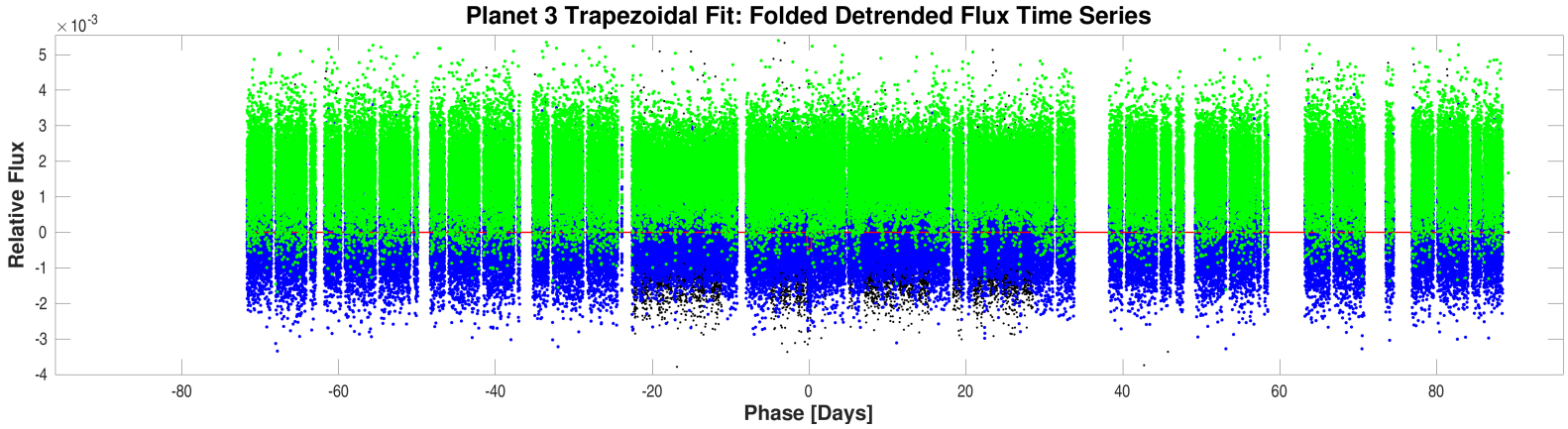
Model Characteristic	Name
Transit Model	trapezoidal_model
Limb Darkening Model	

TCE Parameter	Value	Units
Trial Transit Pulse Duration	12.5	hours
Transit Epoch	1347.6874007	TJD
Orbital Period	192.2443973	days
Maximum SES	10.0	
Maximum MES	8.7	
Robust Statistic	7.4	
Chi Square Goodness of Fit Statistic (DoF)	671.6 (607)	
Chi Square2 Statistic (DoF)	0.1 (5.1)	
Threshold for Desired PFA		

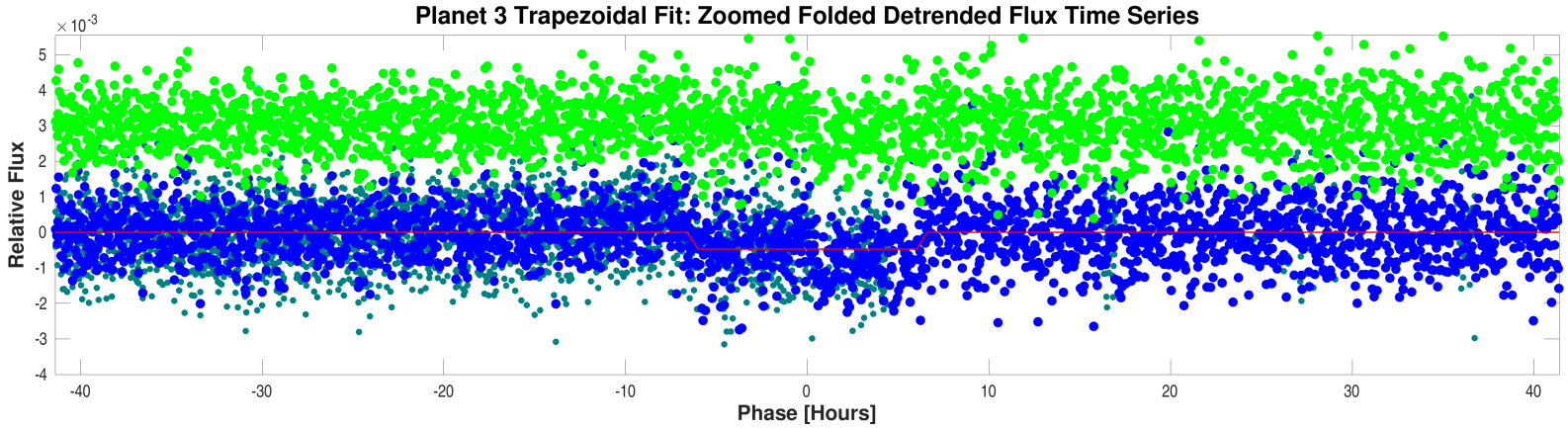
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	13.3		
Orbital Period	192.2443973		days
Transit Epoch	1347.7068628		BTJD
Transit Depth	472		ppm
Transit Duration	13.7962		hours
Transit Ingress Duration	1.1704		hours
Model Chi Square Statistic (DoF)	115259.8 (4472)		

DoF: Degrees of Freedom



Folded detrended flux time series for CatId 149603524, Planet candidate 3 and folded trapezoidal model light curve.
Open `./planet-03/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000149603524-03-all-trapezoidal.fig`



Zoomed folded detrended flux time series for CatId 149603524, Planet candidate 3 and folded trapezoidal model light curve.
Open `./planet-03/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000149603524-03-all-trapezoidal-zoomed.fig`

9.4 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.

9.4.1 Weak Secondary Test

Result	Value	Uncertainty	Units	Statistic in Sigmas	Significance (%)
Orbital Period	192.2444		days		
Transit Duration	12.5		hours		
Maximum MES	8.7				
Secondary Phase	1.5125		days		
Secondary MES	3.3				
Minimum Phase	23.5917		days		
Minimum MES	-2.9				
Median MES	-0.1				
MAD MES	0.63051				
Robust Statistic	0.2				
Secondary Depth	72.2	2.8267e+02	ppm		
Geometric Albedo	1097.7	4.3060e+03		0.2547	39.95
Planet Effective Temperature	3328	3.2639e+03	Kelvin	0.9051	18.27

9.4.2 Eclipsing Binary Discrimination Test

Result	Value	Value in Sigmas	Significance (%)
Odd Even Transit Depth Comparison Statistic	1.7538e+00	1.3243	18.54
Shorter Period Comparison Statistic	1.1421e+04	106.8685	100.00

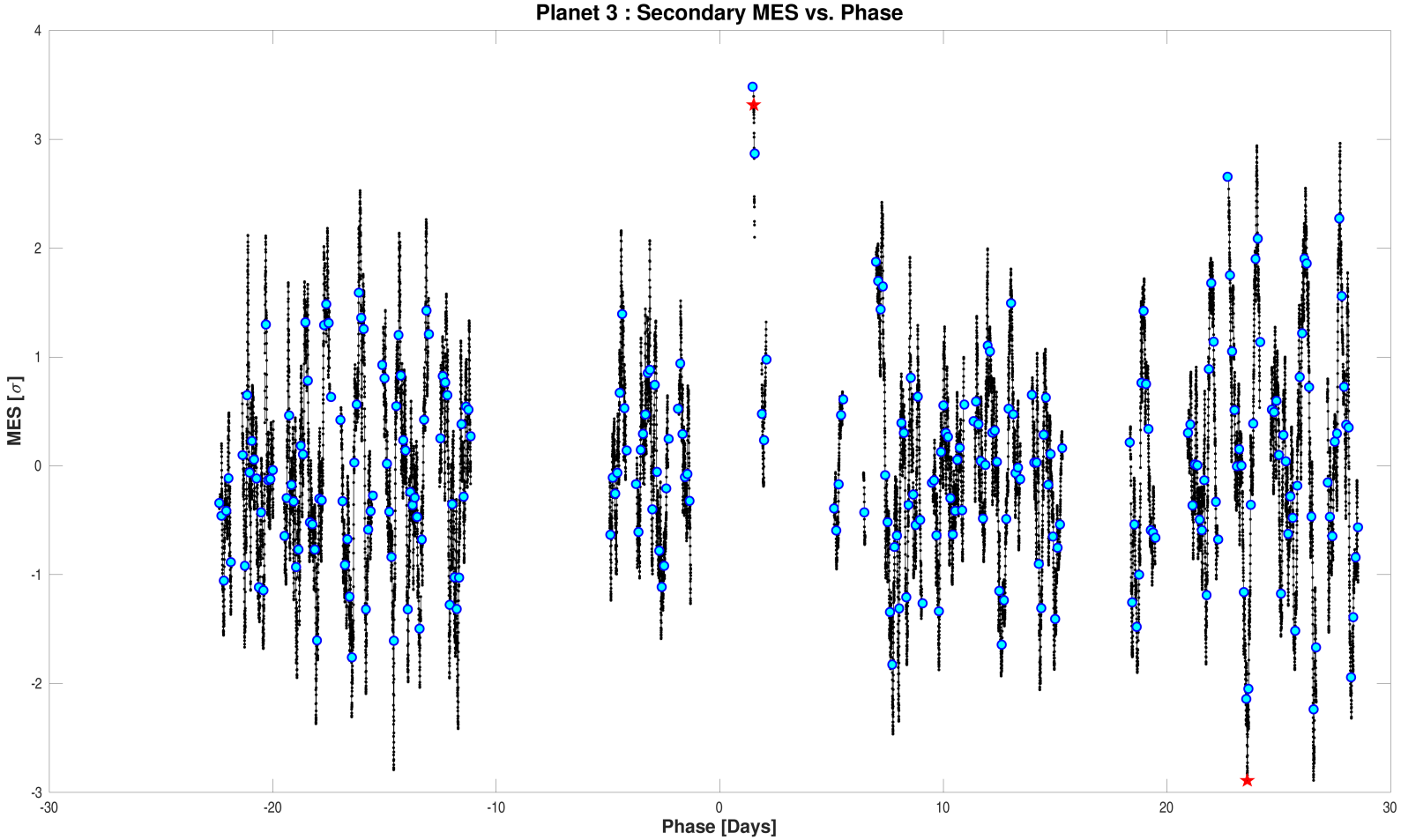
9.4.3 Bootstrap Test

Result	Value
False Alarm Probability	2.8317e-18
Bootstrap Threshold for Desired PFA	6.1
MES Mean	0.91
MES Standard Deviation	0.90
Transit Count	2

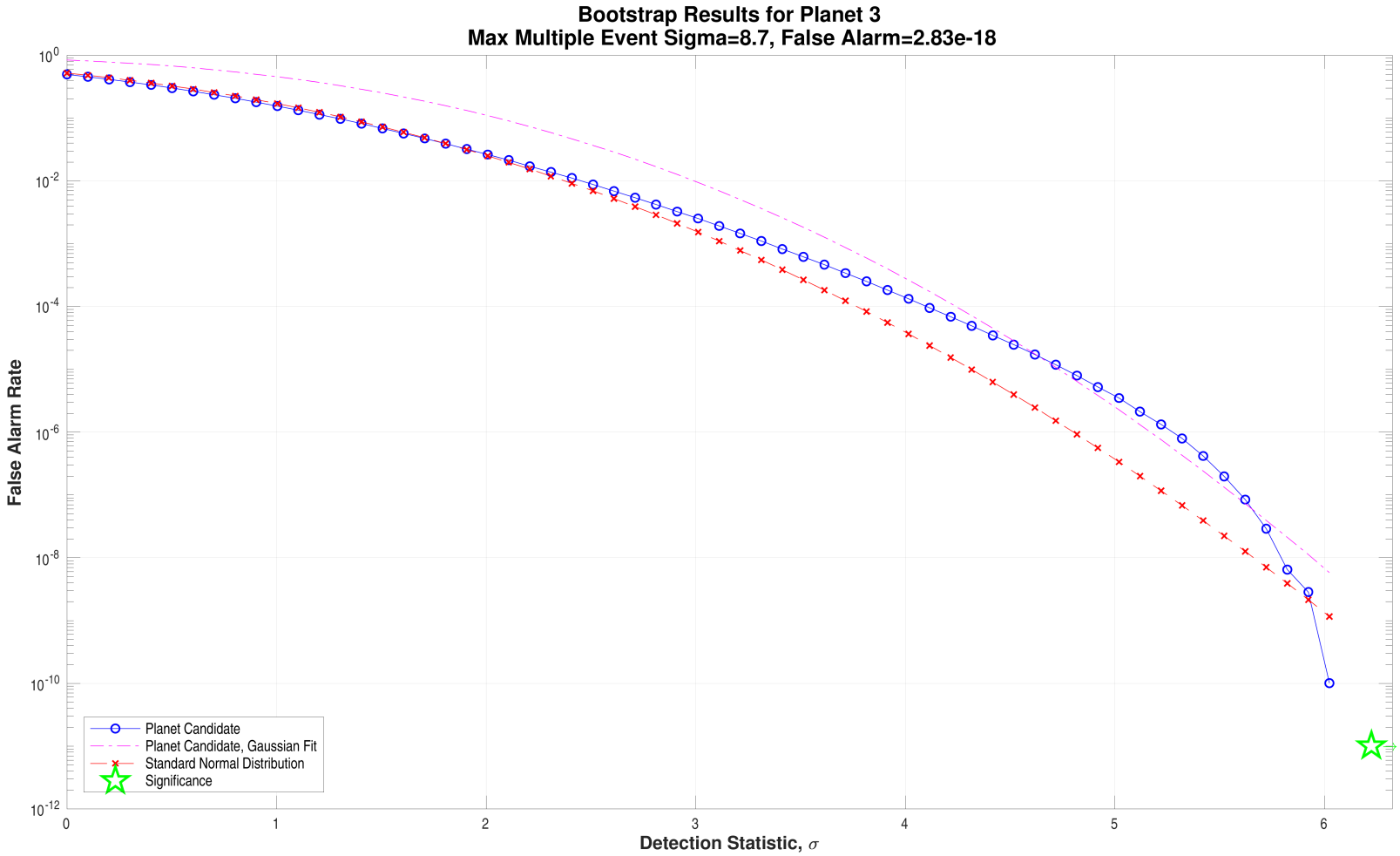
9.4.4 Ghost Diagnostic Test

Result	Value	Significance (%)
Maximum MES	8.7	
SNR	6.8	
Core Aperture Statistic	9.6468e-01	83.26
Halo Aperture Statistic	4.8594e-01	68.65
Ratio of Core/Halo Aperture Statistics	1.9852e+00	

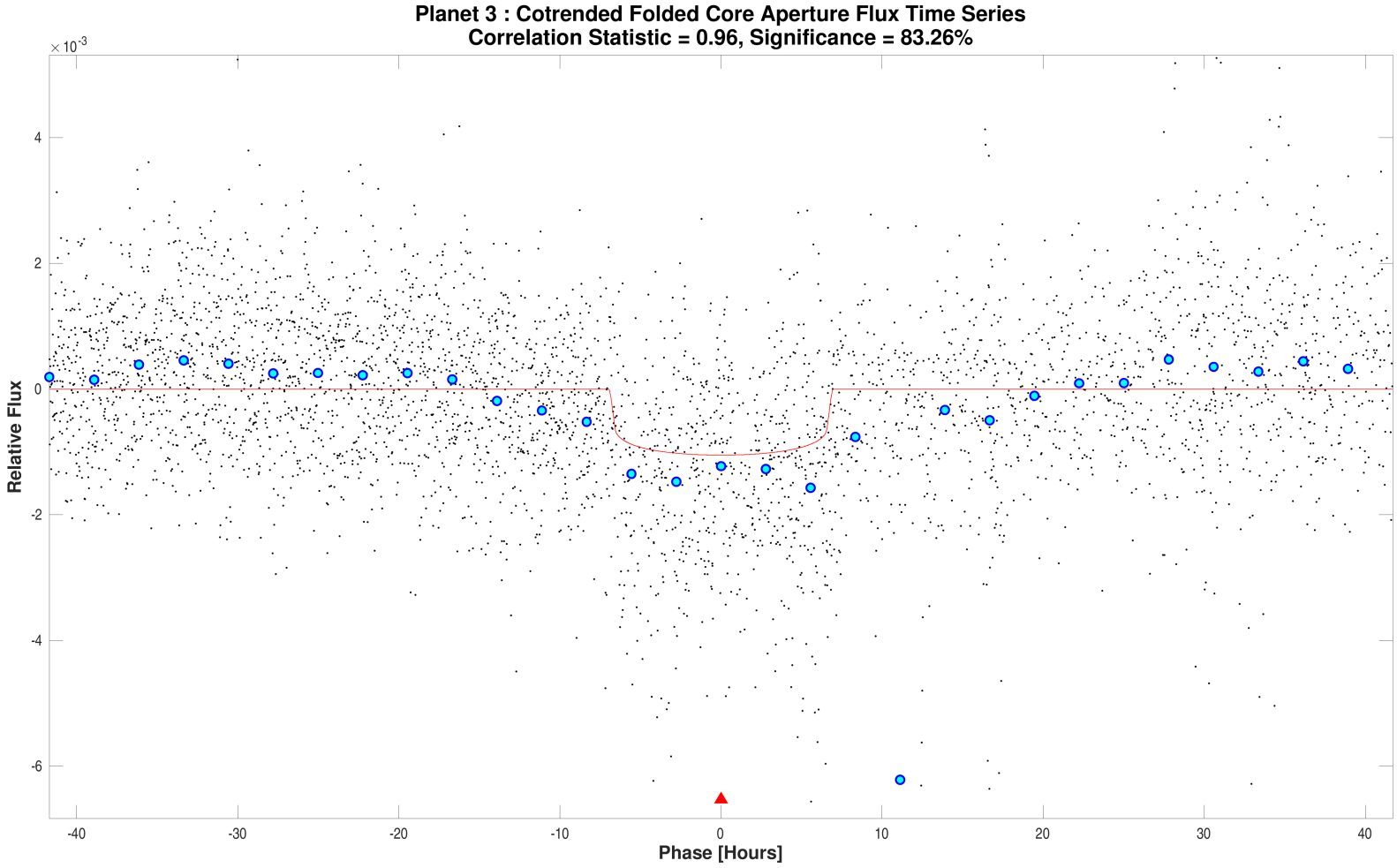
9.4.5 Validation Test Figures



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 12.5. The maximum secondary MES and corresponding phase are 3.3154 and 1.5125 days respectively. The minimum secondary MES and corresponding phase are -2.8915 and 23.5917 days respectively.
Open `./planet-03/report-summary/0000000149603524-03-weak-secondary-diagnostic.fig`

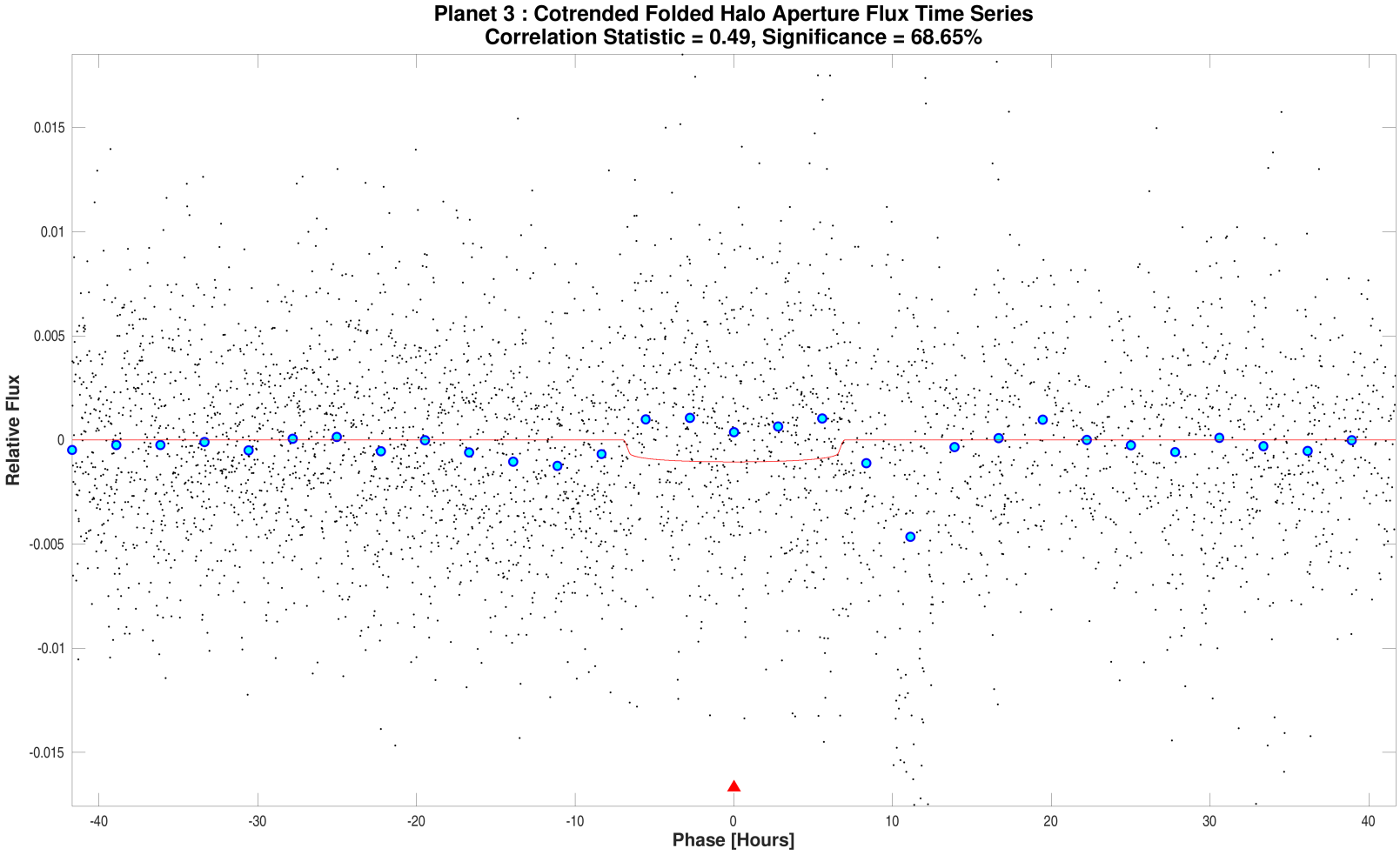


Bootstrap results for target 149603524, planet 3. Cumulative sum of the probabilities (derived from the histogram of counts) from upper tail to the search transit threshold; false alarm probability is indicated by the star. The Gaussian equivalent threshold for this false alarm probability is 8.6391. The threshold on this distribution that achieves the same false alarm rate as a 7.1 sigma threshold on a Gaussian distribution is 6.1229.
Open `./planet-03/bootstrap-results/0000000149603524-03-bootstrap-false-alarm.fig`



Optical ghost diagnostic core aperture flux time series for target 149603524, planet candidate 3. 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-03/ghost-diagnostic-results/0000000149603524-03-core-unwhitened-cotrended-zoomed-model.fig`



Optical ghost diagnostic halo aperture flux time series for target 149603524, planet candidate 3. 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-03/ghost-diagnostic-results/0000000149603524-03-halo-unwhitened-cotrended-zoomed-model.fig`

10 Planet Candidate 4

10.1 Model Fitter: All Transits

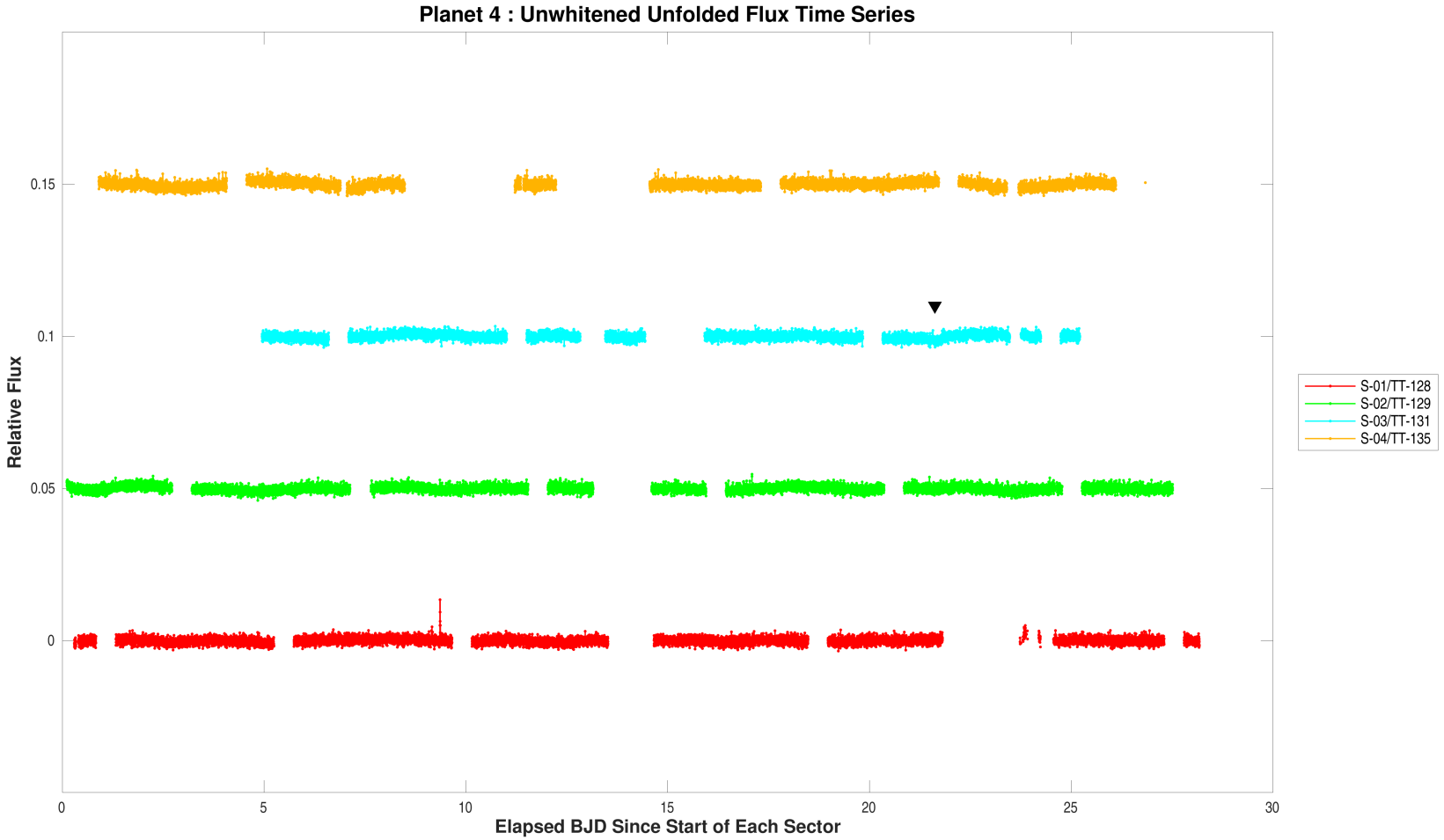
Model Characteristic	Name
Transit Model	mandel-agol_geometric_transit_model
Limb Darkening Model	claret_tess_nonlinear_limb_darkening_model

TCE Parameter	Value	Units
Trial Transit Pulse Duration	7.5	hours
Transit Epoch	1402.6248872	TJD
Orbital Period	121.1624703	days
Maximum SES	9.8	
Maximum MES	7.7	
Robust Statistic	6.9	
Chi Square Goodness of Fit Statistic (DoF)	449.4 (429)	
Chi Square2 Statistic (DoF)	0.2 (5.1)	
Threshold for Desired PFA		

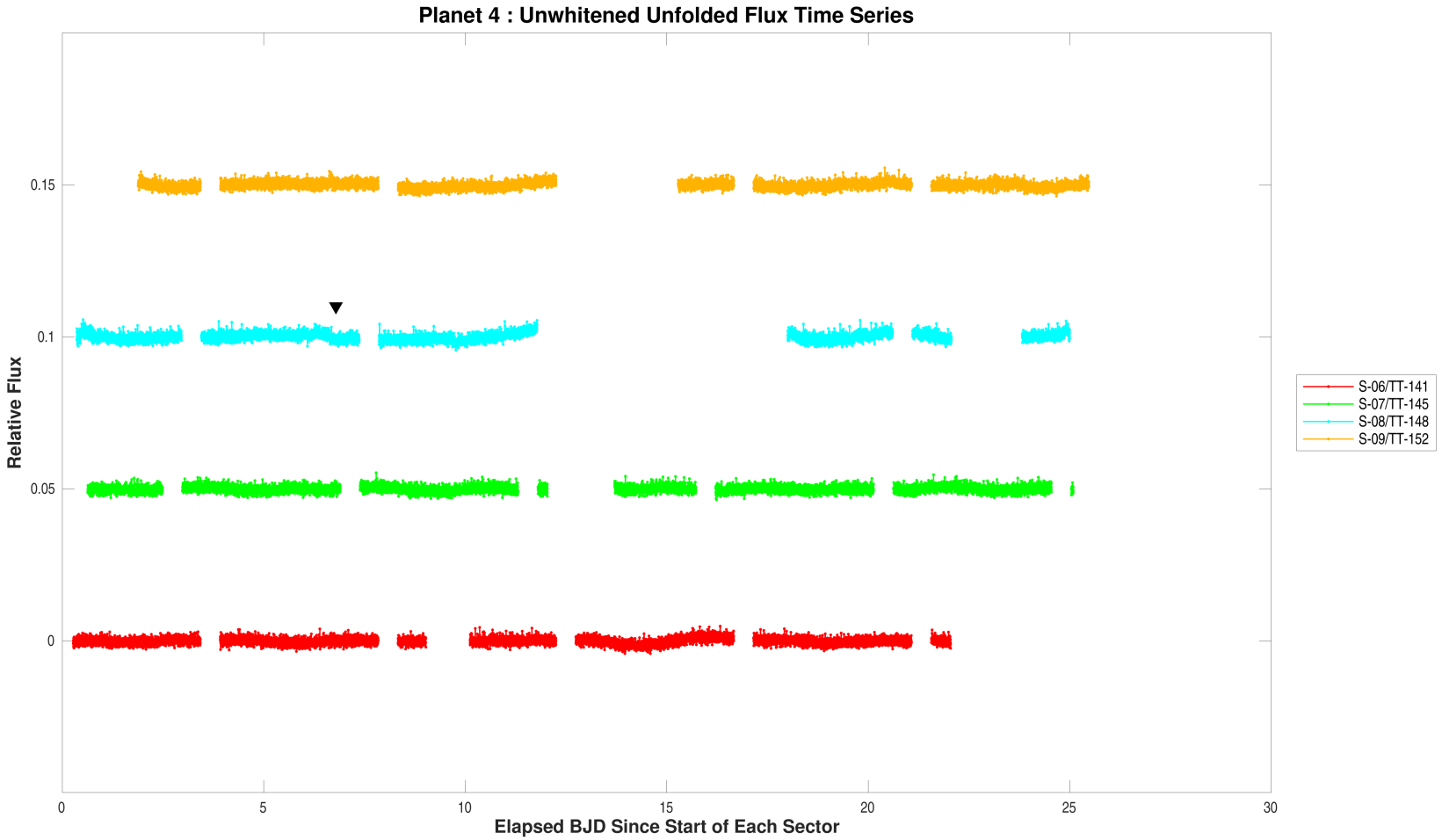
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	6.9		
Orbital Period	121.1689066	7.7970e-03	days
Transit Epoch	1402.6188258	4.2517e-03	BTJD
Impact Parameter	0.2874	3.1775e+00	
Planet Radius to Star Radius Ratio	0.0277210	4.9834e-03	
Semi-major Axis to Star Radius Ratio	116.3137	1.1515e+02	
Planet Radius	3.8737	6.9636e-01	Earth radii
Semi-major Axis	0.5166	2.2164e-05	AU
Effective Stellar Flux	8.5537	7.3389e-04	Goldilocks
Equilibrium Temperature	436	9.3557e-03	Kelvin
Stellar Density	1.4399	4.2765e+00	Solar density
Transit Depth	874	1.2608e+02	ppm
Transit Duration	7.8528	4.8391e-01	hours
Transit Ingress Duration	0.2303	4.9575e-01	hours
Eccentricity	0.0000	0.0000e+00	
Peri Longitude	0.0000	0.0000e+00	degrees
Model Chi Square Statistic (DoF)	1697.1 (2013.4)		
Model Chi Square Goodness of Fit Statistic (DoF)	272.6 (476)		
Model Chi Square2 Statistic (DoF)	0.0 (1)		

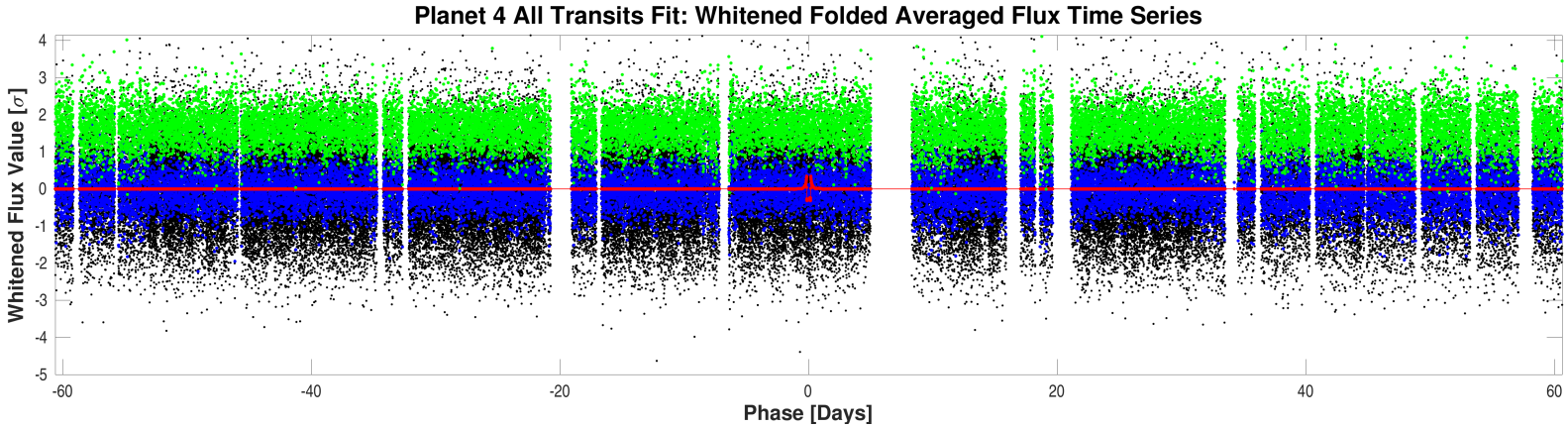
DoF: Degrees of Freedom



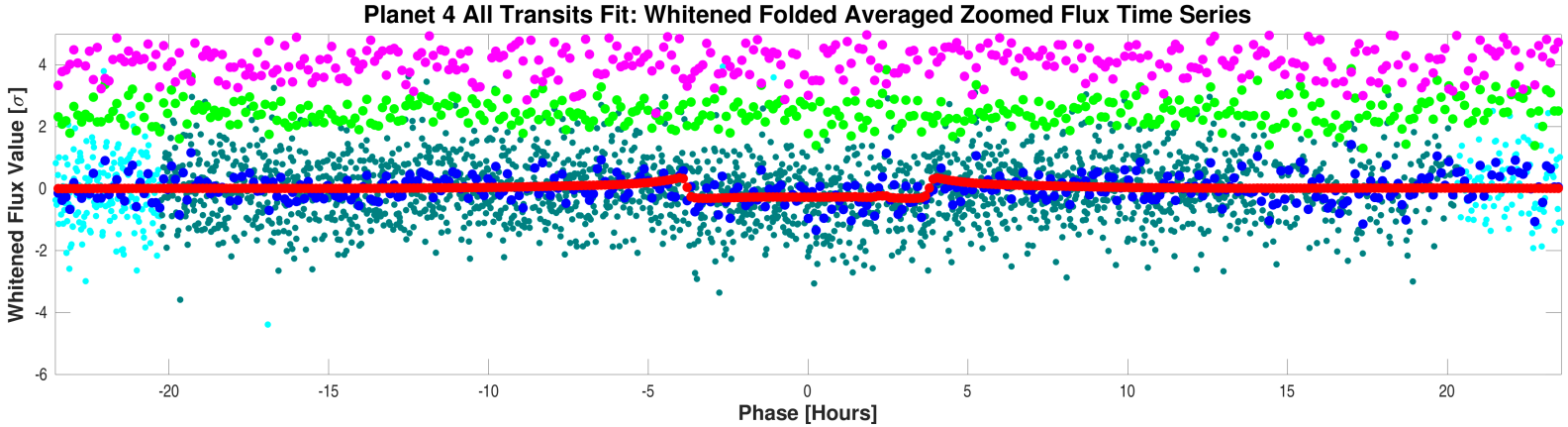
Flux time series for CatId 149603524, Planet candidate 4 in the unwhitened domain. For the data of Sector-01/TargetTableId-128, start BJD is 2458325 and the vertical offset is 0. For the data of Sector-02/TargetTableId-129, start BJD is 2458354 and the vertical offset is 0.05. For the data of Sector-03/TargetTableId-131, start BJD is 2458381 and the vertical offset is 0.1. For the data of Sector-04/TargetTableId-135, start BJD is 2458410 and the vertical offset is 0.15. Transit event markers indicate the location of transits of the given planet candidate. All transits fit completed with full convergence.
Open `./planet-04/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-04-all-unwhitened-01-128.fig`



Flux time series for CatId 149603524, Planet candidate 4 in the unwhitened domain. For the data of Sector-06/TargetTableId-141, start BJD is 2458468 and the vertical offset is 0. For the data of Sector-07/TargetTableId-145, start BJD is 2458491 and the vertical offset is 0.05. For the data of Sector-08/TargetTableId-148, start BJD is 2458517 and the vertical offset is 0.1. For the data of Sector-09/TargetTableId-152, start BJD is 2458543 and the vertical offset is 0.15. Transit event markers indicate the location of transits of the given planet candidate. All transits fit completed with full convergence.
Open `./planet-04/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-04-all-unwhitened-06-141.fig`



Folded flux time series for CatId 149603524, Planet candidate 4 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-04/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-04-all-whitened.fig`

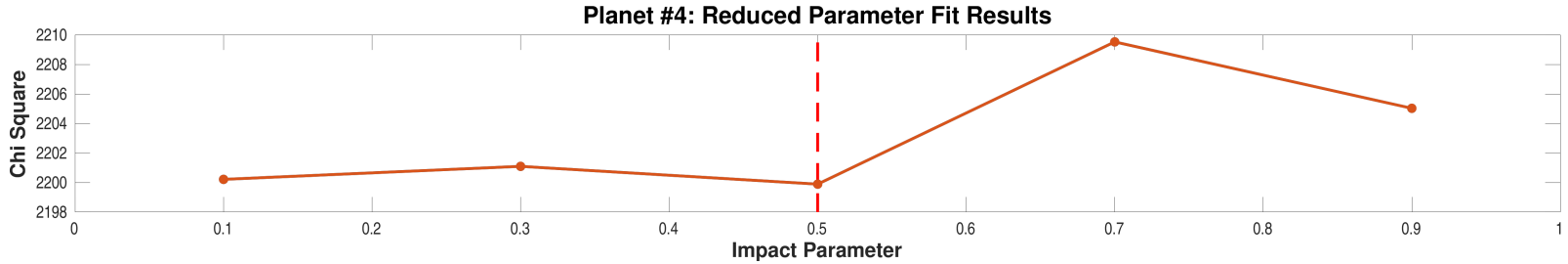


Folded flux time series for CatId 149603524, Planet candidate 4 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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-04/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-04-all-whitened-zoomed.fig`

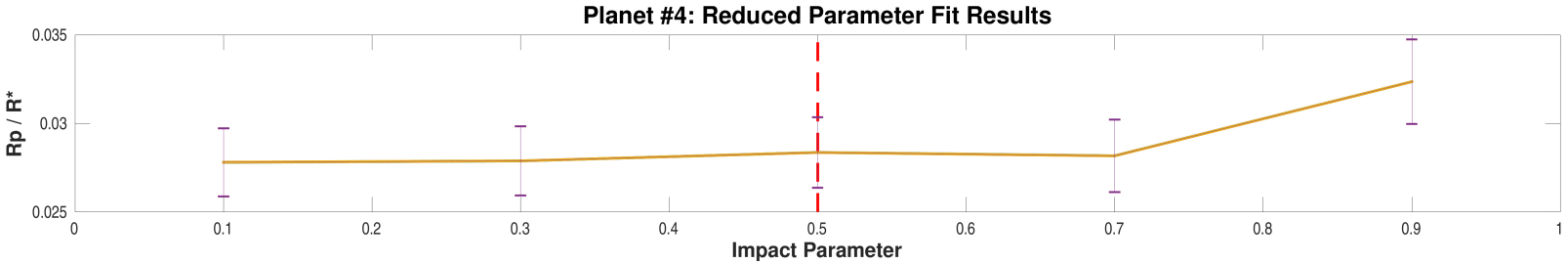
10.2 Model Fitter: Reduced Parameter Fit Results

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	7.4	2200.2	0.0278064	1.9282e-03	119.8313	2.7610e+00	890	1.2277e+02	7.9019	1.8495e-01
0.30	7.3	2201.1	0.0278867	1.9567e-03	115.1003	2.5919e+00	883	1.2330e+02	7.9067	1.8516e-01
0.50	7.4	2199.9	0.0283650	1.9860e-03	104.6082	2.6289e+00	886	1.2345e+02	7.9520	2.1845e-01
0.70	6.7	2209.5	0.0281779	2.0416e-03	79.5922	1.7392e+00	823	1.1860e+02	8.7575	2.1184e-01
0.90	7.2	2205.0	0.0323586	2.3906e-03	49.7128	2.0084e+00	932	1.3791e+02	9.4182	6.2355e-01

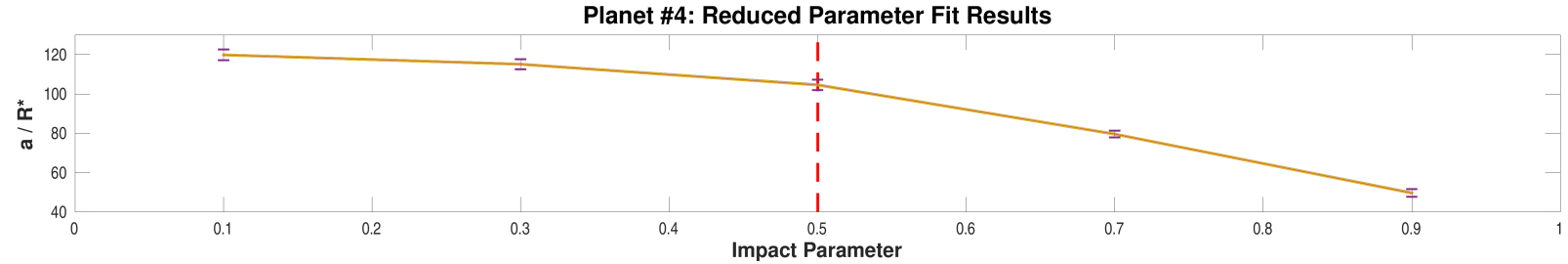
Highlighted row is the best reduced-parameter model fit.



Model chi squares of reduced parameter fits vs. impact parameter for CatId 149603524, Planet candidate 4. The fit result with the minimum chi square is marked with a dashed line in the plot.
Open `./planet-04/planet-search-and-model-fitting-results/reduced-parameter-fits/0000000149603524-04-reduced-fits-chi-square.fig`



Ratios of planet radius to star radius of reduced parameter fits vs. impact parameter for CatId 149603524, Planet candidate 4. The fit result with the minimum chi square is marked with a dashed line in the plot.
Open `./planet-04/planet-search-and-model-fitting-results/reduced-parameter-fits/0000000149603524-04-reduced-fits-rp-over-rstar.fig`



Ratios of semimajor axis to star radius of reduced parameter fits vs. impact parameter for CatId 149603524, Planet candidate 4. The fit result with the minimum chi square is marked with a dashed line in the plot.
Open `./planet-04/planet-search-and-model-fitting-results/reduced-parameter-fits/0000000149603524-04-reduced-fits-a-over-rstar.fig`

10.3 Model Fitter: Trapezoidal Fit Results

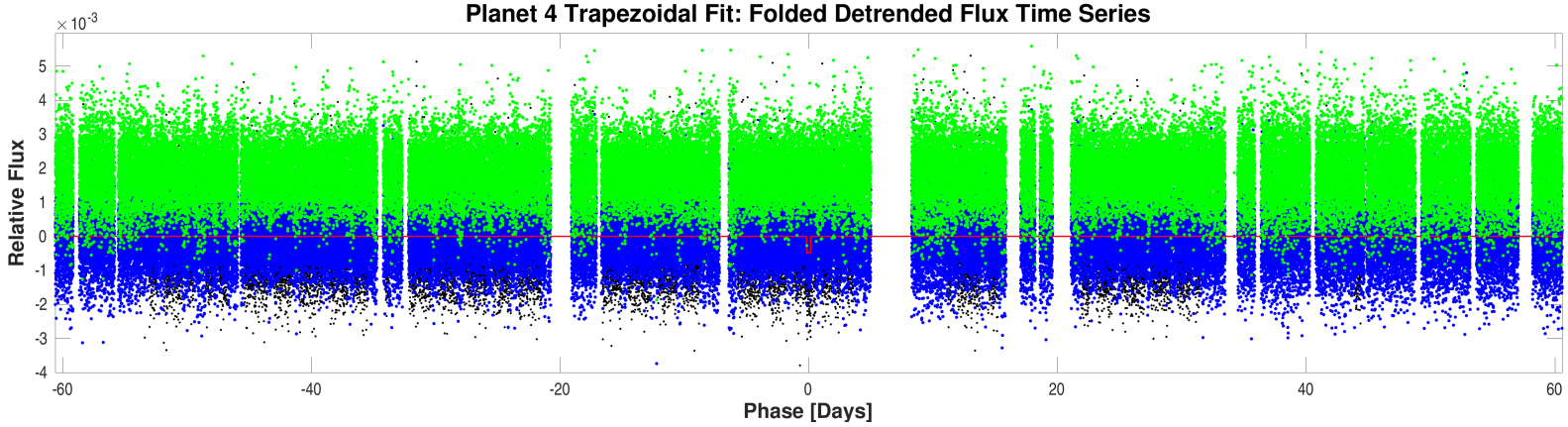
Model Characteristic	Name
Transit Model	trapezoidal_model
Limb Darkening Model	

TCE Parameter	Value	Units
Trial Transit Pulse Duration	7.5	hours
Transit Epoch	1402.6248872	TJD
Orbital Period	121.1624703	days
Maximum SES	9.8	
Maximum MES	7.7	
Robust Statistic	6.9	
Chi Square Goodness of Fit Statistic (DoF)	449.4 (429)	
Chi Square2 Statistic (DoF)	0.2 (5.1)	
Threshold for Desired PFA		

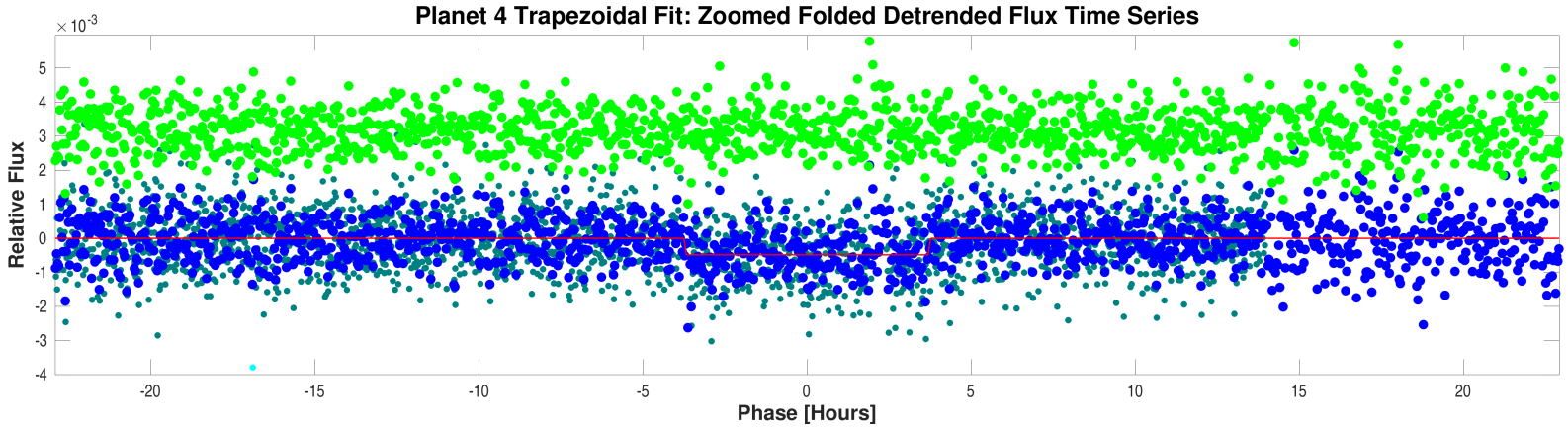
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	11.4		
Orbital Period	121.1624703		days
Transit Epoch	1402.6244515		BTJD
Transit Depth	485		ppm
Transit Duration	7.6360		hours
Transit Ingress Duration	0.1958		hours
Model Chi Square Statistic (DoF)	112857.1 (3198)		

DoF: Degrees of Freedom



Folded detrended flux time series for CatId 149603524, Planet candidate 4 and folded trapezoidal model light curve.
Open `./planet-04/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000149603524-04-all-trapezoidal.fig`



Zoomed folded detrended flux time series for CatId 149603524, Planet candidate 4 and folded trapezoidal model light curve.
Open `./planet-04/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000149603524-04-all-trapezoidal-zoomed.fig`

10.4 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.

10.4.1 Weak Secondary Test

Result	Value	Uncertainty	Units	Statistic in Sigmas	Significance (%)
Orbital Period	121.1625		days		
Transit Duration	7.5		hours		
Maximum MES	7.7				
Secondary Phase	79.3264		days		
Secondary MES	3.6				
Minimum Phase	-1.8111		days		
Minimum MES	-3.0				
Median MES	-0.0				
MAD MES	0.59714				
Robust Statistic	3.7				
Secondary Depth	360.0	9.0323e+01	ppm		
Geometric Albedo	3523.3	1.5446e+03		2.2803	1.13
Planet Effective Temperature	5196	5.6946e+02	Kelvin	8.3578	0.00

10.4.2 Eclipsing Binary Discrimination Test

Result	Value	Value in Sigmas	Significance (%)
Odd Even Transit Depth Comparison Statistic	4.6096e-01	0.6789	49.72
Shorter Period Comparison Statistic	3.7663e+04	194.0702	100.00
Longer Period Comparison Statistic	1.1421e+04	106.8685	100.00

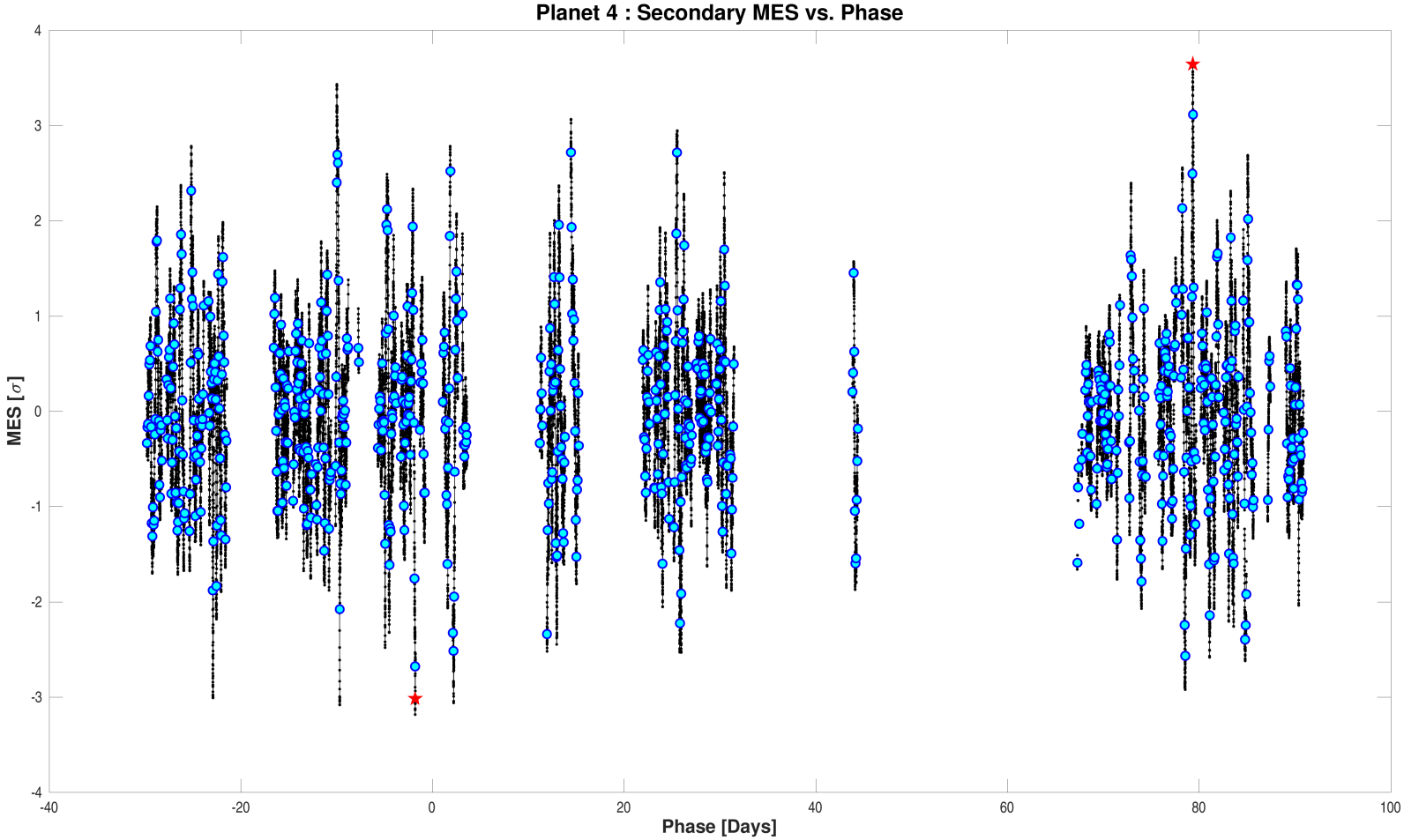
10.4.3 Bootstrap Test

Result	Value
False Alarm Probability	2.2691e-09
Bootstrap Threshold for Desired PFA	7.9
MES Mean	-1.03
MES Standard Deviation	1.51
Transit Count	2

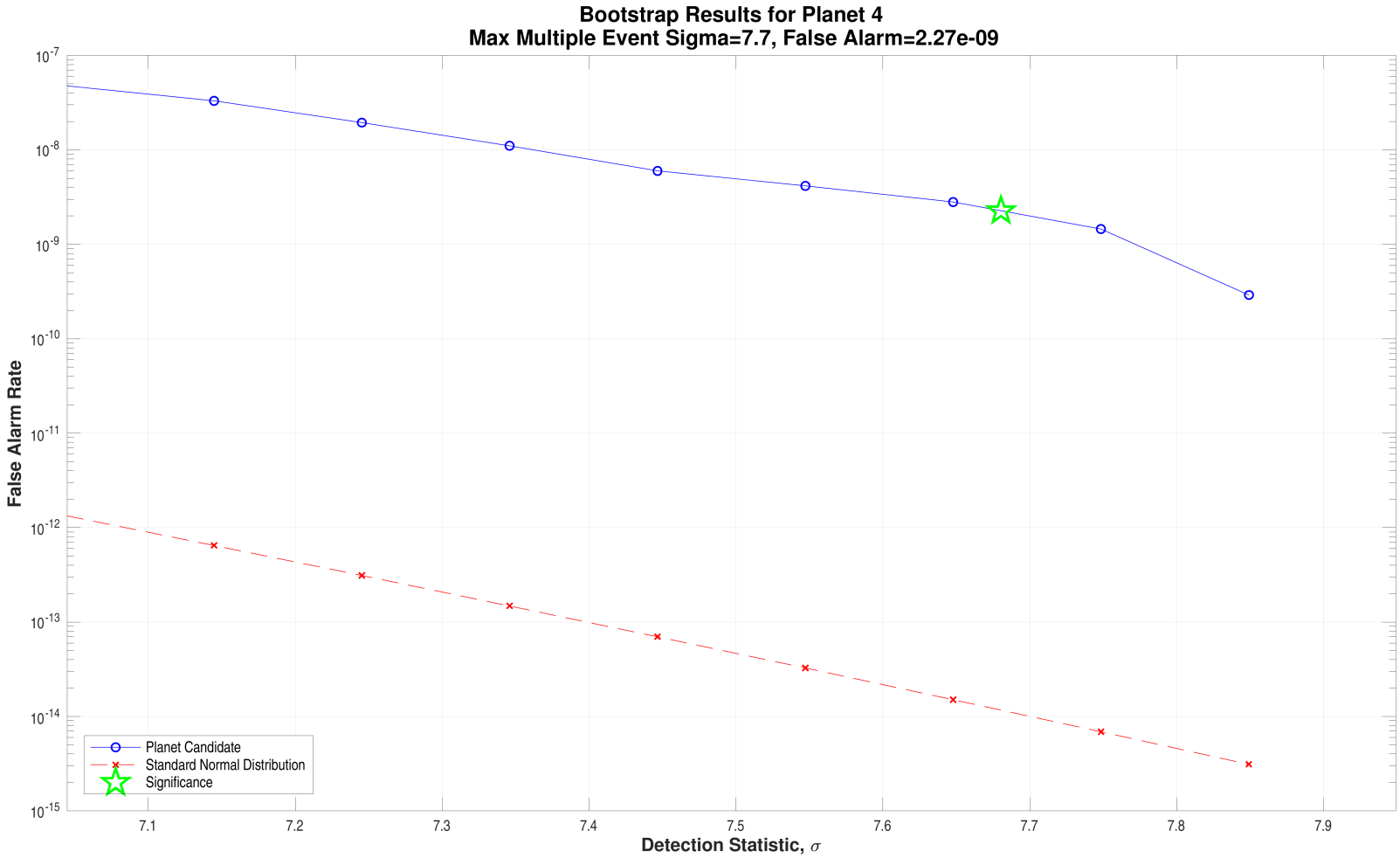
10.4.4 Ghost Diagnostic Test

Result	Value	Significance (%)
Maximum MES	7.7	
SNR	6.9	
Core Aperture Statistic	4.5768e+00	100.00
Halo Aperture Statistic	-1.6651e+00	4.79
Ratio of Core/Halo Aperture Statistics	-2.7487e+00	

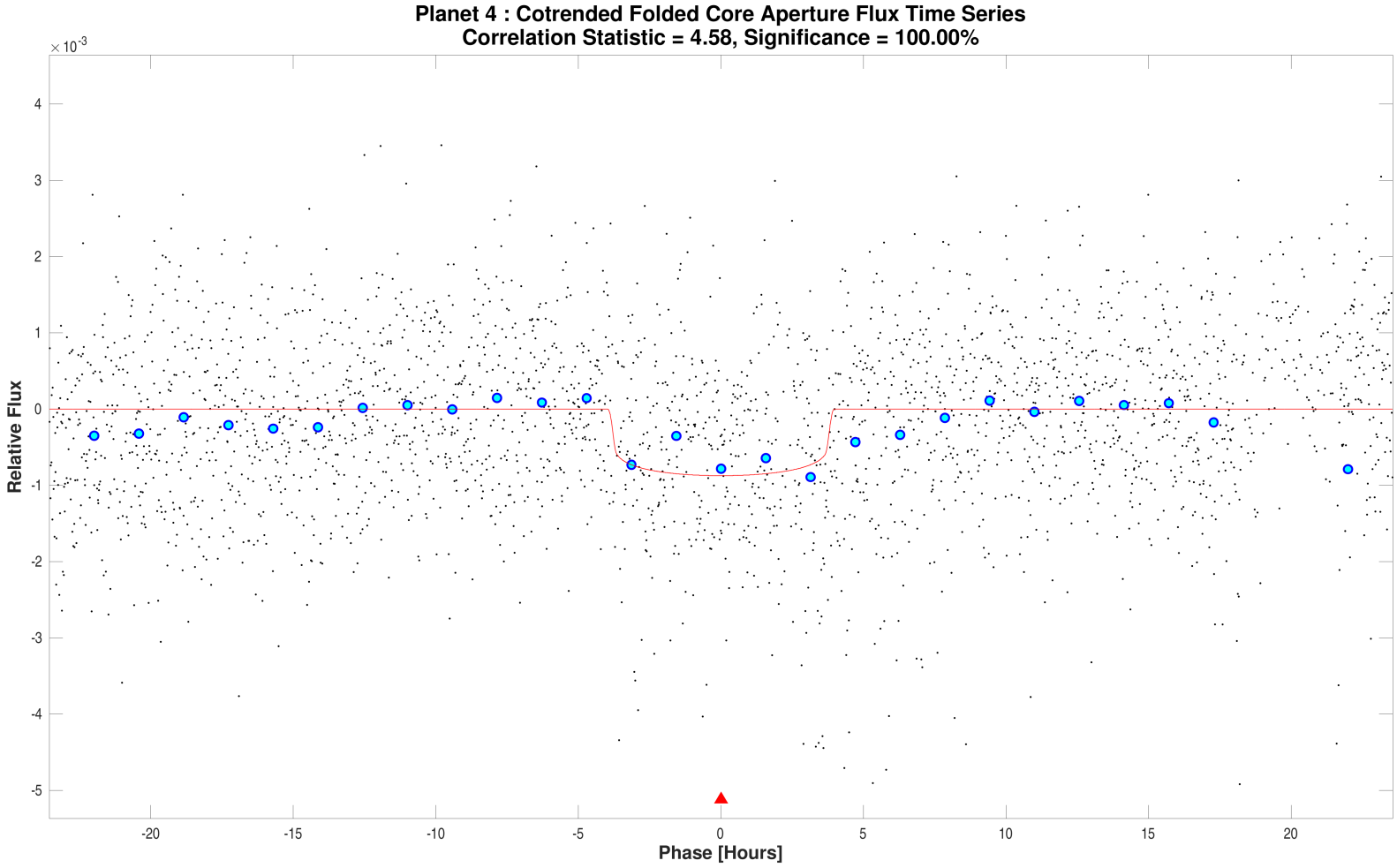
10.4.5 Validation Test Figures



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 7.5. The maximum secondary MES and corresponding phase are 3.6467 and 79.3264 days respectively. The minimum secondary MES and corresponding phase are -3.0146 and -1.8111 days respectively.
Open `./planet-04/report-summary/0000000149603524-04-weak-secondary-diagnostic.fig`

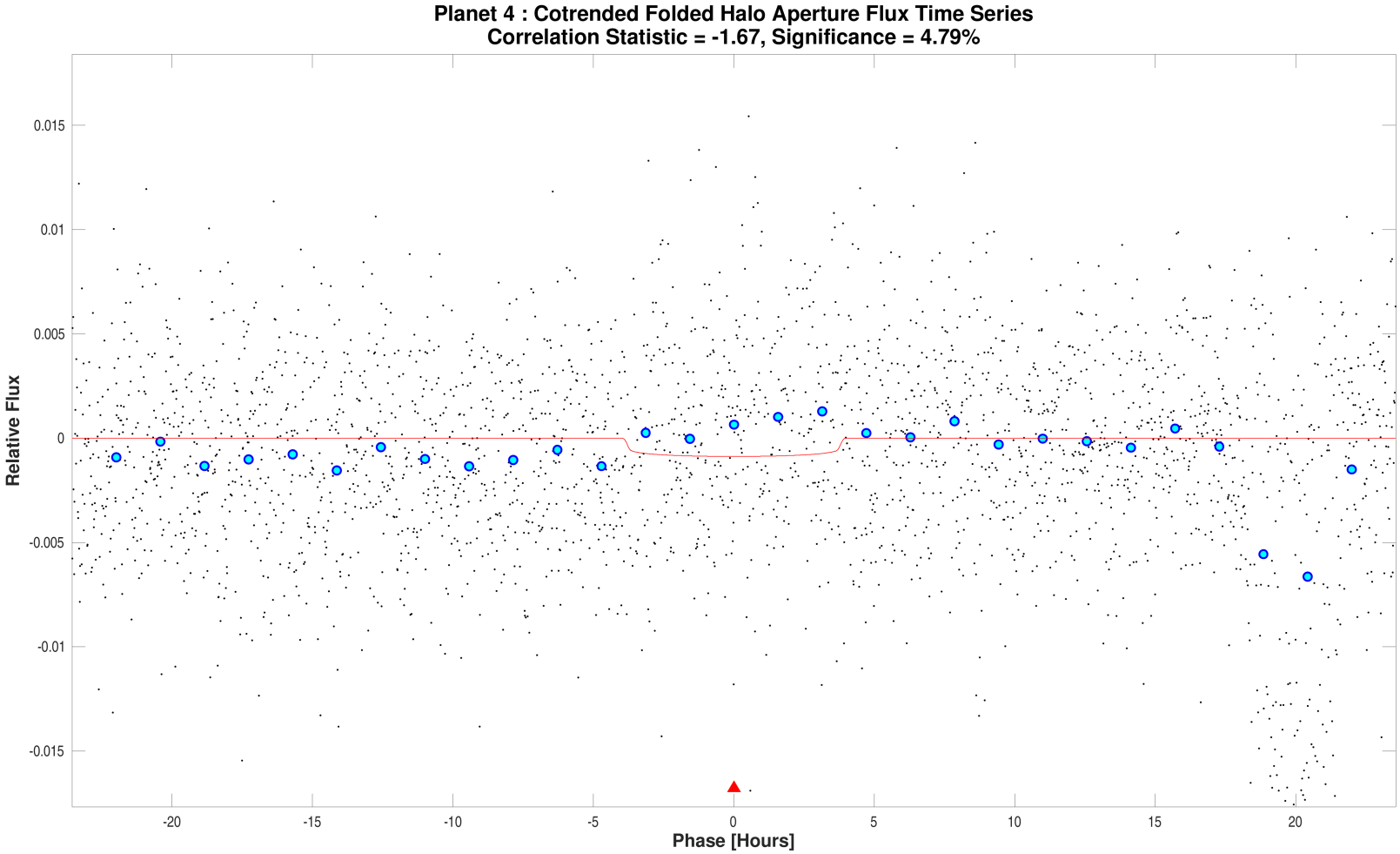


Bootstrap results for target 149603524, planet 4. Cumulative sum of the probabilities (derived from the histogram of counts) from upper tail to the search transit threshold; false alarm probability is indicated by the star. The Gaussian equivalent threshold for this false alarm probability is 5.8633. The threshold on this distribution that achieves the same false alarm rate as a 7.1 sigma threshold on a Gaussian distribution is 7.9495.
Open `./planet-04/bootstrap-results/0000000149603524-04-bootstrap-false-alarm.fig`



Optical ghost diagnostic core aperture flux time series for target 149603524, planet candidate 4. 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-04/ghost-diagnostic-results/0000000149603524-04-core-unwhitened-cotrended-zoomed-model.fig`

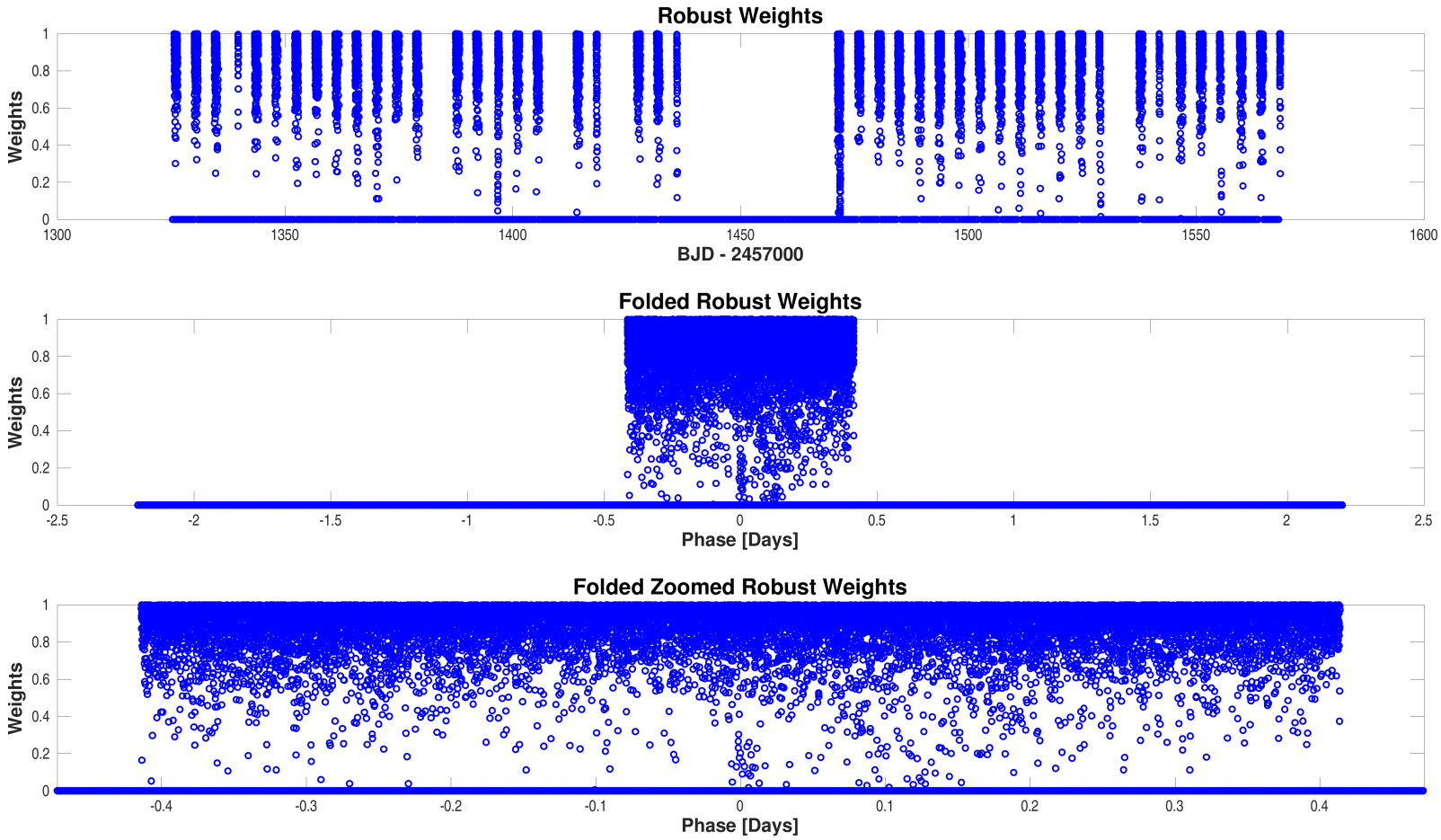


Optical ghost diagnostic halo aperture flux time series for target 149603524, planet candidate 4. The unwhitened time series is phase folded at the orbital period associated with the planet candidate and centered on the epoch of the first transit. The time series was first cotrended against spacecraft 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.

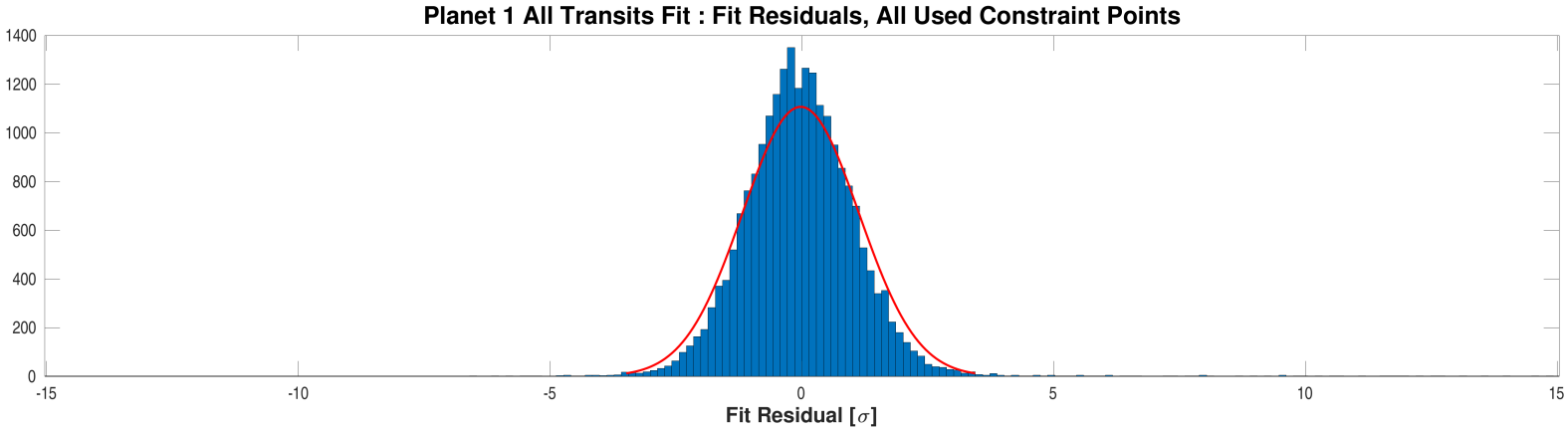
Open `./planet-04/ghost-diagnostic-results/0000000149603524-04-halo-unwhitened-cotrended-zoomed-model.fig`

Appendix A Planet Candidate 1

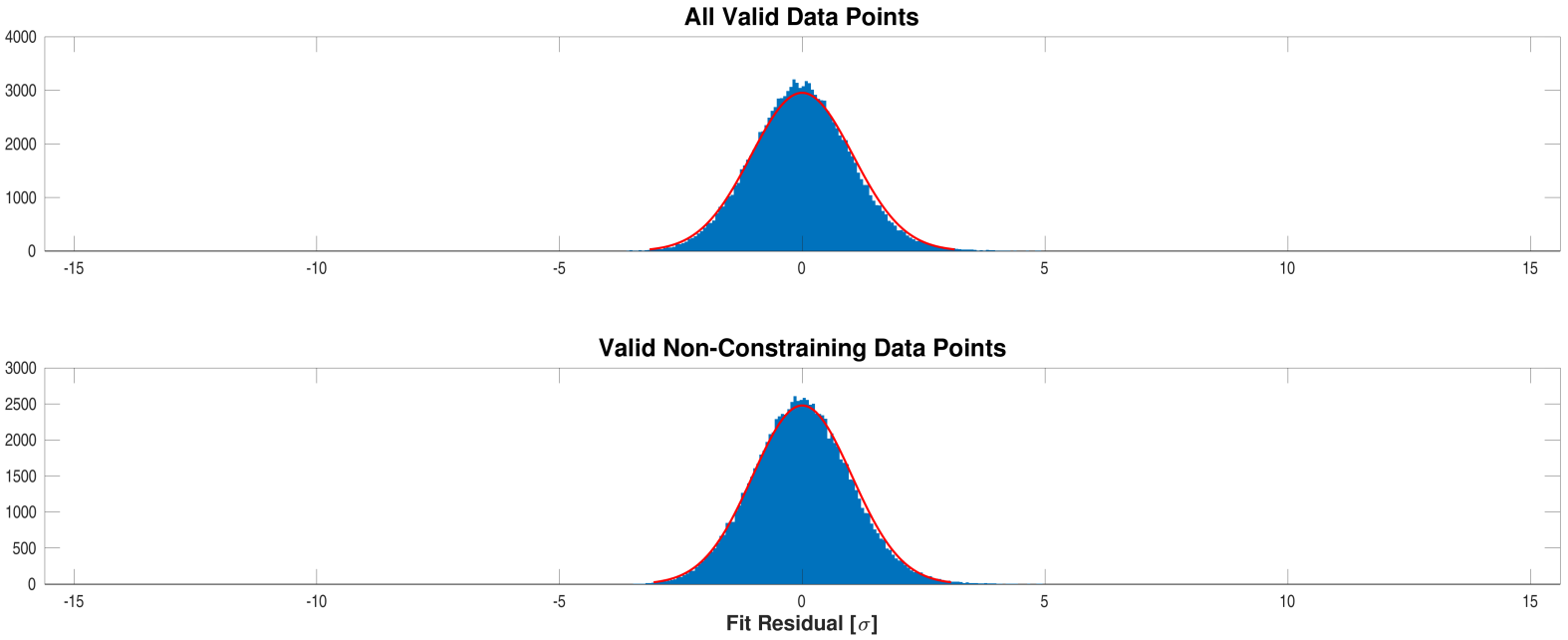
A.1 Model Fitter: All Transits



Robust weights distribution for CatId 149603524, 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/0000000149603524-01-all-robust-weights.fig`



Fit residuals distribution for CatId 149603524, 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/0000000149603524-01-all-histo-used.fig`

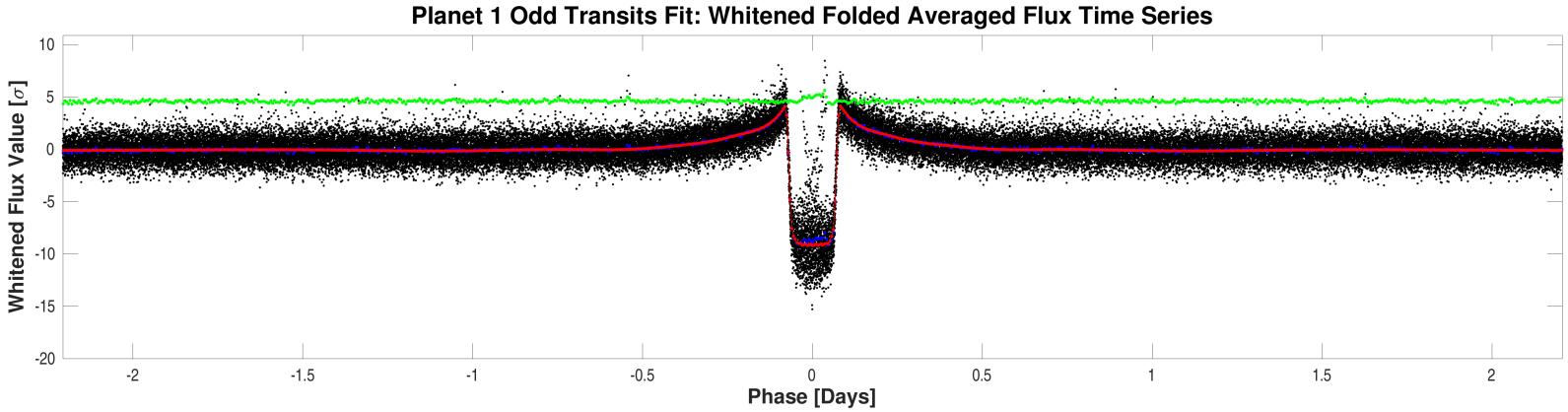


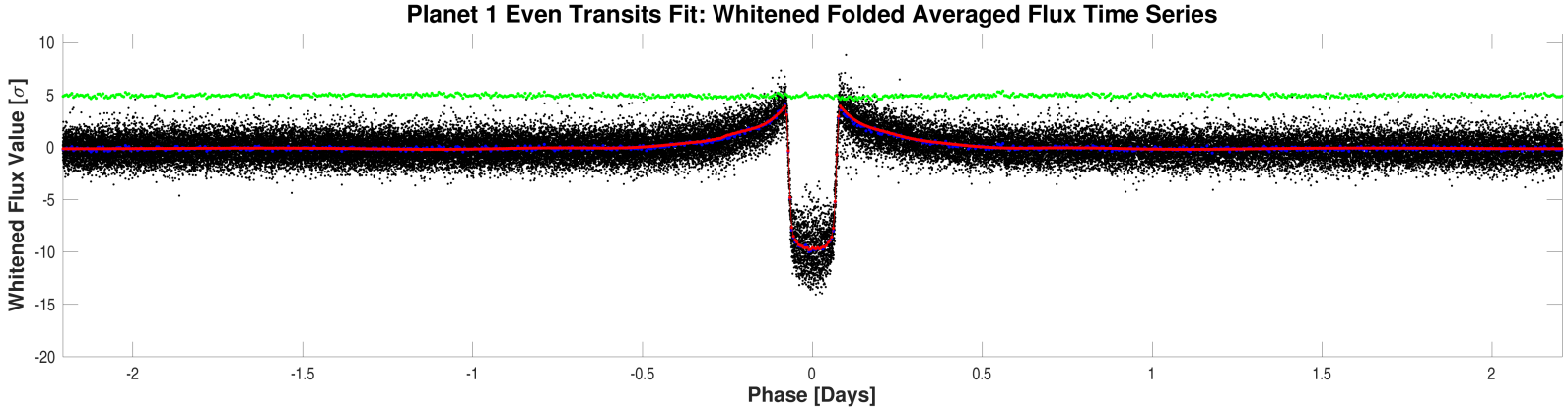
Fit residuals distribution for CatId 149603524, Planet candidate 1. Top plot: all valid data. Bottom plot: valid data not used to constrain fit (due to distance from a transit). Gaussian fits to the histograms are shown in red.
Open `./planet-01/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-01-all-histo-all-and-unused.fig`

A.2 Model Fitter: Odd & Even Transits

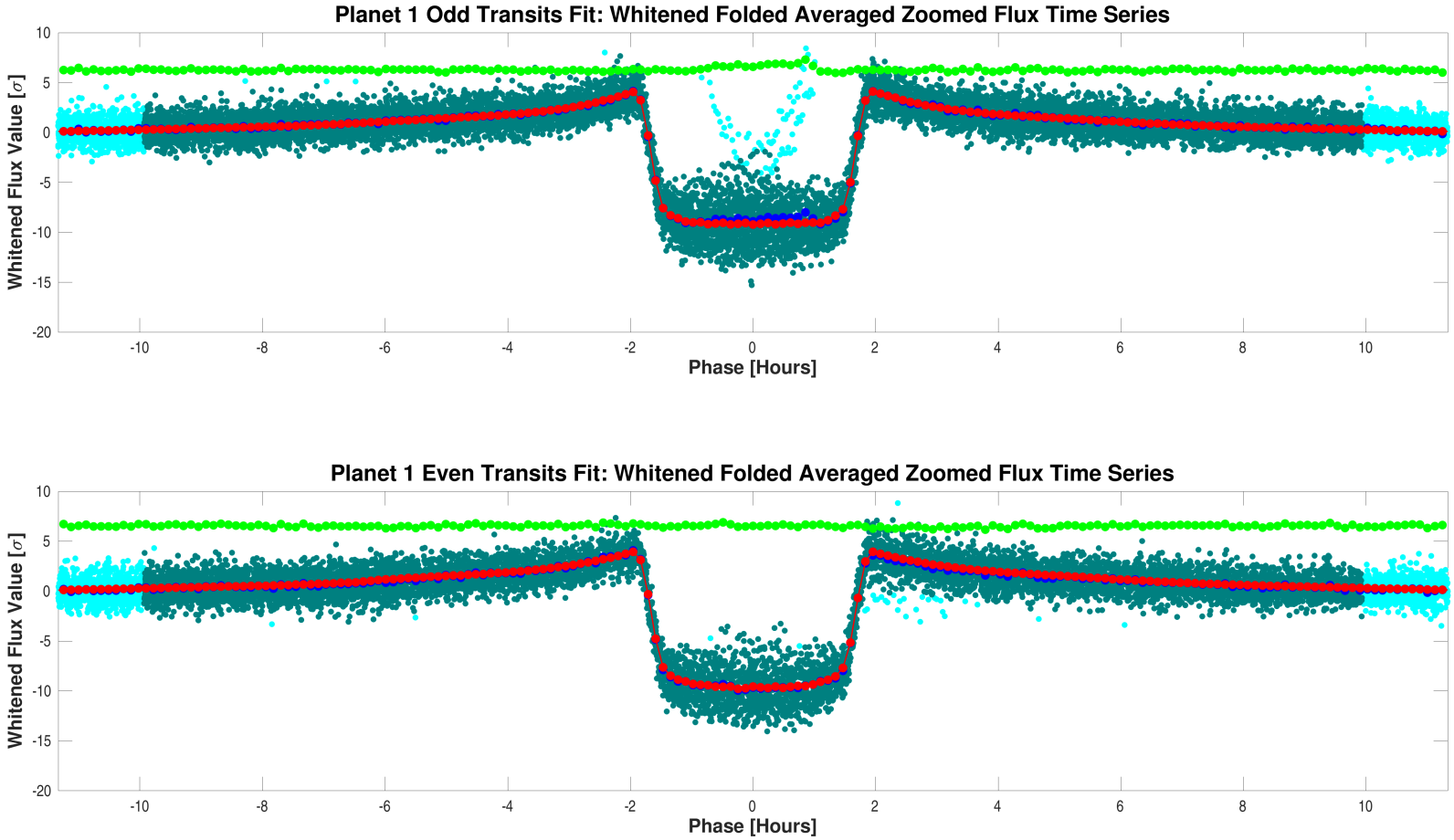
Parameter	Odd Transits Value	Odd Transits Uncertainty	Even Transits Value	Even Transits Uncertainty	Units	Difference / ‖Uncertainty‖
SNR	423.3		366.6			
Orbital Period	4.4119369	3.5678e-06	4.4119363	4.3515e-06	days	1.1235e-01
Transit Epoch	1326.0786963	1.0532e-04	1330.4908291	1.2933e-04	BTJD	1.1696e+00
Impact Parameter	0.0100	1.0836e+00	0.1571	7.9032e-02		1.3543e-01
Planet Radius to Star Radius Ratio	0.1104080	2.4700e-04	0.1102815	2.8881e-04		3.3271e-01
Semi-major Axis to Star Radius Ratio	9.9294	1.0636e-01	9.8155	1.2360e-01		6.9800e-01
Planet Radius	15.4281	3.4514e-02	15.4104	4.0358e-02	Earth radii	3.3271e-01
Semi-major Axis	0.0568	3.0599e-08	0.0568	3.7320e-08	AU	1.1235e-01
Effective Stellar Flux	708.7683	7.6421e-04	708.7685	9.3208e-04	Goldilocks	1.1235e-01
Equilibrium Temperature	1316	3.5473e-04	1316	4.3265e-04	Kelvin	1.1235e-01
Stellar Density	0.6757	2.1712e-02	0.6527	2.4658e-02	Solar density	6.9914e-01
Transit Depth	14036	3.3424e+01	13948	3.8678e+01	ppm	1.7123e+00
Transit Duration	3.7770	8.9683e-03	3.7825	1.0784e-02	hours	3.9695e-01
Transit Ingress Duration	0.3767	8.9272e-03	0.3855	1.0741e-02	hours	6.3065e-01
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)	17492.1 (20469.9)		17492.1 (20469.9)			

DoF: Degrees of Freedom

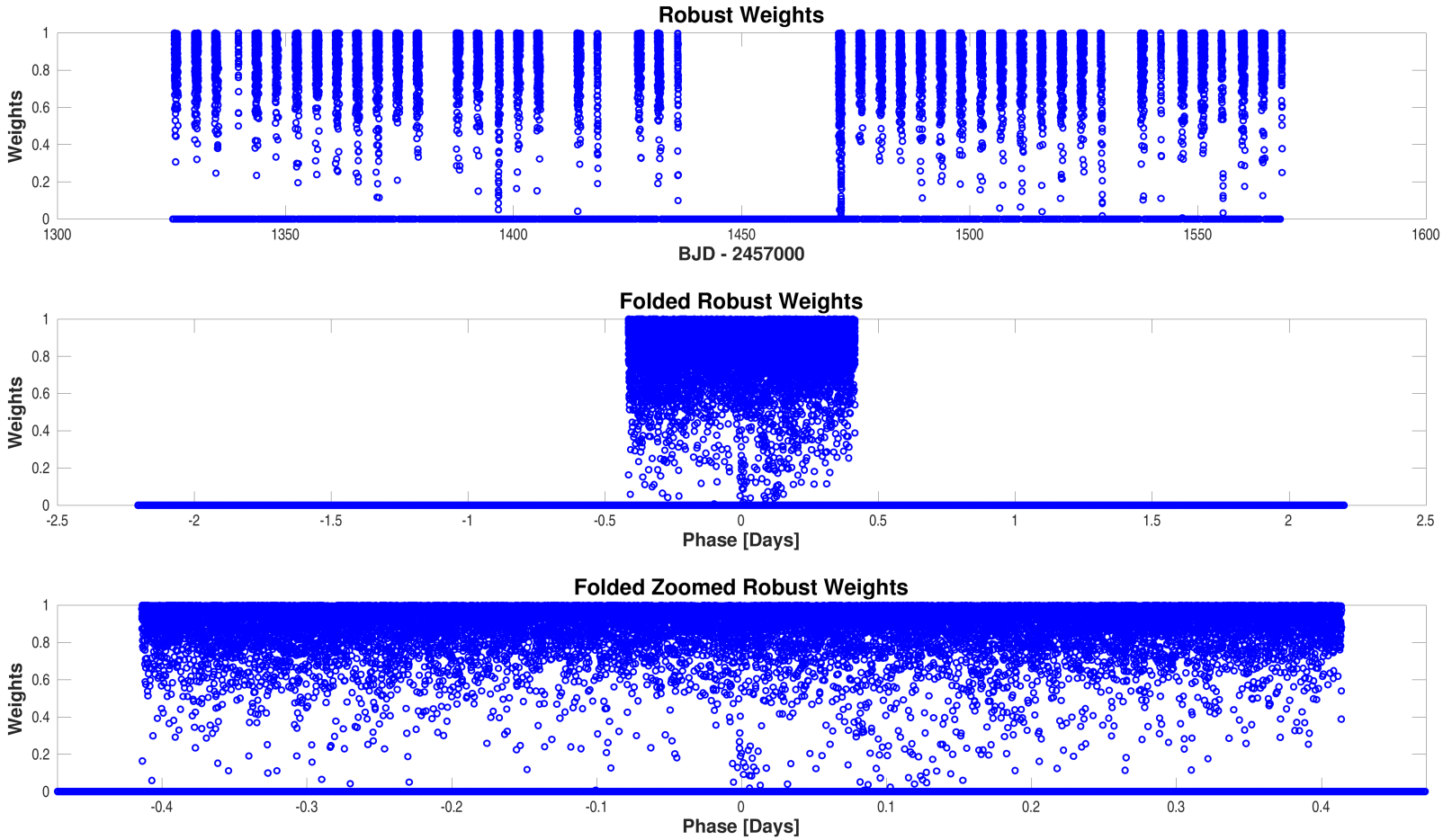




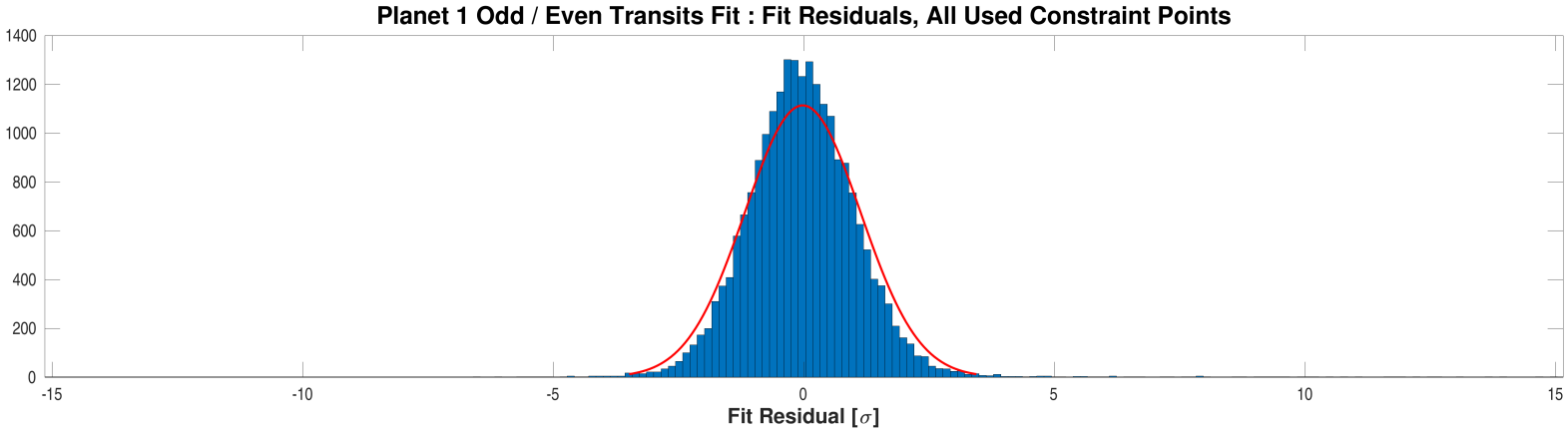
Folded flux time series for CatId 149603524, Planet candidate 1 in the whitened domain is plotted in black dots. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged values of the folded flux time series; the red dots represent the averaged values of the folded model light 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/0000000149603524-01-odd-even-whitened.fig`



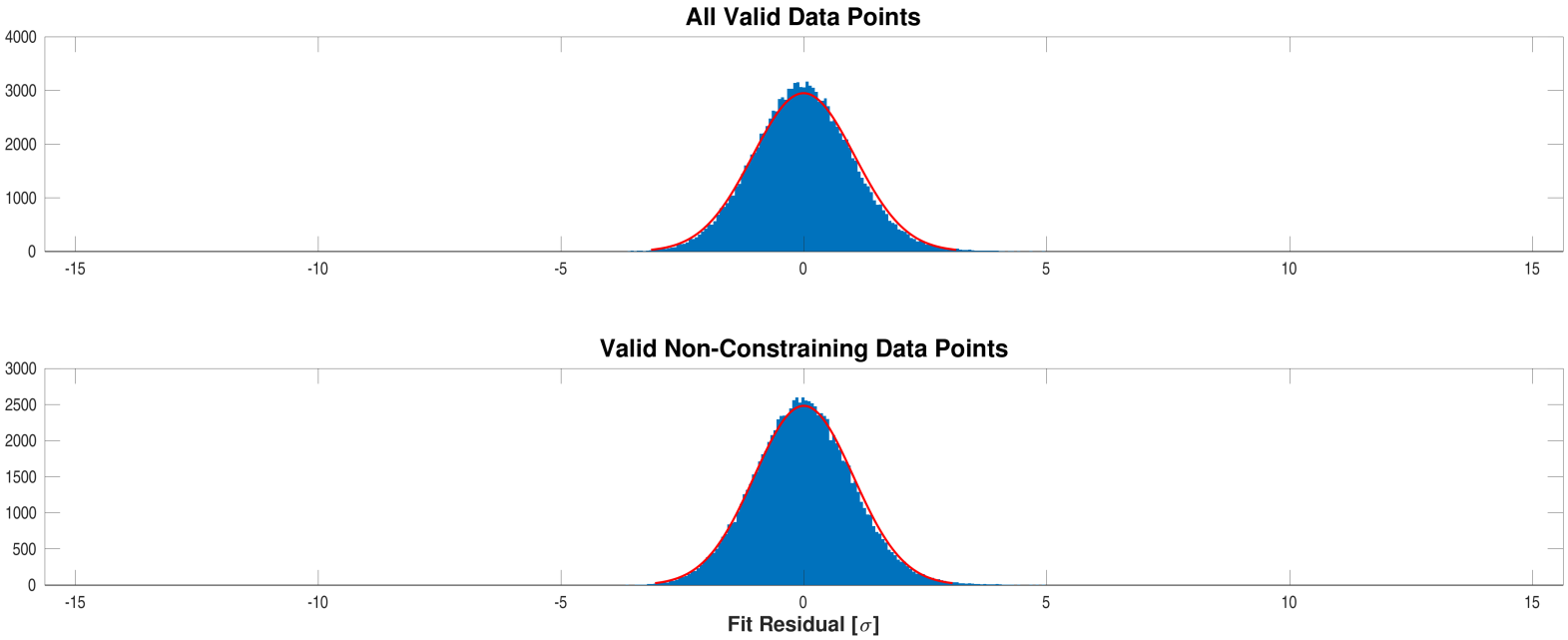
Folded flux time series for CatId 149603524, Planet candidate 1 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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/0000000149603524-01-odd-even-whitened-zoomed.fig`



Robust weights distribution for CatId 149603524, 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/0000000149603524-01-odd-even-robust-weights.fig`

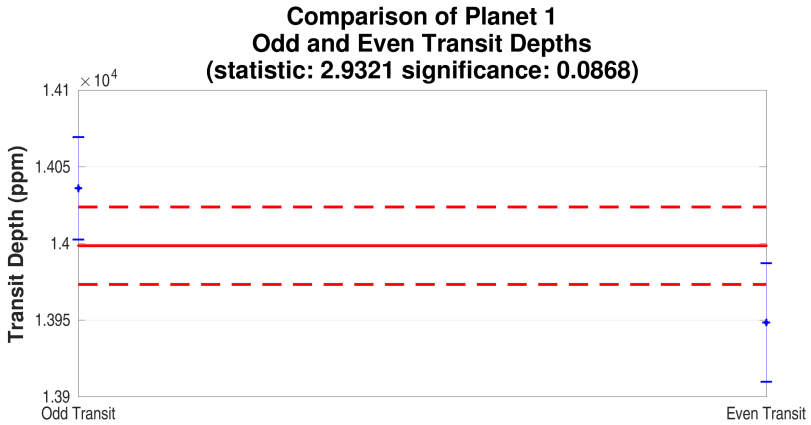


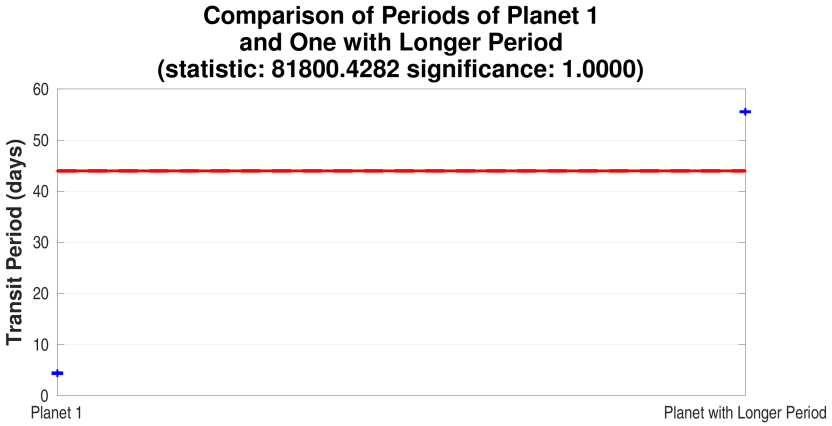
Fit residuals distribution for CatId 149603524, Planet candidate 1. Only the valid data points used to constrain the fit are shown here. A Gaussian fit to the histogram is shown in red.
Open `./planet-01/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000149603524-01-odd-even-histo-used.fig`



Fit residuals distribution for CatId 149603524, 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/0000000149603524-01-odd-even-histo-all-and-unused.fig`

A.3 Eclipsing Binary Discrimination Test

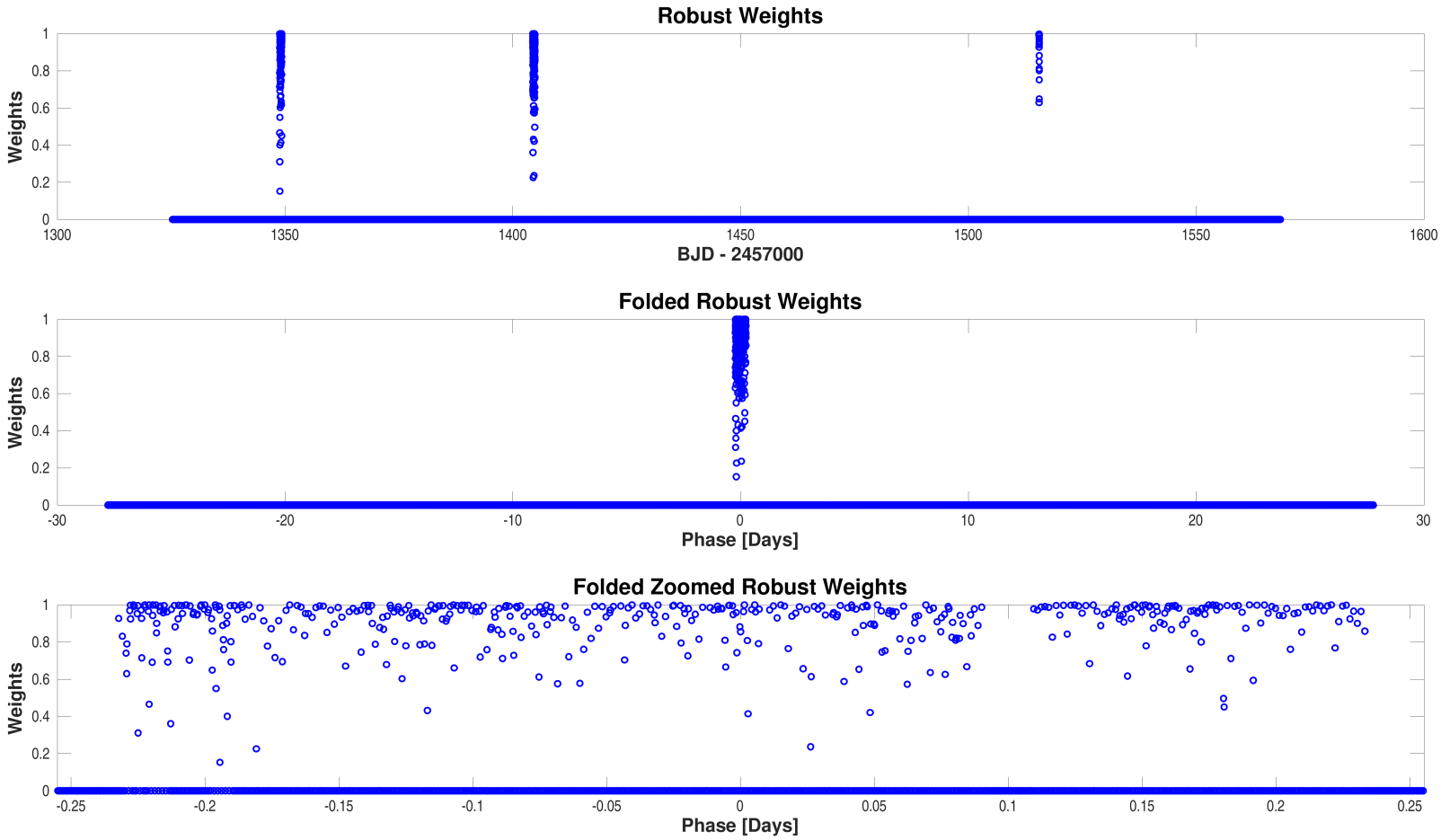




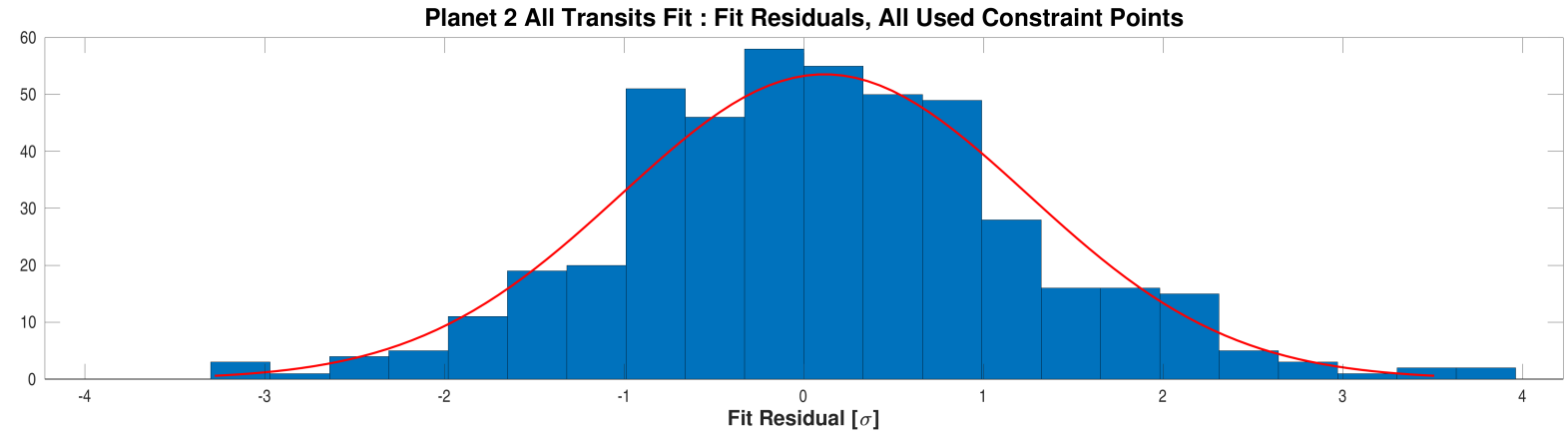
Top-left: Diagnostic plot of Odd/Even Transit Depth Test for catId 149603524, planet 1. A significance level close to 1/0 favors a transiting planet/an eclipsing binary. Bottom-left: Diagnostic plot of Orbital Period Test for catId 149603524. Orbital periods of planet 1 and the planet with longer period are compared. A significance level close to 1/0 favors a transiting planet/an eclipsing binary.
Open `./planet-01/binary-discrimination-test-results/0000000149603524-01-eclipsing-binary-discrimination-tests.fig`

Appendix B Planet Candidate 2

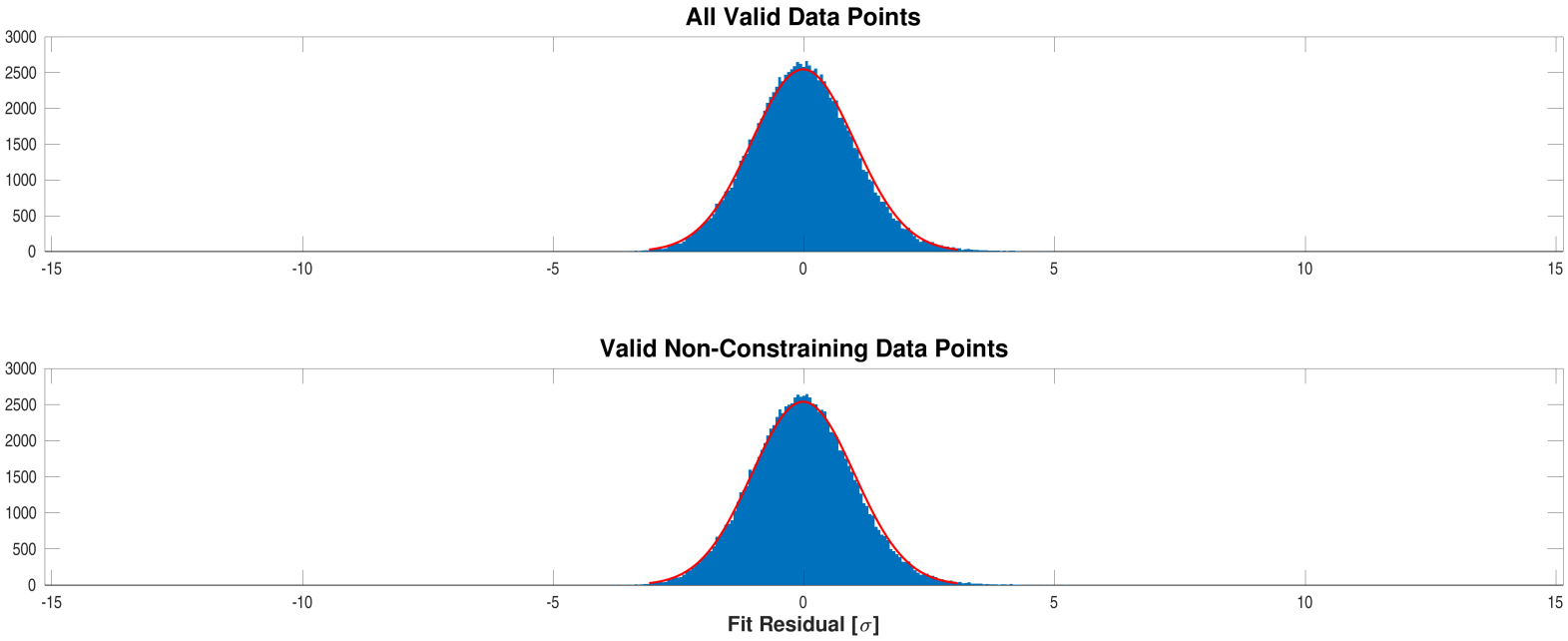
B.1 Model Fitter: All Transits



Robust weights distribution for CatId 149603524, Planet candidate 2. 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-02/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-02-all-robust-weights.fig`



Fit residuals distribution for CatId 149603524, Planet candidate 2. 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-02/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-02-all-histo-used.fig`

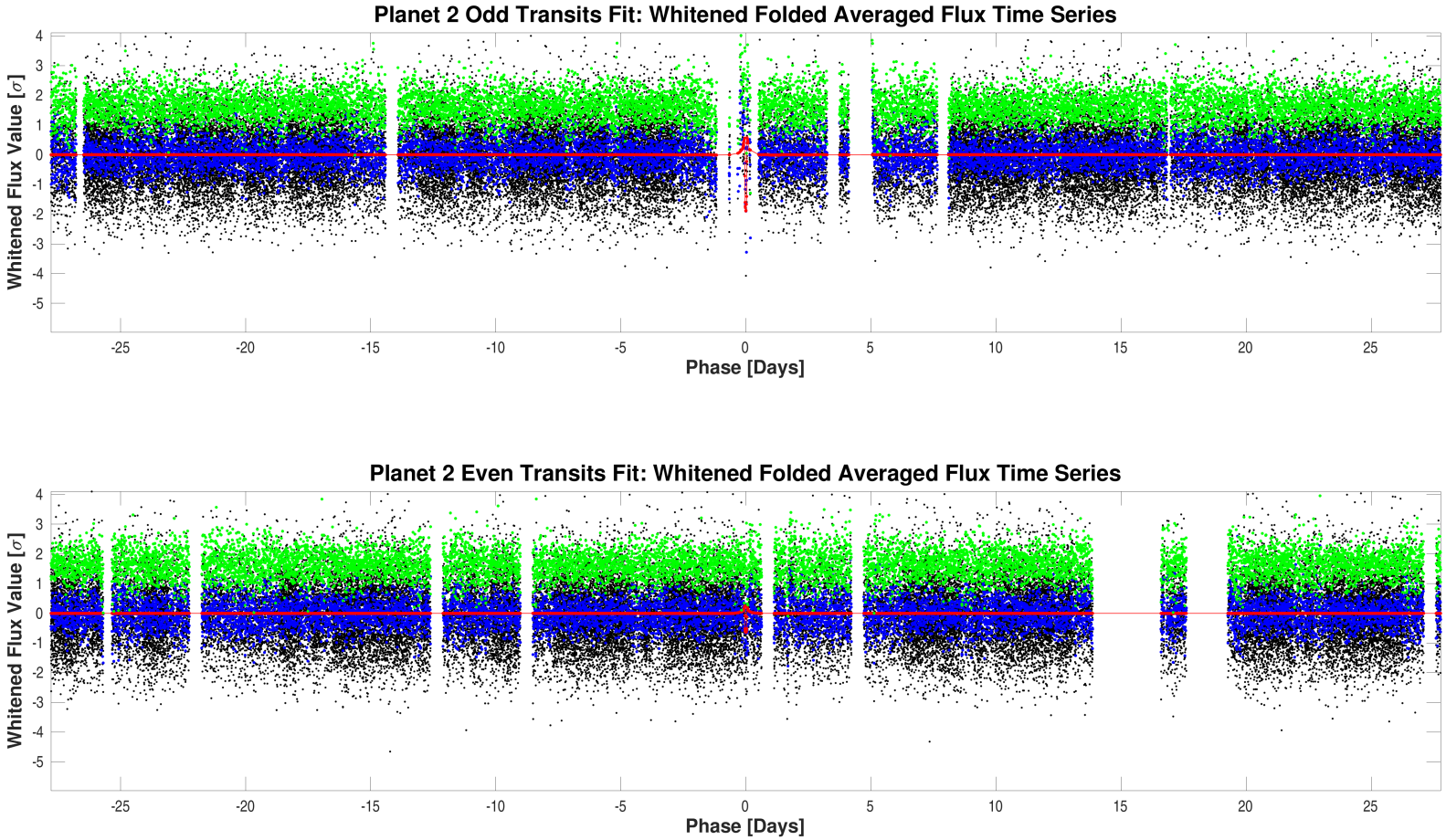


Fit residuals distribution for CatId 149603524, Planet candidate 2. Top plot: all valid data. Bottom plot: valid data not used to constrain fit (due to distance from a transit). Gaussian fits to the histograms are shown in red.
Open `./planet-02/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-02-all-histo-all-and-unused.fig`

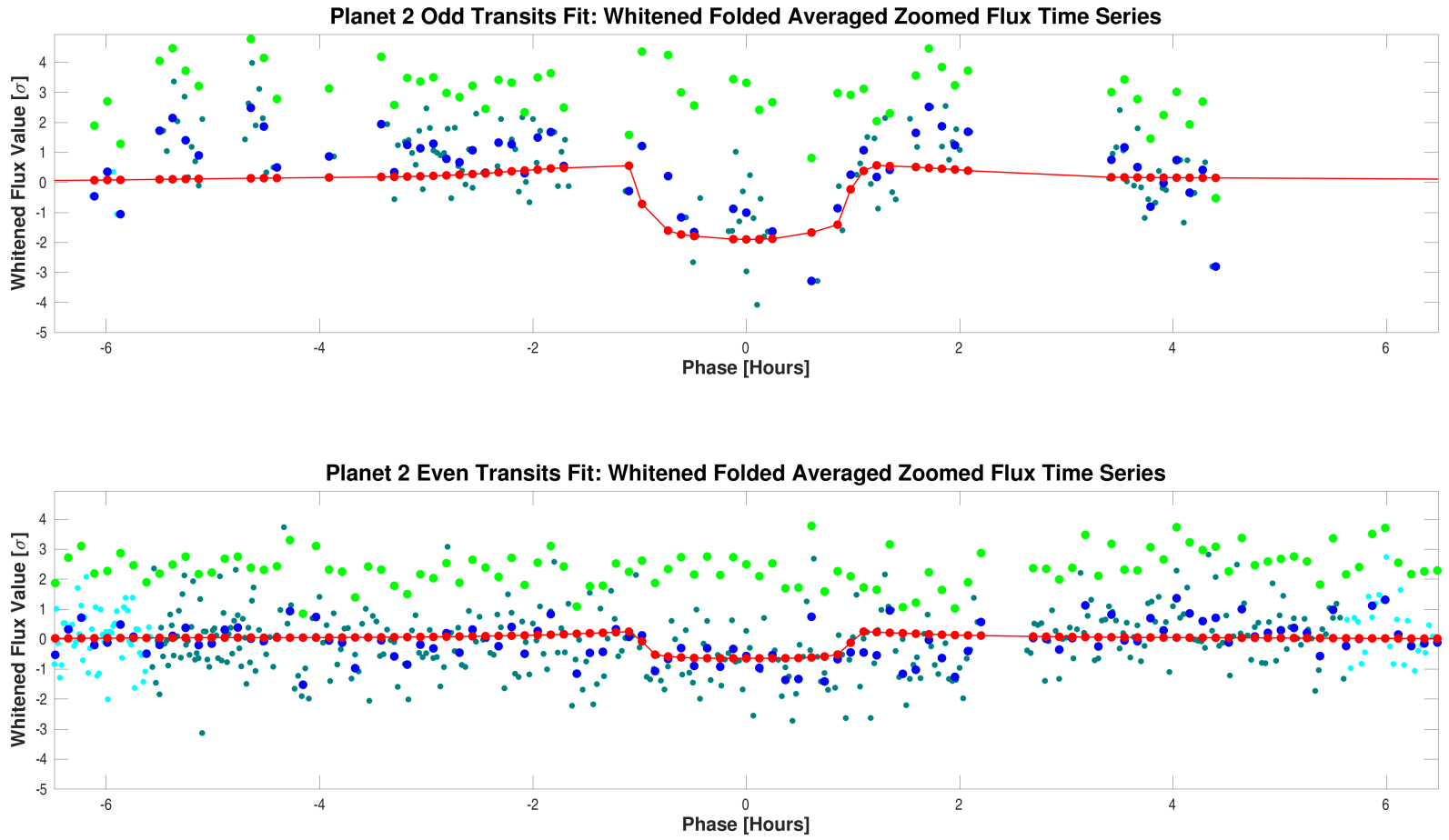
B.2 Model Fitter: Odd & Even Transits

Parameter	Odd Transits Value	Odd Transits Uncertainty	Even Transits Value	Even Transits Uncertainty	Units	Difference / Uncertainty
SNR	8.0		4.4			
Orbital Period	55.5600218	0.0000e+00	55.5600218	0.0000e+00	days	
Transit Epoch	1349.0553977	3.1620e-03	1404.6155801	3.1513e-03	BTJD	3.0121e-01
Impact Parameter	0.0645	1.4162e+02	0.2518	3.8891e+01		1.2754e-03
Planet Radius to Star Radius Ratio	0.0443133	6.4743e-02	0.0274002	4.5824e-02		2.1323e-01
Semi-major Axis to Star Radius Ratio	204.6437	1.8707e+03	207.7620	2.1672e+03		1.0892e-03
Planet Radius	6.1922	9.0470e+00	3.8288	6.4034e+00	Earth radii	2.1323e-01
Semi-major Axis	0.3072	0.0000e+00	0.3072	0.0000e+00	AU	
Effective Stellar Flux	24.1914	0.0000e+00	24.1914	0.0000e+00	Goldilocks	
Equilibrium Temperature	566	0.0000e+00	566	0.0000e+00	Kelvin	
Stellar Density	37.2999	1.0229e+03	39.0311	1.2214e+03	Solar density	1.0867e-03
Transit Depth	2261	3.5253e+02	856	2.2749e+02	ppm	3.3485e+00
Transit Duration	2.1619	1.7199e+00	2.0349	1.2457e+00	hours	5.9782e-02
Transit Ingress Duration	0.0921	1.8231e+00	0.0578	1.3053e+00	hours	1.5279e-02
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)	422.9 (417.0)		422.9 (417.0)			

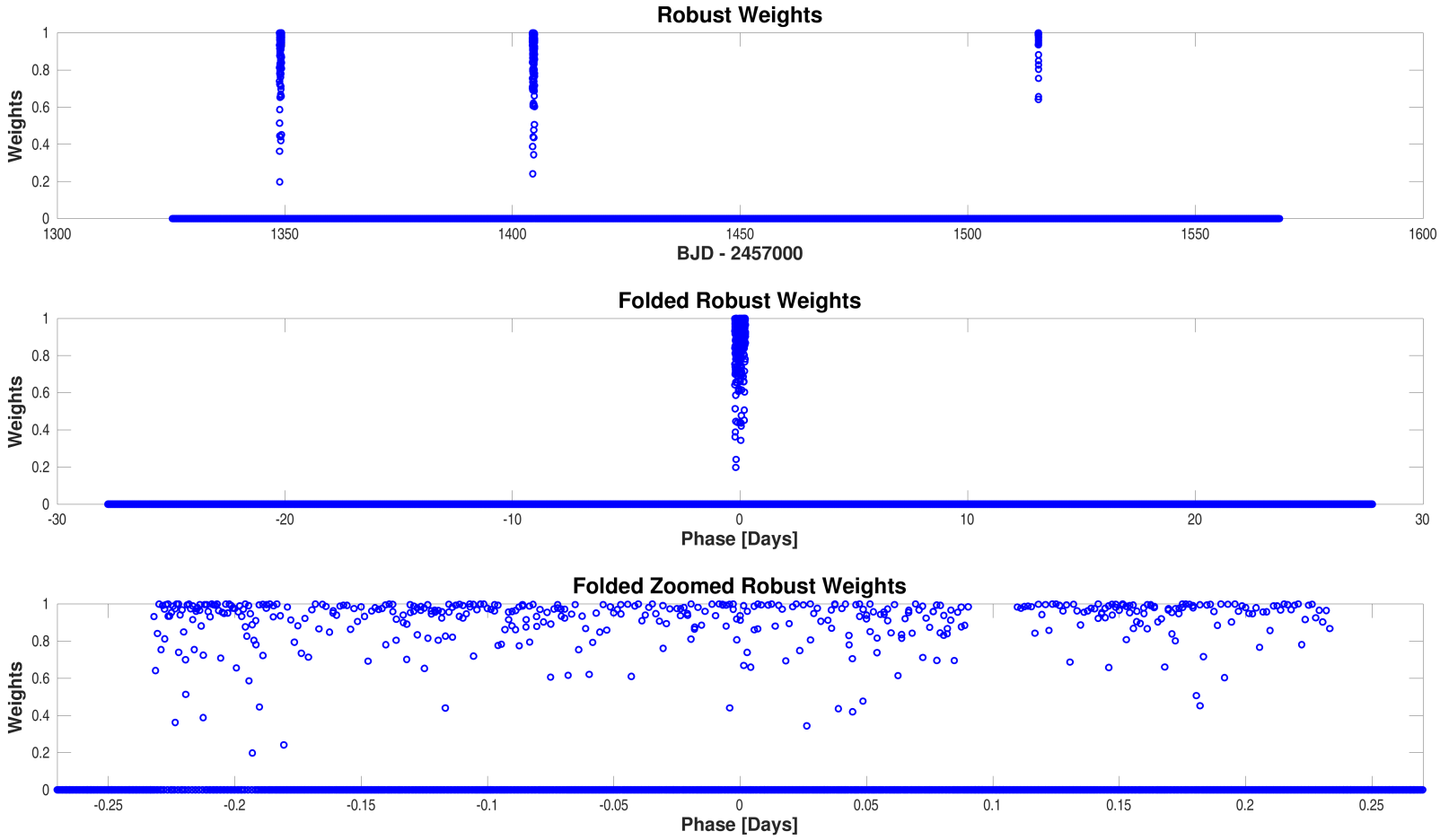
DoF: Degrees of Freedom



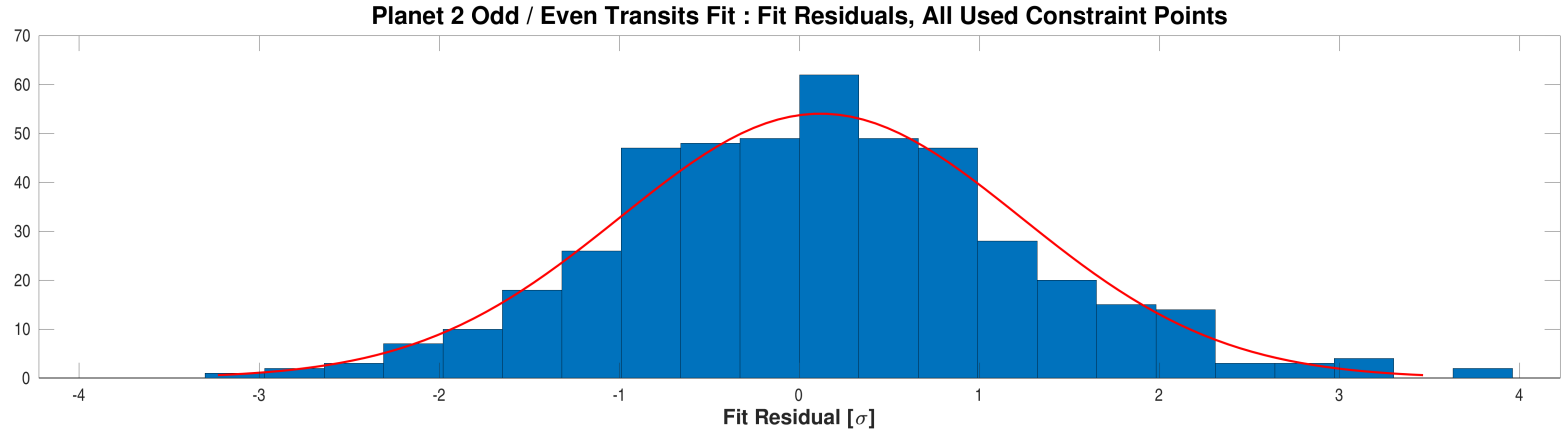
Folded flux time series for CatId 149603524, Planet candidate 2 in the whitened domain is plotted in black dots. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged values of the folded flux time series; the red dots represent the averaged values of the folded model light 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-02/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000149603524-02-odd-even-whitened.fig`



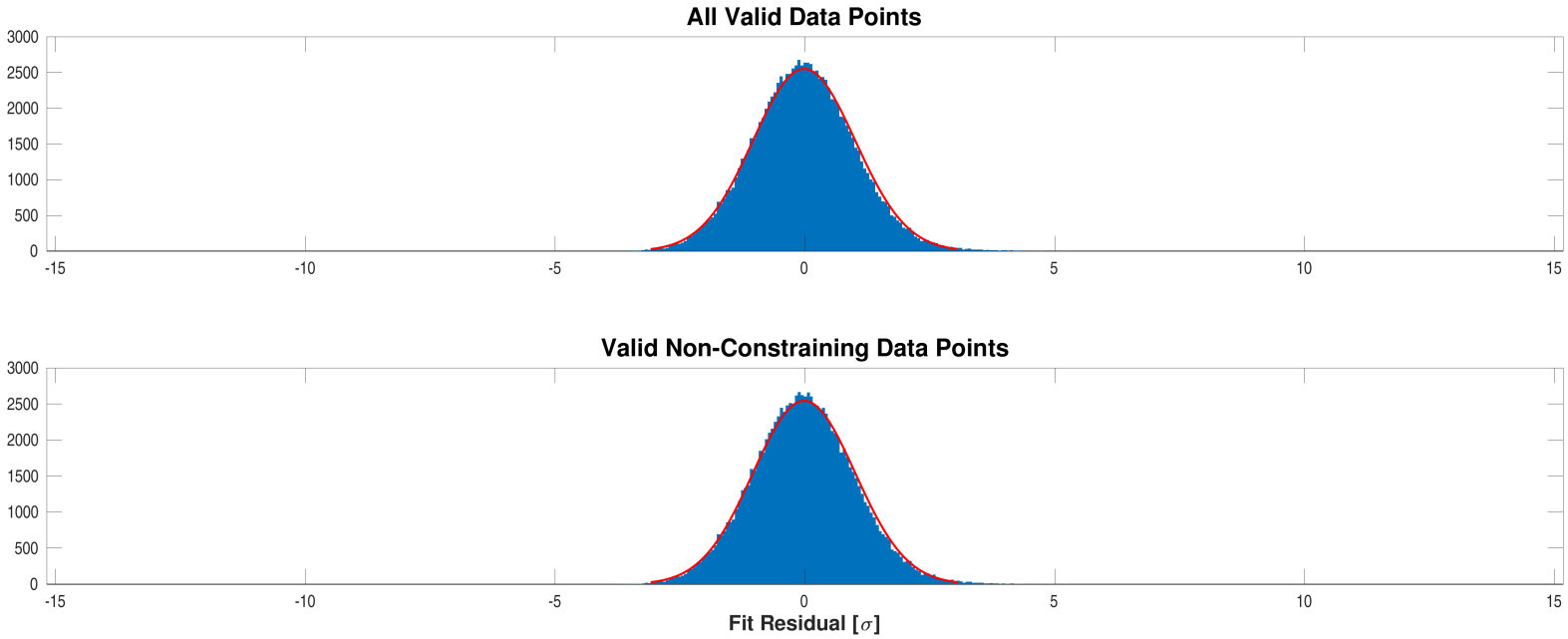
Folded flux time series for CatId 149603524, Planet candidate 2 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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-02/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000149603524-02-odd-even-whitened-zoomed.fig`



Robust weights distribution for CatId 149603524, Planet candidate 2. 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-02/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000149603524-02-odd-even-robust-weights.fig`

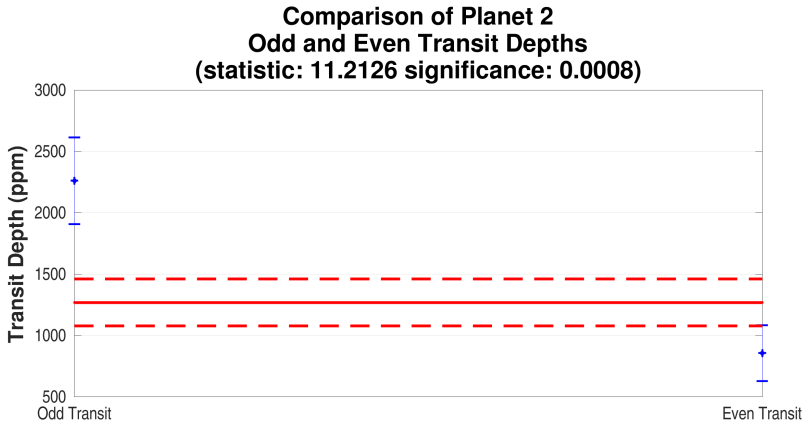


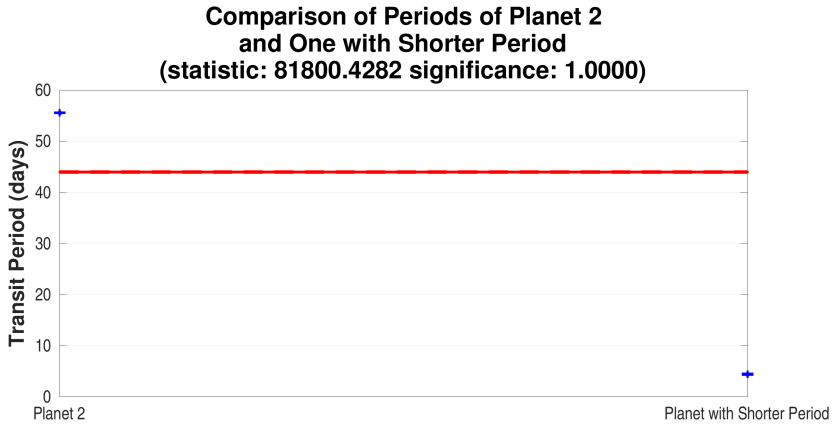
Fit residuals distribution for CatId 149603524, Planet candidate 2. Only the valid data points used to constrain the fit are shown here. A Gaussian fit to the histogram is shown in red.
Open `./planet-02/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000149603524-02-odd-even-histo-used.fig`

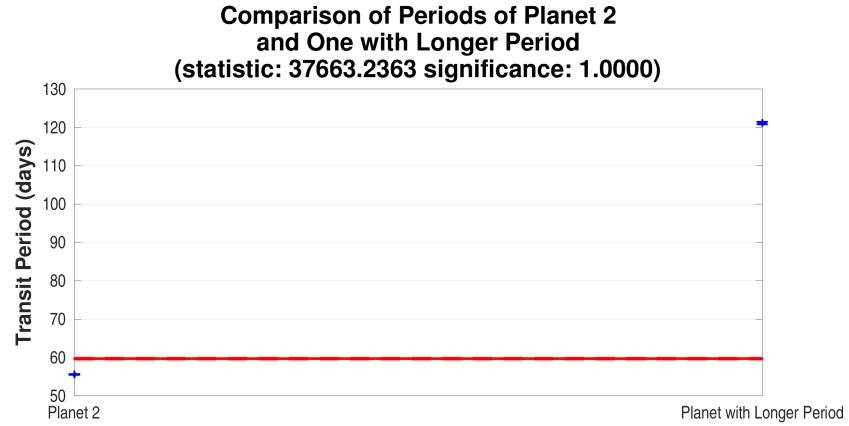


Fit residuals distribution for CatId 149603524, Planet candidate 2. Top plot: all valid data. Bottom plot: valid data not used to constrain fit (due to distance from a transit). Gaussian fits to the histograms are shown in red.
Open `./planet-02/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000149603524-02-odd-even-histo-all-and-unused.fig`

B.3 Eclipsing Binary Discrimination Test



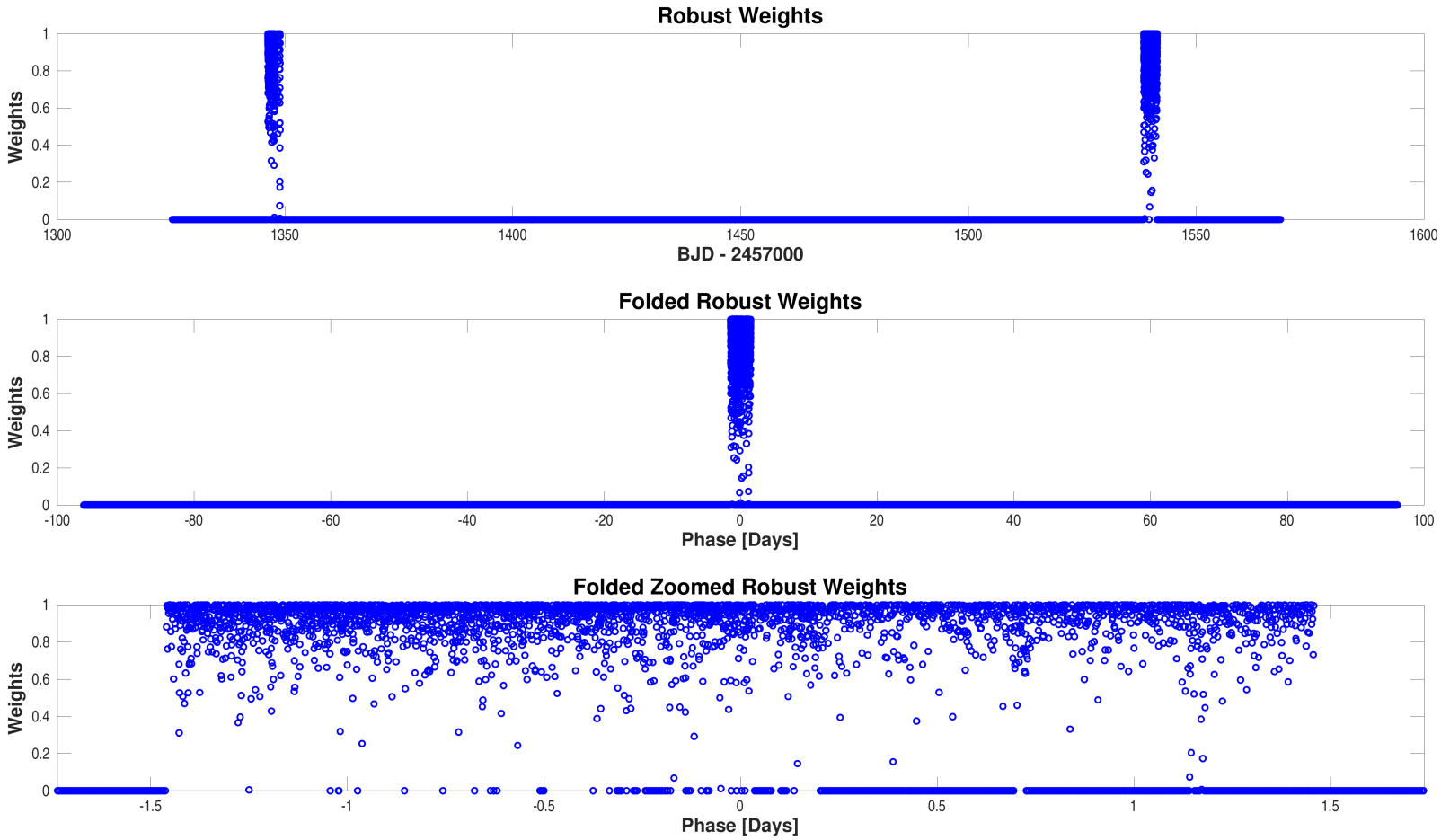




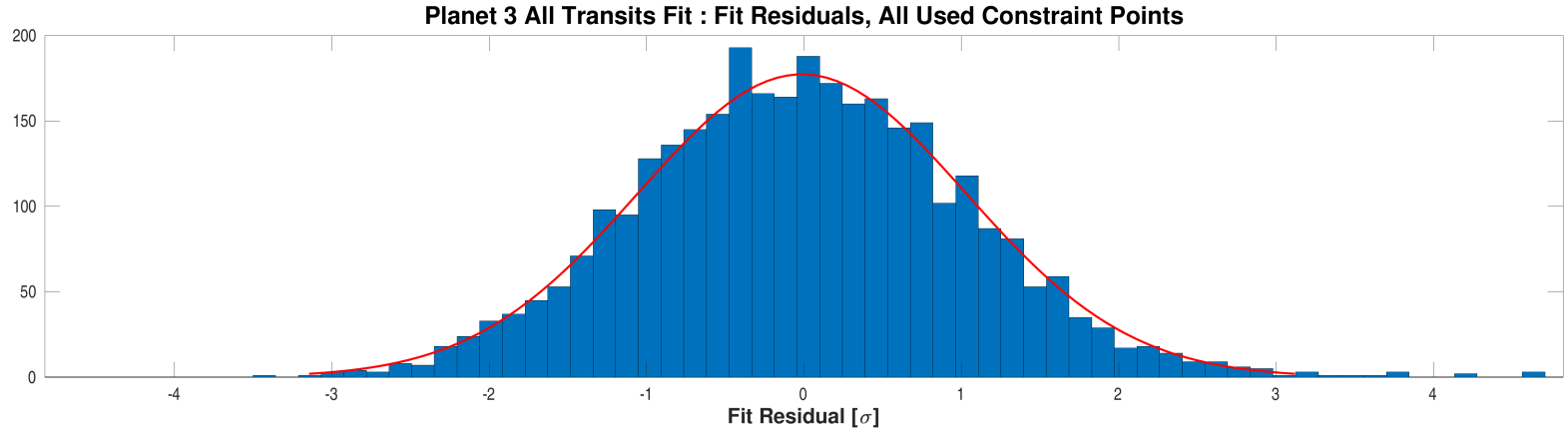
Top-left: Diagnostic plot of Odd/Even Transit Depth Test for catId 149603524, planet 2. A significance level close to 1/0 favors a transiting planet/an eclipsing binary. Top-right: Diagnostic plot of Orbital Period Test for catId 149603524. Orbital periods of planet 2 and the planet with shorter period are compared. A significance level close to 1/0 favors a transiting planet/an eclipsing binary. Bottom-left: Diagnostic plot of Orbital Period Test for catId 149603524. Orbital periods of planet 2 and the planet with longer period are compared. A significance level close to 1/0 favors a transiting planet/an eclipsing binary.
Open `./planet-02/binary-discrimination-test-results/0000000149603524-02-eclipsing-binary-discrimination-tests.fig`

Appendix C Planet Candidate 3

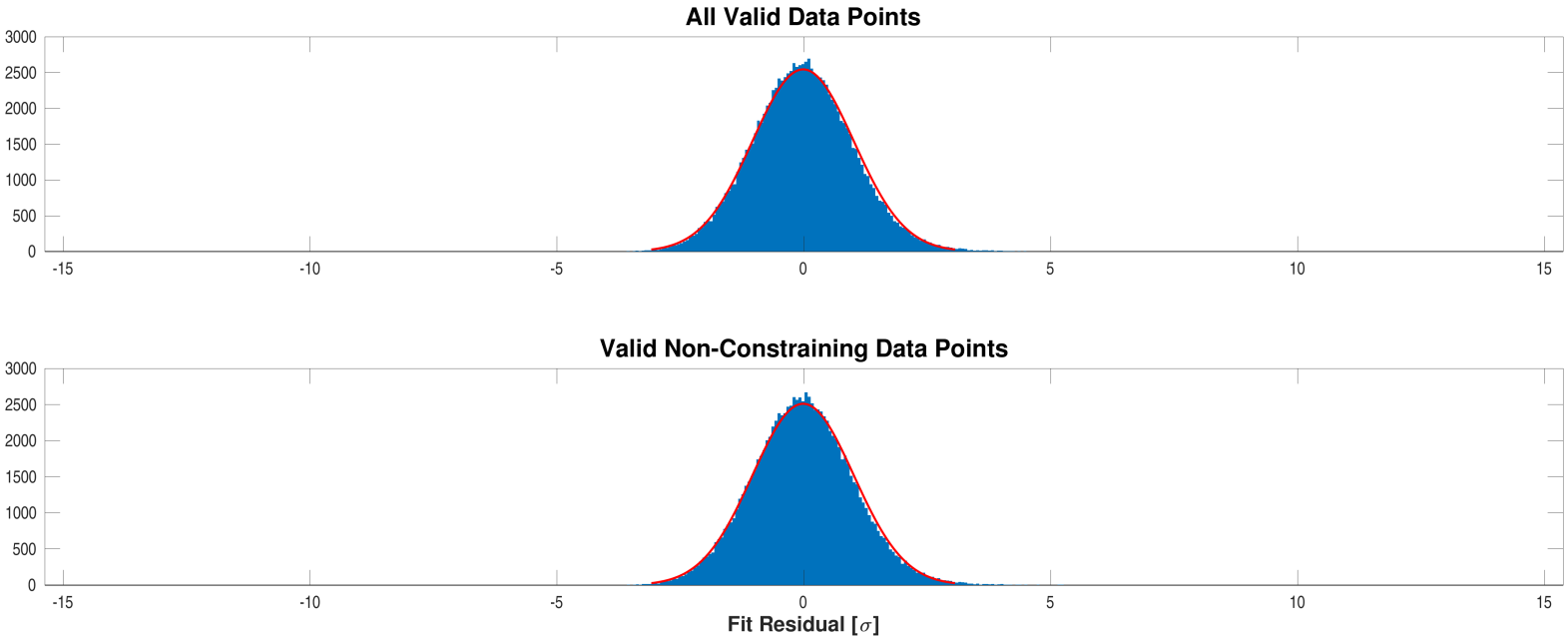
C.1 Model Fitter: All Transits



Robust weights distribution for CatId 149603524, Planet candidate 3. 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-03/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-03-all-robust-weights.fig`



Fit residuals distribution for CatId 149603524, Planet candidate 3. 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-03/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-03-all-histo-used.fig`

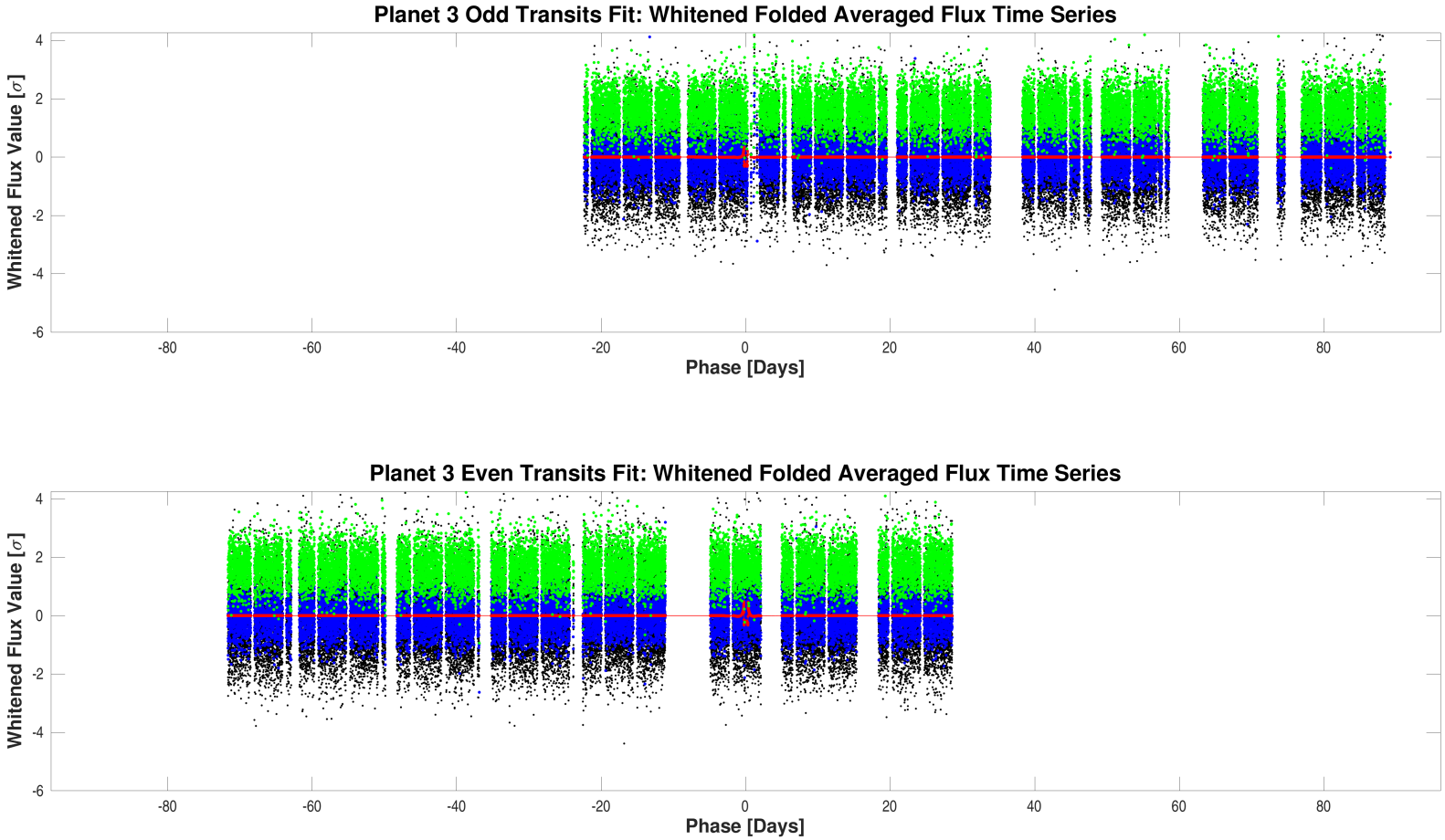


Fit residuals distribution for CatId 149603524, Planet candidate 3. Top plot: all valid data. Bottom plot: valid data not used to constrain fit (due to distance from a transit). Gaussian fits to the histograms are shown in red.
Open `./planet-03/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-03-all-histo-all-and-unused.fig`

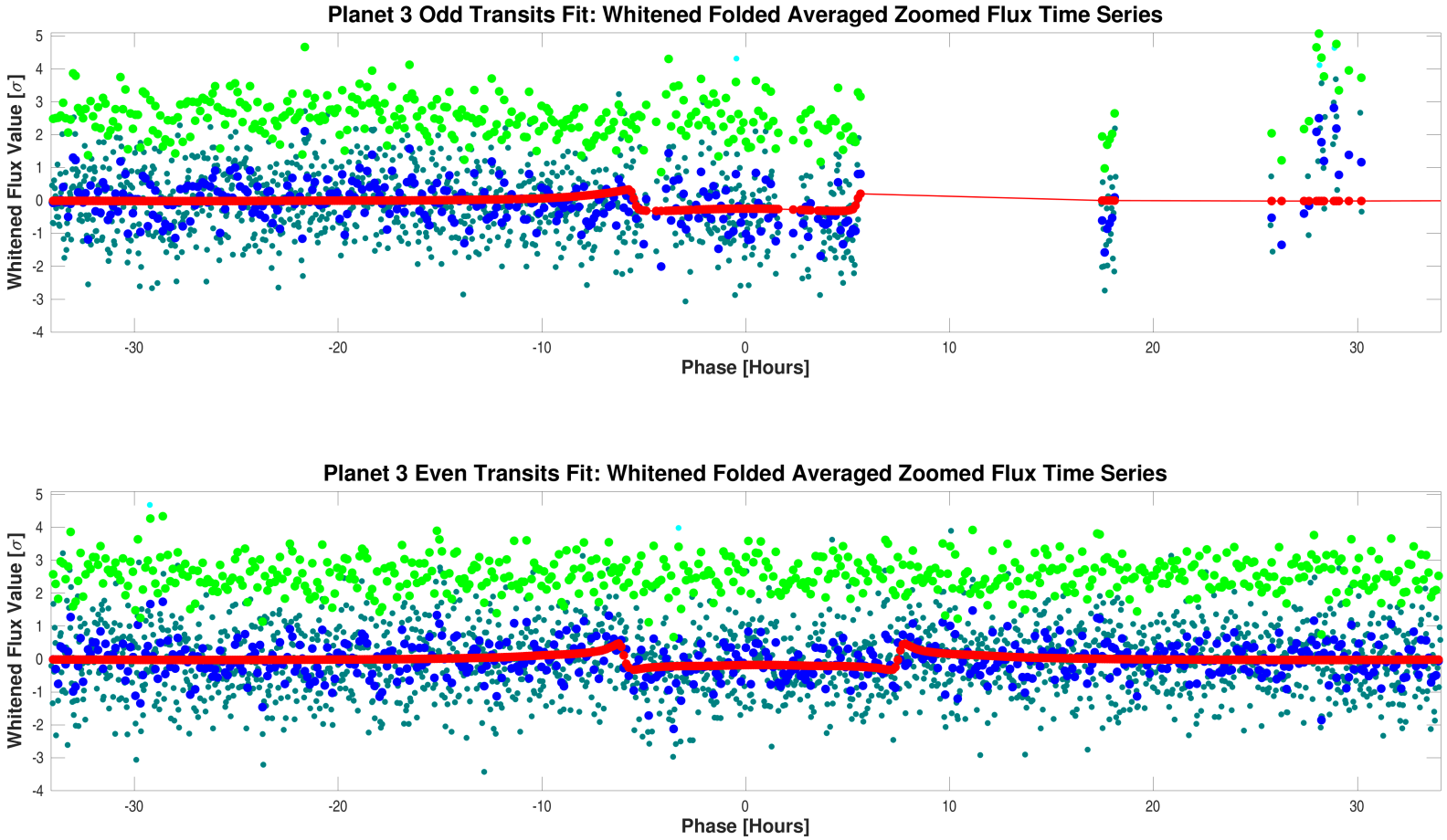
C.2 Model Fitter: Odd & Even Transits

Parameter	Odd Transits Value	Odd Transits Uncertainty	Even Transits Value	Even Transits Uncertainty	Units	Difference / Uncertainty
SNR	4.5		5.6			
Orbital Period	192.2502245	0.0000e+00	192.2502245	0.0000e+00	days	
Transit Epoch	1347.6594517	5.8559e-03	1539.9413951	4.5909e-03	BTJD	4.1571e+00
Impact Parameter	0.3433	2.8227e+00	0.0633	9.5002e+00		2.8254e-02
Planet Radius to Star Radius Ratio	0.0275217	5.9911e-03	0.0330067	4.6398e-03		7.2383e-01
Semi-major Axis to Star Radius Ratio	125.1967	1.3764e+02	108.4267	6.5314e+01		1.1008e-01
Planet Radius	3.8458	8.3718e-01	4.6123	6.4836e-01	Earth radii	7.2383e-01
Semi-major Axis	0.7028	0.0000e+00	0.7028	0.0000e+00	AU	
Effective Stellar Flux	4.6223	0.0000e+00	4.6223	0.0000e+00	Goldilocks	
Equilibrium Temperature	374	0.0000e+00	374	0.0000e+00	Kelvin	
Stellar Density	0.7133	2.3526e+00	0.4634	8.3734e-01	Solar density	1.0010e-01
Transit Depth	856	1.9422e+02	1255	2.3027e+02	ppm	1.3243e+00
Transit Duration	11.3615	8.6616e-01	13.9665	6.1003e-01	hours	2.4588e+00
Transit Ingress Duration	0.3438	8.2083e-01	0.4480	5.8980e-01	hours	1.0312e-01
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)	2582.3 (2934.8)		2582.3 (2934.8)			

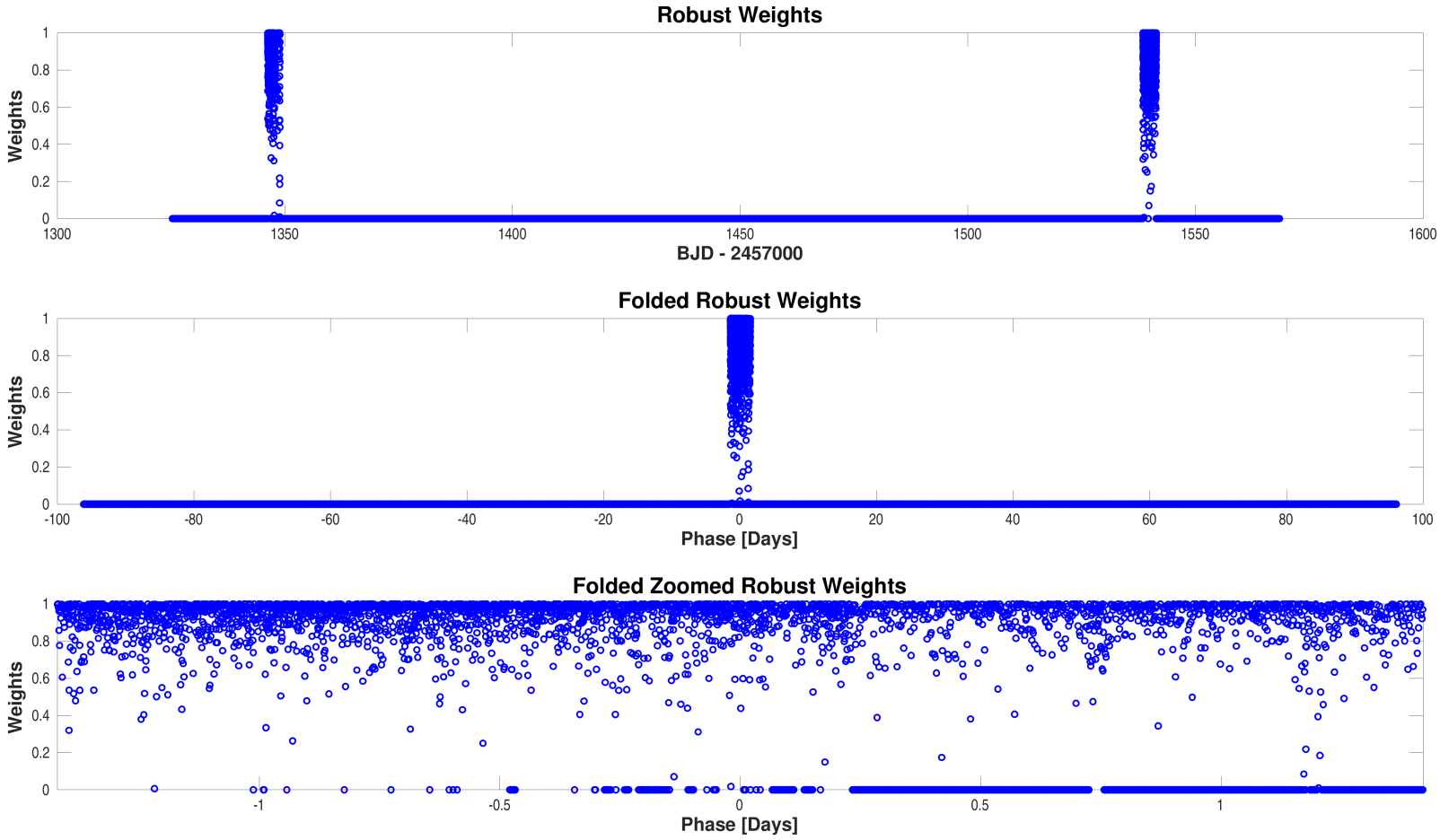
DoF: Degrees of Freedom



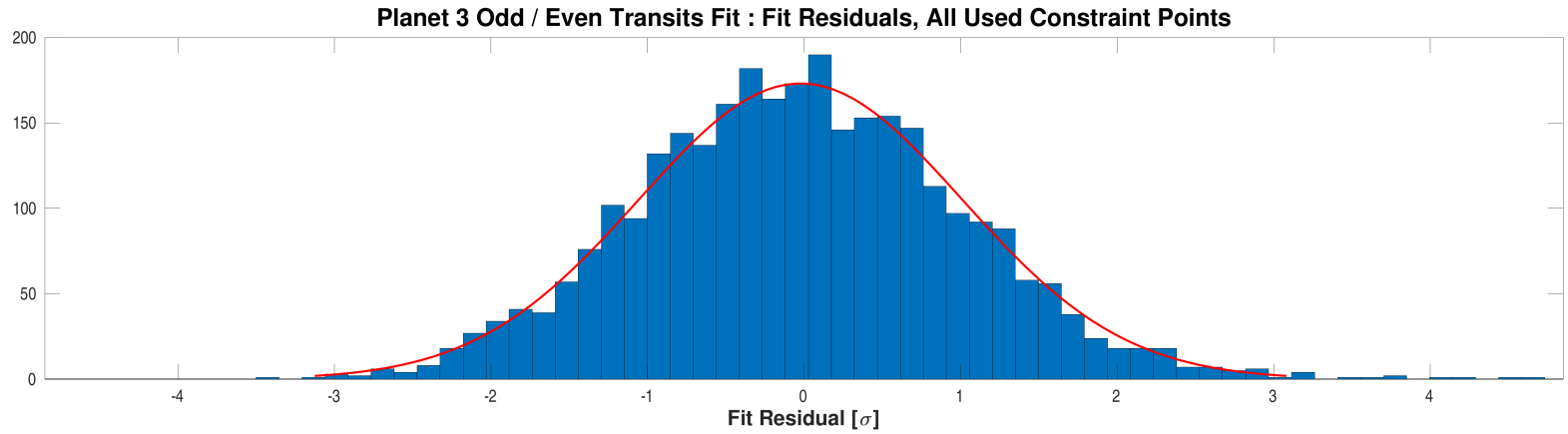
Folded flux time series for CatId 149603524, Planet candidate 3 in the whitened domain is plotted in black dots. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged values of the folded flux time series; the red dots represent the averaged values of the folded model light 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-03/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000149603524-03-odd-even-whitened.fig`



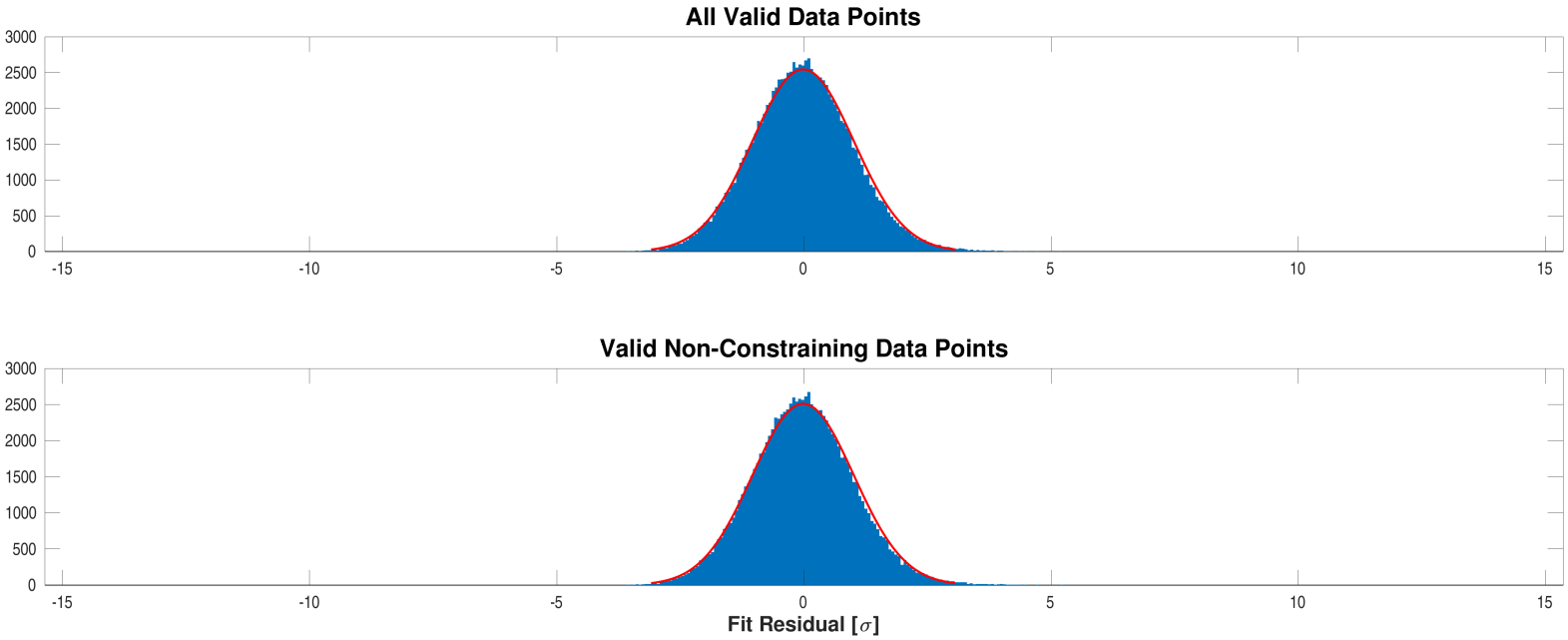
Folded flux time series for CatId 149603524, Planet candidate 3 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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-03/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000149603524-03-odd-even-whitened-zoomed.fig`



Robust weights distribution for CatId 149603524, Planet candidate 3. 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-03/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000149603524-03-odd-even-robust-weights.fig`

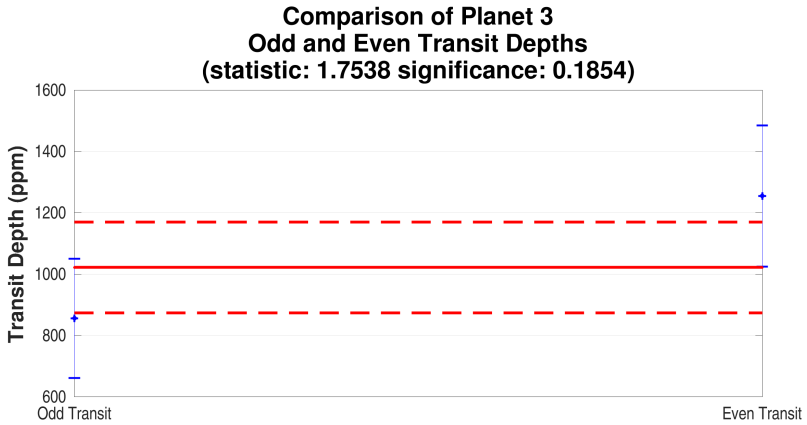


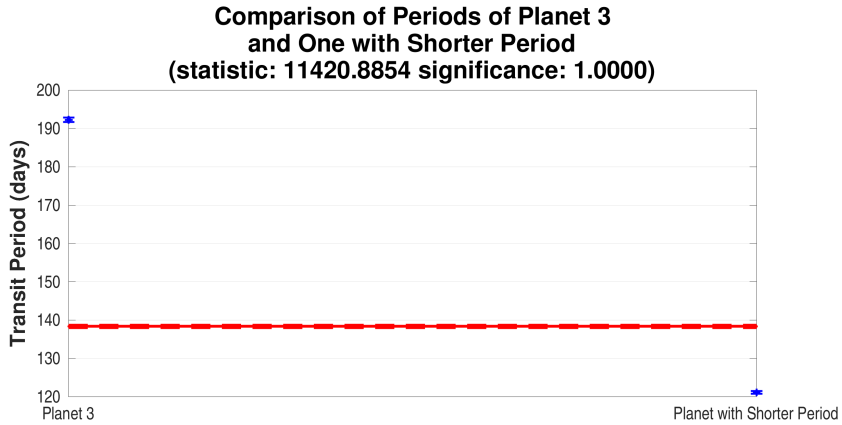
Fit residuals distribution for CatId 149603524, Planet candidate 3. Only the valid data points used to constrain the fit are shown here. A Gaussian fit to the histogram is shown in red.
Open `./planet-03/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000149603524-03-odd-even-histo-used.fig`



Fit residuals distribution for CatId 149603524, Planet candidate 3. 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-03/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000149603524-03-odd-even-histo-all-and-unused.fig`

C.3 Eclipsing Binary Discrimination Test

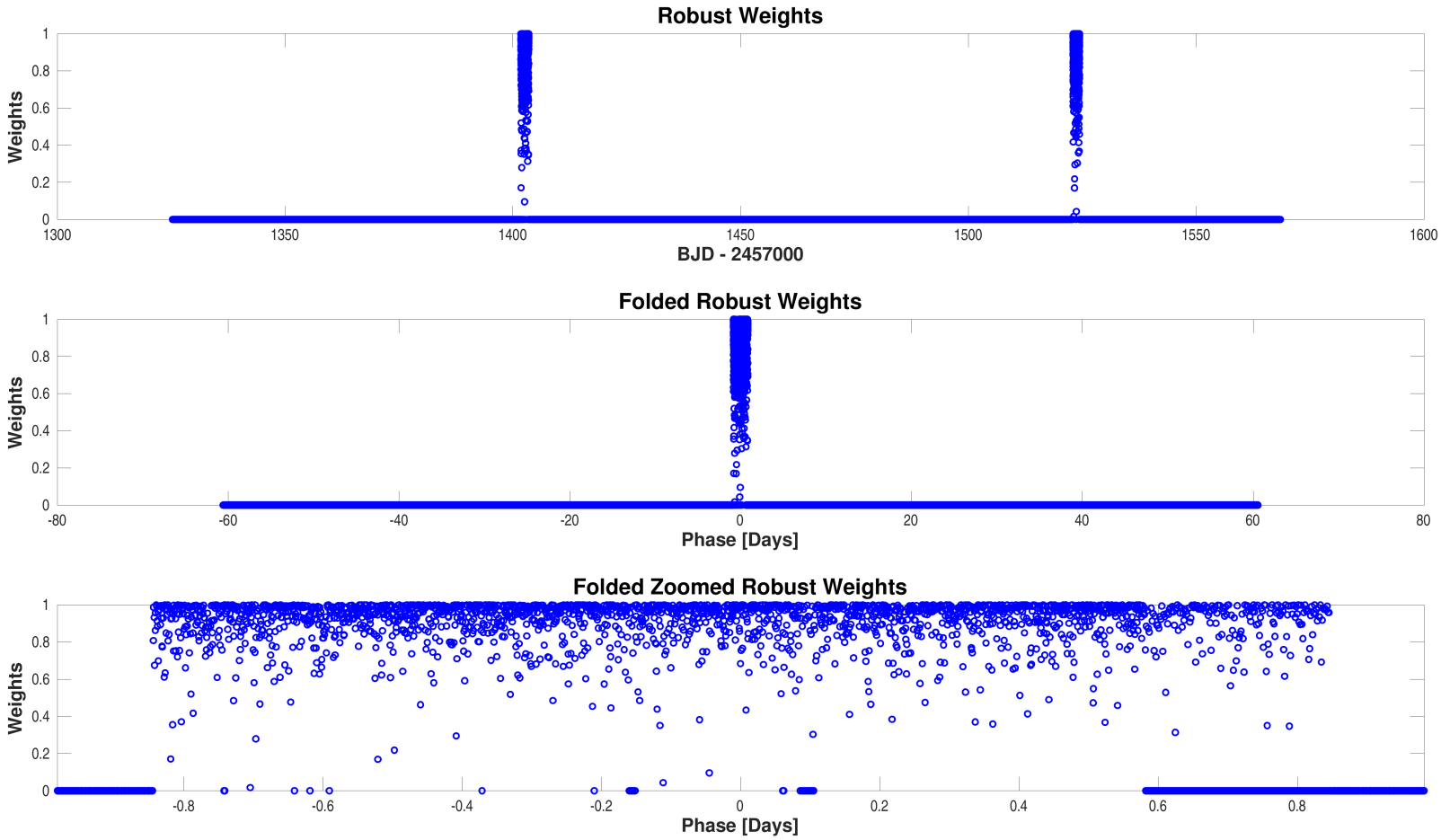




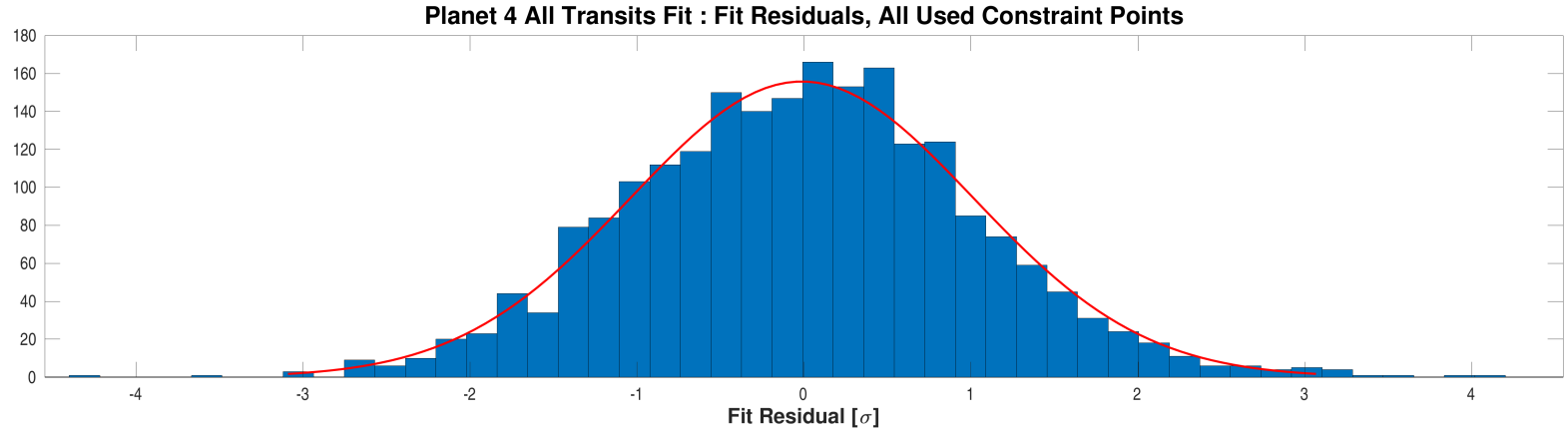
Top-left: Diagnostic plot of Odd/Even Transit Depth Test for catId 149603524, planet 3. A significance level close to 1/0 favors a transiting planet/an eclipsing binary. Top-right: Diagnostic plot of Orbital Period Test for catId 149603524. Orbital periods of planet 3 and the planet with shorter period are compared. A significance level close to 1/0 favors a transiting planet/an eclipsing binary.
Open `./planet-03/binary-discrimination-test-results/0000000149603524-03-eclipsing-binary-discrimination-tests.fig`

Appendix D Planet Candidate 4

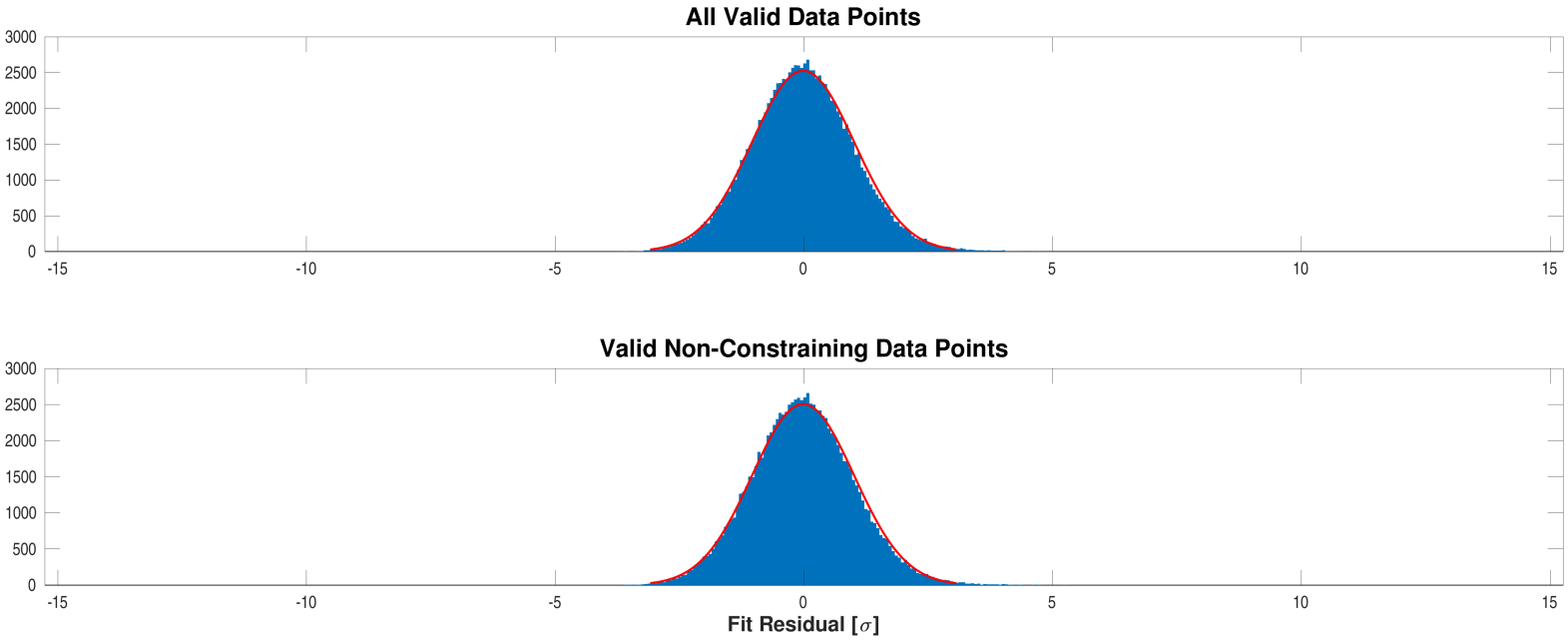
D.1 Model Fitter: All Transits



Robust weights distribution for CatId 149603524, Planet candidate 4. 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-04/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-04-all-robust-weights.fig`



Fit residuals distribution for CatId 149603524, Planet candidate 4. 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-04/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-04-all-histo-used.fig`

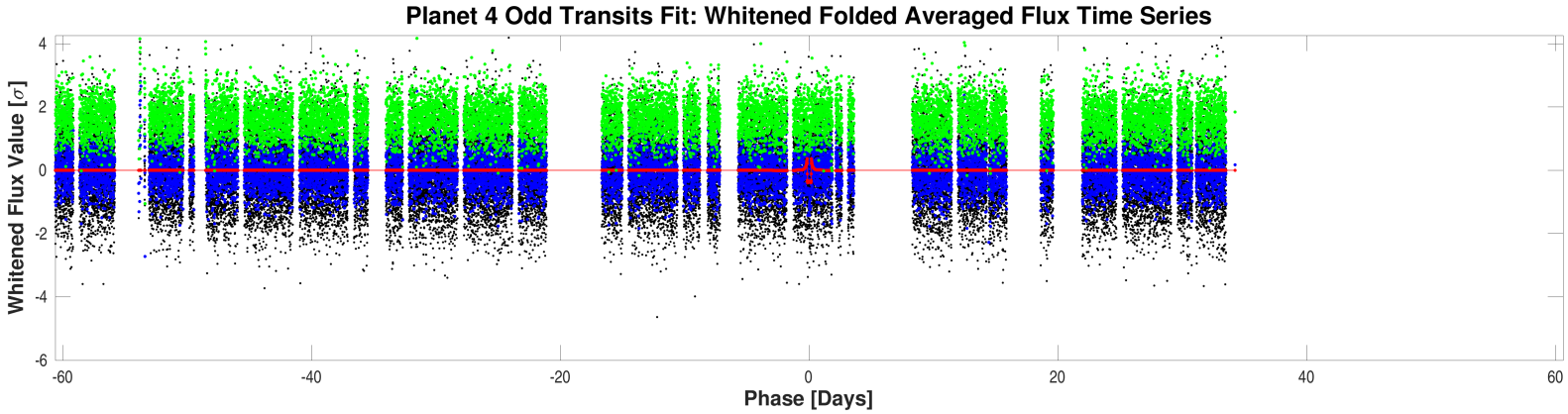


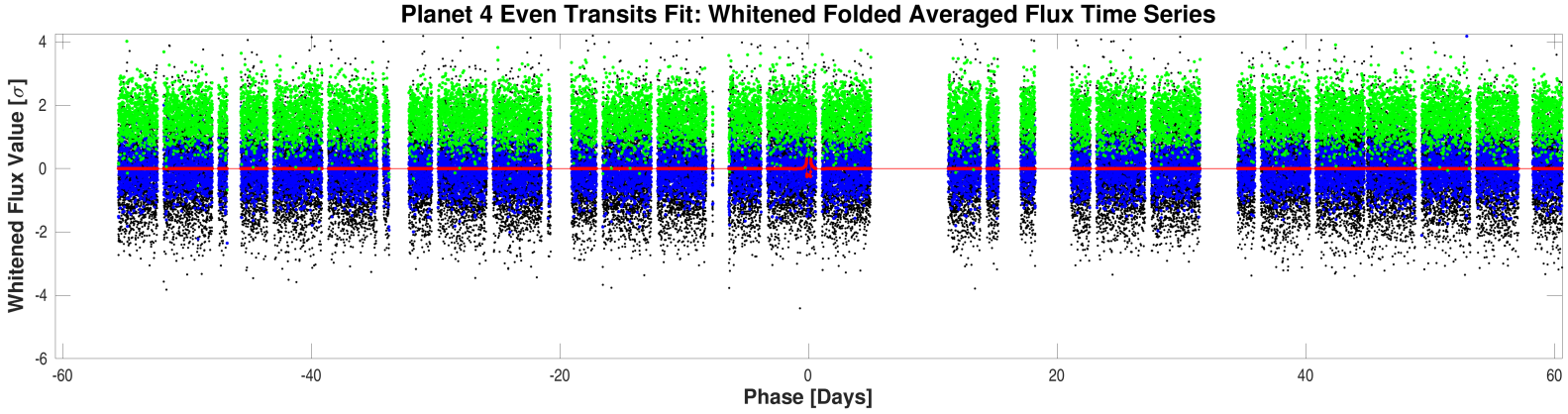
Fit residuals distribution for CatId 149603524, Planet candidate 4. Top plot: all valid data. Bottom plot: valid data not used to constrain fit (due to distance from a transit). Gaussian fits to the histograms are shown in red.
Open `./planet-04/planet-search-and-model-fitting-results/all-transits-fit/0000000149603524-04-all-histo-all-and-unused.fig`

D.2 Model Fitter: Odd & Even Transits

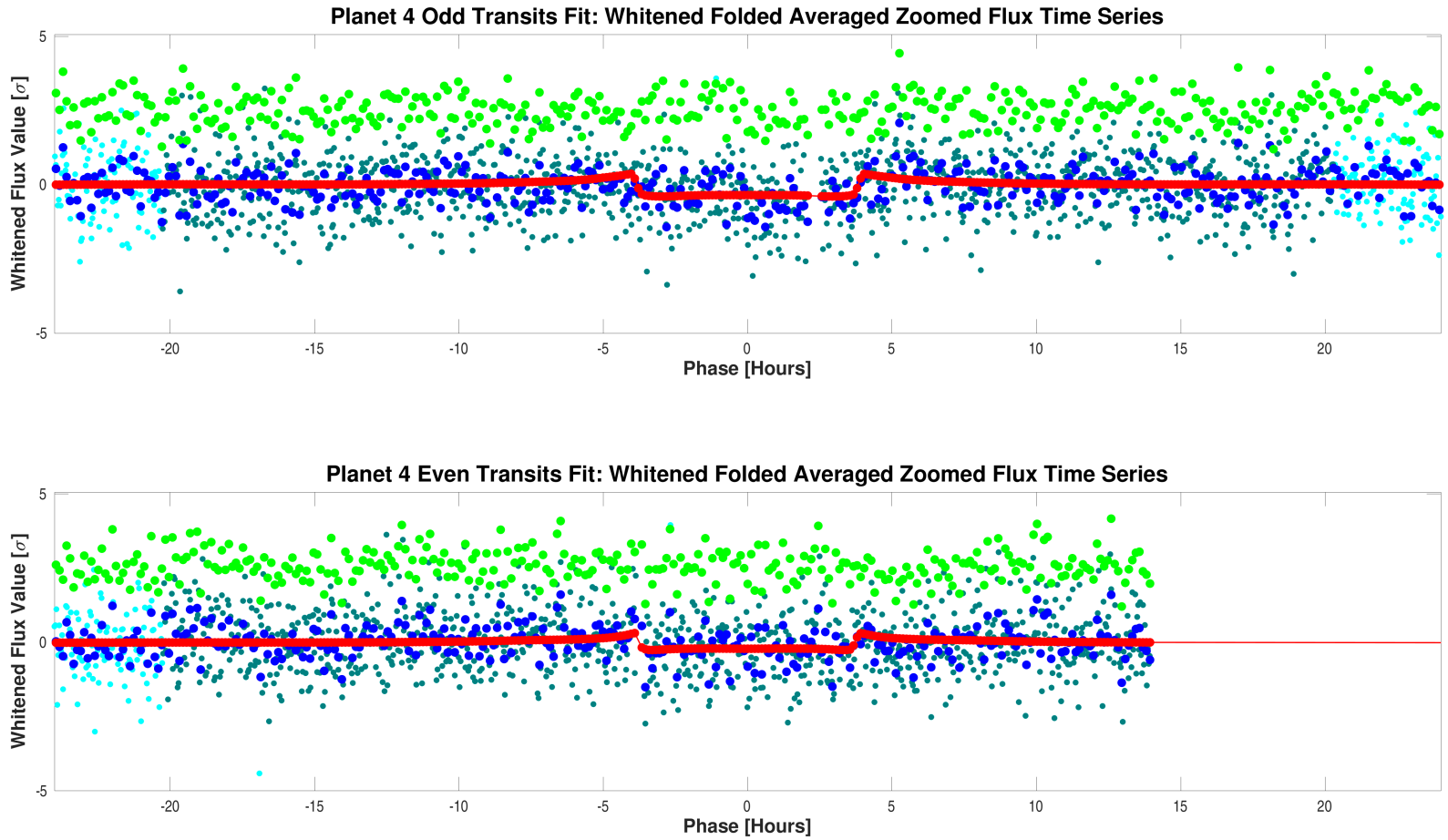
Parameter	Odd Transits Value	Odd Transits Uncertainty	Even Transits Value	Even Transits Uncertainty	Units	Difference / ‖Uncertainty‖
SNR	5.9		3.8			
Orbital Period	121.1686197	0.0000e+00	121.1686197	0.0000e+00	days	
Transit Epoch	1402.6192038	4.2473e-03	1523.7884928	1.1175e-02	BTJD	3.1990e-02
Impact Parameter	0.4688	1.4125e+00	0.4917	2.4133e+00		8.1705e-03
Planet Radius to Star Radius Ratio	0.0292553	4.8744e-03	0.0264672	7.6239e-03		3.0812e-01
Semi-major Axis to Star Radius Ratio	105.9954	8.9712e+01	107.8530	1.7070e+02		9.6327e-03
Planet Radius	4.0881	6.8114e-01	3.6985	1.0653e+00	Earth radii	3.0812e-01
Semi-major Axis	0.5166	0.0000e+00	0.5166	0.0000e+00	AU	
Effective Stellar Flux	8.5537	0.0000e+00	8.5537	0.0000e+00	Goldilocks	
Equilibrium Temperature	436	0.0000e+00	436	0.0000e+00	Kelvin	
Stellar Density	1.0897	2.7670e+00	1.1480	5.4510e+00	Solar density	9.5373e-03
Transit Depth	948	1.6208e+02	773	2.0168e+02	ppm	6.7894e-01
Transit Duration	8.0022	5.4363e-01	7.7336	1.1264e+00	hours	2.1470e-01
Transit Ingress Duration	0.2893	5.3279e-01	0.2609	8.8929e-01	hours	2.7382e-02
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)	1704.0 (2012.1)		1704.0 (2012.1)			

DoF: Degrees of Freedom

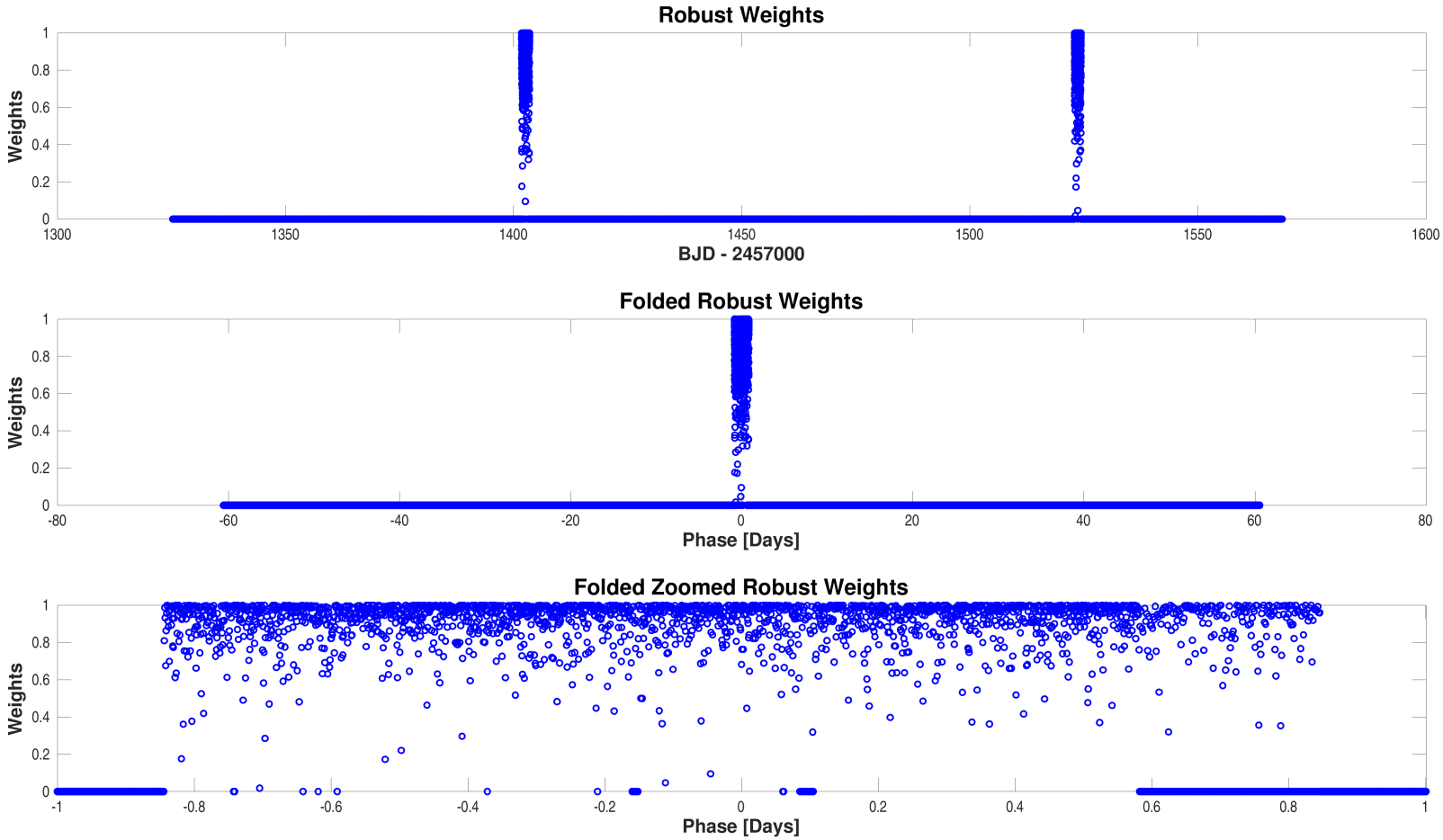




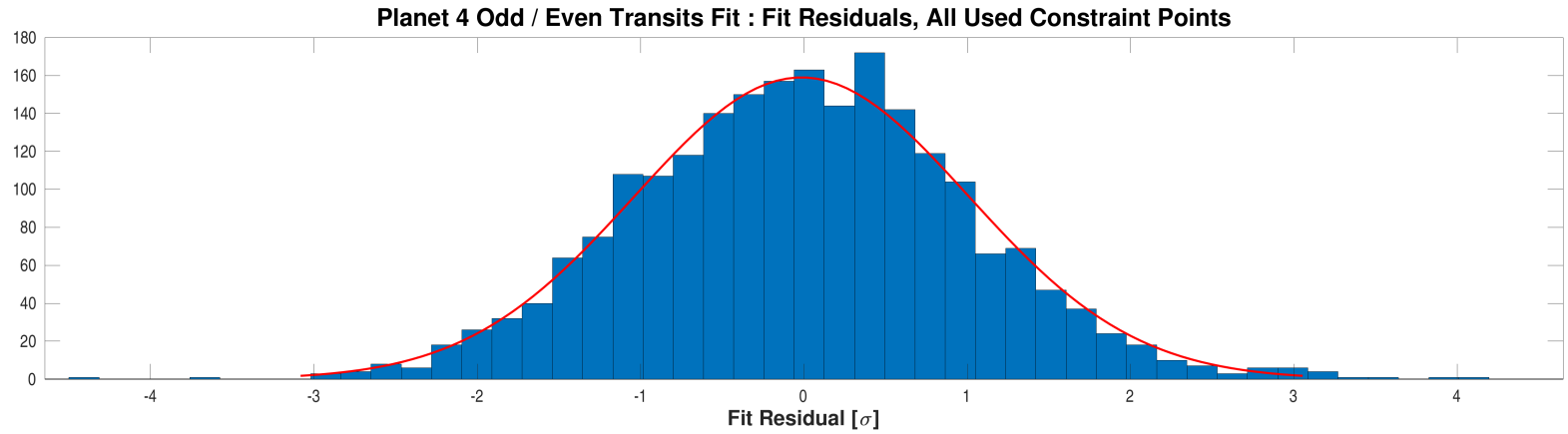
Folded flux time series for CatId 149603524, Planet candidate 4 in the whitened domain is plotted in black dots. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged values of the folded flux time series; the red dots represent the averaged values of the folded model light 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-04/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000149603524-04-odd-even-whitened.fig`



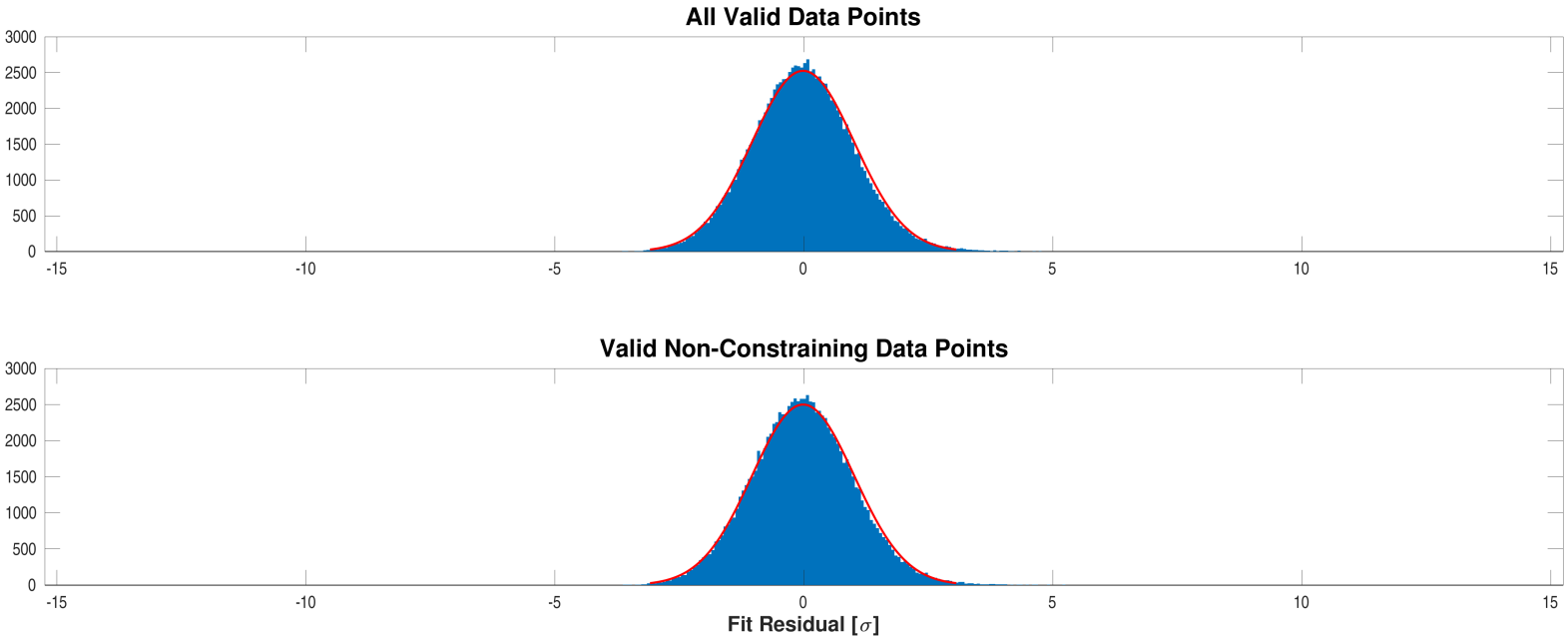
Folded flux time series for CatId 149603524, Planet candidate 4 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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-04/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000149603524-04-odd-even-whitened-zoomed.fig`



Robust weights distribution for CatId 149603524, Planet candidate 4. 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-04/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000149603524-04-odd-even-robust-weights.fig`

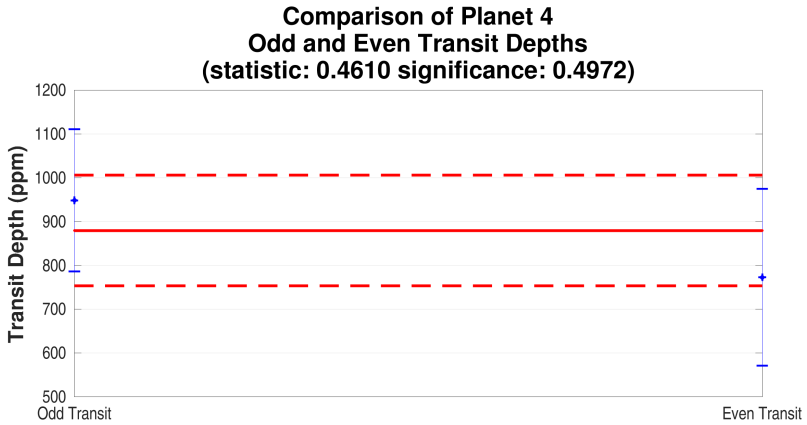


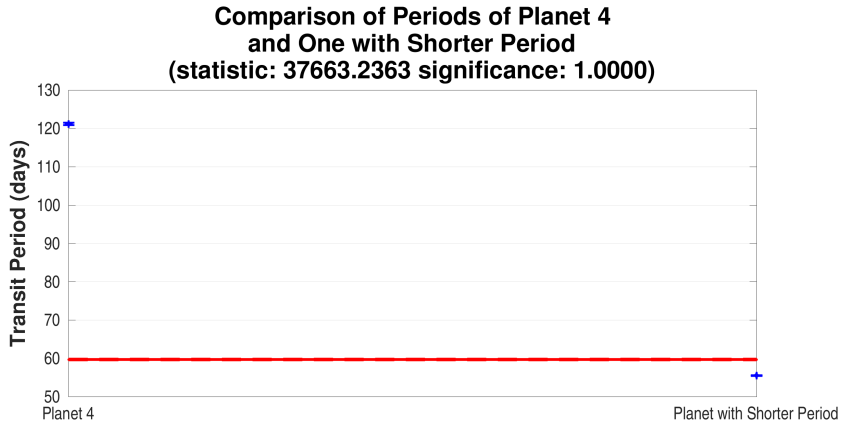
Fit residuals distribution for CatId 149603524, Planet candidate 4. Only the valid data points used to constrain the fit are shown here. A Gaussian fit to the histogram is shown in red.
Open `./planet-04/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000149603524-04-odd-even-histo-used.fig`

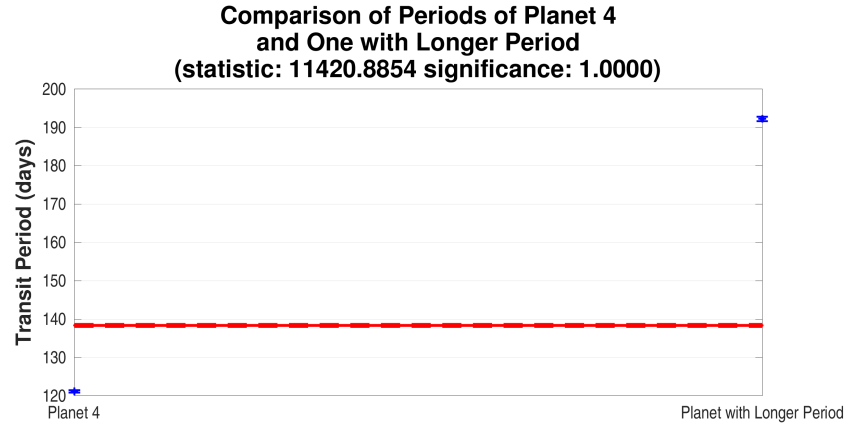


Fit residuals distribution for CatId 149603524, Planet candidate 4. Top plot: all valid data. Bottom plot: valid data not used to constrain fit (due to distance from a transit). Gaussian fits to the histograms are shown in red.
Open `./planet-04/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000149603524-04-odd-even-histo-all-and-unused.fig`

D.3 Eclipsing Binary Discrimination Test







Top-left: Diagnostic plot of Odd/Even Transit Depth Test for catId 149603524, planet 4. A significance level close to 1/0 favors a transiting planet/an eclipsing binary. Top-right: Diagnostic plot of Orbital Period Test for catId 149603524. Orbital periods of planet 4 and the planet with shorter period are compared. A significance level close to 1/0 favors a transiting planet/an eclipsing binary. Bottom-left: Diagnostic plot of Orbital Period Test for catId 149603524. Orbital periods of planet 4 and the planet with longer period are compared. A significance level close to 1/0 favors a transiting planet/an eclipsing binary.
Open `./planet-04/binary-discrimination-test-results/0000000149603524-04-eclipsing-binary-discrimination-tests.fig`

Appendix E Alerts

Time	Severity	Message
1609.4200	warning	Not excluding transits that overlap those of another candidate in S7 (target=1, catId=149603524, planet=2, targetTable=145, component=generateDvDifferenceImages)
1609.4214	warning	Difference image cannot be generated because there were no clean transits for this planet candidate and target pixel table (target=1, catId=149603524, planet=2, targetTable=128, component=generateDvDifferenceImages)
1609.4220	warning	Difference image cannot be generated because there were no clean transits for this planet candidate and target pixel table (target=1, catId=149603524, planet=3, targetTable=128, component=generateDvDifferenceImages)
1609.4226	warning	Difference image cannot be generated because there were no transits for this planet candidate and target pixel table (target=1, catId=149603524, planet=4, targetTable=128, component=generateDvDifferenceImages)
1609.4241	warning	Difference image cannot be generated because there were no transits for this planet candidate and target pixel table (target=1, catId=149603524, planet=2, targetTable=129, component=generateDvDifferenceImages)
1609.4247	warning	Difference image cannot be generated because there were no transits for this planet candidate and target pixel table (target=1, catId=149603524, planet=3, targetTable=129, component=generateDvDifferenceImages)
1609.4253	warning	Difference image cannot be generated because there were no transits for this planet candidate and target pixel table (target=1, catId=149603524, planet=4, targetTable=129, component=generateDvDifferenceImages)
1609.4266	warning	Difference image cannot be generated because there were no transits for this planet candidate and target pixel table (target=1, catId=149603524, planet=3, targetTable=131, component=generateDvDifferenceImages)
1609.4280	warning	Difference image cannot be generated because there were no transits for this planet candidate and target pixel table (target=1, catId=149603524, planet=2, targetTable=135, component=generateDvDifferenceImages)
1609.4285	warning	Difference image cannot be generated because there were no transits for this planet candidate and target pixel table (target=1, catId=149603524, planet=3, targetTable=135, component=generateDvDifferenceImages)
1609.4289	warning	Difference image cannot be generated because there were no transits for this planet candidate and target pixel table (target=1, catId=149603524, planet=4, targetTable=135, component=generateDvDifferenceImages)
1609.4301	warning	Difference image cannot be generated because there were no transits for this planet candidate and target pixel table (target=1, catId=149603524, planet=2, targetTable=141, component=generateDvDifferenceImages)
1609.4306	warning	Difference image cannot be generated because there were no transits for this planet candidate and target pixel table (target=1, catId=149603524, planet=3, targetTable=141, component=generateDvDifferenceImages)
1609.4311	warning	Difference image cannot be generated because there were no transits for this planet candidate and target pixel table (target=1, catId=149603524, planet=4, targetTable=141, component=generateDvDifferenceImages)
1609.4327	warning	Difference image cannot be generated because there were no transits for this planet candidate and target pixel table (target=1, catId=149603524, planet=3, targetTable=145, component=generateDvDifferenceImages)
1609.4332	warning	Difference image cannot be generated because there were no transits for this planet candidate and target pixel table (target=1, catId=149603524, planet=4, targetTable=145, component=generateDvDifferenceImages)
1609.4338	warning	Difference image cannot be generated because there were no transits for this planet candidate and target pixel table (target=1, catId=149603524, planet=2, targetTable=148, component=generateDvDifferenceImages)
1609.4351	warning	Difference image cannot be generated because there were no transits for this planet candidate and target pixel table (target=1, catId=149603524, planet=2, targetTable=152, component=generateDvDifferenceImages)
1609.4357	warning	Difference image cannot be generated because there were no transits for this planet candidate and target pixel table (target=1, catId=149603524, planet=3, targetTable=152, component=generateDvDifferenceImages)

Time	Severity	Message
1609.4362	warning	Difference image cannot be generated because there were no transits for this planet candidate and target pixel table (target=1, catId=149603524, planet=4, targetTable=152, component=generateDvDifferenceImages)