Data Validation (DV) Report
for TESS ID 299096355
Sectors 14 - 26

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

03-Aug-2020 07:39:10 Z

Contents

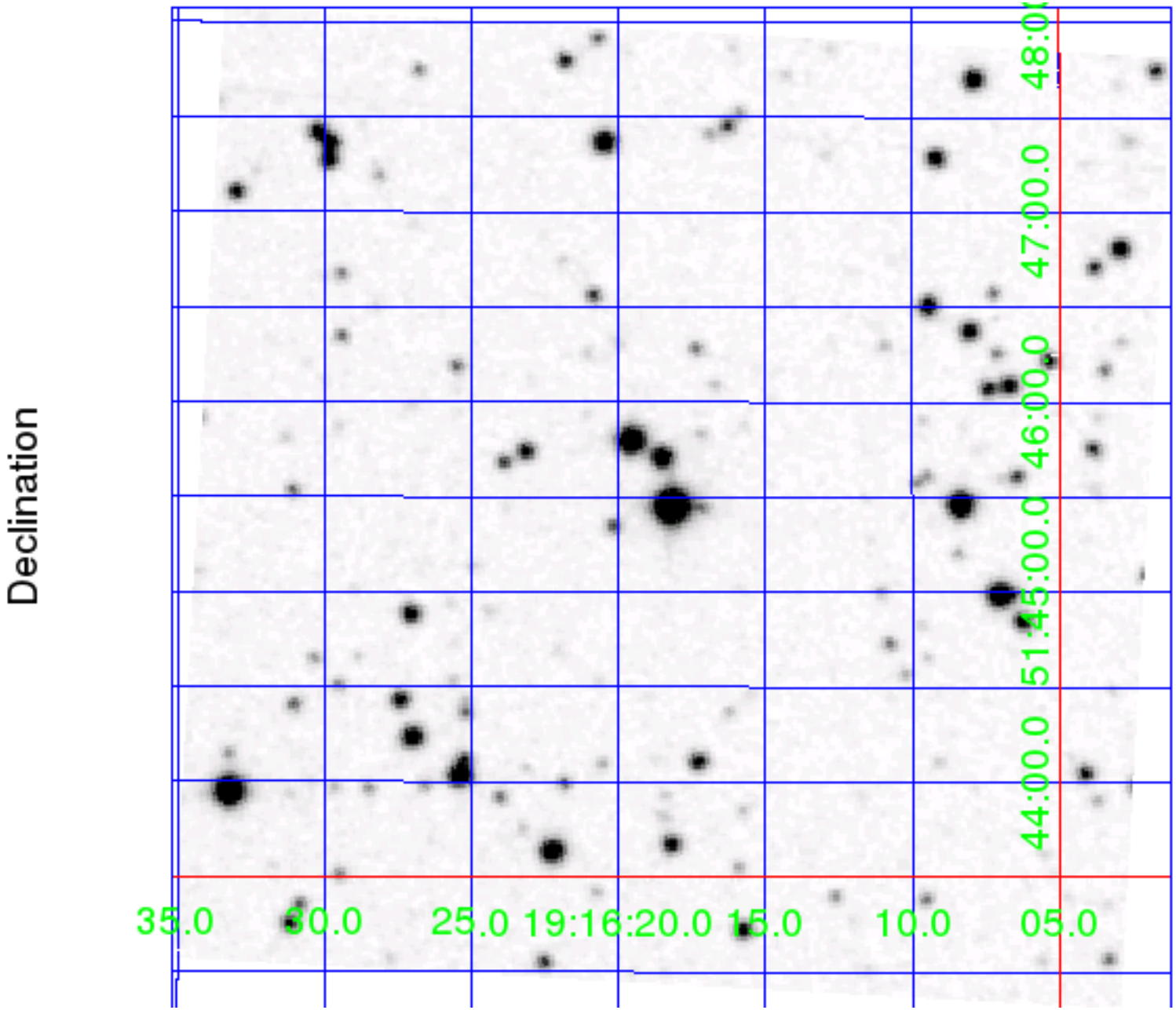
1 Summary

Target Properties	Value	Uncertainty	Units	Provenance
Catalog ID	299096355			
TOI ID	-			
TESS Name	-			
RA	289.07573299	0	degrees	TIC8
Dec	51.75743827	0	degrees	TIC8
Magnitude	10.9438	0.006		TIC8
Radius	0.769	0.071	Solar radii	TIC8
Effective Temperature	4018	111	Kelvin	TIC8
log(g)	4.466	0.10967	cm/sec^2	TIC8
[M/H]	-0.124	0.059	Solar metallicity	TIC8
Stellar Density	1.388	0.373	Solar density	TIC8-Derived
Limb Darkening Coefficient 1	0.66933			
Limb Darkening Coefficient 2	-0.0059595			
Limb Darkening Coefficient 3	0.14892			
Limb Darkening Coefficient 4	-0.047024			
Number of Planet Candidates	2			
TOI Model	csv-file-toi-catalog-07-29-20-edited.csv			
TESS Names Model	-			
External TCE Model	-			
Software Revision	spoc-5.0.5-20200728			
Date Report Generated	03-Aug-2020 07:39:10 Z			

Sector	Target Table	Camera/ CCD	Crowding Metric	Flux Fraction
14	167	2:4	0.8693	0.8323
15	169	2:2	0.8449	0.8461
26	254	2:1	0.8908	0.8213

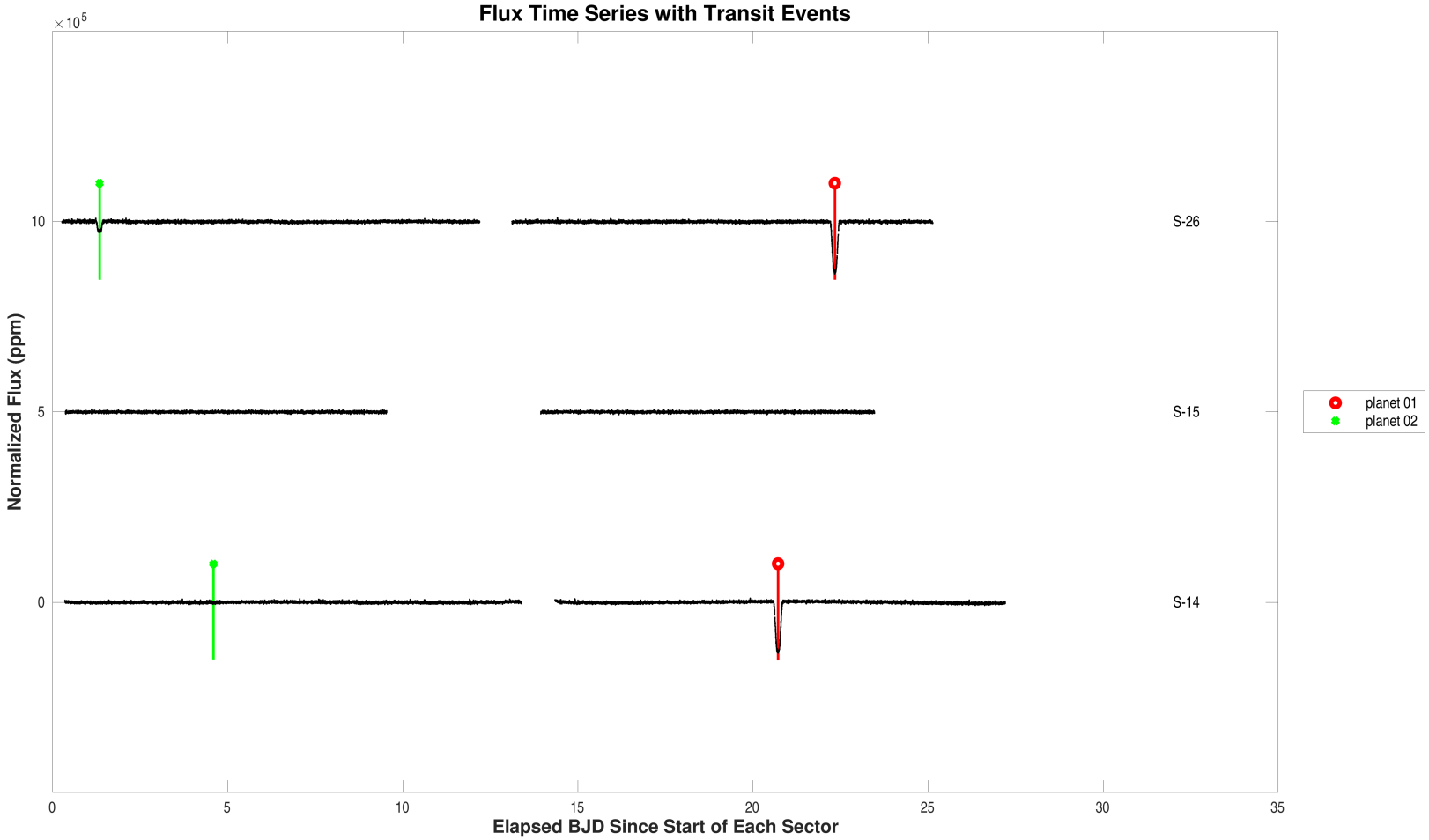
Planet Candidate	TOI ID	TESS Name	TOI Correlation	Period (days)	Period Ratio	Epoch (BTJD)	Semi-major Axis (AU)	Radius (Re)	Seff	Teq (K)	False Alarm	Suspected EB
1	-	-	-	328.621	1.02	1703.719	0.80	29.2	0.2	174	0.00e+00	false
2	-	-	-	323.749	1.00	1687.591	0.79	13.1	0.2	175	1.96e-156	false

2 Survey Image

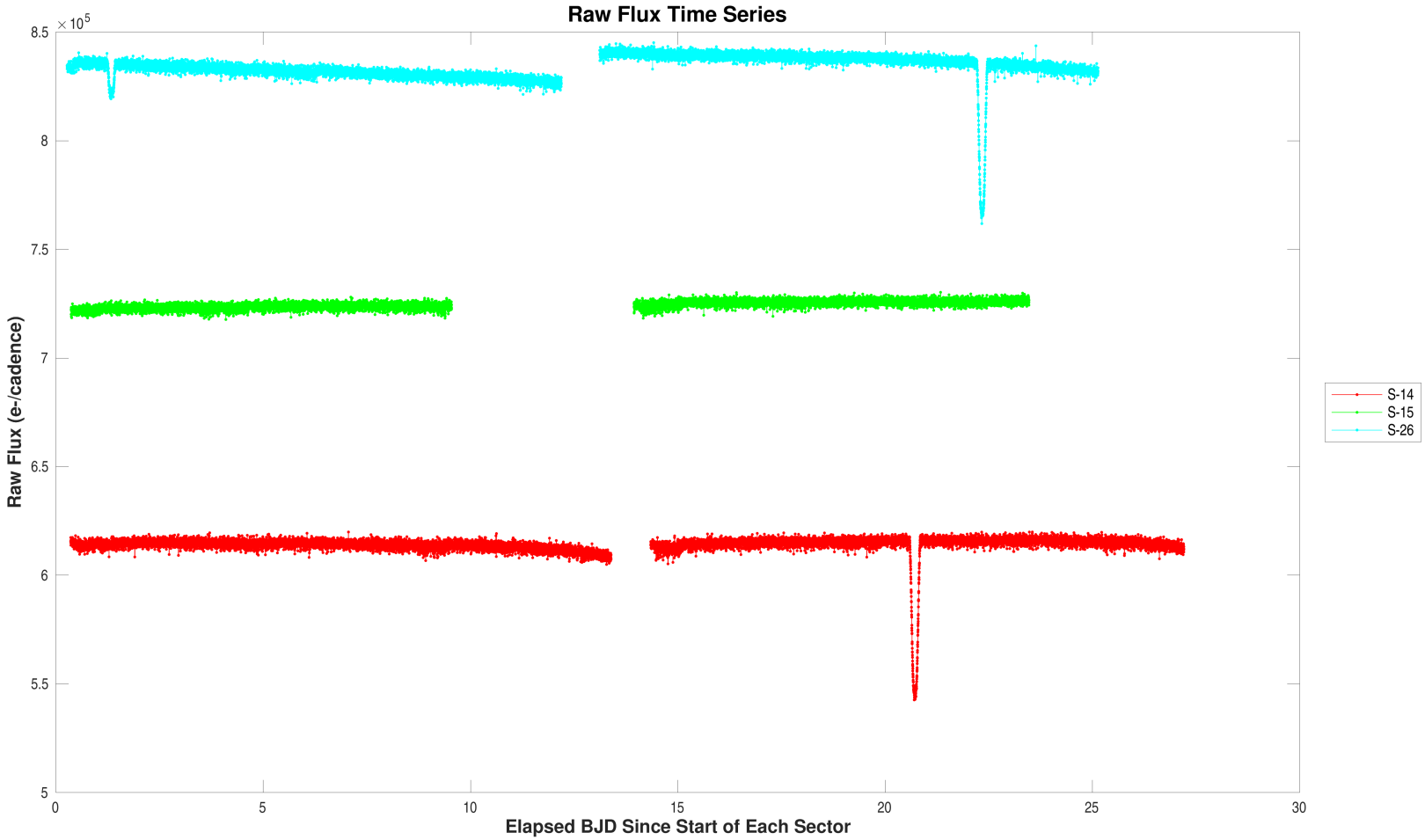


Digitized Sky Survey (DSS) red image. The 5' x 5' image is centered on the J2000 coordinates of target (299096355).

3 Flux Time Series



Summary plot of sector-stitched flux time series and transits for target 299096355, marked with DV fitted epoch/period (or TPS epoch/period if fit was not successful). Transits of identified planets are labeled with epoch BTJD and orbital period. For the data of sector 14, target table 167, start BJD is 2458683 and the vertical offset is 0 ppm. For the data of sector 15, target table 169, start BJD is 2458711 and the vertical offset is 500000 ppm. For the data of sector 26, target table 254, start BJD is 2459010 and the vertical offset is 1000000 ppm.
Open `./summary-plots/0000000299096355-00-flux-dv-fit-14-167.fig`



Summary plot of raw flux time series. For the data of sector 14, target table 167, start BJD is 2458683 and the vertical offset is 0 electrons/cadence. For the data of sector 15, target table 169, start BJD is 2458711 and the vertical offset is 110000 electrons/cadence. For the data of sector 26, target table 254, start BJD is 2459010 and the vertical offset is 220000 electrons/cadence.
Open `./summary-plots/0000000299096355-00-raw-flux-14-167.fig`

4 Dashboards

Planet Candidate 1

<table>
<tr><td rowspan="2">Model Fitter</td><td colspan="2">Stellar Radius
0.8 ± 0.1 Solar units</td><td rowspan="2">Core Aperture Correlation Statistic
Value = 319.56
Significance = 100.00%
Halo Aperture Correlation Statistic
Value = 68.04
Significance = 100.00%
Core/Halo Ratio
Ratio = 4.70</td><td rowspan="2">Ghost Diagnostic Test</td></tr>
<tr><td colspan="2">Period = 328.6 ± 0.0 days
Depth = 132365 ± 286 ppm
Planet Radius = 29.2 ± 2.7 Earth radii
Semi-major Axis = 0.8 ± 0.1 AU
Effective Stellar Flux = 0.2 ± 0.0
Equilibrium Temperature = 174 ± 9 Kelvin
Chi-squared/DoF = 0.8
SNR = 515.1</td></tr>
<tr><td rowspan="2">Eclipsing Binary Discrimination Test</td><td colspan="2">Odd-Even Depth Comparison Statistic
Value = 3.41e-01
Significance = 55.93%</td><td>Offsets Relative to Out of Transit Centroid
Source RA Offset = -1.53e+00 ± 2.50e+00 arcsec (-0.61 σ)
Source Dec Offset = -2.12e+00 ± 2.58e+00 arcsec (-0.82 σ)
Source Offset Distance = 2.61e+00 ± 2.57e+00 arcsec (1.02 σ)
Offsets Relative to TIC Position
Source RA Offset = 8.91e-01 ± 2.51e+00 arcsec (0.36 σ)
Source Dec Offset = -4.34e-01 ± 2.50e+00 arcsec (-0.17 σ)
Source Offset Distance = 9.91e-01 ± 2.51e+00 arcsec (0.40 σ)</td><td>Difference Image Centroid Offsets</td></tr>
<tr><td>Shorter Period Comparison Statistic
Value = 2.33e+02
Significance = 100.00%</td><td>Longer Period Comparison Statistic
Value = N/A
Significance = N/A</td><td>False Alarm = 0.00e+00
Transit Count = 2
Max Multiple Event Statistic = 527.7</td><td>Bootstrap Test</td></tr>
</table>

Summary of model fitter results and validation test results for target 299096355, 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
0.8 ± 0.1 Solar units</td><td rowspan="2">Core Aperture Correlation Statistic
Value = 3.74
Significance = 99.99%
Halo Aperture Correlation Statistic
Value = 3.74
Significance = 99.99%
Core/Halo Ratio
Ratio = 1.00</td><td rowspan="2">Ghost Diagnostic Test</td></tr>
<tr><td colspan="2">Period = 323.7 ± 0.0 days
Depth = 22670 ± 454 ppm
Planet Radius = 13.1 ± 1.2 Earth radii
Semi-major Axis = 0.8 ± 0.1 AU
Effective Stellar Flux = 0.2 ± 0.0
Equilibrium Temperature = 175 ± 9 Kelvin
Chi-squared/DoF = 1.6
SNR = 62.9</td></tr>
<tr><td rowspan="2">Eclipsing Binary Discrimination Test</td><td colspan="2">Odd-Even Depth Comparison Statistic
Value = 2.24e+03
Significance = 0.00%</td><td>Offsets Relative to Out of Transit Centroid
Source RA Offset = 1.62e+00 ± 2.67e+00 arcsec (0.61 σ)
Source Dec Offset = -2.64e+00 ± 2.70e+00 arcsec (-0.98 σ)
Source Offset Distance = 3.10e+00 ± 2.69e+00 arcsec (1.15 σ)
Offsets Relative to TIC Position
Source RA Offset = 4.33e+00 ± 3.10e+00 arcsec (1.40 σ)
Source Dec Offset = 2.89e-01 ± 2.75e+00 arcsec (0.11 σ)
Source Offset Distance = 4.34e+00 ± 3.14e+00 arcsec (1.38 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 = 2.33e+02
Significance = 100.00%</td><td>False Alarm = 1.96e-156
Transit Count = 2
Max Multiple Event Statistic = 56.2</td><td>Bootstrap Test</td></tr>
</table>

Summary of model fitter results and validation test results for target 299096355, 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.

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

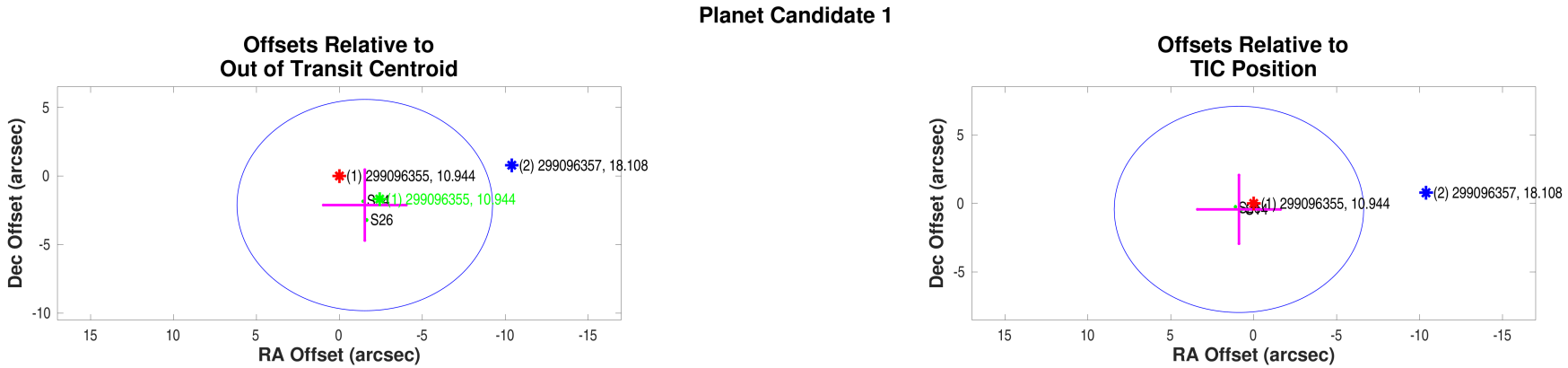
Multi-Sector Average PRF Fit of the Difference Images

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

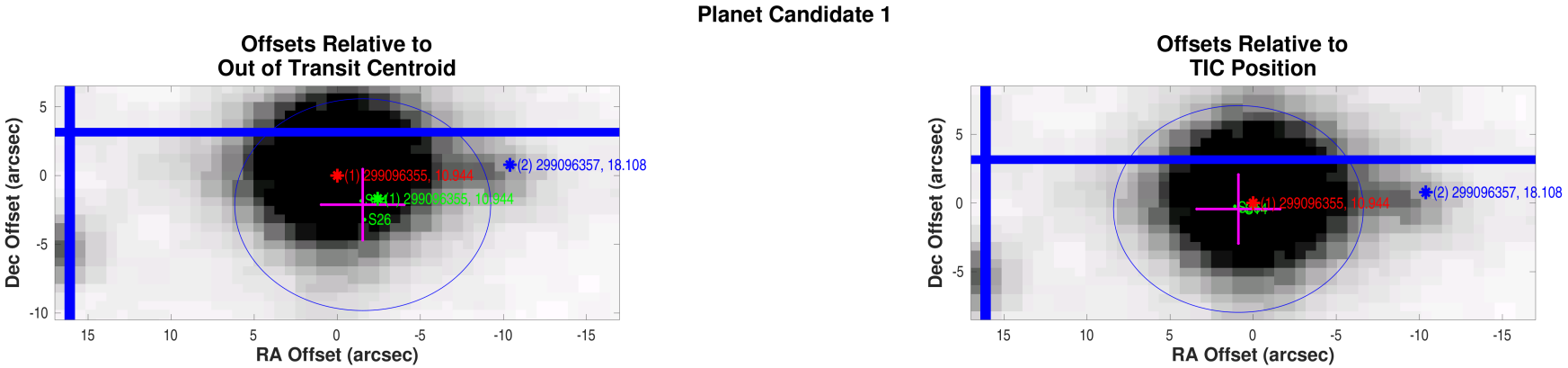
	RA	Dec	Units
Offset	$-1.5324 \pm 2.50e+00$	$-2.1189 \pm 2.58e+00$	arcseconds
Offset/σ	-0.61	-0.82	
Offset Distance	$2.6149 \pm 2.57e+00$		arcseconds
Offset Distance/σ	1.02		
3σ Radius	7.7066		arcseconds

Mean offset from the TIC RA and Dec

	RA	Dec	Units
Offset	$0.8910 \pm 2.51e+00$	$-0.4338 \pm 2.50e+00$	arcseconds
Offset/σ	0.36	-0.17	
Offset Distance	$0.9910 \pm 2.51e+00$		arcseconds
Offset Distance/σ	0.40		
3σ Radius	7.5225		arcseconds



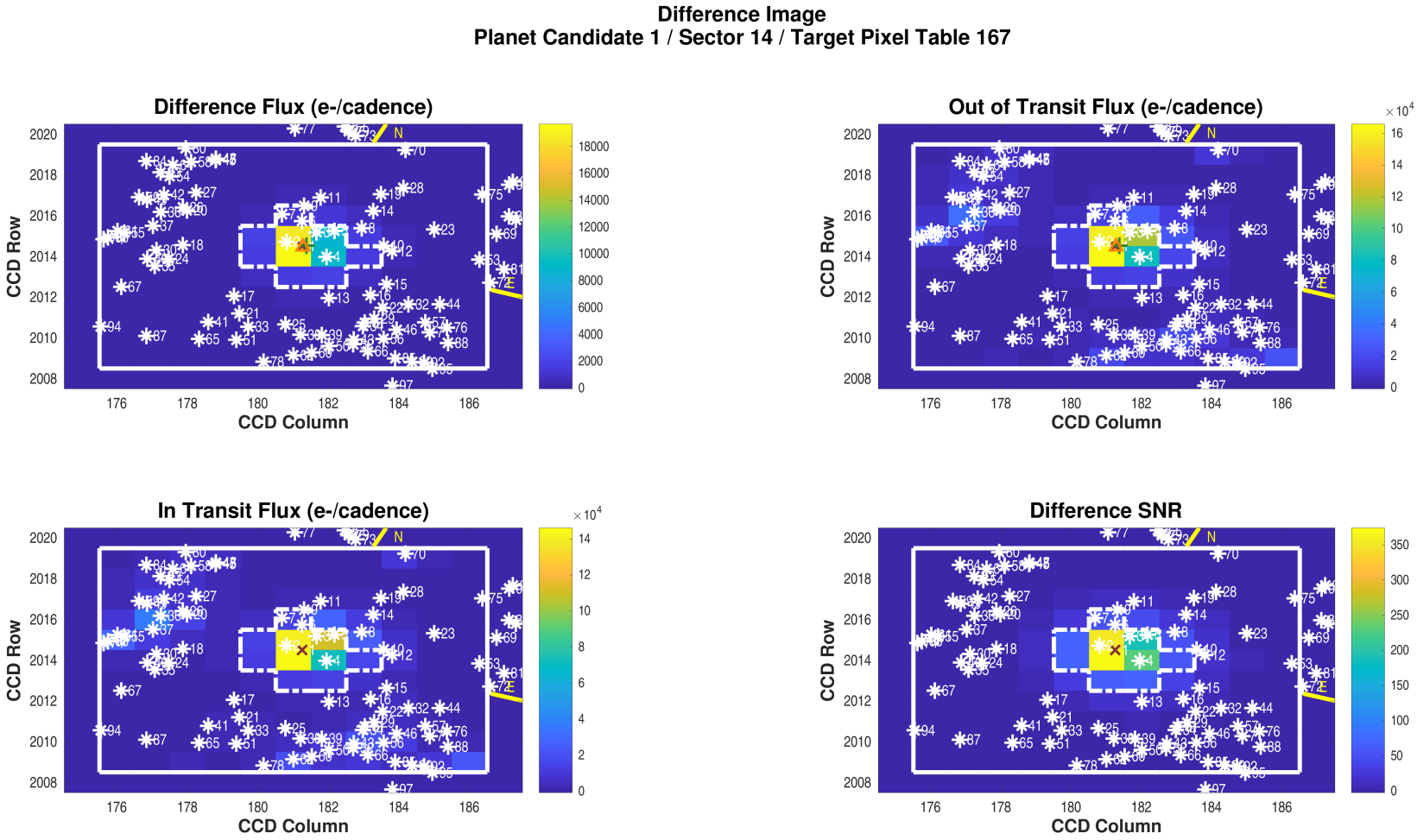
Difference image centroid offsets for target 299096355, planet candidate 1. Left: difference image PRF centroid offsets in RA and Dec with respect to the per sector out-of-transit centroids for the given target. Right: difference image PRF centroid offsets in RA and Dec with respect to the TC coordinates of the given target. Symbol key: green cross: per sector centroid offsets with 1-sigma error bars in RA and Dec; magenta cross: robust weighted mean offset over all sectors with 1-sigma error bars in RA and Dec; blue circle: 3-sigma radius of confusion for weighted mean offset; red asterisk: location of target star (out-of-transit centroid in left panel and TIC position in right panel); green asterisk: TIC location of target star with respect to out-of-transit centroid; blue asterisk: location of other TIC objects in the neighborhood. TIC ID and magnitude are noted in the text associated with each marked object. A constant error term of 2.5000 arcseconds has been added in quadrature to the computed uncertainty in the RA and Dec components of the robust mean offset.
Open `./planet-01/difference-image/0000000299096355-01-difference-image-centroid-offsets.fig`



Difference image centroid offsets for target 299096355, planet candidate 1, diplayed on survey image for given target. Left: difference image PRF centroid offsets in RA and Dec with respect to the per sector out-of-transit centroids for the given target. Right: difference image PRF centroid offsets in RA and Dec with respect to the TIC coordinates of the given target. Symbol key: green cross: per sector centroid offsets with 1-sigma error bars in RA and Dec; magenta cross: robust weighted mean offset over all sectors with 1-sigma error bars in RA and Dec; blue circle: 3-sigma radius of confusion for weighted mean offset; red asterisk: location of target star (out-of-transit centroid in left panel and TIC position in right panel); green asterisk: TIC location of target star with respect to out-of-transit centroid; blue asterisk: location of other TIC objects in the neighborhood. TIC ID and magnitude are noted in the text associated with each marked object. A constant error term of 2.5000 arcseconds has been added in quadrature to the computed uncertainty in the RA and Dec components of the robust mean offset.
Open `./planet-01/difference-image/0000000299096355-01-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
2	2	2	1.0000	0.70



Difference image for target 299096355, planet candidate 1, sector 14, target pixel table 167. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 1; number of valid in-transit cadences = 86; number of in-transit cadence gaps = 0; number of valid out-of-transit cadences = 379; number of out-of-transit cadence gaps = 0. Difference image quality metric = 1.00 (good).
Open `./planet-01/difference-image/0000000299096355-01-difference-image-14-167.fig`

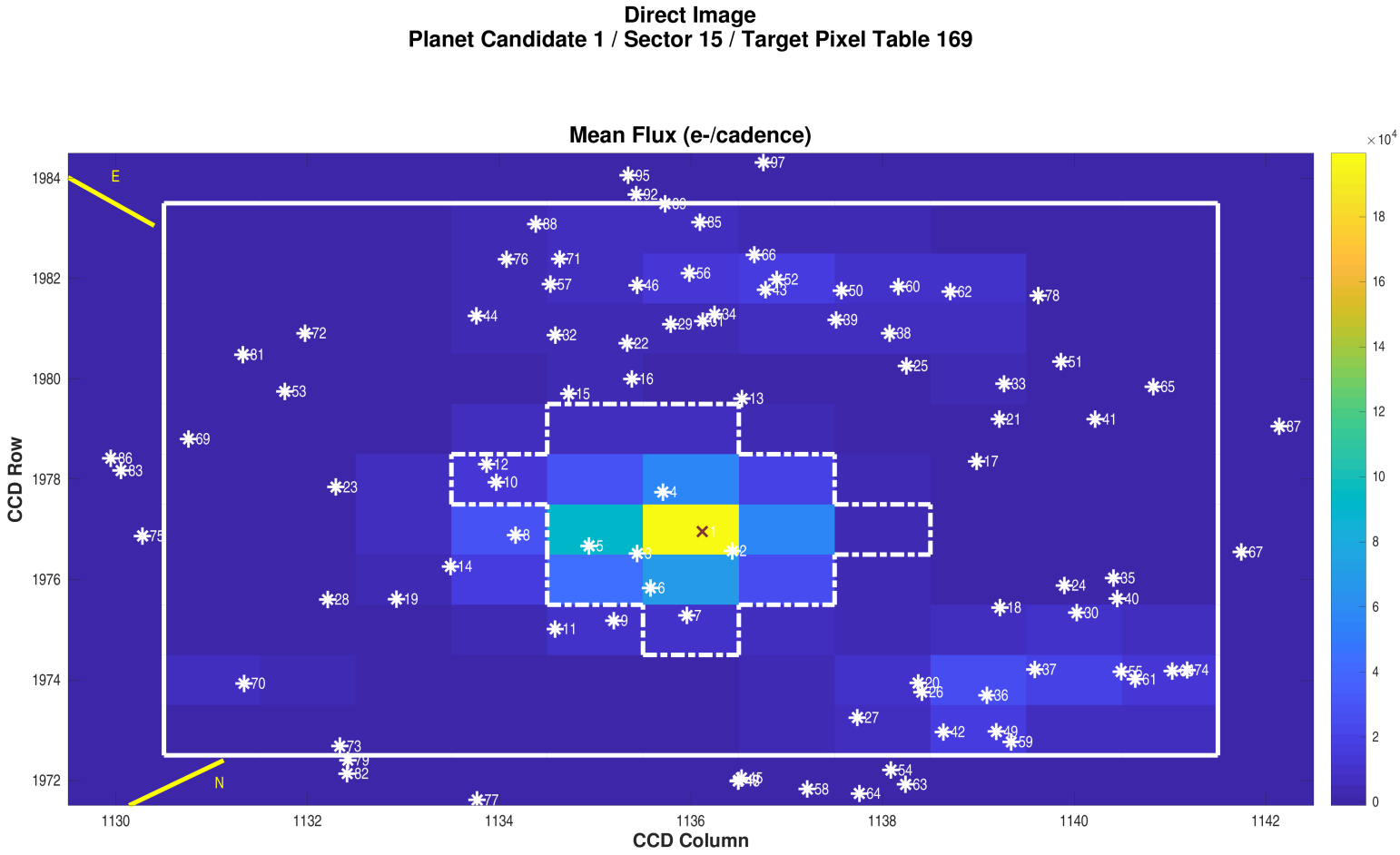
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$2014.53 \pm 4.54e-05$	$181.37 \pm 5.04e-05$	pixels	$289.07683033 \pm 1.70e-06$	$51.75755389 \pm 1.67e-06$	degrees
Difference Image Centroid	$2014.47 \pm 9.19e-04$	$181.27 \pm 1.24e-03$	pixels	$289.07618860 \pm 7.25e-06$	$51.75704176 \pm 5.58e-06$	degrees
Offset	$-0.0558 \pm 9.20e-04$	$-0.0950 \pm 1.25e-03$	pixels	$-1.4300 \pm 1.98e-02$	$-1.8436 \pm 2.10e-02$	arcseconds
Offset/σ	-60.60	-76.29		-72.30	-87.94	
Offset Distance	$0.1101 \pm 1.15e-03$		pixels	$2.3332 \pm 1.98e-02$		arcseconds
Offset Distance/σ	96.00			117.61		

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

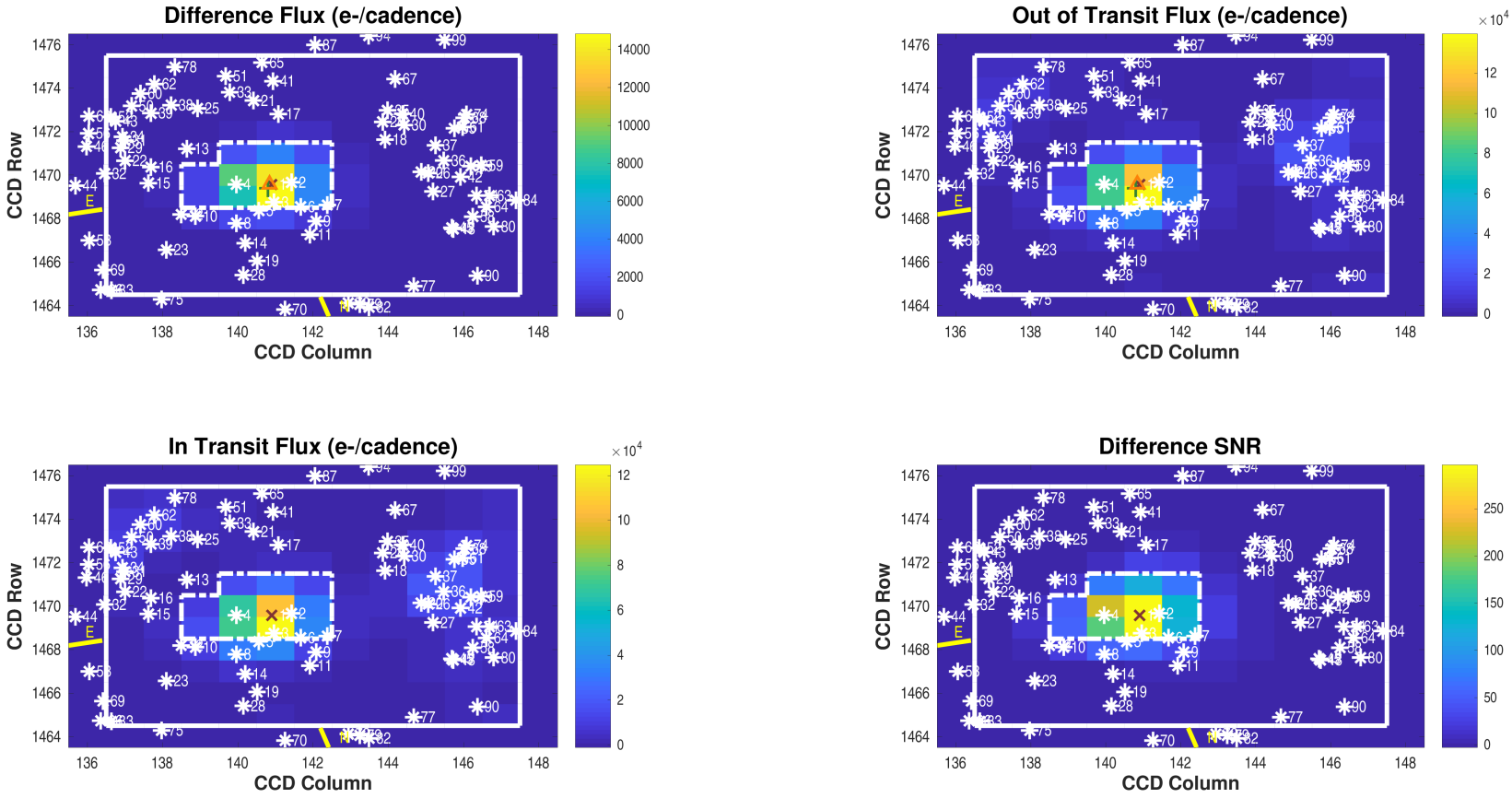
	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$2014.51 \pm 2.86e-04$	$181.25 \pm 2.95e-04$	pixels	$289.07585637 \pm 0.00e+00$	$51.75717393 \pm 0.00e+00$	degrees
Difference Image Centroid	$2014.47 \pm 9.19e-04$	$181.27 \pm 1.24e-03$	pixels	$289.07618860 \pm 7.25e-06$	$51.75704176 \pm 5.58e-06$	degrees
Offset	$-0.0338 \pm 9.63e-04$	$0.0242 \pm 1.28e-03$	pixels	$0.7404 \pm 1.61e-02$	$-0.4758 \pm 2.01e-02$	arcseconds
Offset/σ	-35.16	18.90		45.86	-23.69	
Offset Distance	$0.0416 \pm 1.11e-03$		pixels	$0.8801 \pm 1.64e-02$		arcseconds
Offset Distance/σ	37.60			53.61		



Direct image for target 299096355, planet candidate 1, sector 15, target pixel table 169. 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-01/difference-image/0000000299096355-01-difference-image-15-169.fig`

PRF Fit of the Difference Image

The out of transit image centroid and difference image centroid could not be calculated for target 299096355, planet candidate 1, in target table 169.



Difference image for target 299096355, planet candidate 1, sector 26, target pixel table 254. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 1; number of valid in-transit cadences = 82; number of in-transit cadence gaps = 4; number of valid out-of-transit cadences = 374; number of out-of-transit cadence gaps = 5. Difference image quality metric = 1.00 (good).
Open `./planet-01/difference-image/0000000299096355-01-difference-image-26-254.fig`

PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$1469.40 \pm 8.68e-05$	$140.80 \pm 7.59e-05$	pixels	$289.07709728 \pm 1.06e-06$	$51.75798265 \pm 1.08e-06$	degrees
Difference Image Centroid	$1469.57 \pm 1.99e-03$	$140.84 \pm 1.53e-03$	pixels	$289.07635765 \pm 8.62e-06$	$51.75709126 \pm 1.15e-05$	degrees
Offset	$0.1729 \pm 1.99e-03$	$0.0436 \pm 1.53e-03$	pixels	$-1.6481 \pm 2.10e-02$	$-3.2090 \pm 4.17e-02$	arcseconds
Offset/σ	87.01	28.54		−78.37	−76.91	
Offset Distance	$0.1784 \pm 1.92e-03$		pixels	$3.6075 \pm 3.75e-02$		arcseconds
Offset Distance/σ	92.97			96.29		

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

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$1469.57 \pm 1.68e-04$	$140.90 \pm 1.70e-04$	pixels	$289.07586199 \pm 0.00e+00$	$51.75716188 \pm 0.00e+00$	degrees
Difference Image Centroid	$1469.57 \pm 1.99e-03$	$140.84 \pm 1.53e-03$	pixels	$289.07635765 \pm 8.62e-06$	$51.75709126 \pm 1.15e-05$	degrees
Offset	$-0.0020 \pm 1.99e-03$	$-0.0578 \pm 1.54e-03$	pixels	$1.1045 \pm 1.92e-02$	$-0.2543 \pm 4.15e-02$	arcseconds
Offset/σ	−1.00	−37.62		57.48	−6.12	
Offset Distance	$0.0578 \pm 1.53e-03$		pixels	$1.1334 \pm 2.14e-02$		arcseconds
Offset Distance/σ	37.83			52.90		

5.2 Planet Candidate 2

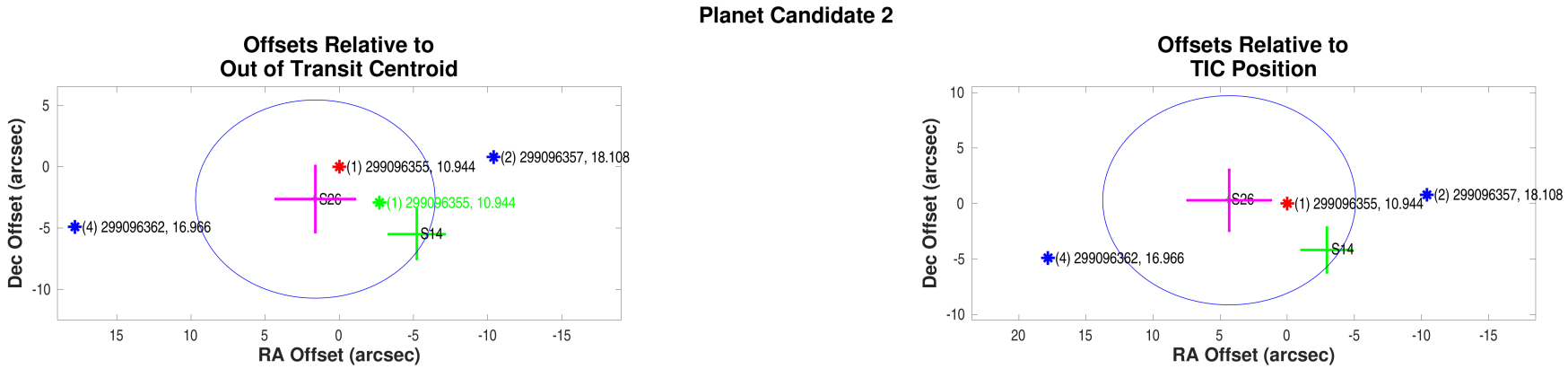
Multi-Sector Average PRF Fit of the Difference Images

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

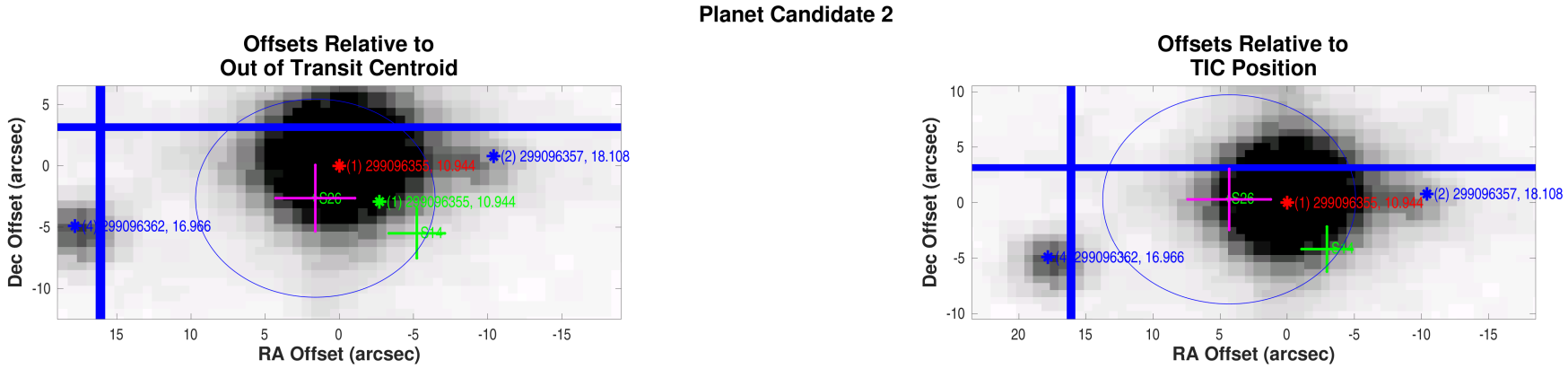
	RA	Dec	Units
Offset	$1.6218 \pm 2.67e+00$	$-2.6388 \pm 2.70e+00$	arcseconds
Offset/σ	0.61	−0.98	
Offset Distance	$3.0974 \pm 2.69e+00$		arcseconds
Offset Distance/σ	1.15		
3σ Radius	8.0763		arcseconds

Mean offset from the TIC RA and Dec

	RA	Dec	Units
Offset	$4.3281 \pm 3.10e+00$	$0.2895 \pm 2.75e+00$	arcseconds
Offset/σ	1.40	0.11	
Offset Distance	$4.3377 \pm 3.14e+00$		arcseconds
Offset Distance/σ	1.38		
3σ Radius	9.4222		arcseconds



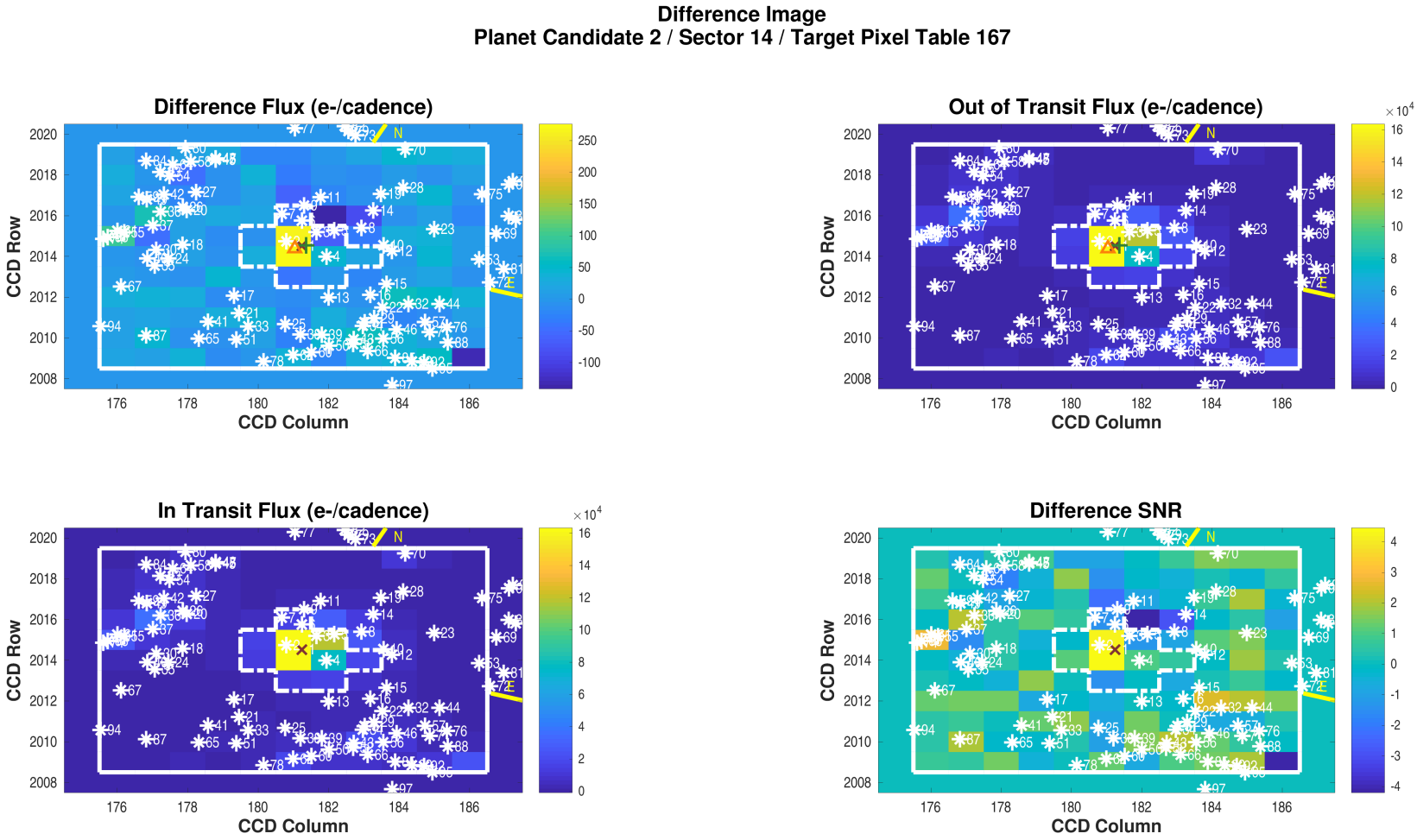
Difference image centroid offsets for target 299096355, planet candidate 2. Left: difference image PRF centroid offsets in RA and Dec with respect to the per sector out-of-transit centroids for the given target. Right: difference image PRF centroid offsets in RA and Dec with respect to the TC coordinates 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 (out-of-transit centroid in left panel and TIC position in right panel); green asterisk: TIC location of target star with respect to out-of-transit centroid; blue asterisk: location of other TIC objects in the neighborhood. TIC ID and magnitude are noted in the text associated with each marked object. A constant error term of 2.5000 arcseconds has been added in quadrature to the computed uncertainty in the RA and Dec components of the robust mean offset.
Open `./planet-02/difference-image/0000000299096355-02-difference-image-centroid-offsets.fig`



Difference image centroid offsets for target 299096355, 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 (out-of-transit centroid in left panel and TIC position in right panel); green asterisk: TIC location of target star with respect to out-of-transit centroid; blue asterisk: location of other TIC objects in the neighborhood. TIC ID and magnitude are noted in the text associated with each marked object. A constant error term of 2.5000 arcseconds has been added in quadrature to the computed uncertainty in the RA and Dec components of the robust mean offset.
Open `./planet-02/difference-image/0000000299096355-02-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



Difference image for target 299096355, planet candidate 2, sector 14, target pixel table 167. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 1; number of valid in-transit cadences = 66; number of in-transit cadence gaps = 0; number of valid out-of-transit cadences = 273; number of out-of-transit cadence gaps = 6. Difference image quality metric = 0.63 (not good).
Open `./planet-02/difference-image/0000000299096355-02-difference-image-14-167.fig`

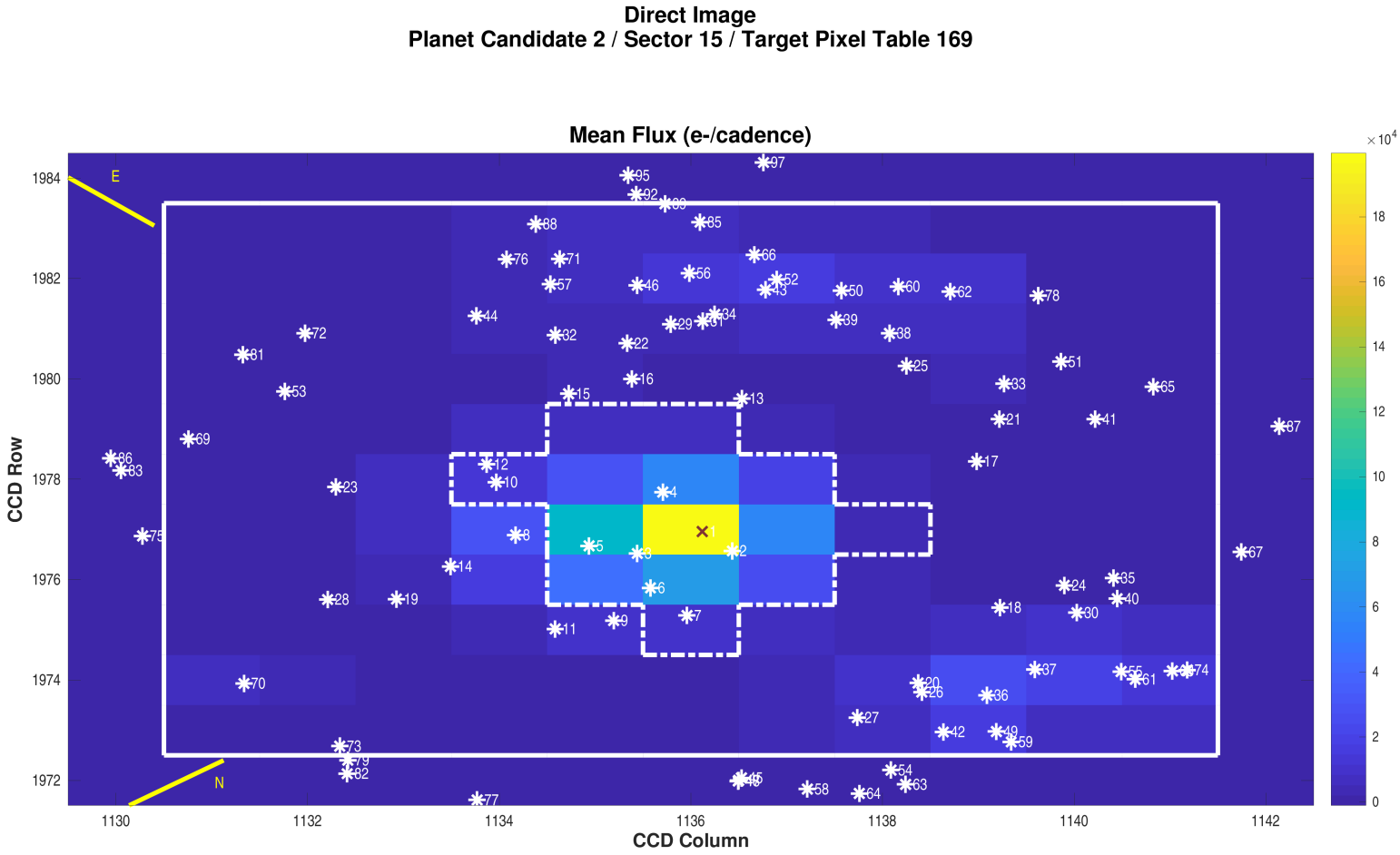
PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$2014.54 \pm 5.33e-05$	$181.36 \pm 5.91e-05$	pixels	$289.07687487 \pm 1.78e-06$	$51.75753941 \pm 1.69e-06$	degrees
Difference Image Centroid	$2014.39 \pm 9.71e-02$	$181.04 \pm 1.49e-01$	pixels	$289.07453170 \pm 8.46e-04$	$51.75601007 \pm 5.62e-04$	degrees
Offset	$-0.1498 \pm 9.71e-02$	$-0.3254 \pm 1.49e-01$	pixels	$-5.2214 \pm 1.89e+00$	$-5.5056 \pm 2.02e+00$	arcseconds
Offset/σ	-1.54	-2.18		-2.77	-2.72	
Offset Distance	$0.3582 \pm 1.38e-01$		pixels	$7.5878 \pm 2.09e+00$		arcseconds
Offset Distance/σ	2.60			3.62		

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

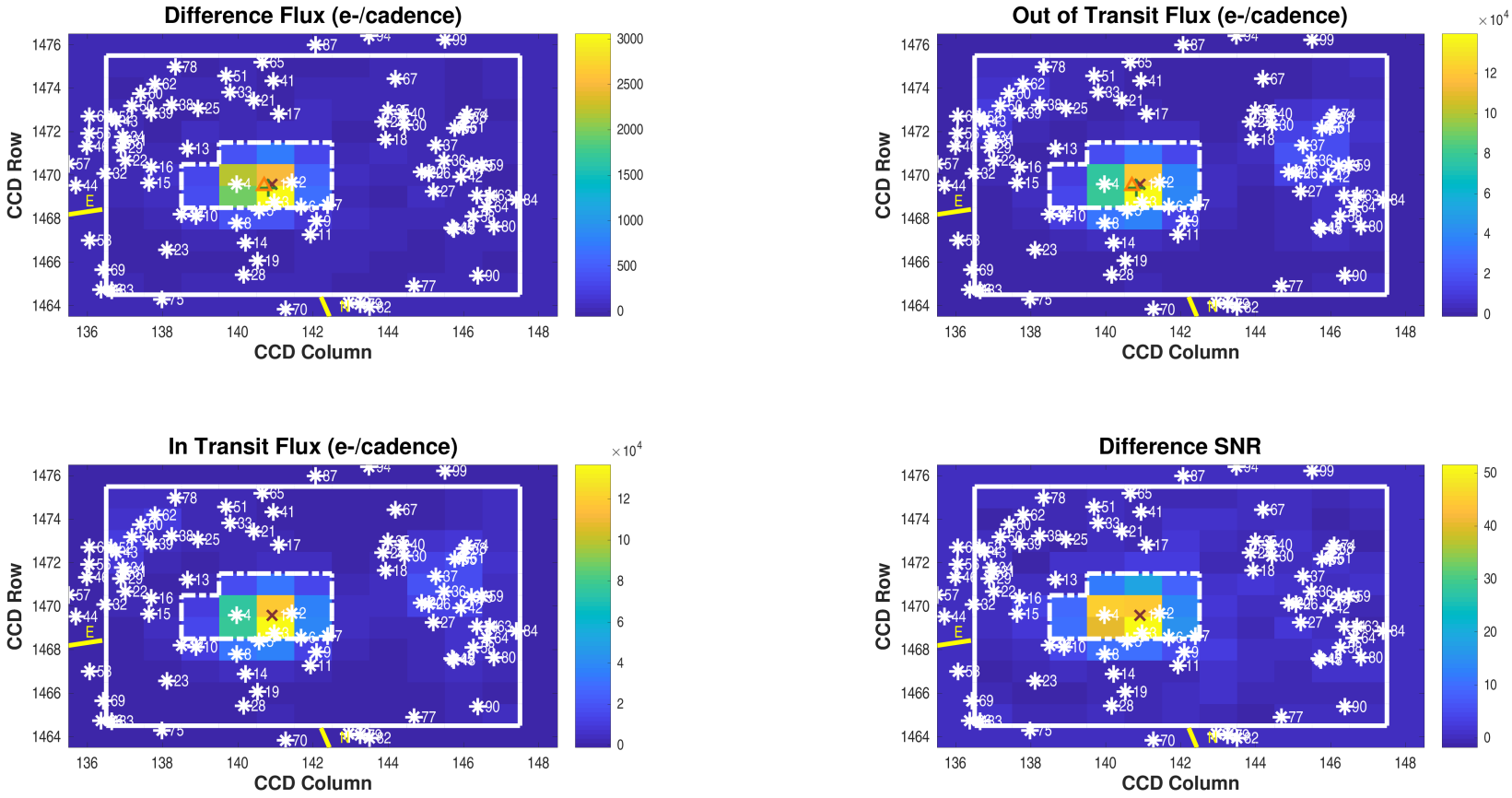
	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$2014.53 \pm 2.88e-04$	$181.24 \pm 3.08e-04$	pixels	$289.07585637 \pm 0.00e+00$	$51.75717393 \pm 0.00e+00$	degrees
Difference Image Centroid	$2014.39 \pm 9.71e-02$	$181.04 \pm 1.49e-01$	pixels	$289.07453170 \pm 8.46e-04$	$51.75601007 \pm 5.62e-04$	degrees
Offset	$-0.1319 \pm 9.71e-02$	$-0.2028 \pm 1.49e-01$	pixels	$-2.9519 \pm 1.89e+00$	$-4.1899 \pm 2.02e+00$	arcseconds
Offset/σ	-1.36	-1.36		-1.57	-2.07	
Offset Distance	$0.2419 \pm 1.31e-01$		pixels	$5.1253 \pm 2.10e+00$		arcseconds
Offset Distance/σ	1.85			2.44		



Direct image for target 299096355, planet candidate 2, sector 15, target pixel table 169. 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/0000000299096355-02-difference-image-15-169.fig`

PRF Fit of the Difference Image

The out of transit image centroid and difference image centroid could not be calculated for target 299096355, planet candidate 2, in target table 169.



Difference image for target 299096355, planet candidate 2, sector 26, target pixel table 254. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 1; number of valid in-transit cadences = 67; number of in-transit cadence gaps = 0; number of valid out-of-transit cadences = 280; number of out-of-transit cadence gaps = 0. Difference image quality metric = 1.00 (good).
Open `./planet-02/difference-image/0000000299096355-02-difference-image-26-254.fig`

PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$1469.40 \pm 1.07e-04$	$140.81 \pm 9.18e-05$	pixels	$289.07707738 \pm 1.13e-06$	$51.75798118 \pm 1.15e-06$	degrees
Difference Image Centroid	$1469.51 \pm 1.11e-02$	$140.70 \pm 1.09e-02$	pixels	$289.07782130 \pm 6.11e-05$	$51.75725866 \pm 6.45e-05$	degrees
Offset	$0.1021 \pm 1.11e-02$	$-0.1131 \pm 1.09e-02$	pixels	$1.6577 \pm 1.37e-01$	$-2.6011 \pm 2.32e-01$	arcseconds
Offset/σ	9.20	−10.42		12.14	−11.21	
Offset Distance	$0.1524 \pm 1.14e-02$		pixels	$3.0844 \pm 2.16e-01$		arcseconds
Offset Distance/σ	13.34			14.31		

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

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$1469.58 \pm 1.70e-04$	$140.91 \pm 1.77e-04$	pixels	$289.07586199 \pm 0.00e+00$	$51.75716188 \pm 0.00e+00$	degrees
Difference Image Centroid	$1469.51 \pm 1.11e-02$	$140.70 \pm 1.09e-02$	pixels	$289.07782130 \pm 6.11e-05$	$51.75725866 \pm 6.45e-05$	degrees
Offset	$-0.0720 \pm 1.11e-02$	$-0.2124 \pm 1.09e-02$	pixels	$4.3661 \pm 1.36e-01$	$0.3484 \pm 2.32e-01$	arcseconds
Offset/σ	−6.49	−19.56		32.05	1.50	
Offset Distance	$0.2243 \pm 1.06e-02$		pixels	$4.3800 \pm 1.35e-01$		arcseconds
Offset Distance/σ	21.17			32.38		

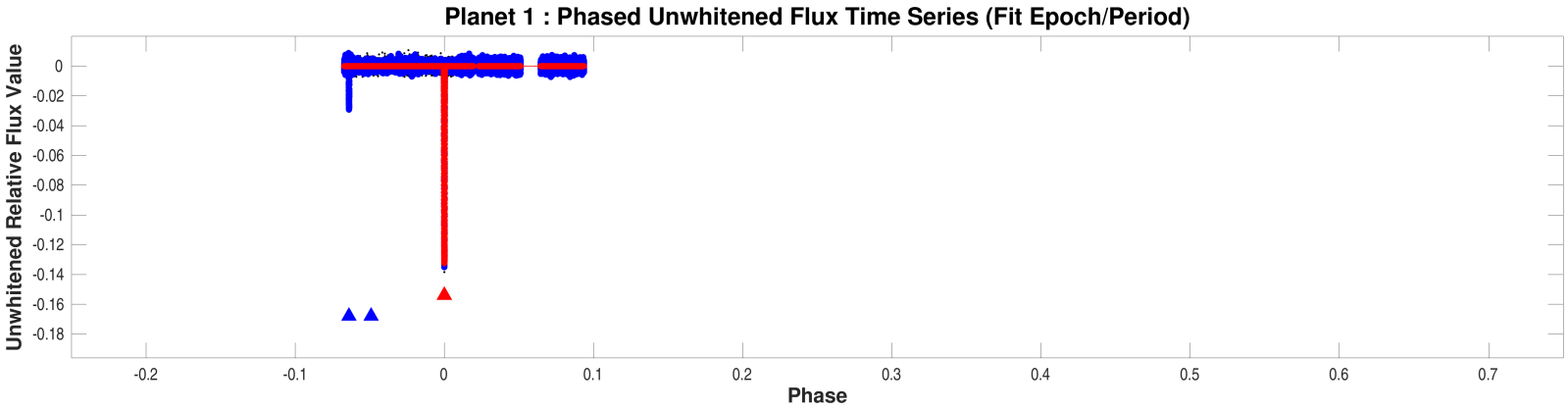
5.3 Difference Image TIC Key

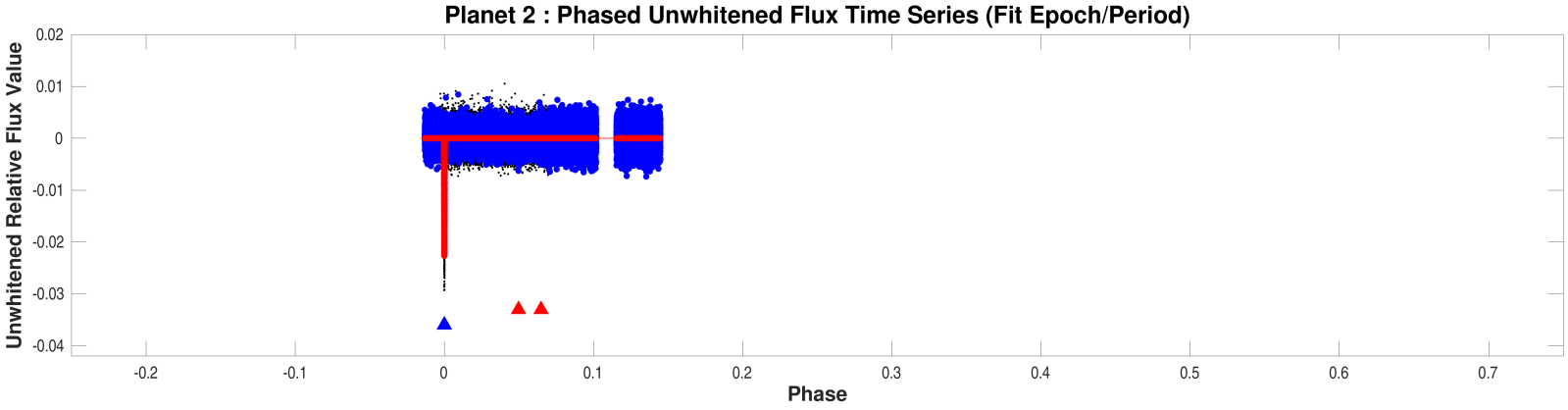
Index	Catalog ID	Mag	RA (degrees)	Dec (degrees)	Distance (arcsec)
1	299096355	10.944	289.07585917	51.75716793	0.00
2	299096357	18.108	289.07119370	51.75738511	10.43
3	299096344	14.361	289.07710912	51.76176715	16.79
4	299096362	16.966	289.08385975	51.75580453	18.49
5	299096335	12.850	289.08131820	51.76329410	25.19
6	1717328416	18.784	289.07150185	51.76390458	26.12
7	1717328417	19.675	289.06531790	51.76446947	35.25
8	1717328418	19.589	289.08765075	51.76567212	40.35
9	1717328415	18.973	289.06941851	51.76811274	41.93
10	299096342	15.812	289.09619516	51.76235272	49.01
11	299096318	17.447	289.07212788	51.77134015	51.69
12	299096349	16.850	289.09927276	51.76136533	54.32
13	1717328406	19.722	289.09150869	51.74493475	56.17
14	1717328419	19.487	289.08760206	51.77102211	56.32
15	1717328411	18.851	289.10357751	51.75218554	64.32
16	1717328409	19.290	289.10144099	51.74823218	65.46
17	1717328407	18.667	289.06745519	51.73955647	66.11
18	1717328633	18.717	289.04583883	51.75005973	71.62
19	299096310	16.935	289.08666496	51.77597999	71.88
20	1717328638	18.128	289.04085544	51.75960984	78.50
21	299096417	15.920	289.07176423	51.73522642	79.51
22	1717328413	19.877	289.10666031	51.74563035	80.23
23	299161558	17.375	289.10606244	51.76980163	81.23
24	299096385	17.528	289.04465845	51.74547050	81.29
25	299096422	18.245	289.08518294	51.73510967	82.08
26	1717328636	18.392	289.03933362	51.76017068	82.11
27	1717328639	19.133	289.04008044	51.76501877	84.59
28	1717328451	19.147	289.09114258	51.77904415	85.80
29	299161532	18.277	289.10641373	51.74218976	86.85
30	1717328635	19.500	289.04009512	51.74707377	87.59
31	299096406	17.875	289.10473369	51.74053381	87.90
32	299161538	15.286	289.11252250	51.74813434	87.93
33	1717328401	19.351	289.07632026	51.73221957	89.82
34	299161527	17.667	289.10489429	51.73948157	90.78
35	1717326598	18.598	289.04243978	51.74273012	90.82
36	299096353	13.105	289.03463600	51.75755878	91.87
37	1717328634	18.725	289.03503514	51.75339960	91.98
38	299096431	16.646	289.09078810	51.73328211	92.20

Index	Catalog ID	Mag	RA (degrees)	Dec (degrees)	Distance (arcsec)
39	1717328404	19.603	289.09615444	51.73456746	93.09
40	1717326597	18.910	289.03935763	51.74418993	93.80
41	299096444	18.278	289.06547684	51.73100253	97.00
42	1717328644	19.911	289.03244204	51.76236238	98.54
43	299096415	16.763	289.10491945	51.73531072	101.91
44	1717328399	19.082	289.12033487	51.75010918	102.31
45	1717328648	15.868	289.03938012	51.77488843	103.33
46	299161530	15.784	289.11397381	51.74059278	103.80
47	299096312	15.412	289.03922600	51.77521500	104.33
48	1717328649	16.468	289.03917616	51.77527708	104.56
49	1717328643	18.959	289.02902407	51.75999505	104.86
50	1717328403	17.694	289.09981912	51.73201923	105.11
51	299096454	15.621	289.07562720	51.72796677	105.13
52	299096429	13.908	289.10558943	51.73399505	106.53
53	1717328432	19.383	289.12257360	51.76449932	107.39
54	299096329	16.148	289.03065467	51.76767741	107.60
55	299096370	13.561	289.02907016	51.74976569	107.62
56	299161524	14.605	289.11221065	51.73734864	107.95
57	1717328398	19.292	289.11982980	51.74434321	108.32
58	299096316	14.867	289.03353671	51.77286063	109.94
59	299096351	16.919	289.02661601	51.76016374	110.26
60	299096447	17.593	289.09661433	51.72920775	110.77
61	299096372	16.477	289.02709928	51.74975085	111.89
62	299096456	13.877	289.09250808	51.72732121	113.67
63	299096326	15.431	289.02772107	51.76816113	114.34
64	299096320	17.743	289.02951066	51.77091663	114.53
65	299096461	18.123	289.06611844	51.72587790	114.72
66	299161519	17.879	289.11046148	51.73302842	116.18
67	299096419	18.359	289.03763407	51.73504066	116.62
68	299096378	15.743	289.02580037	51.74746010	116.90
69	299161562	17.504	289.12237843	51.77249209	117.43
70	299096282	14.283	289.08509503	51.78935490	117.69
71	1717328396	18.008	289.12270879	51.74192643	117.94
72	299161550	17.460	289.12923194	51.75902242	119.12
73	1717328653	18.419	289.07017321	51.79008222	119.17
74	1717326606	19.338	289.02496137	51.74672578	119.49
75	1717328448	19.234	289.11206035	51.78217891	120.89
76	1717328400	18.345	289.12614026	51.74429401	121.25

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

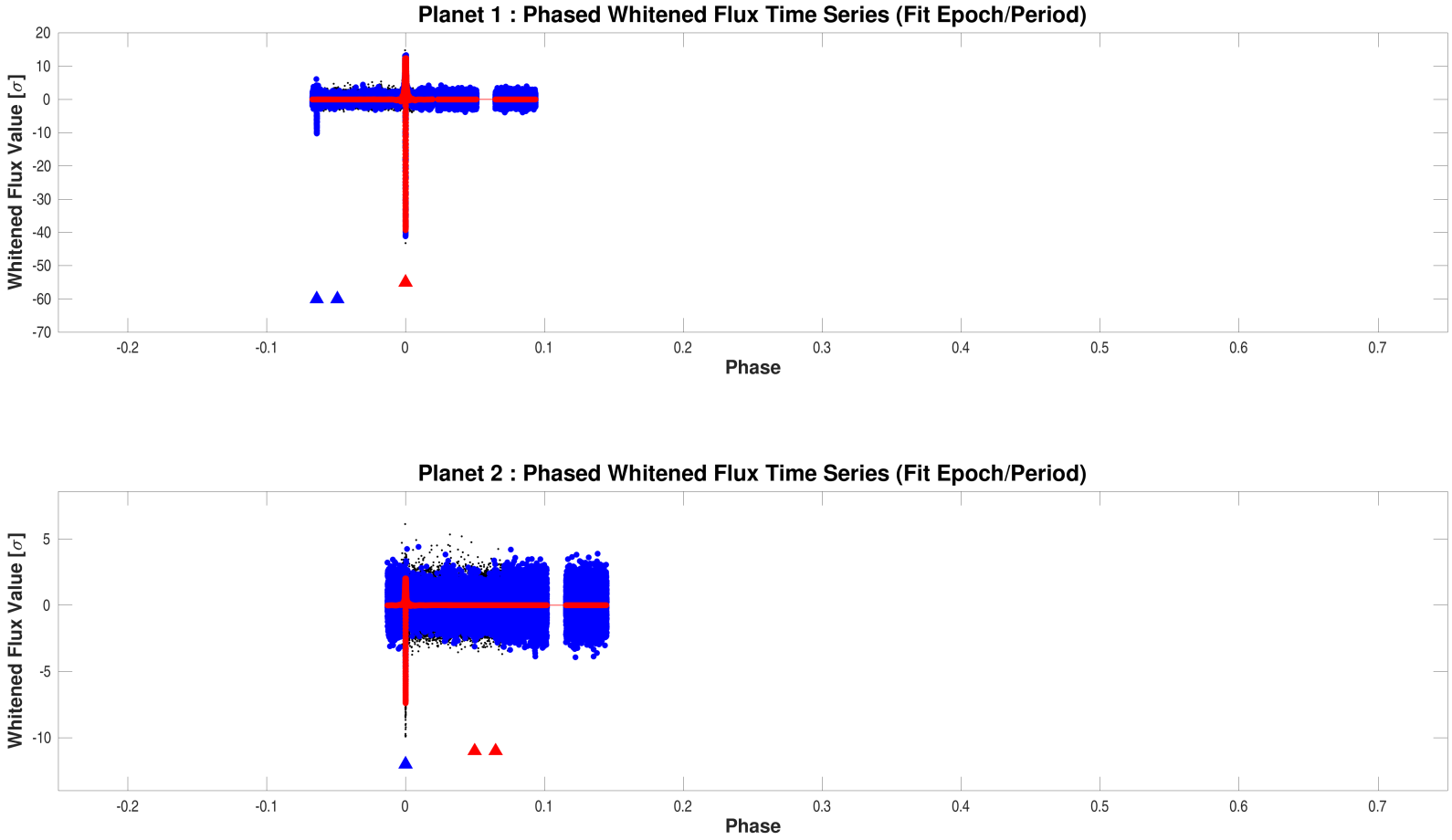
6 Phased Light Curves





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/0000000299096355-01-phased-unwhitened-flux-time-series.fig`



Phased whitened flux time series is plotted in black dots. When all transits fit completed with full or secondary convergence, the phase is determined with the fitted epoch and period; otherwise, the phase is determined with the TPS epoch and period. The values of the phased whitened flux time series averaged in one cadence wide bins are plotted in bigger blue dots. When all transits fit completes with full or secondary convergence, the averaged values of the phased whitened fitted model light curve are plotted in red dots. Transit event markers in different colors indicate the locations of the transits of all planet candidates. The transits of the same planet candidate are labeled with the markers of the same color, for example, blue markers for transits of plane candidate #1, red markers for transits of planet candidate #2, etc.
Open `./summary-plots/0000000299096355-01-phased-whitened-flux-time-series.fig`

Phased unwhitened flux time series by sector for target 299096355, planet candidate 1. Period = 328.6209 days; transit epoch = 1703.7187 BTJD.
Open `./summary-plots/0000000299096355-01-phased-unwhitened-flux-time-series-by-sector.fig`

Phased unwhitened flux time series by sector for target 299096355, planet candidate 2. Period = 323.7488 days; transit epoch = 1687.5907 BTJD.
Open `./summary-plots/0000000299096355-02-phased-unwhitened-flux-time-series-by-sector.fig`

7 Planet Candidate 1

7.1 Model Fitter: All Transits

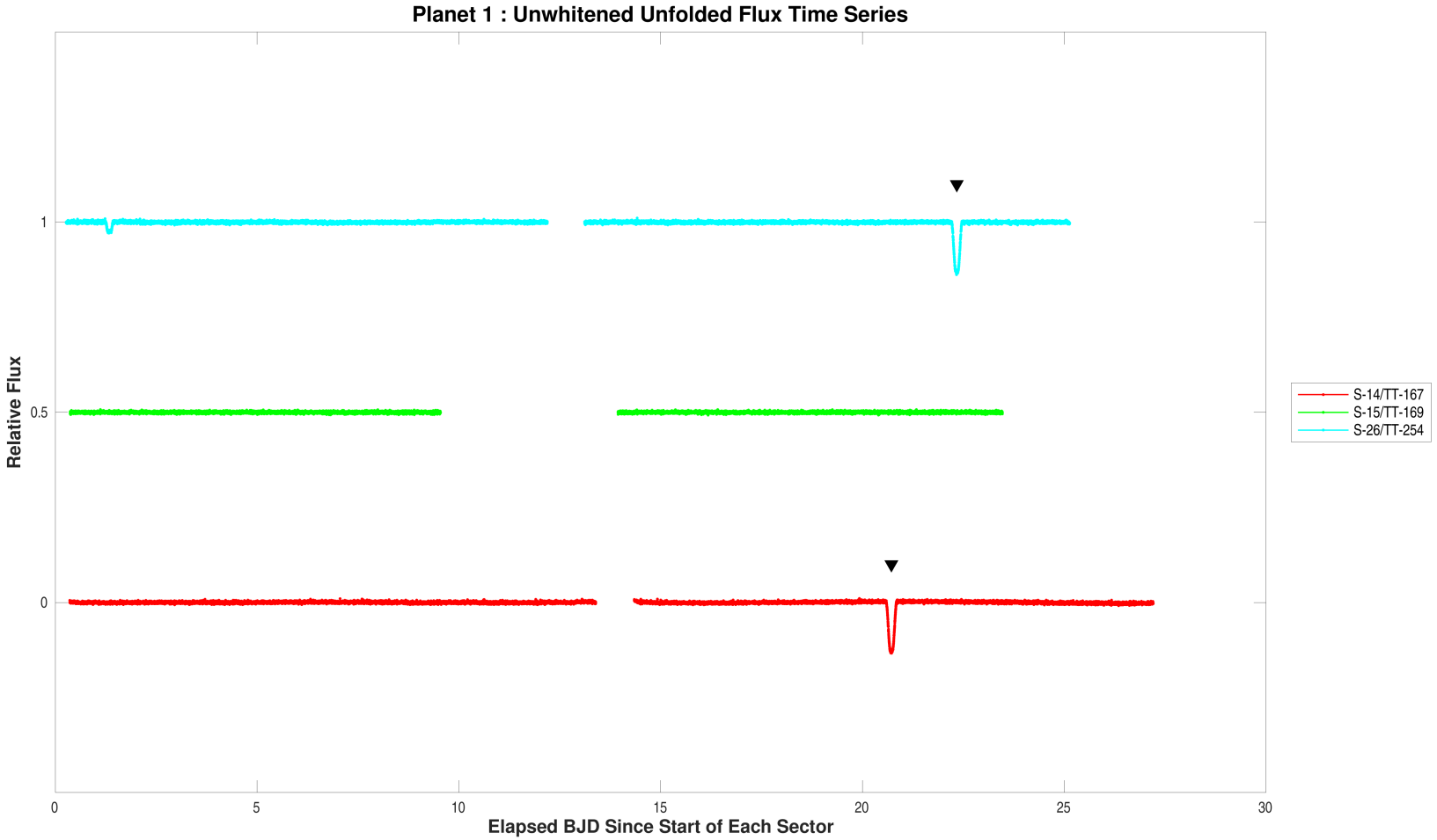
Model Characteristic	Name
Transit Model	mandel-agol_geometric_transit_model
Limb Darkening Model	claret_tess_nonlinear_limb_darkening_model

TCE Parameter	Value	Units
Trial Transit Pulse Duration	4.5	hours
Transit Epoch	1703.7205829	TJD
Orbital Period	328.6206970	days
Maximum SES	377.2	
Maximum MES	527.7	
Robust Statistic	486.8	
Chi Square Goodness of Fit Statistic (DoF)	16007.0 (264)	
Chi Square2 Statistic (DoF)	19.4 (20795.5)	
Threshold for Desired PFA		

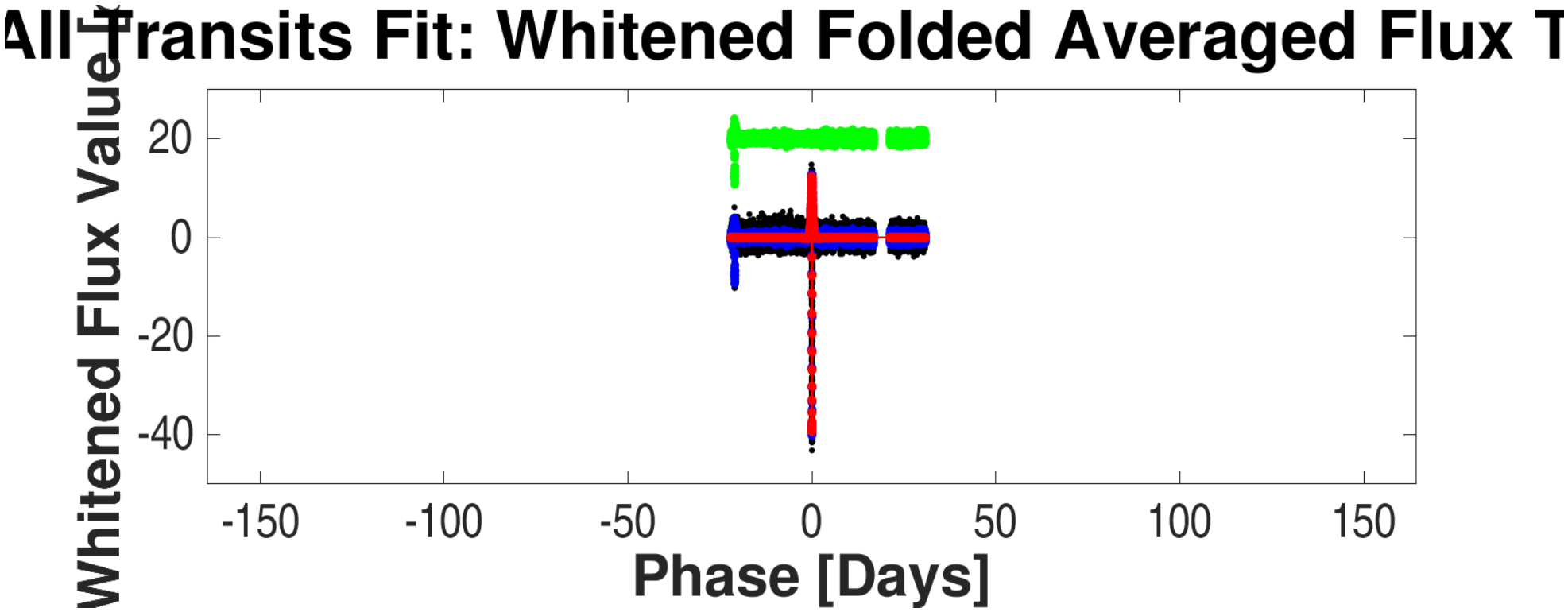
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	515.1		
Orbital Period	328.6208949	2.1199e-04	days
Transit Epoch	1703.7187144	1.4698e-04	BTJD
Impact Parameter	0.5315	3.4483e-03	
Planet Radius to Star Radius Ratio	0.3481511	5.2294e-04	
Semi-major Axis to Star Radius Ratio	503.4713	1.2502e+00	
Planet Radius	29.2129	2.6869e+00	Earth radii
Semi-major Axis	0.7994	8.3246e-02	AU
Effective Stellar Flux	0.2159	4.5507e-02	Goldilocks
Equilibrium Temperature	174	9.1601e+00	Kelvin
Stellar Density	15.8771	1.1828e-01	Solar density
Transit Depth	132365	2.8573e+02	ppm
Transit Duration	6.1778	1.1276e-02	hours
Transit Ingress Duration	2.1481	1.5904e-02	hours
Eccentricity	0.0000	0.0000e+00	
Peri Longitude	0.0000	0.0000e+00	degrees
Model Chi Square Statistic (DoF)	1441.7 (1713.0)		
Model Chi Square Goodness of Fit Statistic (DoF)	196.4 (376)		
Model Chi Square2 Statistic (DoF)	0.3 (1)		

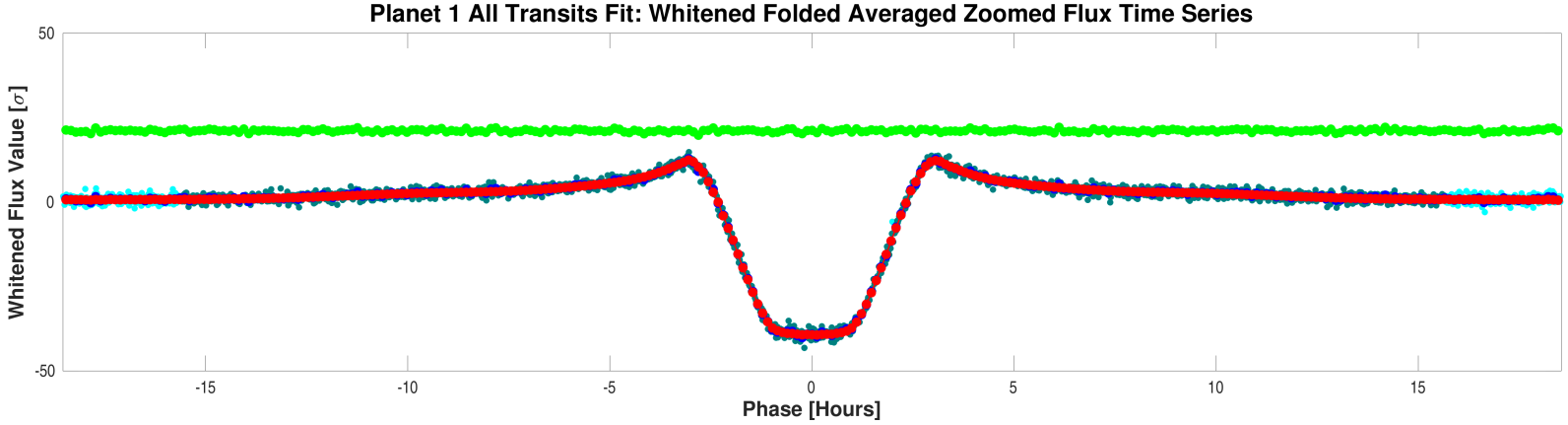
DoF: Degrees of Freedom



Flux time series for CatId 299096355, Planet candidate 1 in the unwhitened domain. For the data of Sector-14/TargetTableId-167, start BJD is 2458683 and the vertical offset is 0. For the data of Sector-15/TargetTableId-169, start BJD is 2458711 and the vertical offset is 0.5. For the data of Sector-26/TargetTableId-254, start BJD is 2459010 and the vertical offset is 1. 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/0000000299096355-01-all-unwhitened-14-167.fig`



Folded flux time series for CatId 299096355, 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/0000000299096355-01-all-whitened.fig`



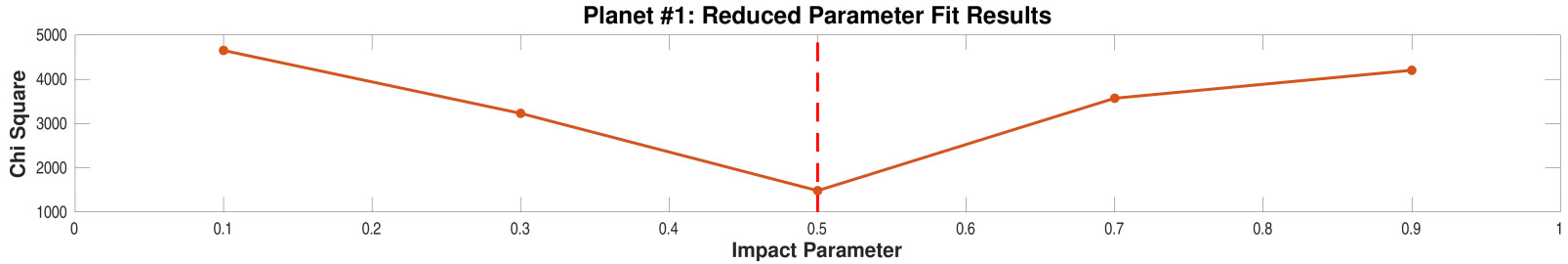
Folded flux time series for CatId 299096355, Planet candidate 1 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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/0000000299096355-01-all-whitened-zoomed.fig`

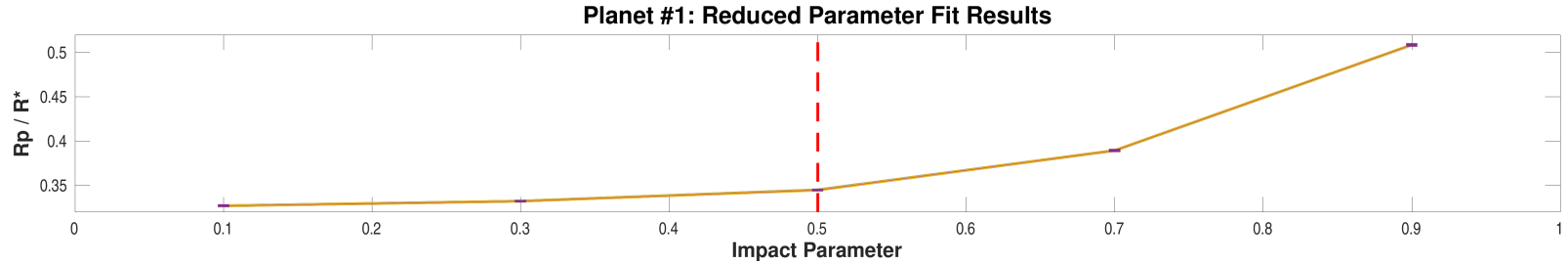
7.2 Model Fitter: Reduced Parameter Fit Results

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	512.5	4649.3	0.3270625	6.1774e-04	584.3572	1.2538e+00	127269	4.7214e+02	5.6850	1.2337e-02
0.30	519.5	3228.9	0.3323521	5.2066e-04	560.9714	1.0649e+00	128603	3.9467e+02	5.8095	1.1112e-02
0.50	536.9	1483.4	0.3449823	3.6577e-04	513.3102	7.1352e-01	131597	2.7075e+02	6.1066	8.4885e-03
0.70	535.1	3570.4	0.3895072	7.6077e-04	464.7096	1.2268e+00	139675	4.4625e+02	6.4844	1.6250e-02
0.90	517.8	4200.8	0.5087363	9.7223e-04	464.9321	1.4162e+00	141125	5.0206e+02	6.5385	1.8454e-02

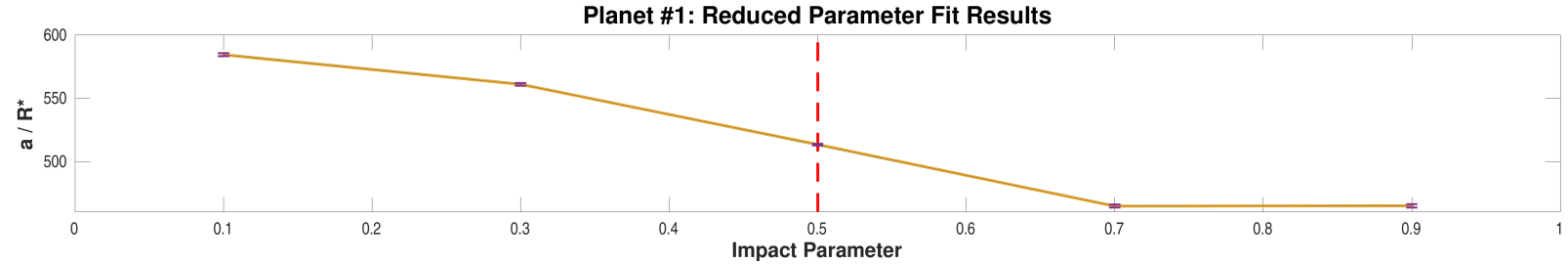
Highlighted row is the best reduced-parameter model fit.



Model chi squares of reduced parameter fits vs. impact parameter for CatId 299096355, 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/0000000299096355-01-reduced-fits-chi-square.fig`



Ratios of planet radius to star radius of reduced parameter fits vs. impact parameter for CatId 299096355, 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/0000000299096355-01-reduced-fits-rp-over-rstar.fig`



Ratios of semimajor axis to star radius of reduced parameter fits vs. impact parameter for CatId 299096355, 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/0000000299096355-01-reduced-fits-a-over-rstar.fig`

7.3 Model Fitter: Trapezoidal Fit Results

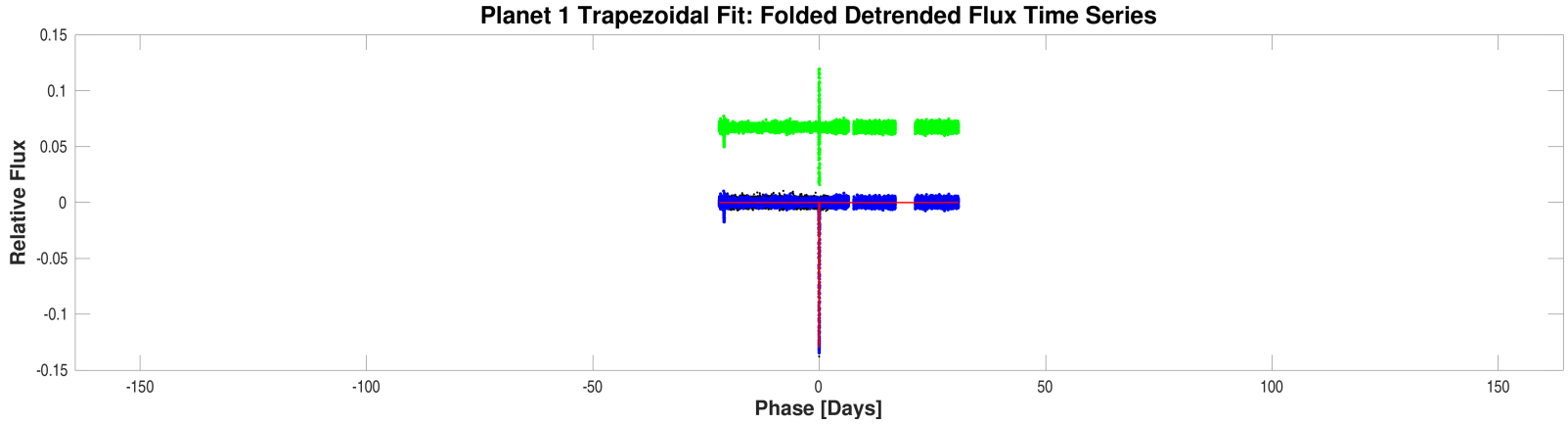
Model Characteristic	Name
Transit Model	trapezoidal_model
Limb Darkening Model	

TCE Parameter	Value	Units
Trial Transit Pulse Duration	4.5	hours
Transit Epoch	1703.7205829	TJD
Orbital Period	328.6206970	days
Maximum SES	377.2	
Maximum MES	527.7	
Robust Statistic	486.8	
Chi Square Goodness of Fit Statistic (DoF)	16007.0 (264)	
Chi Square2 Statistic (DoF)	19.4 (20795.5)	
Threshold for Desired PFA		

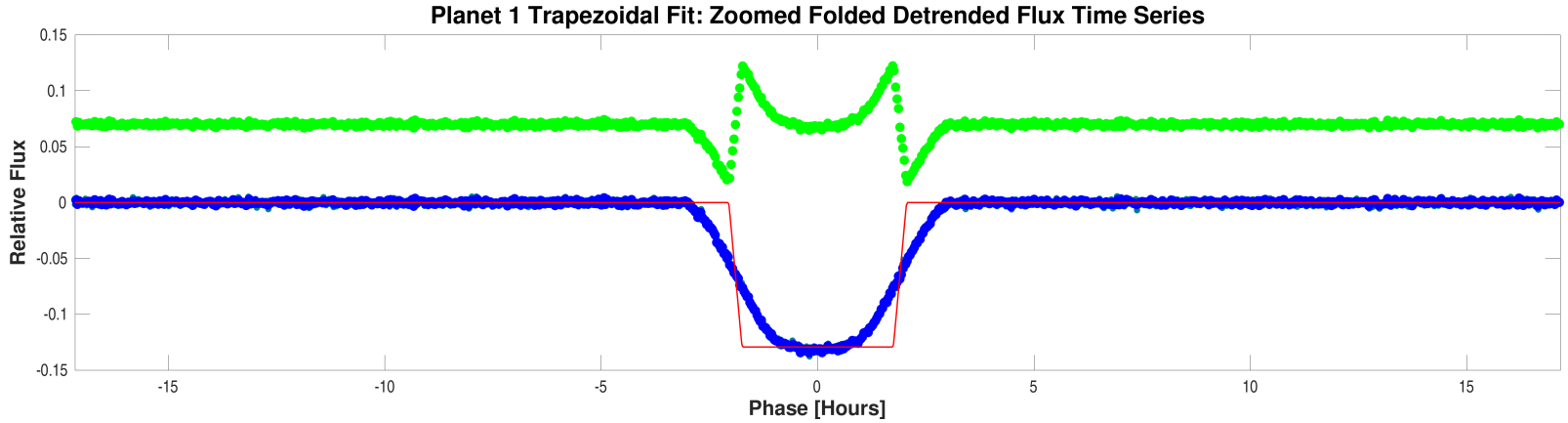
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	828.6		
Orbital Period	328.6206970		days
Transit Epoch	1703.7188372		BTJD
Transit Depth	129305		ppm
Transit Duration	5.7185		hours
Transit Ingress Duration	1.9179		hours
Model Chi Square Statistic (DoF)	53969.2 (2135)		

DoF: Degrees of Freedom



Folded detrended flux time series for CatId 299096355, Planet candidate 1 and folded trapezoidal model light curve.
Open `./planet-01/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000299096355-01-all-trapezoidal.fig`



Zoomed folded detrended flux time series for CatId 299096355, Planet candidate 1 and folded trapezoidal model light curve.
Open `./planet-01/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000299096355-01-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	328.6207		days		
Transit Duration	4.5		hours		
Maximum MES	527.7				
Secondary Phase	-1.1639		days		
Secondary MES	5.7				
Minimum Phase	-0.47361		days		
Minimum MES	-14.6				
Median MES	0.0				
MAD MES	0.66825				
Robust Statistic	2.2				
Secondary Depth	654.7	3.0006e+02	ppm		
Geometric Albedo	269.7	1.3272e+02		2.0246	2.15
Planet Effective Temperature	1089	1.2842e+02	Kelvin	7.1108	0.00

7.4.2 Eclipsing Binary Discrimination Test

Result	Value	Value in Sigmas	Significance (%)
Odd Even Transit Depth Comparison Statistic	3.4084e-01	0.5838	55.93
Shorter Period Comparison Statistic	2.3292e+02	15.2618	100.00

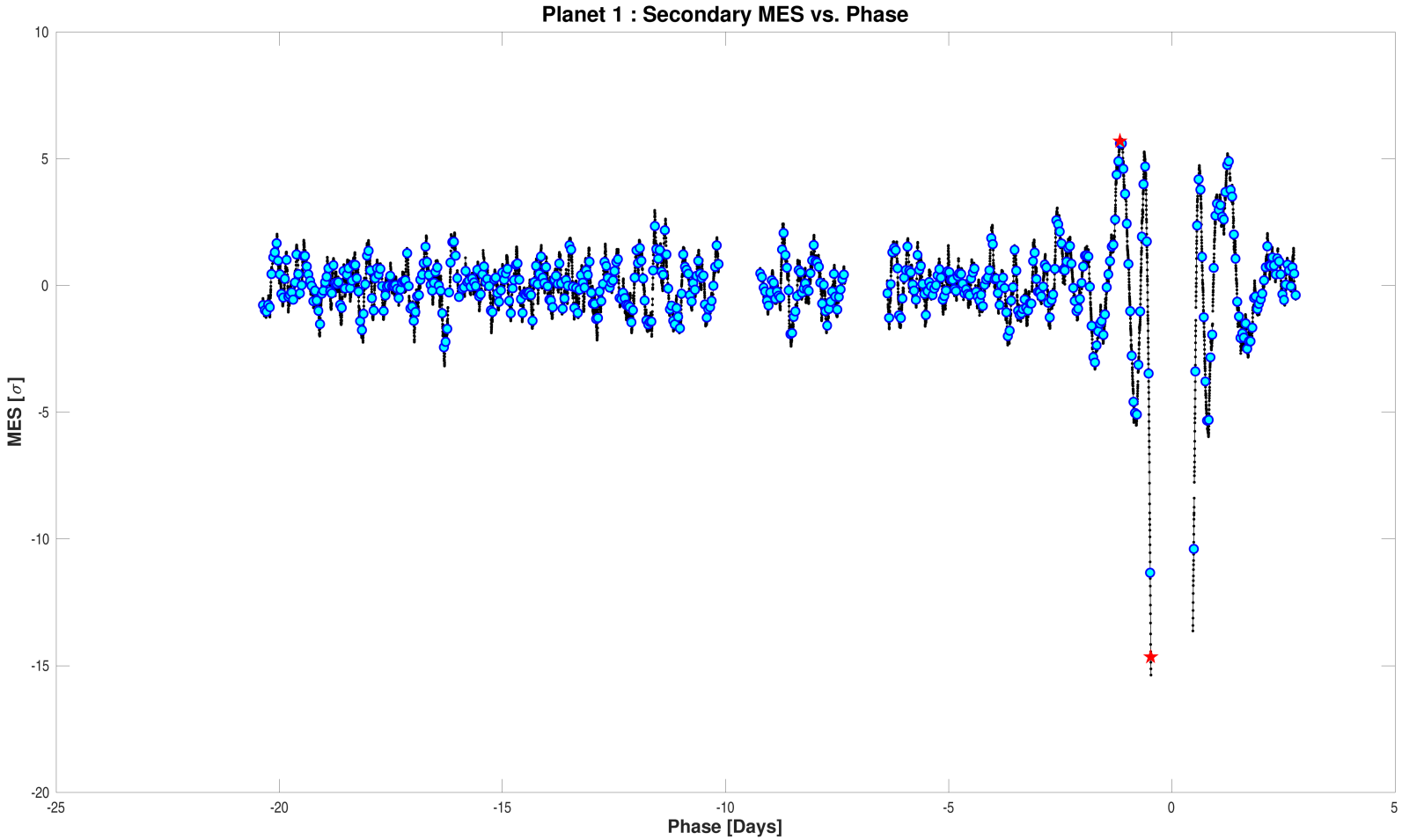
7.4.3 Bootstrap Test

Result	Value
False Alarm Probability	0.0000e+00
Bootstrap Threshold for Desired PFA	6.5
MES Mean	-0.96
MES Standard Deviation	1.42
Transit Count	2

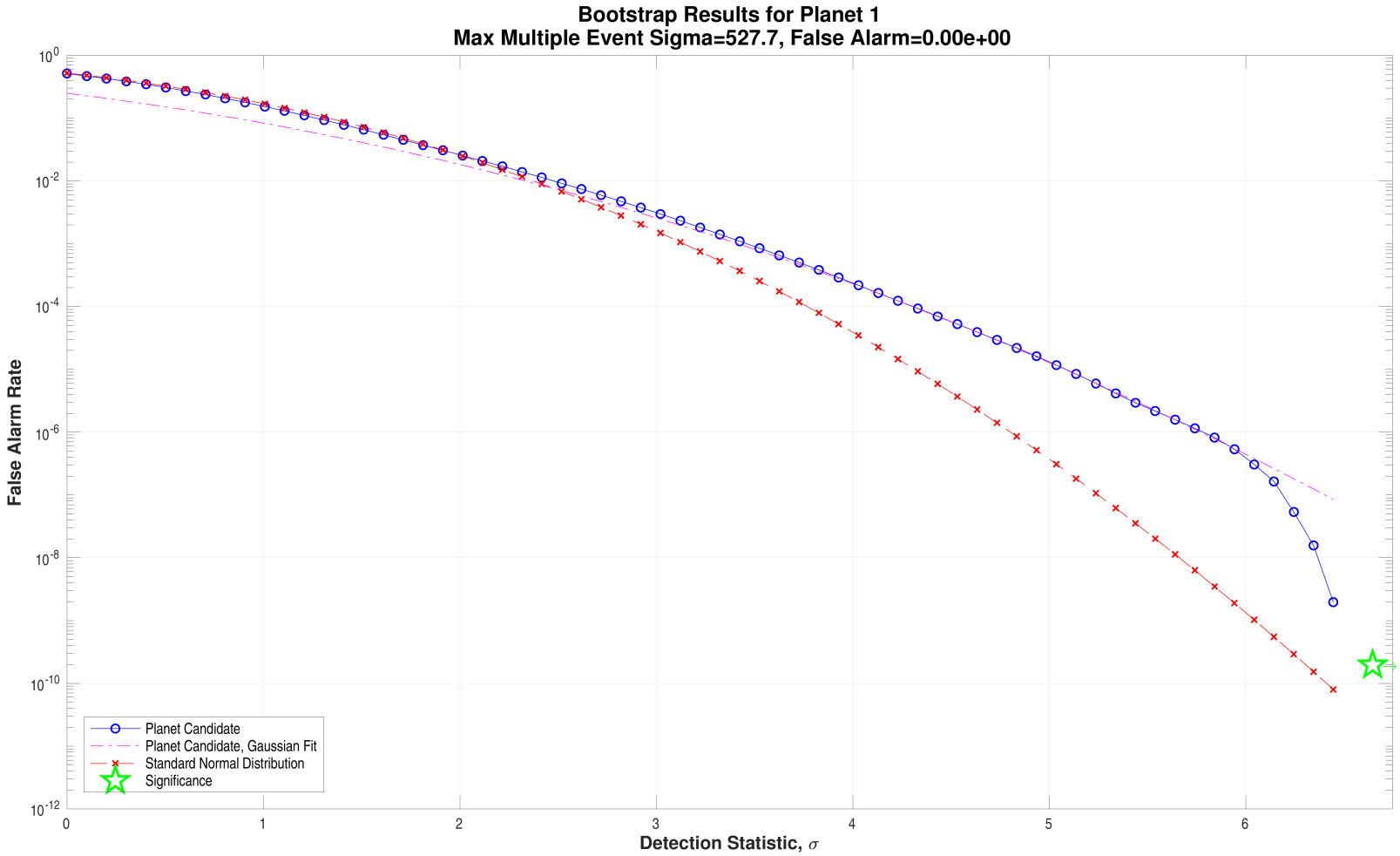
7.4.4 Ghost Diagnostic Test

Result	Value	Significance (%)
Maximum MES	527.7	
SNR	515.1	
Core Aperture Statistic	3.1956e+02	100.00
Halo Aperture Statistic	6.8045e+01	100.00
Ratio of Core/Halo Aperture Statistics	4.6962e+00	

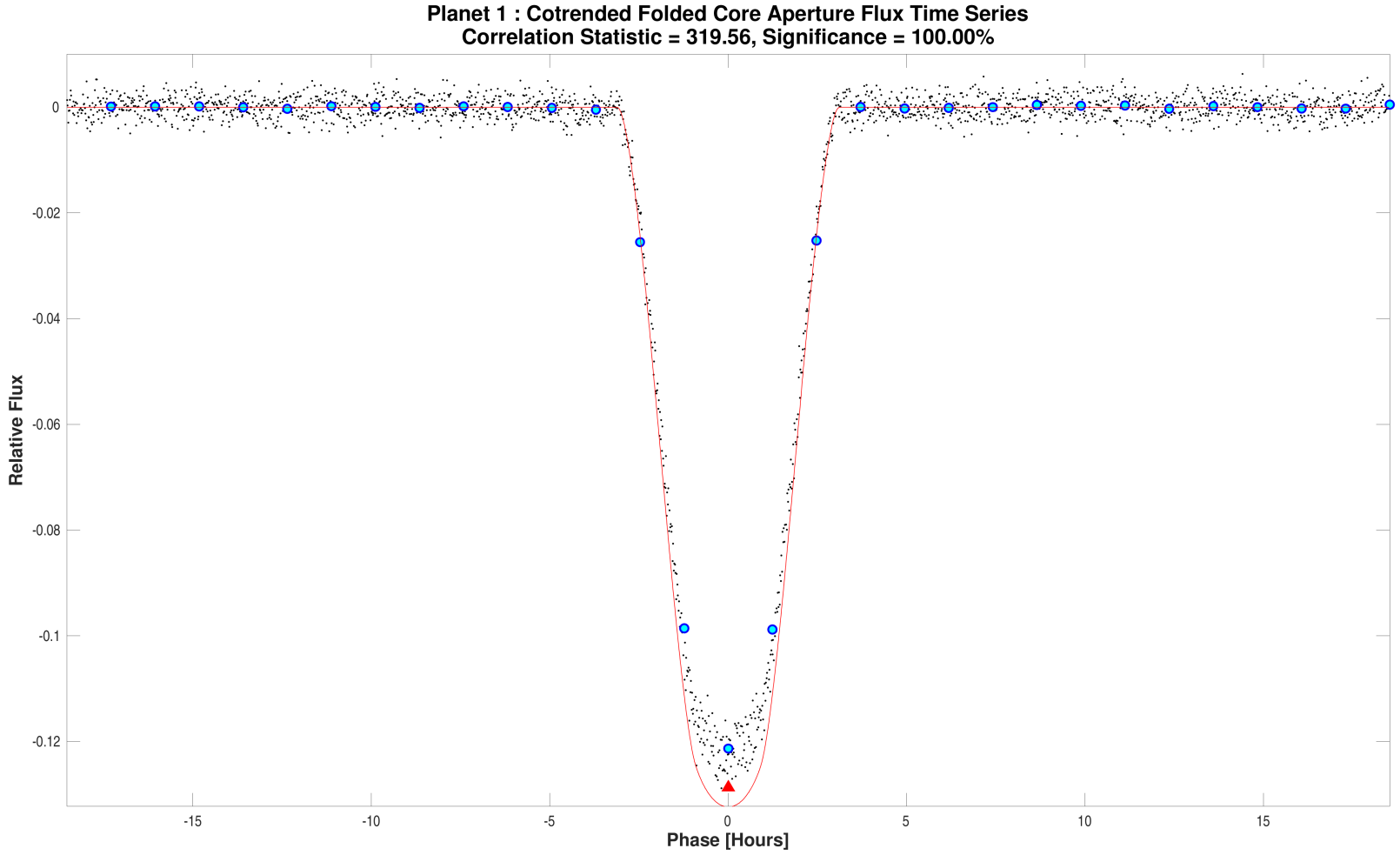
7.4.5 Validation Test Figures



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 4.5. The maximum secondary MES and corresponding phase are 5.7026 and -1.1639 days respectively. The minimum secondary MES and corresponding phase are -14.6442 and -0.47361 days respectively.
Open `./planet-01/report-summary/0000000299096355-01-weak-secondary-diagnostic.fig`

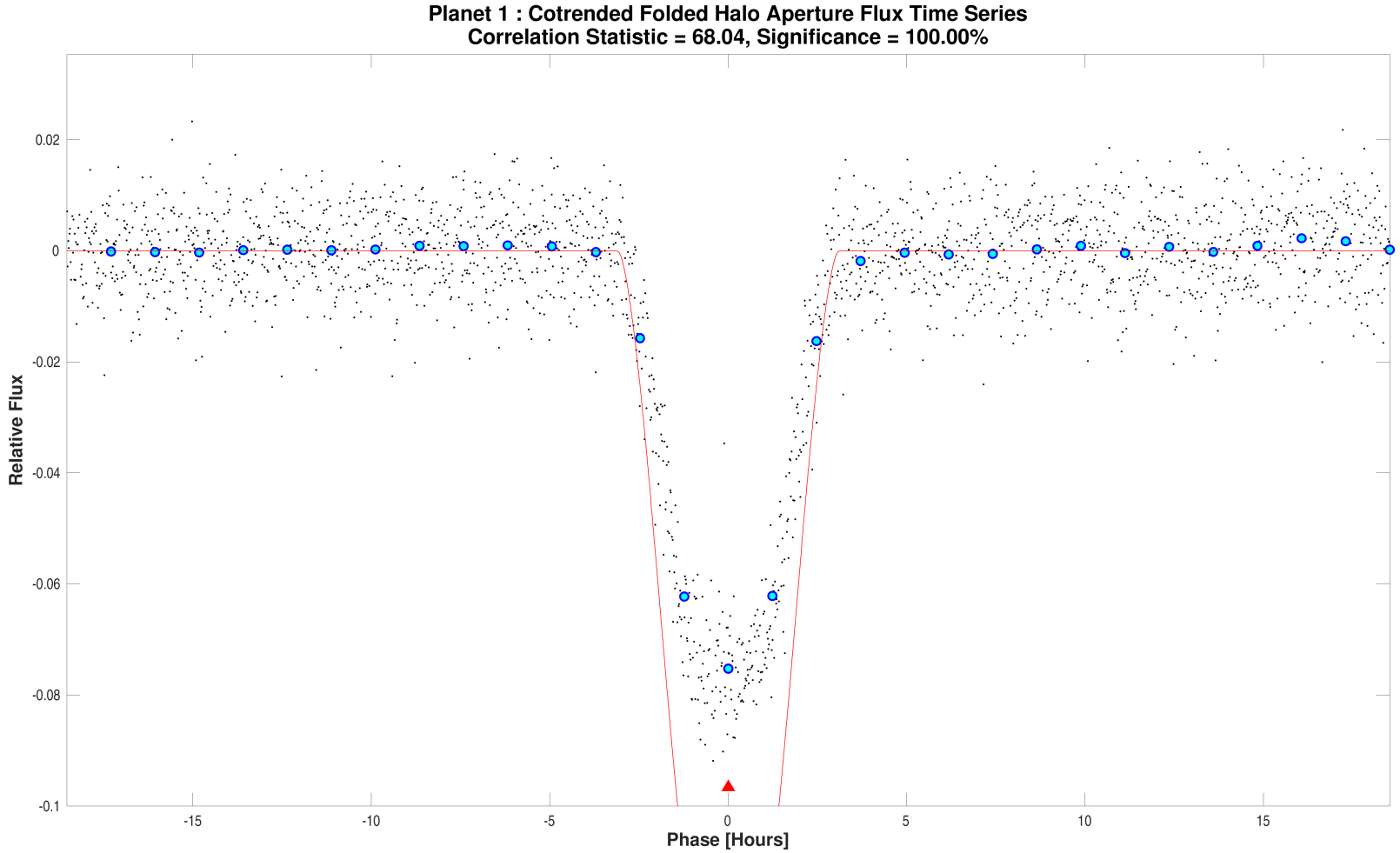


Bootstrap results for target 299096355, planet 1. Cumulative sum of the probabilities (derived from the histogram of counts) from upper tail to the search transit threshold; false alarm probability is indicated by the star. The Gaussian equivalent threshold for this false alarm probability is Inf. The threshold on this distribution that achieves the same false alarm rate as a 7.1 sigma threshold on a Gaussian distribution is 6.5467.
Open `./planet-01/bootstrap-results/0000000299096355-01-bootstrap-false-alarm.fig`



Optical ghost diagnostic core aperture flux time series for target 299096355, 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/0000000299096355-01-core-unwhitened-cotrended-zoomed-model.fig`



Optical ghost diagnostic halo aperture flux time series for target 299096355, 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/0000000299096355-01-halo-unwhitened-cotrended-zoomed-model.fig`

8 Planet Candidate 2

8.1 Model Fitter: All Transits

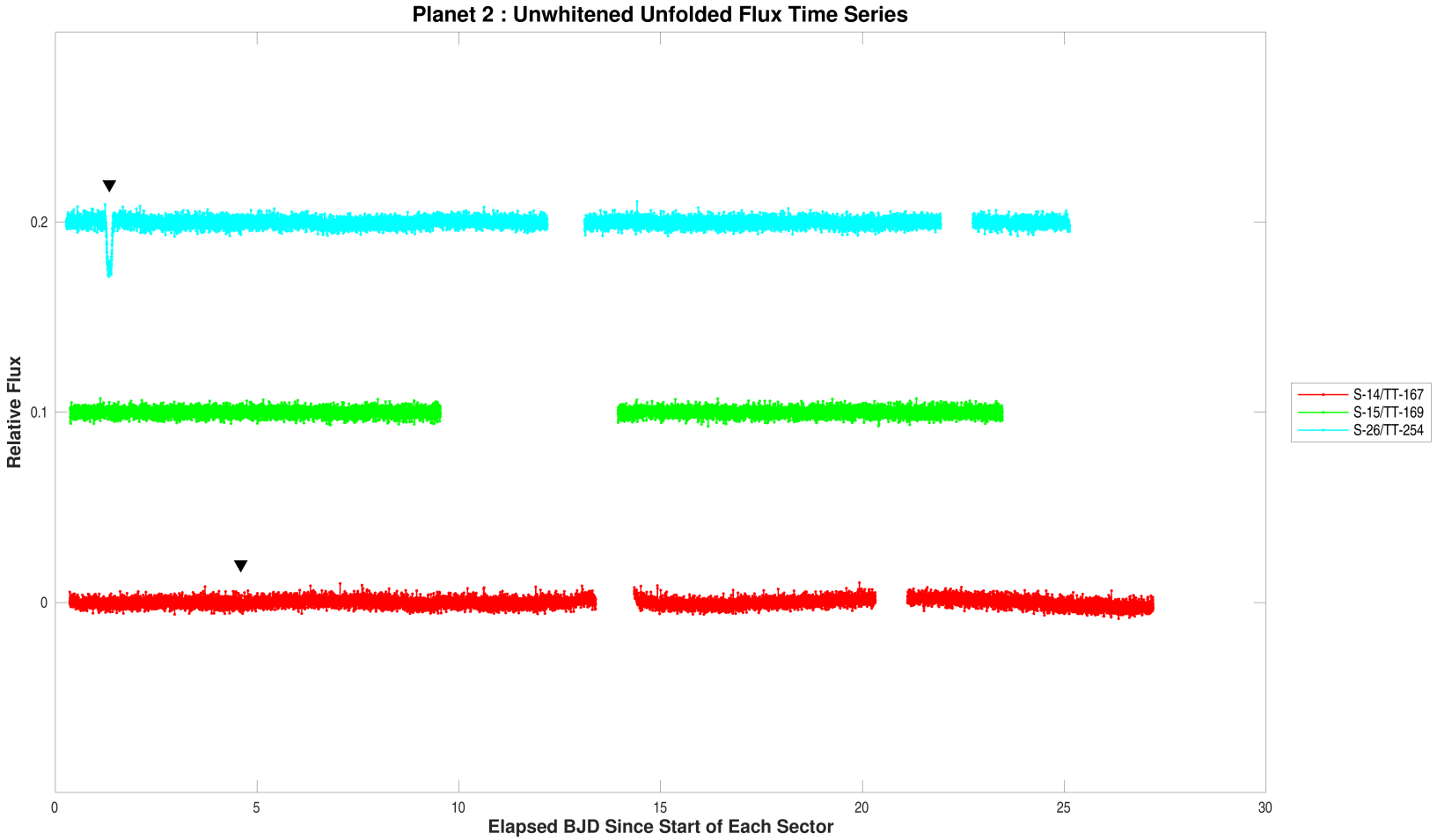
Model Characteristic	Name
Transit Model	mandel-agol_geometric_transit_model
Limb Darkening Model	claret_tess_nonlinear_limb_darkening_model

TCE Parameter	Value	Units
Trial Transit Pulse Duration	3.5	hours
Transit Epoch	1687.6094788	TJD
Orbital Period	323.7290264	days
Maximum SES	76.2	
Maximum MES	56.2	
Robust Statistic	51.2	
Chi Square Goodness of Fit Statistic (DoF)	2587.8 (209)	
Chi Square2 Statistic (DoF)	2321.8 (233.4)	
Threshold for Desired PFA		

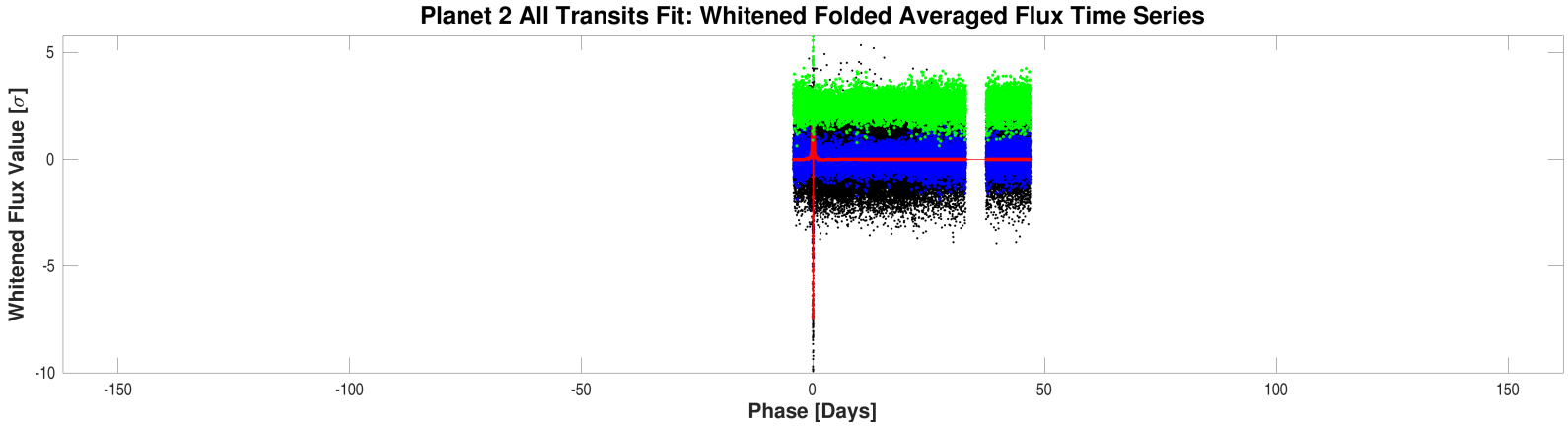
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	62.9		
Orbital Period	323.7488187	1.4395e-03	days
Transit Epoch	1687.5906860	9.7757e-04	BTJD
Impact Parameter	0.8188	1.1955e-02	
Planet Radius to Star Radius Ratio	0.1559725	2.3705e-03	
Semi-major Axis to Star Radius Ratio	445.3735	1.1086e+01	
Planet Radius	13.0874	1.2199e+00	Earth radii
Semi-major Axis	0.7915	8.2421e-02	AU
Effective Stellar Flux	0.2203	4.6422e-02	Goldilocks
Equilibrium Temperature	175	9.2059e+00	Kelvin
Stellar Density	11.3238	8.4563e-01	Solar density
Transit Depth	22670	4.5410e+02	ppm
Transit Duration	4.5315	7.2218e-02	hours
Transit Ingress Duration	1.6968	1.6726e-01	hours
Eccentricity	0.0000	0.0000e+00	
Peri Longitude	0.0000	0.0000e+00	degrees
Model Chi Square Statistic (DoF)	1798.9 (1150.3)		
Model Chi Square Goodness of Fit Statistic (DoF)	292.8 (277)		
Model Chi Square2 Statistic (DoF)	242.5 (1)		

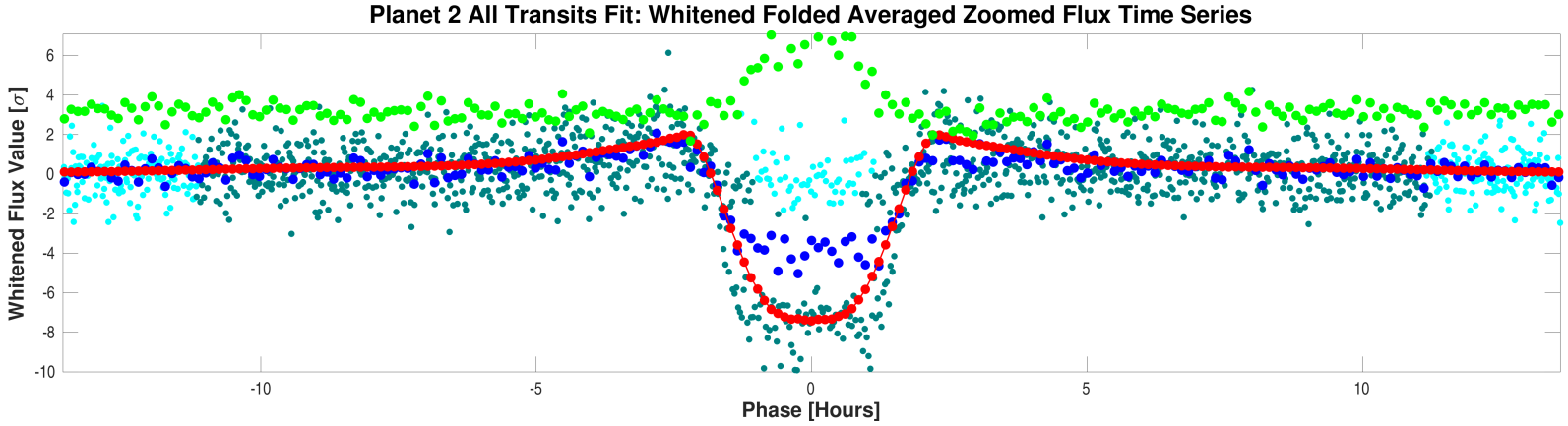
DoF: Degrees of Freedom



Flux time series for CatId 299096355, Planet candidate 2 in the unwhitened domain. For the data of Sector-14/TargetTableId-167, start BJD is 2458683 and the vertical offset is 0. For the data of Sector-15/TargetTableId-169, start BJD is 2458711 and the vertical offset is 0.1. For the data of Sector-26/TargetTableId-254, start BJD is 2459010 and the vertical offset is 0.2. 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/0000000299096355-02-all-unwhitened-14-167.fig`



Folded flux time series for CatId 299096355, 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/0000000299096355-02-all-whitened.fig`

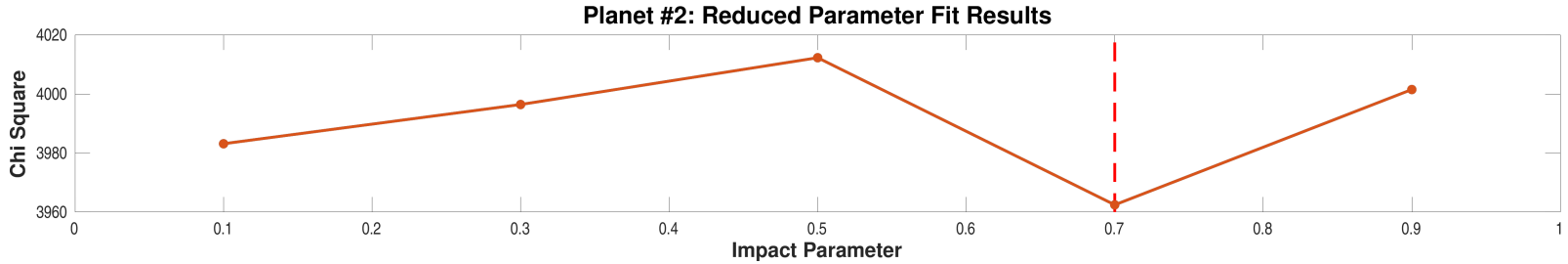


Folded flux time series for CatId 299096355, Planet candidate 2 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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/0000000299096355-02-all-whitened-zoomed.fig`

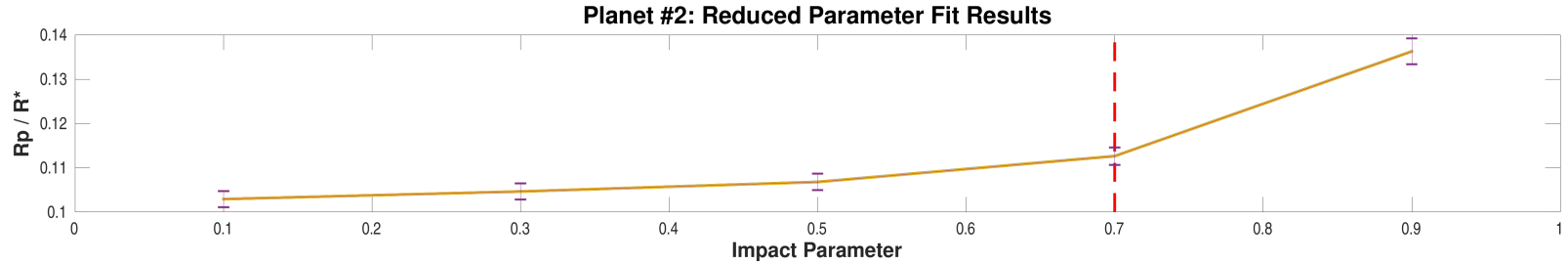
8.2 Model Fitter: Reduced Parameter Fit Results

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	55.6	3983.1	0.1029277	1.8040e-03	703.8575	1.0148e+01	12751	4.4420e+02	3.8594	5.5520e-02
0.30	56.5	3996.4	0.1046467	1.8078e-03	662.6032	9.6917e+00	12928	4.4381e+02	3.9682	5.7967e-02
0.50	56.3	4012.3	0.1068018	1.8610e-03	608.2474	9.6234e+00	12886	4.4601e+02	4.0149	6.3542e-02
0.70	56.9	3962.4	0.1126398	1.9662e-03	496.6764	9.3330e+00	13152	4.5527e+02	4.3066	8.1228e-02
0.90	55.5	4001.5	0.1362789	2.9083e-03	337.3491	9.8835e+00	14269	5.5933e+02	5.0852	1.4615e-01

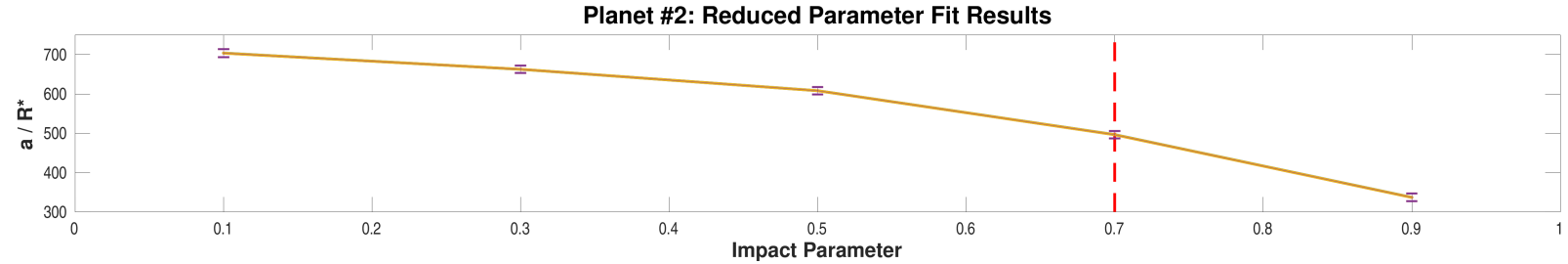
Highlighted row is the best reduced-parameter model fit.



Model chi squares of reduced parameter fits vs. impact parameter for CatId 299096355, 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/0000000299096355-02-reduced-fits-chi-square.fig`



Ratios of planet radius to star radius of reduced parameter fits vs. impact parameter for CatId 299096355, 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/0000000299096355-02-reduced-fits-rp-over-rstar.fig`



Ratios of semimajor axis to star radius of reduced parameter fits vs. impact parameter for CatId 299096355, 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/0000000299096355-02-reduced-fits-a-over-rstar.fig`

8.3 Model Fitter: Trapezoidal Fit Results

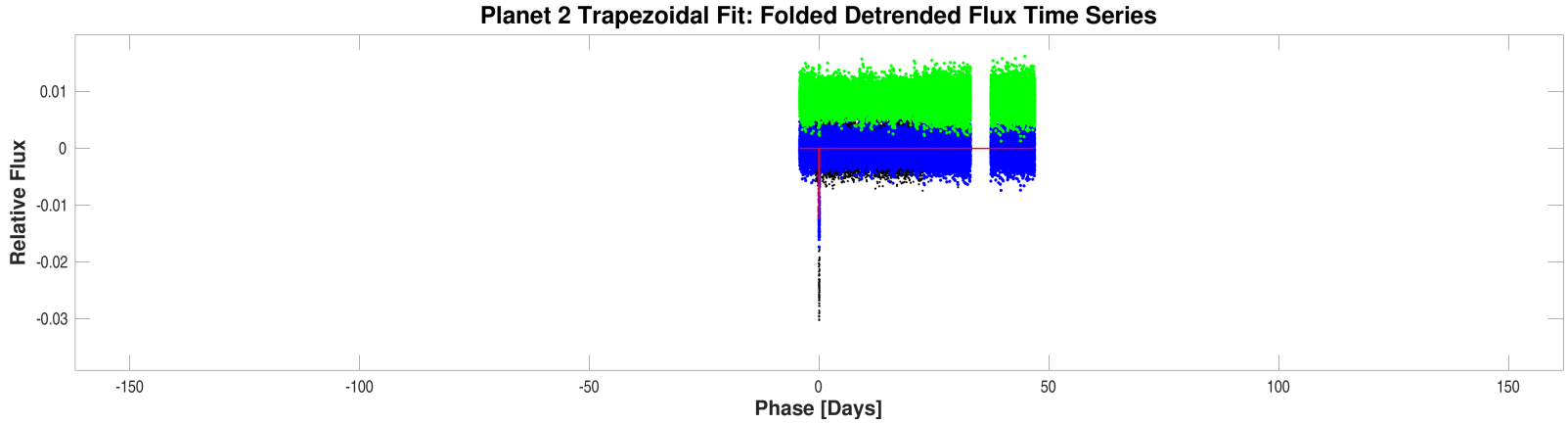
Model Characteristic	Name
Transit Model	trapezoidal_model
Limb Darkening Model	

TCE Parameter	Value	Units
Trial Transit Pulse Duration	3.5	hours
Transit Epoch	1687.6094788	TJD
Orbital Period	323.7290264	days
Maximum SES	76.2	
Maximum MES	56.2	
Robust Statistic	51.2	
Chi Square Goodness of Fit Statistic (DoF)	2587.8 (209)	
Chi Square2 Statistic (DoF)	2321.8 (233.4)	
Threshold for Desired PFA		

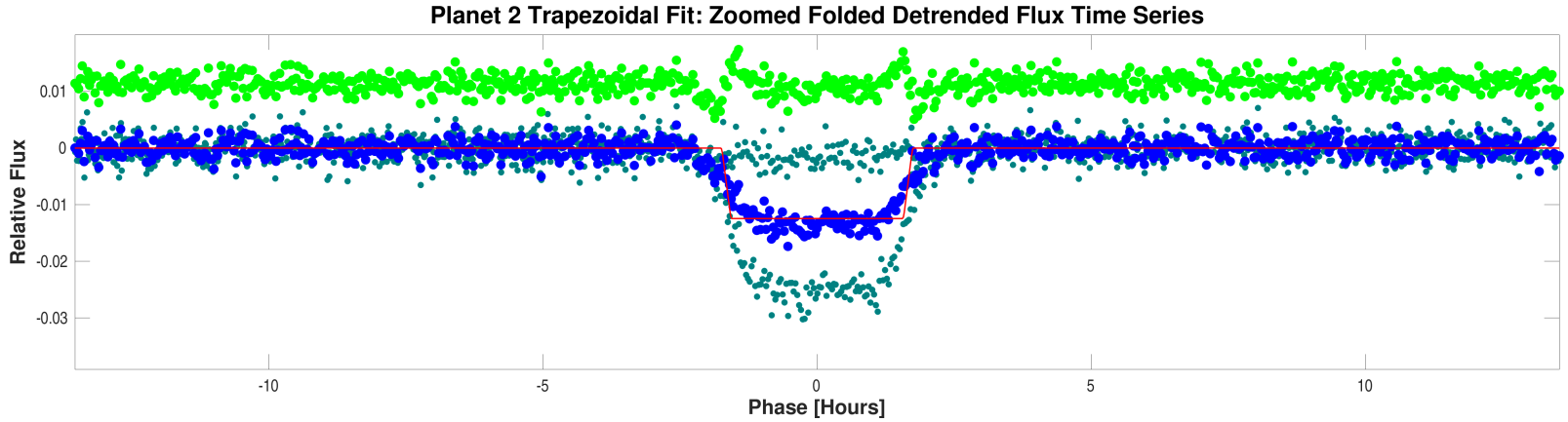
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	85.7		
Orbital Period	323.7290264		days
Transit Epoch	1687.6089946		BTJD
Transit Depth	12444		ppm
Transit Duration	4.5112		hours
Transit Ingress Duration	1.1990		hours
Model Chi Square Statistic (DoF)	55941.0 (1653)		

DoF: Degrees of Freedom



Folded detrended flux time series for CatId 299096355, Planet candidate 2 and folded trapezoidal model light curve.
Open `./planet-02/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000299096355-02-all-trapezoidal.fig`



Zoomed folded detrended flux time series for CatId 299096355, Planet candidate 2 and folded trapezoidal model light curve.
Open `./planet-02/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000299096355-02-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	323.729		days		
Transit Duration	3.5		hours		
Maximum MES	56.2				
Secondary Phase	4.1792		days		
Secondary MES	2.8				
Minimum Phase	4.0181		days		
Minimum MES	-3.2				
Median MES	-0.0				
MAD MES	0.5775				
Robust Statistic	2.7				
Secondary Depth	739.6	2.6788e+02	ppm		
Geometric Albedo	1488.0	6.0301e+02		2.4659	0.68
Planet Effective Temperature	1678	1.5942e+02	Kelvin	9.4131	0.00

8.4.2 Eclipsing Binary Discrimination Test

Result	Value	Value in Sigmas	Significance (%)
Odd Even Transit Depth Comparison Statistic	2.2374e+03	47.3016	0.00
Longer Period Comparison Statistic	2.3292e+02	15.2618	100.00

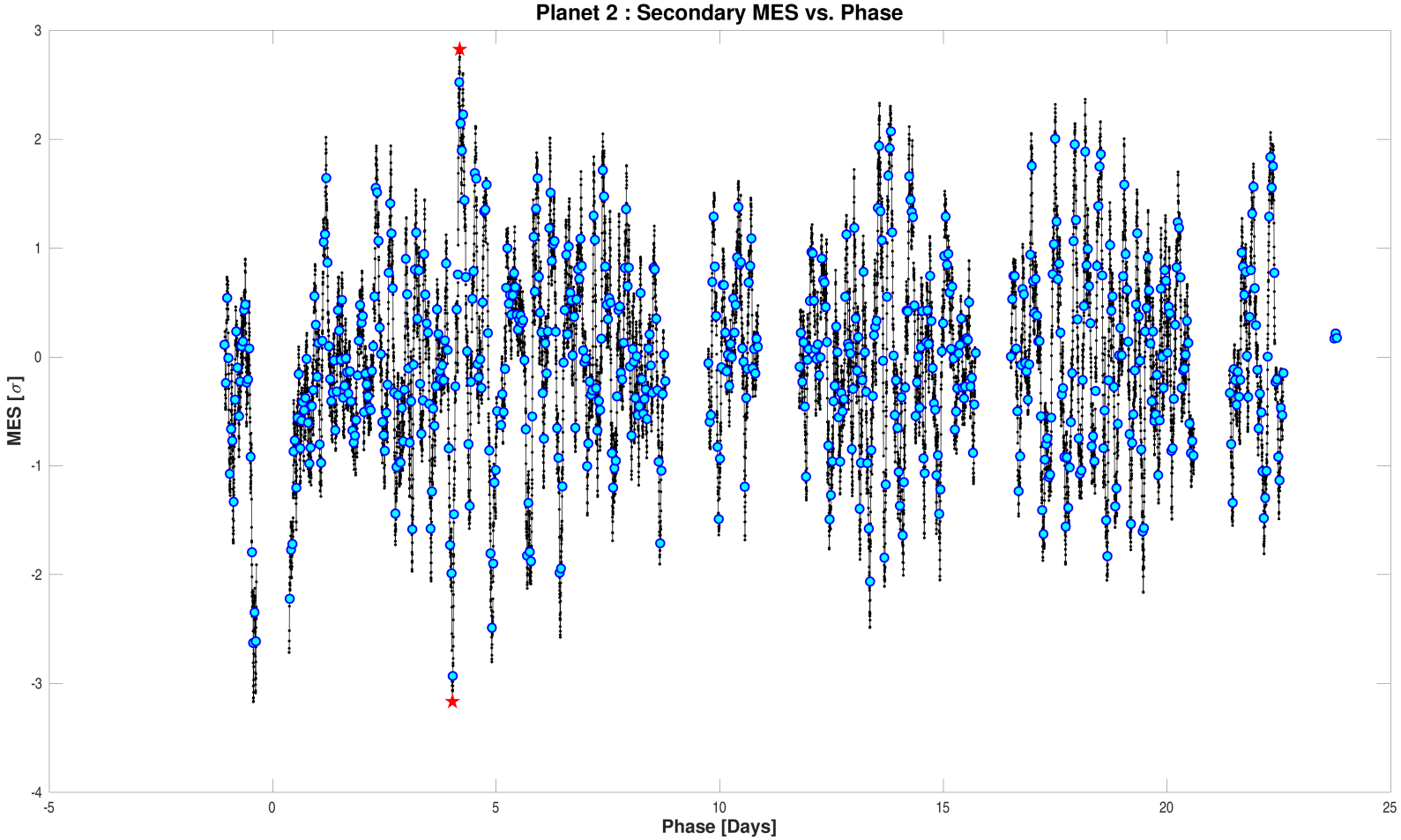
8.4.3 Bootstrap Test

Result	Value
False Alarm Probability	1.9563e-156
Bootstrap Threshold for Desired PFA	8.8
MES Mean	-3.58
MES Standard Deviation	2.25
Transit Count	2

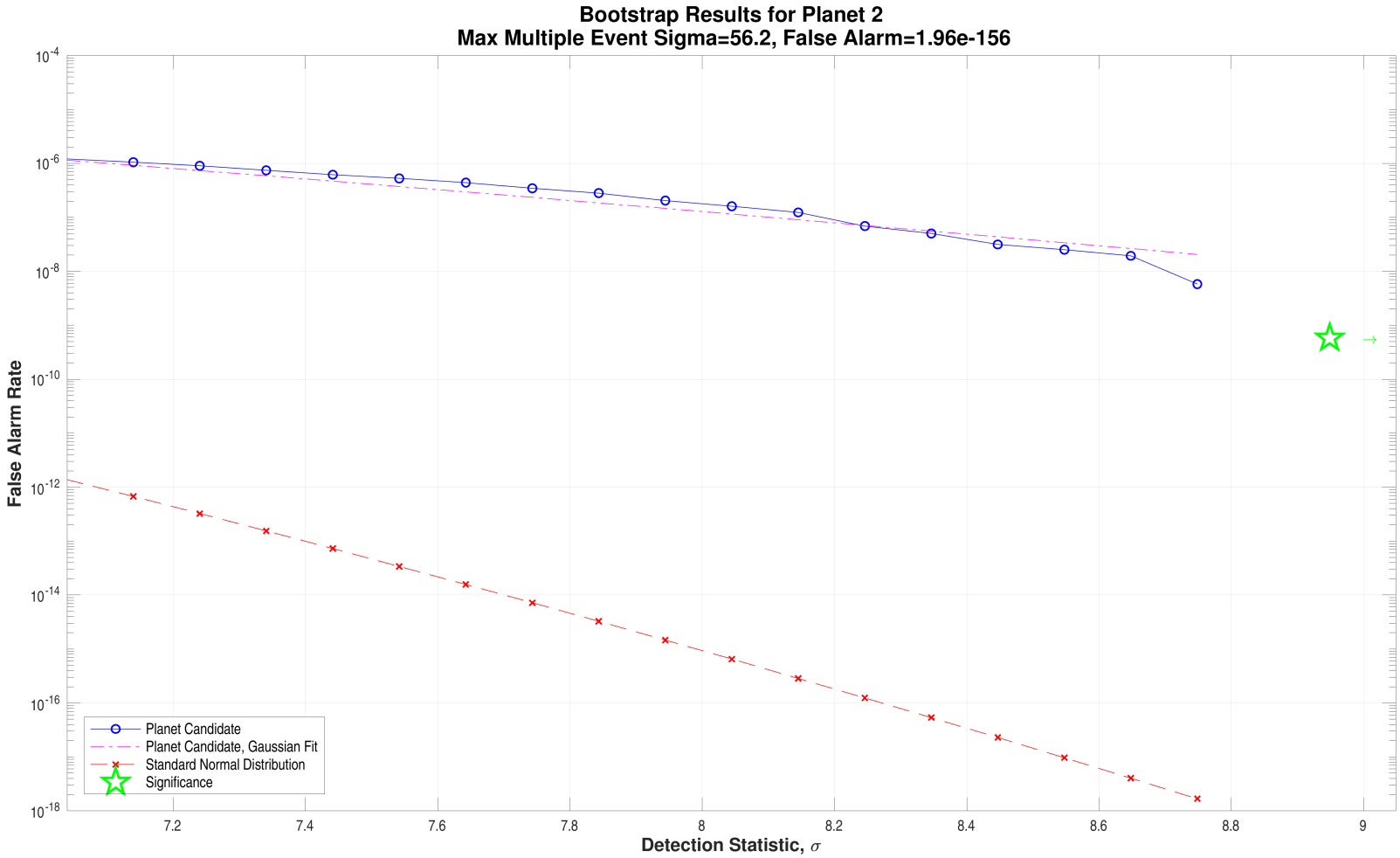
8.4.4 Ghost Diagnostic Test

Result	Value	Significance (%)
Maximum MES	56.2	
SNR	62.9	
Core Aperture Statistic	3.7408e+00	99.99
Halo Aperture Statistic	3.7414e+00	99.99
Ratio of Core/Halo Aperture Statistics	9.9983e-01	

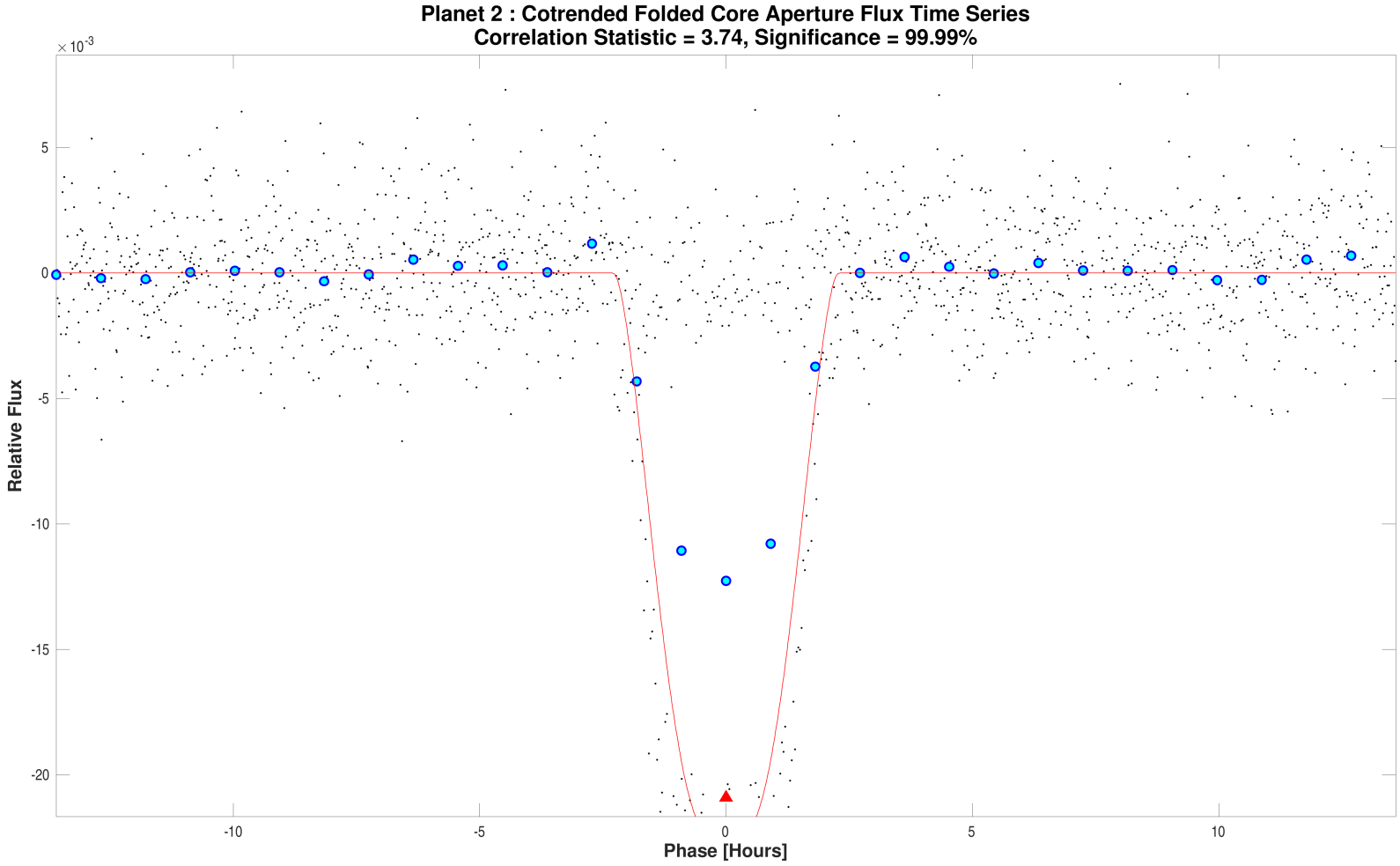
8.4.5 Validation Test Figures



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 3.5. The maximum secondary MES and corresponding phase are 2.827 and 4.1792 days respectively. The minimum secondary MES and corresponding phase are -3.1649 and 4.0181 days respectively.
Open `./planet-02/report-summary/0000000299096355-02-weak-secondary-diagnostic.fig`

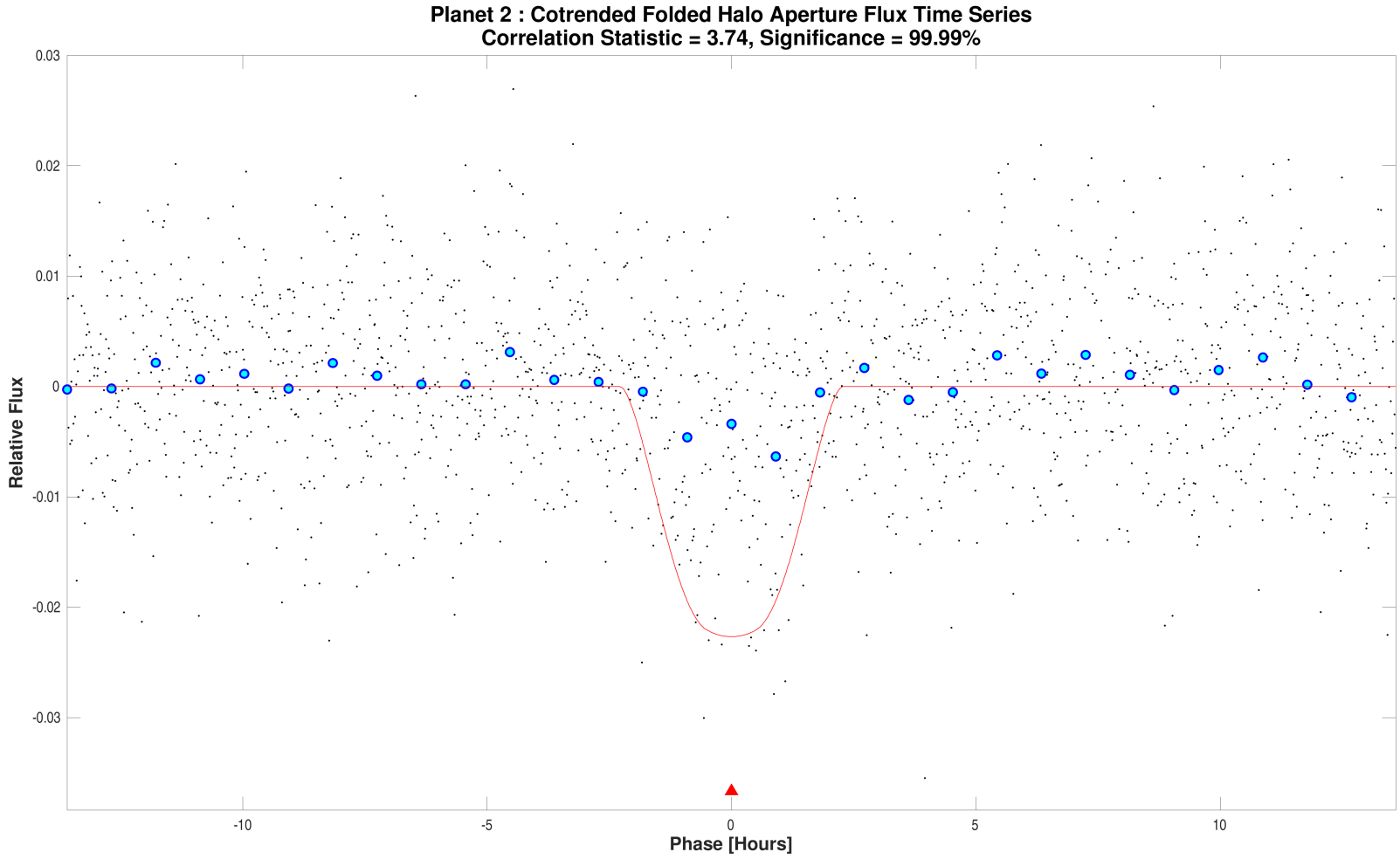


Bootstrap results for target 299096355, planet 2. Cumulative sum of the probabilities (derived from the histogram of counts) from upper tail to the search transit threshold; false alarm probability is indicated by the star. The Gaussian equivalent threshold for this false alarm probability is 26.6207. The threshold on this distribution that achieves the same false alarm rate as a 7.1 sigma threshold on a Gaussian distribution is 8.8492.
Open `./planet-02/bootstrap-results/0000000299096355-02-bootstrap-false-alarm.fig`



Optical ghost diagnostic core aperture flux time series for target 299096355, 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/0000000299096355-02-core-unwhitened-cotrended-zoomed-model.fig`

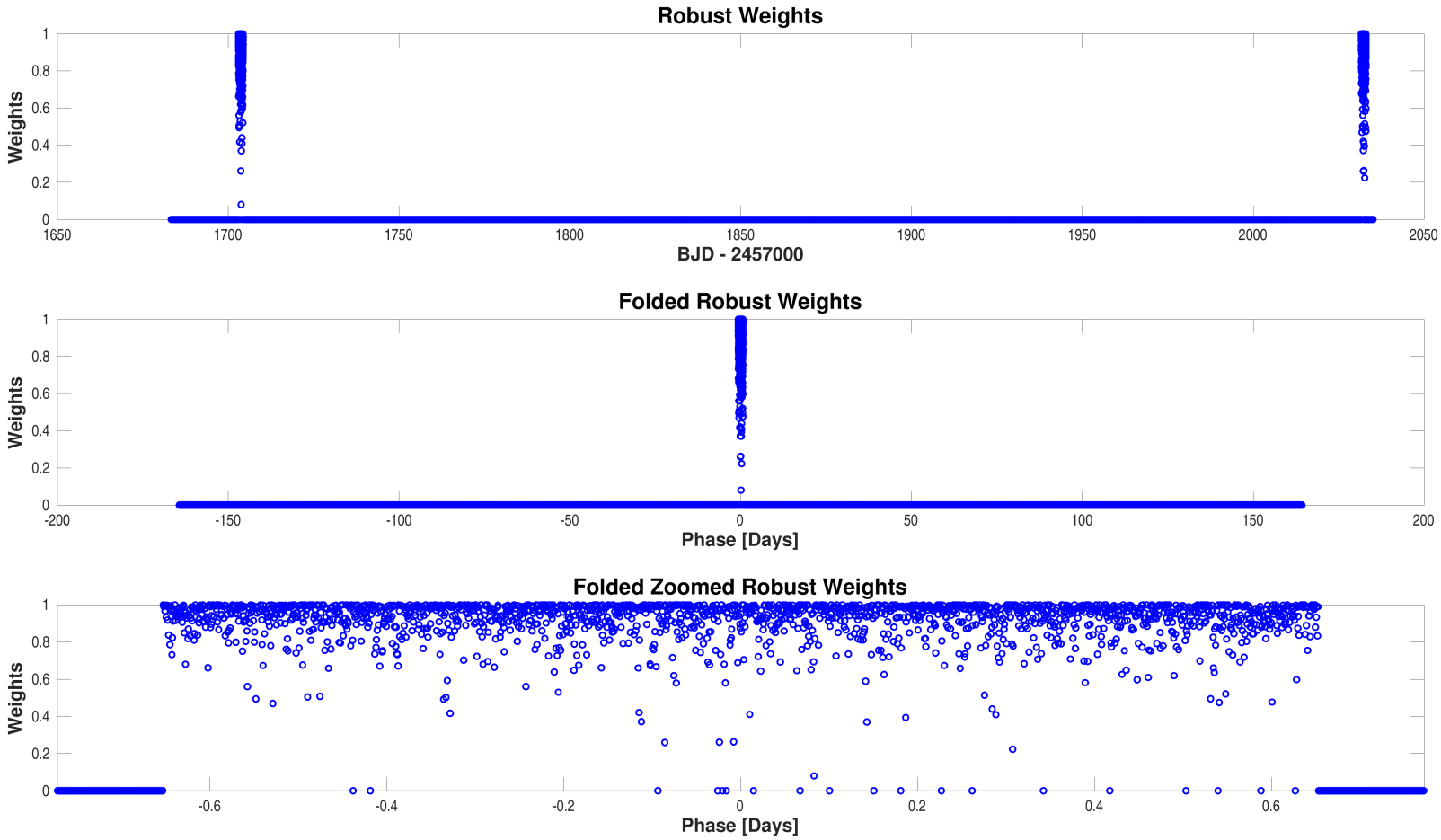


Optical ghost diagnostic halo aperture flux time series for target 299096355, planet candidate 2. The unwhitened time series is phase folded at the orbital period associated with the planet candidate and centered on the epoch of the first transit. The time series was first cotrended against spacecraft 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.

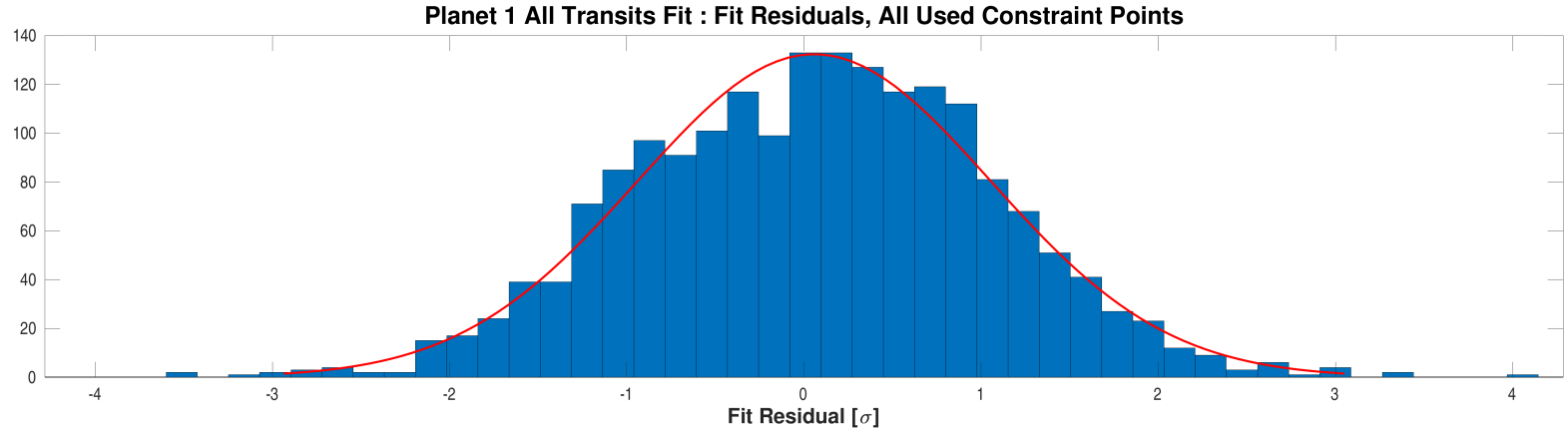
Open `./planet-02/ghost-diagnostic-results/0000000299096355-02-halo-unwhitened-cotrended-zoomed-model.fig`

Appendix A Planet Candidate 1

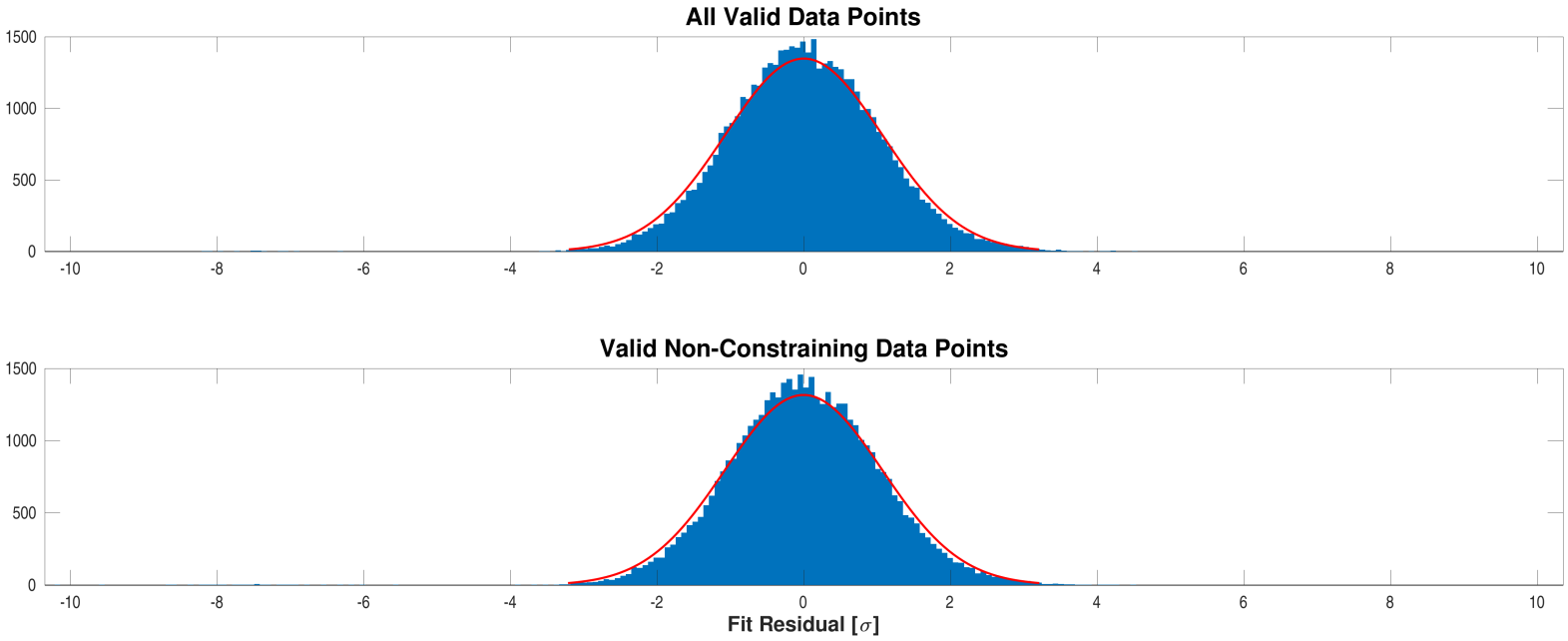
A.1 Model Fitter: All Transits



Robust weights distribution for CatId 299096355, 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/0000000299096355-01-all-robust-weights.fig`



Fit residuals distribution for CatId 299096355, 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/0000000299096355-01-all-histo-used.fig`

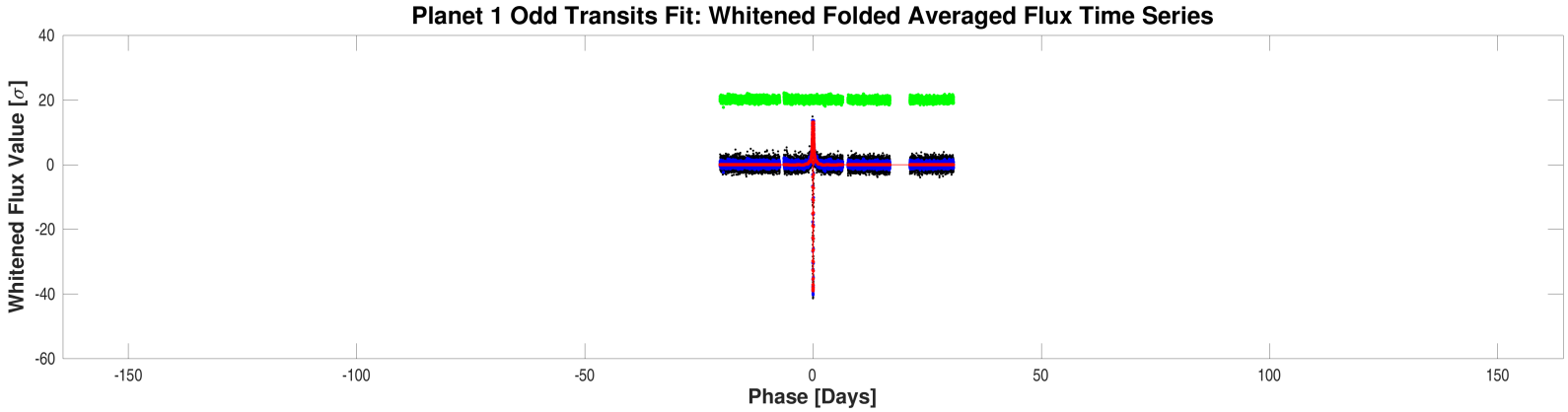


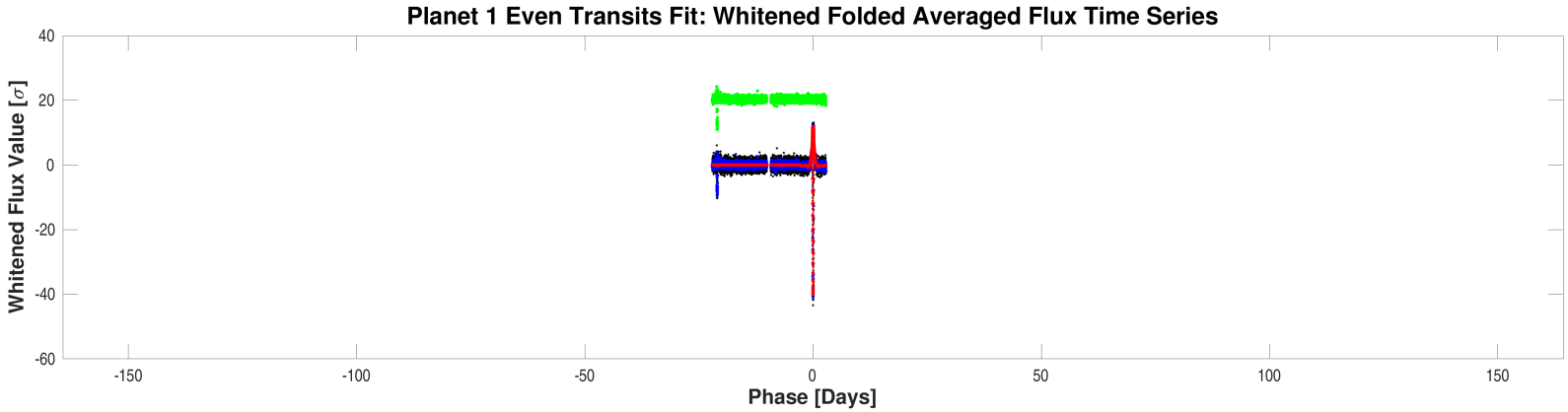
Fit residuals distribution for CatId 299096355, Planet candidate 1. Top plot: all valid data. Bottom plot: valid data not used to constrain fit (due to distance from a transit). Gaussian fits to the histograms are shown in red.
Open `./planet-01/planet-search-and-model-fitting-results/all-transits-fit/0000000299096355-01-all-histo-all-and-unused.fig`

A.2 Model Fitter: Odd & Even Transits

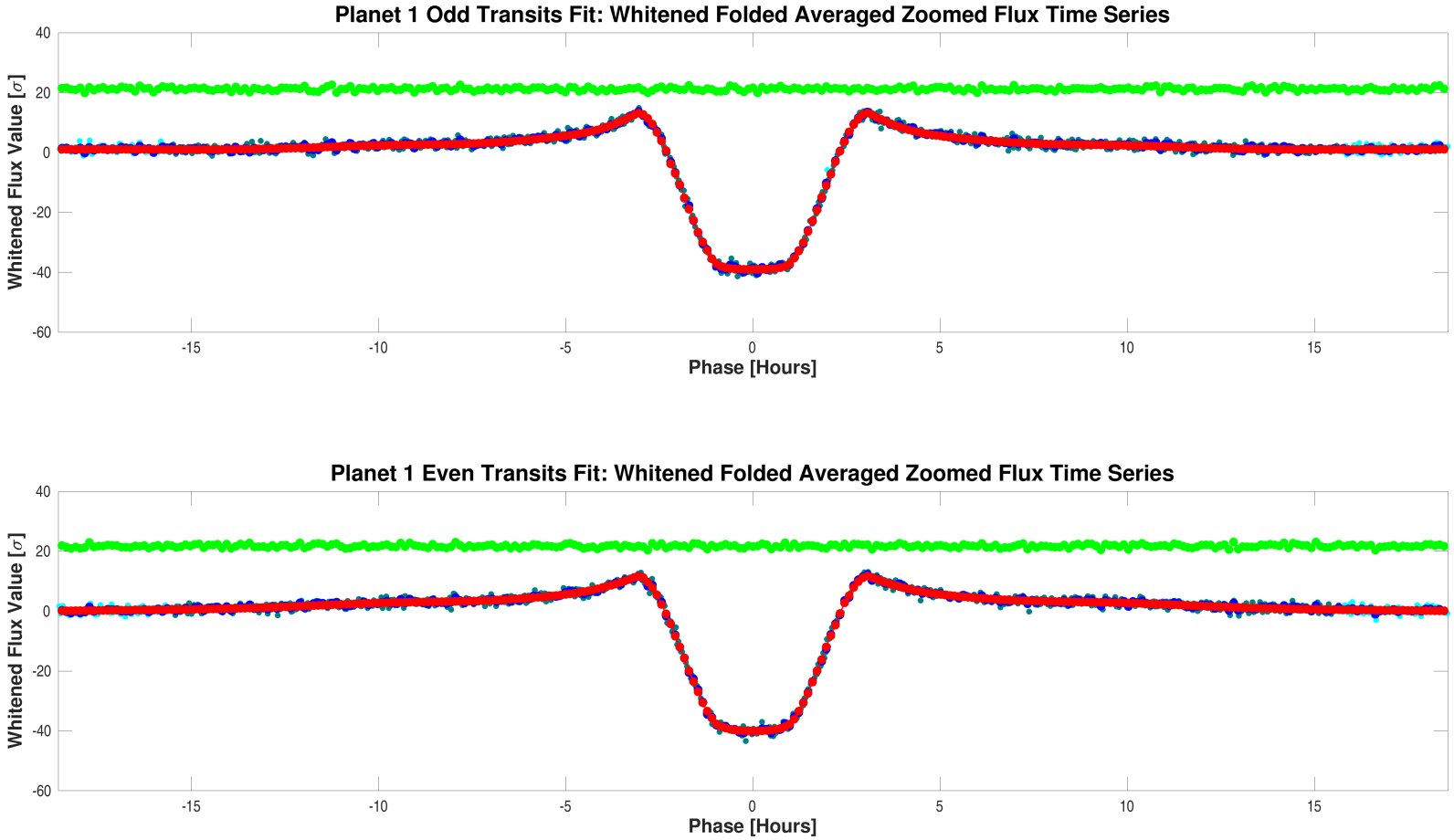
Parameter	Odd Transits Value	Odd Transits Uncertainty	Even Transits Value	Even Transits Uncertainty	Units	Difference / ‖Uncertainty‖
SNR	365.7		365.0			
Orbital Period	328.6209910	0.0000e+00	328.6209910	0.0000e+00	days	
Transit Epoch	1703.7187111	1.4702e-04	2032.3396151	1.5157e-04	BTJD	4.2987e-02
Impact Parameter	0.5345	4.5972e-03	0.5276	5.2676e-03		9.8811e-01
Planet Radius to Star Radius Ratio	0.3481336	7.1581e-04	0.3480852	7.6888e-04		4.6028e-02
Semi-major Axis to Star Radius Ratio	502.4301	1.6913e+00	504.8499	1.8683e+00		9.6021e-01
Planet Radius	29.2114	2.6870e+00	29.2073	2.6868e+00	Earth radii	1.0677e-03
Semi-major Axis	0.7994	8.3246e-02	0.7994	8.3246e-02	AU	0.0000e+00
Effective Stellar Flux	0.2159	4.5507e-02	0.2159	4.5507e-02	Goldilocks	0.0000e+00
Equilibrium Temperature	174	9.1601e+00	174	9.1601e+00	Kelvin	0.0000e+00
Stellar Density	15.7788	1.5934e-01	16.0078	1.7772e-01	Solar density	9.5974e-01
Transit Depth	132191	3.9696e+02	132524	4.1032e+02	ppm	5.8382e-01
Transit Duration	6.1841	1.5453e-02	6.1689	1.6551e-02	hours	6.7037e-01
Transit Ingress Duration	2.1599	2.1675e-02	2.1324	2.3600e-02	hours	8.5701e-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)	1436.7 (1709.7)		1436.7 (1709.7)			

DoF: Degrees of Freedom

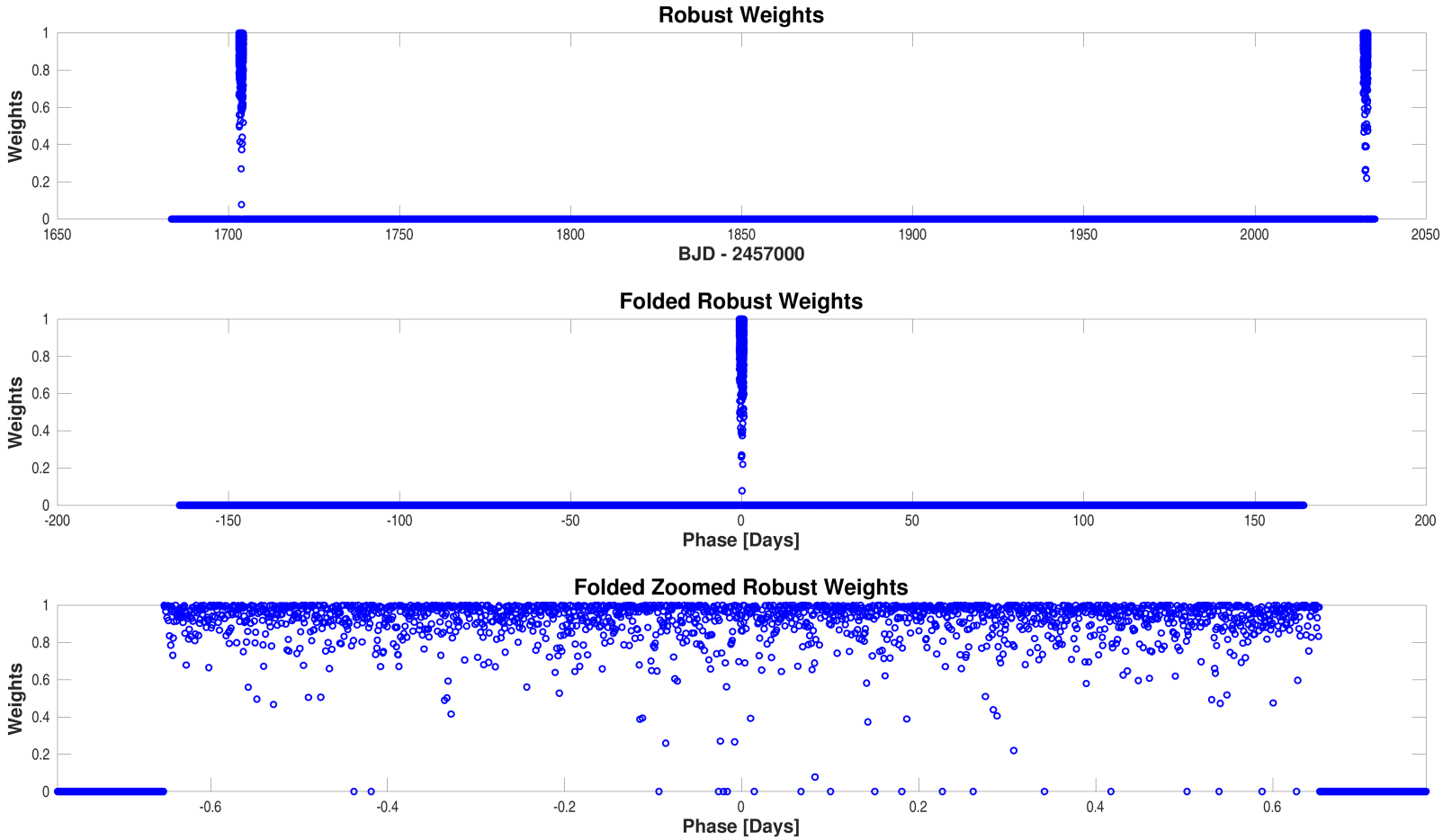




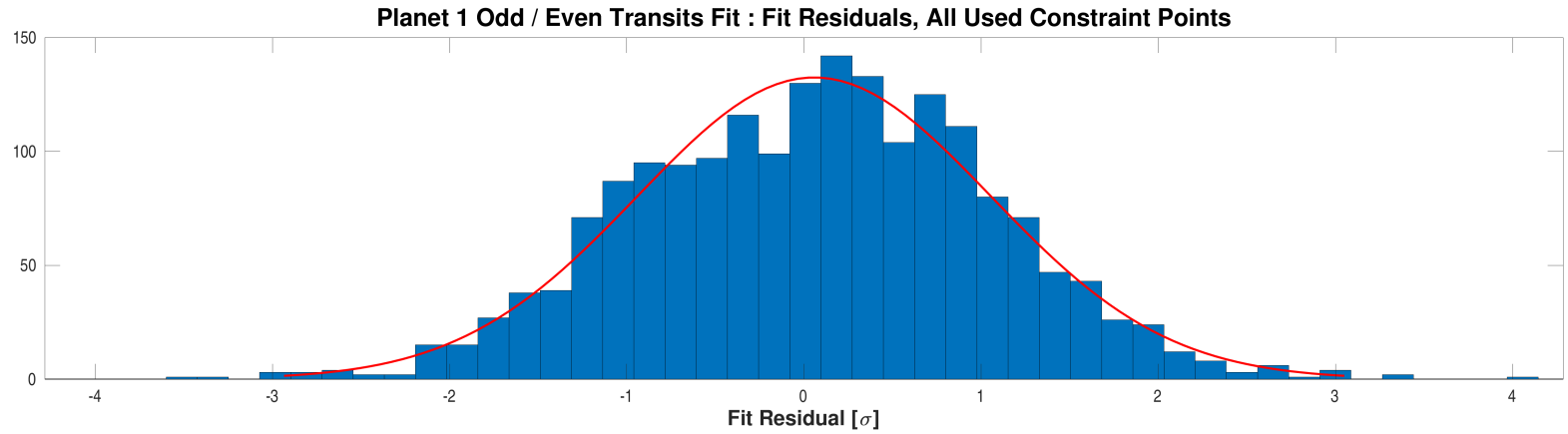
Folded flux time series for CatId 299096355, Planet candidate 1 in the whitened domain is plotted in black dots. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged values of the folded flux time series; the red dots represent the averaged values of the folded model light 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/0000000299096355-01-odd-even-whitened.fig`



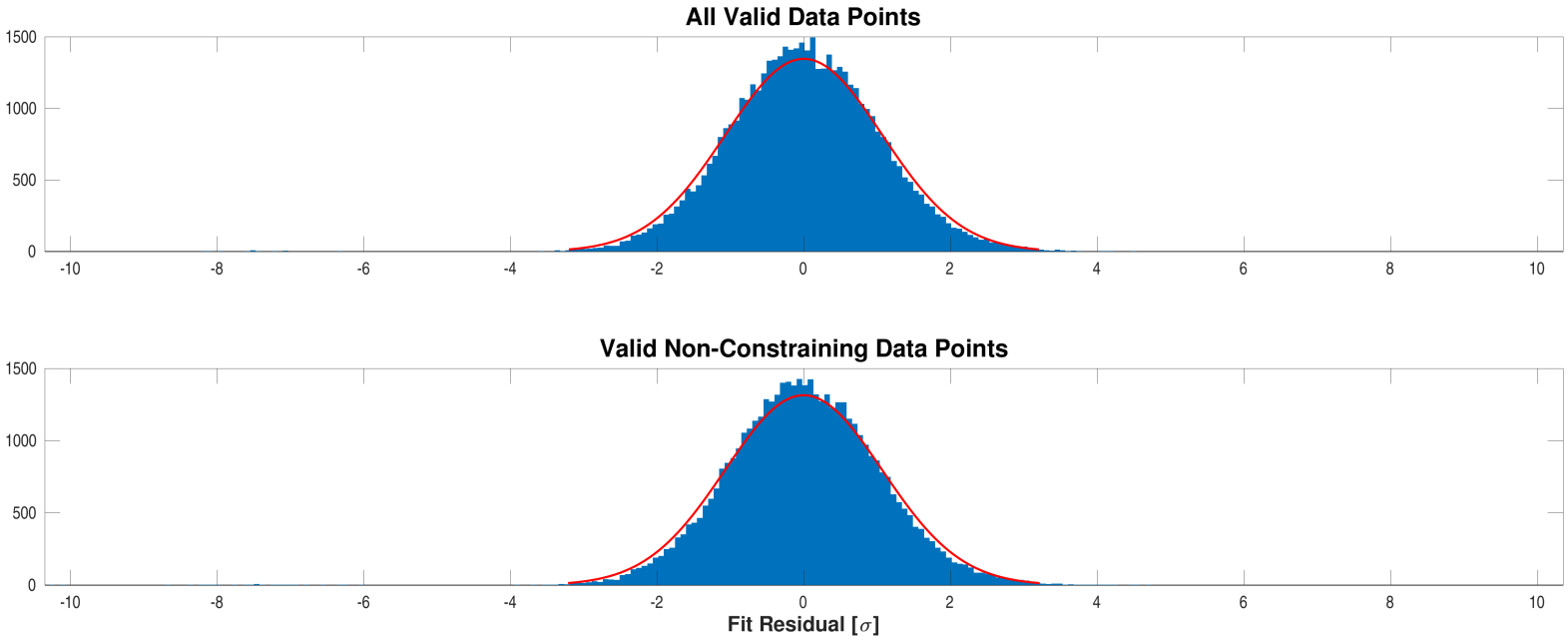
Folded flux time series for CatId 299096355, Planet candidate 1 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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/0000000299096355-01-odd-even-whitened-zoomed.fig`



Robust weights distribution for CatId 299096355, 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/0000000299096355-01-odd-even-robust-weights.fig`

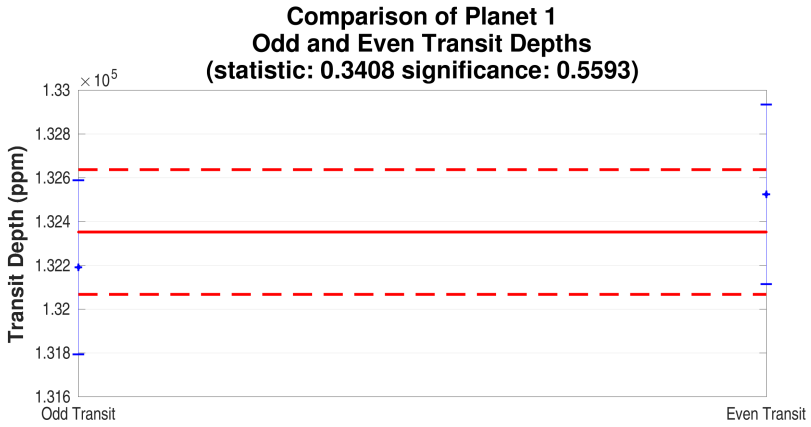


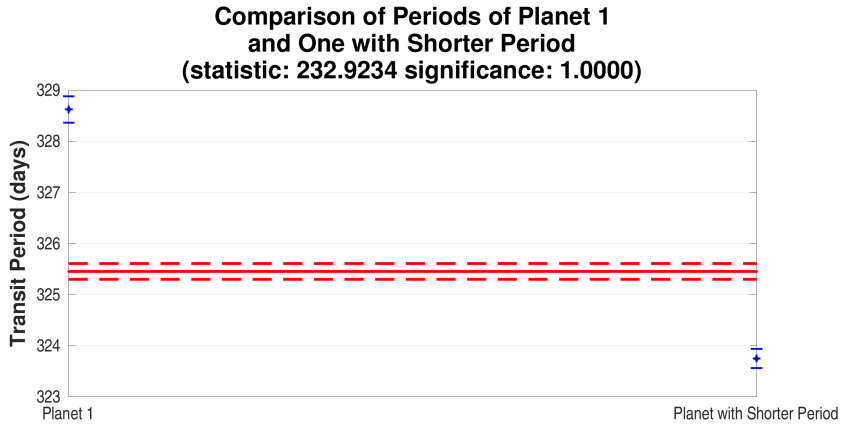
Fit residuals distribution for CatId 299096355, Planet candidate 1. Only the valid data points used to constrain the fit are shown here. A Gaussian fit to the histogram is shown in red.
Open `./planet-01/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000299096355-01-odd-even-histo-used.fig`



Fit residuals distribution for CatId 299096355, 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/0000000299096355-01-odd-even-histo-all-and-unused.fig`

A.3 Eclipsing Binary Discrimination Test

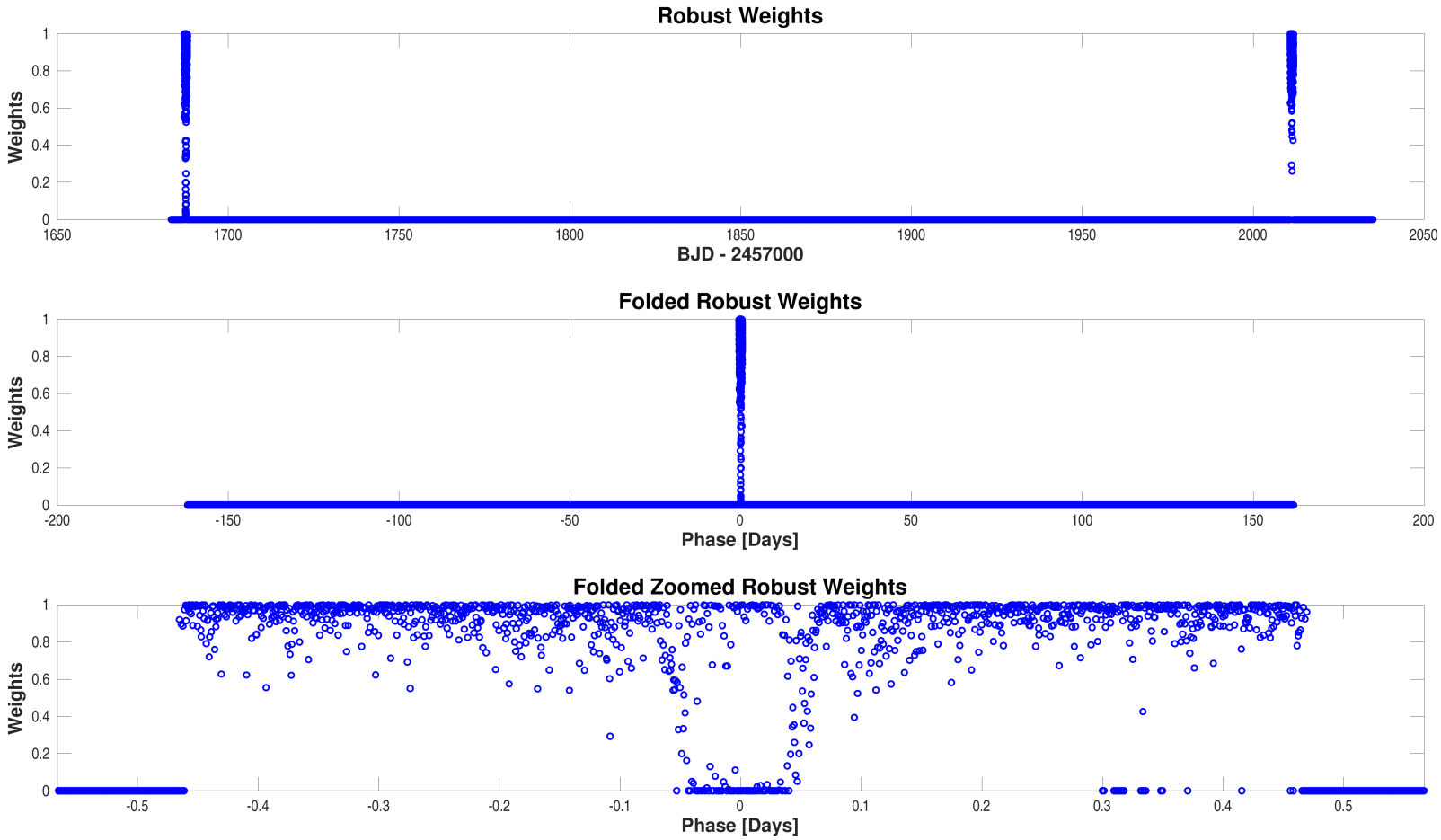




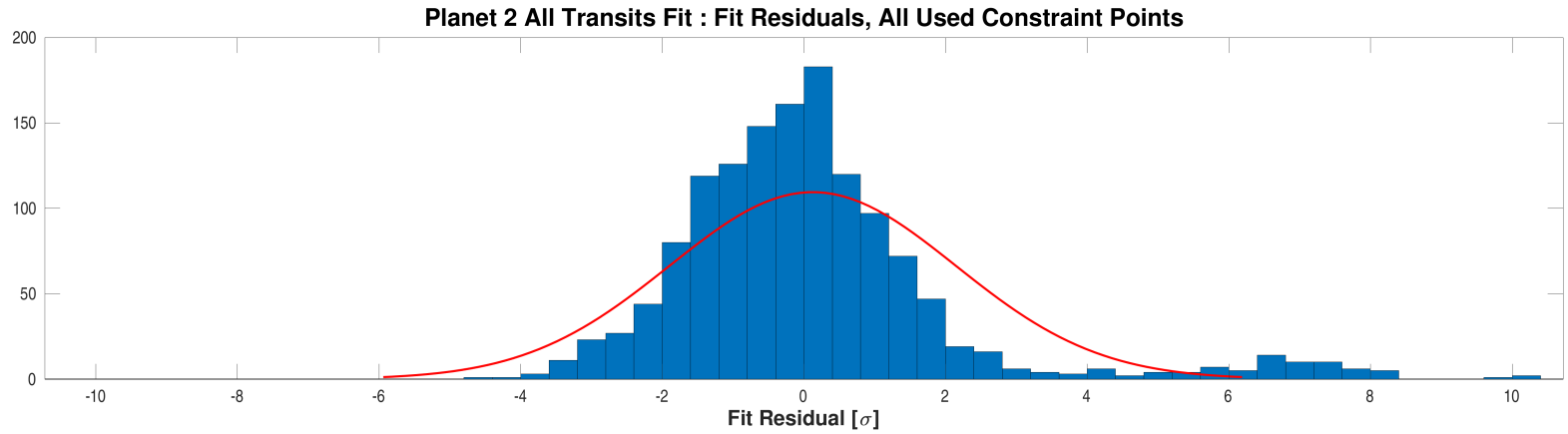
Top-left: Diagnostic plot of Odd/Even Transit Depth Test for catId 299096355, planet 1. A significance level close to 1/0 favors a transiting planet/an eclipsing binary. Top-right: Diagnostic plot of Orbital Period Test for catId 299096355. Orbital periods of planet 1 and the planet with shorter period are compared. A significance level close to 1/0 favors a transiting planet/an eclipsing binary.
Open `./planet-01/binary-discrimination-test-results/0000000299096355-01-eclipsing-binary-discrimination-tests.fig`

Appendix B Planet Candidate 2

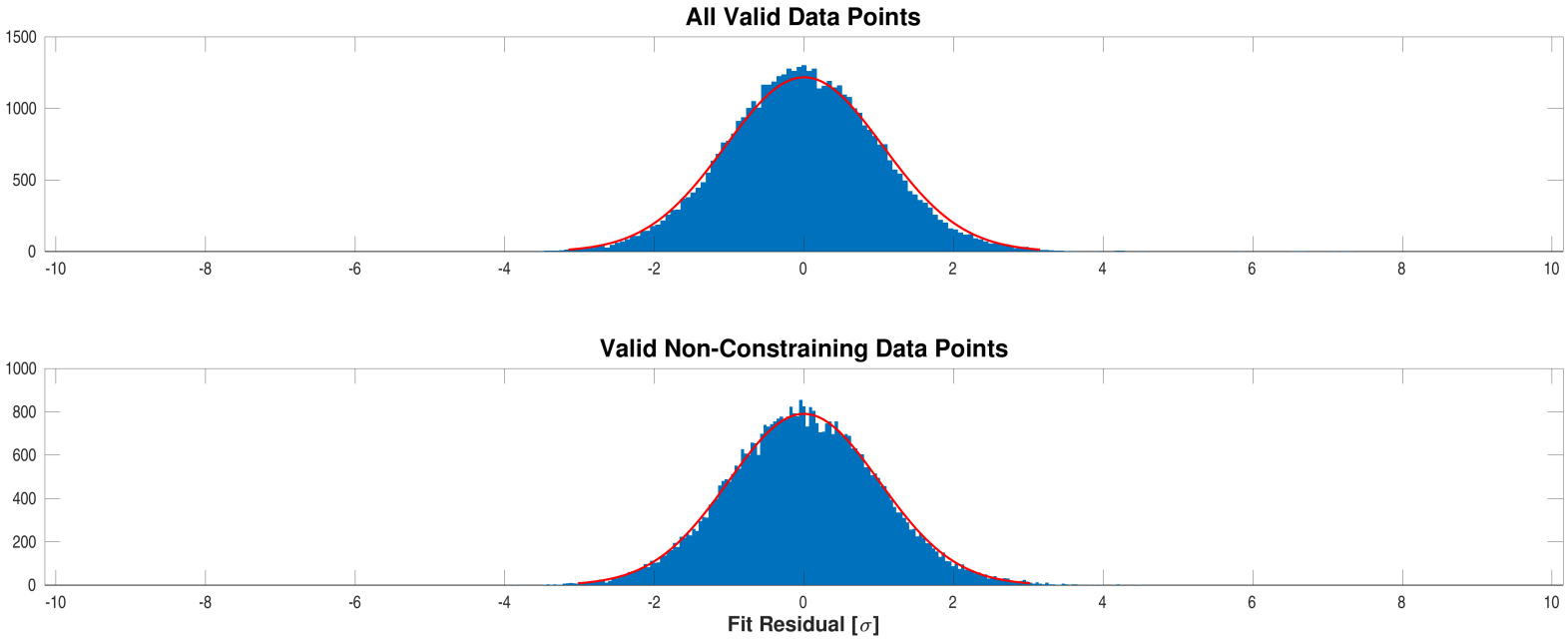
B.1 Model Fitter: All Transits



Robust weights distribution for CatId 299096355, 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/0000000299096355-02-all-robust-weights.fig`



Fit residuals distribution for CatId 299096355, 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/0000000299096355-02-all-histo-used.fig`

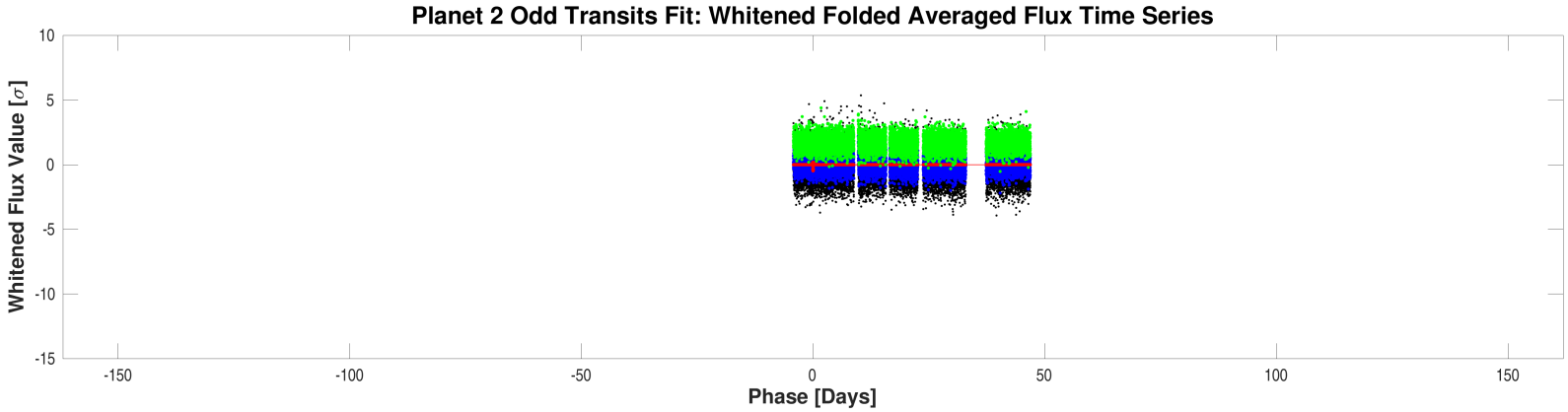


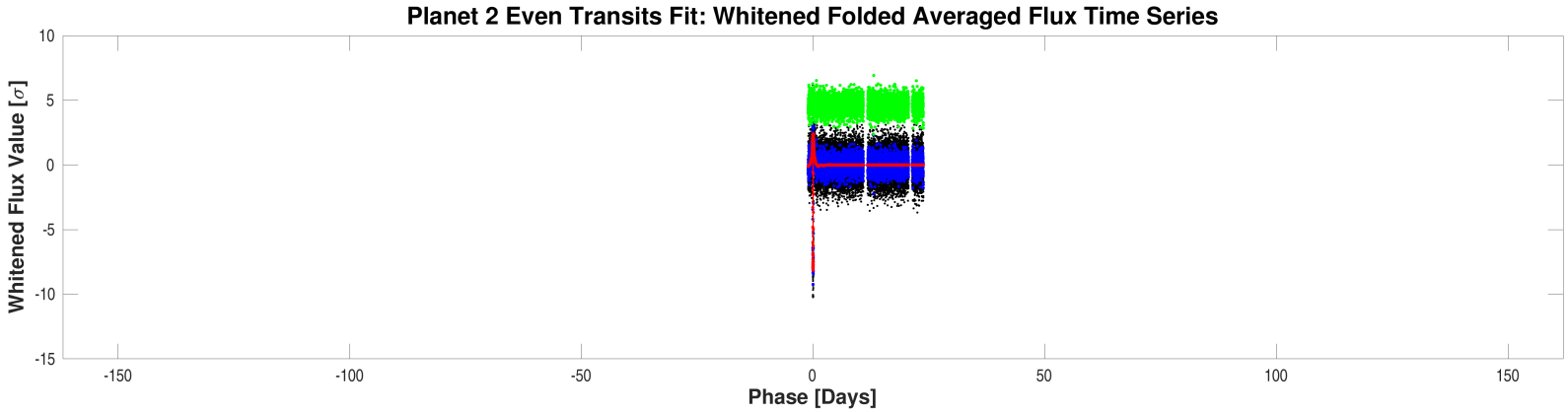
Fit residuals distribution for CatId 299096355, Planet candidate 2. Top plot: all valid data. Bottom plot: valid data not used to constrain fit (due to distance from a transit). Gaussian fits to the histograms are shown in red.
Open `./planet-02/planet-search-and-model-fitting-results/all-transits-fit/0000000299096355-02-all-histo-all-and-unused.fig`

B.2 Model Fitter: Odd & Even Transits

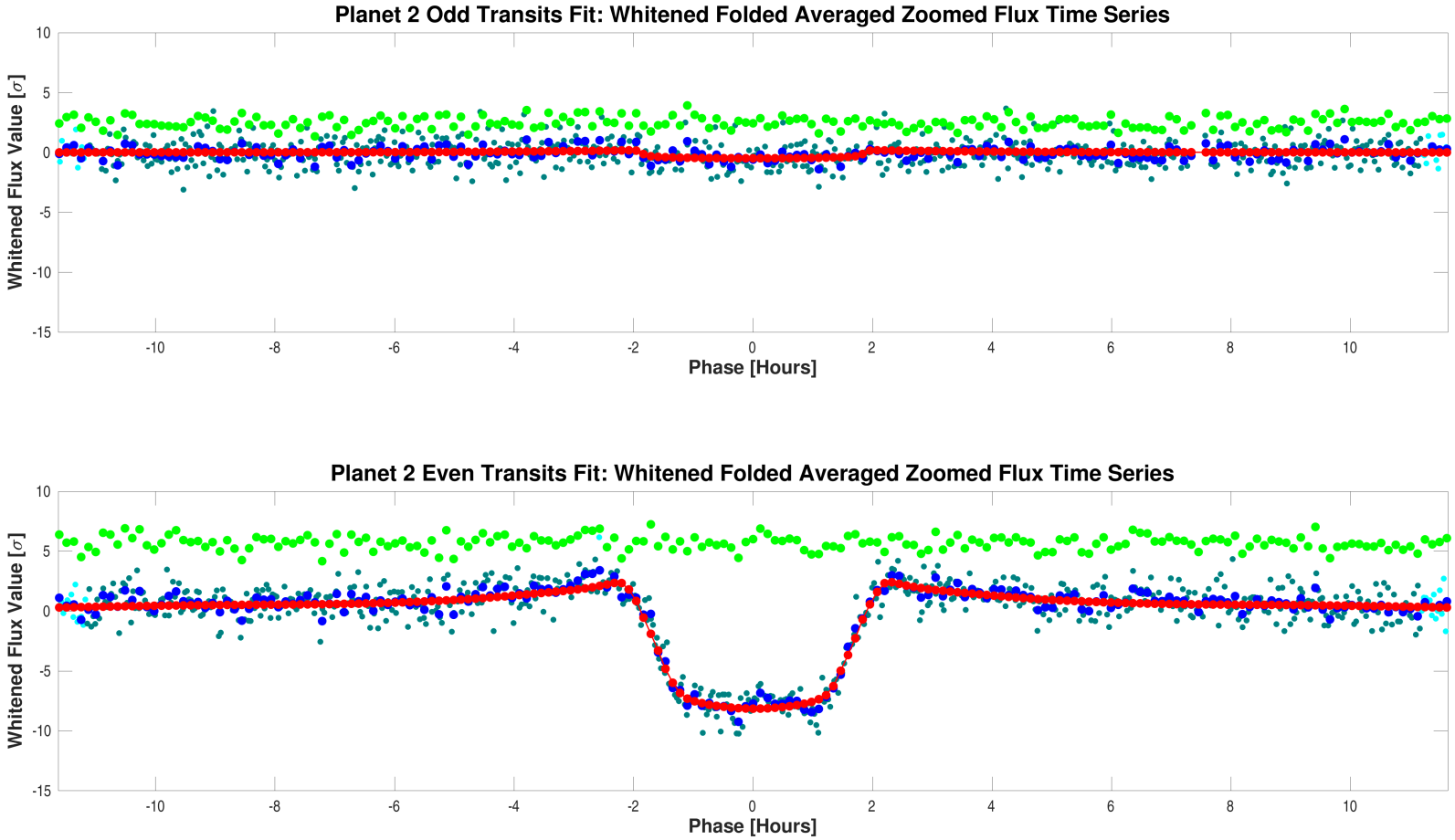
Parameter	Odd Transits Value	Odd Transits Uncertainty	Even Transits Value	Even Transits Uncertainty	Units	Difference / ‖Uncertainty‖
SNR	4.6		72.6			
Orbital Period	323.7440290	0.0000e+00	323.7440290	0.0000e+00	days	
Transit Epoch	1687.5945103	4.9629e-03	2011.3392037	5.8363e-04	BTJD	8.2555e-01
Impact Parameter	0.0100	3.9822e+02	0.6752	2.6291e-02		1.6705e-03
Planet Radius to Star Radius Ratio	0.0351850	3.1682e-02	0.1562956	1.8478e-03		3.8162e+00
Semi-major Axis to Star Radius Ratio	660.5658	2.6143e+03	515.9773	1.6425e+01		5.5305e-02
Planet Radius	2.9523	2.6723e+00	13.1145	1.2160e+00	Earth radii	3.4613e+00
Semi-major Axis	0.7915	8.2420e-02	0.7915	8.2420e-02	AU	0.0000e+00
Effective Stellar Flux	0.2203	4.6423e-02	0.2203	4.6423e-02	Goldilocks	0.0000e+00
Equilibrium Temperature	175	9.2059e+00	175	9.2059e+00	Kelvin	0.0000e+00
Stellar Density	36.9472	4.3868e+02	17.6086	1.6816e+00	Solar density	4.4084e-02
Transit Depth	1495	3.3334e+02	25588	3.8510e+02	ppm	4.7302e+01
Transit Duration	3.8757	1.0807e+00	4.4993	6.8073e-02	hours	5.7597e-01
Transit Ingress Duration	0.1317	1.1645e+00	1.0372	8.1326e-02	hours	7.7570e-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)	1078.1 (1192.4)		1078.1 (1192.4)			

DoF: Degrees of Freedom

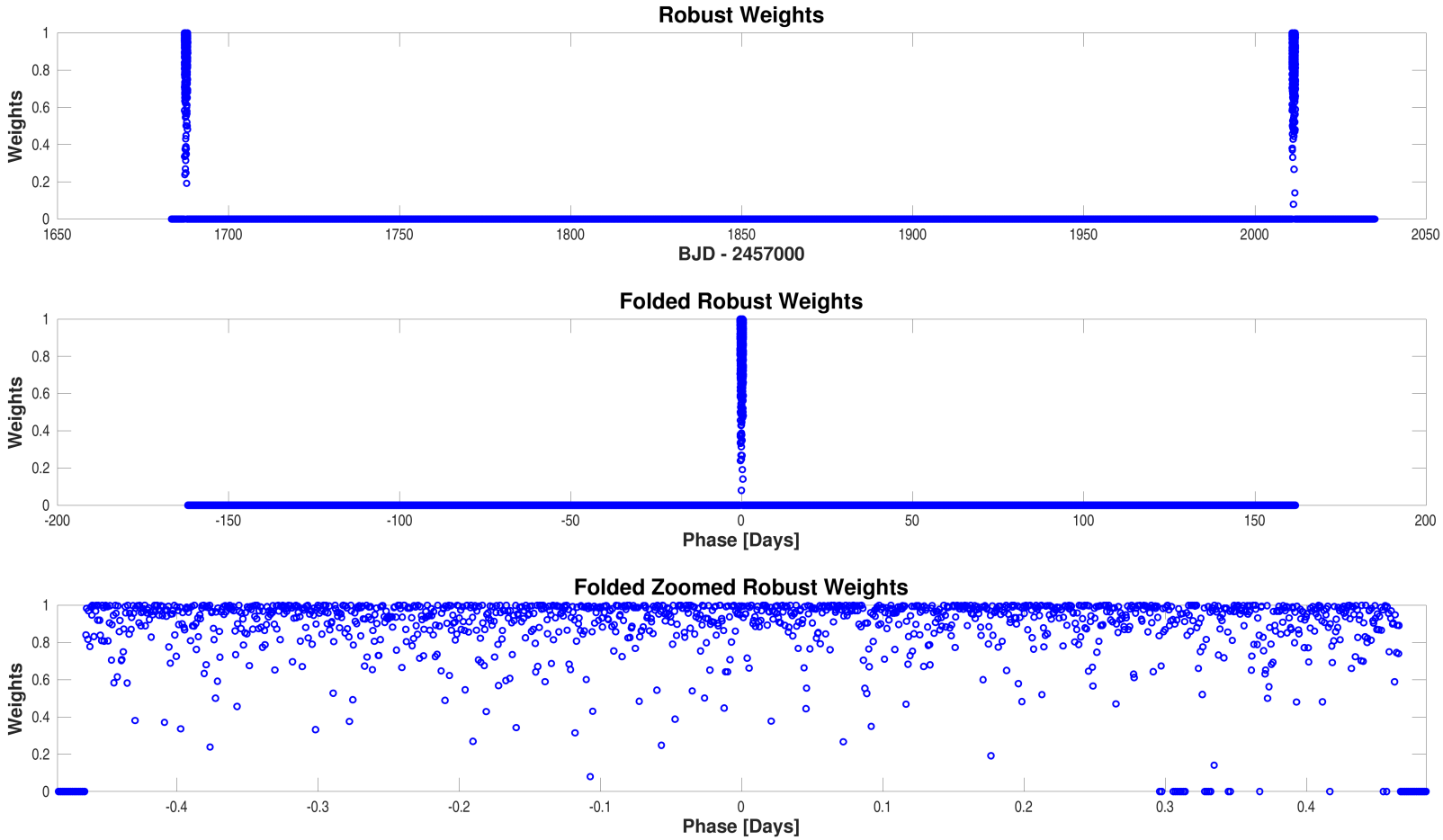




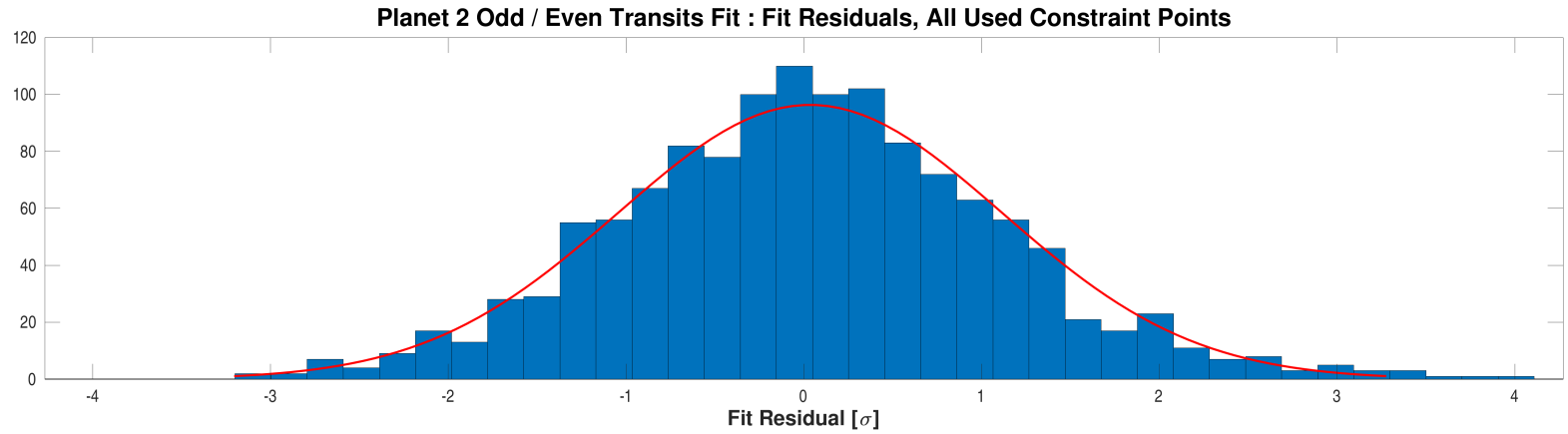
Folded flux time series for CatId 299096355, Planet candidate 2 in the whitened domain is plotted in black dots. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged values of the folded flux time series; the red dots represent the averaged values of the folded model light 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/0000000299096355-02-odd-even-whitened.fig`



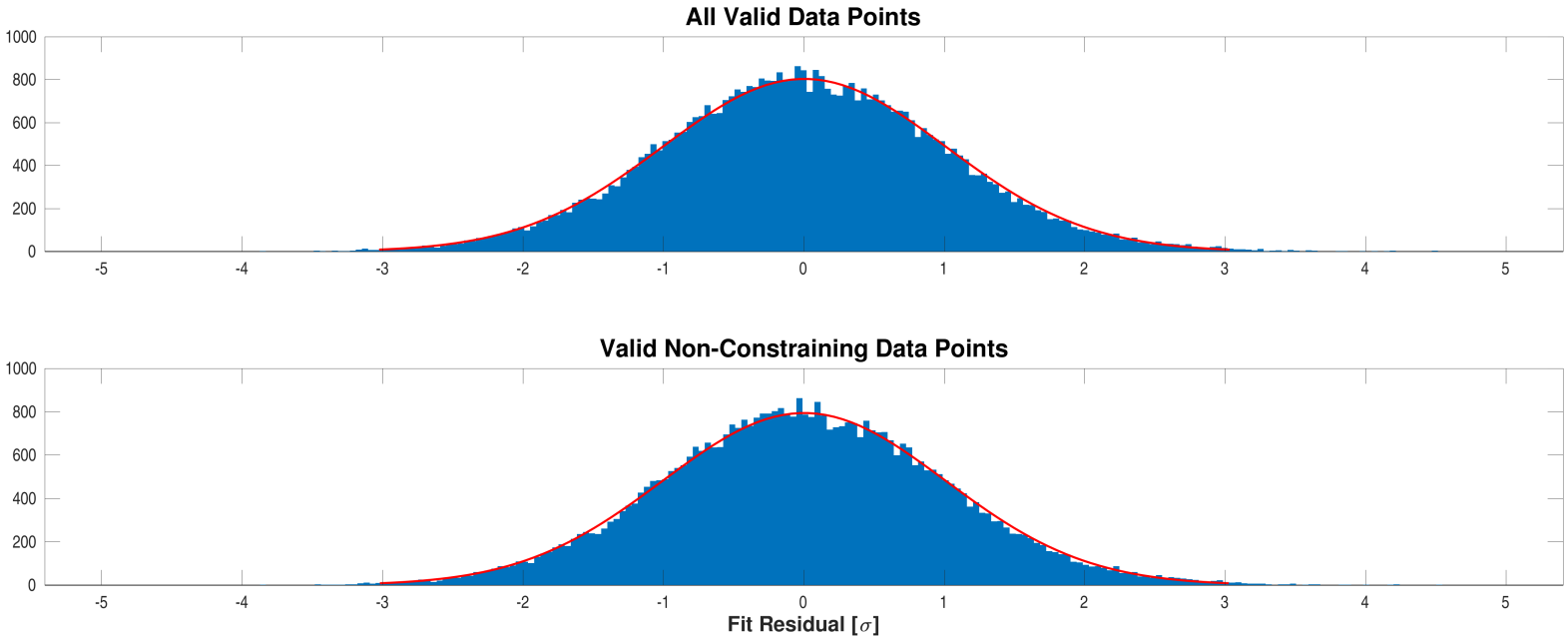
Folded flux time series for CatId 299096355, Planet candidate 2 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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/0000000299096355-02-odd-even-whitened-zoomed.fig`



Robust weights distribution for CatId 299096355, 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/0000000299096355-02-odd-even-robust-weights.fig`

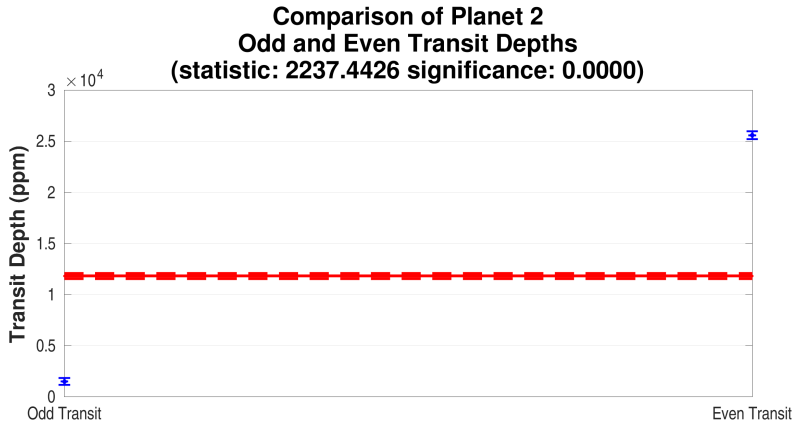


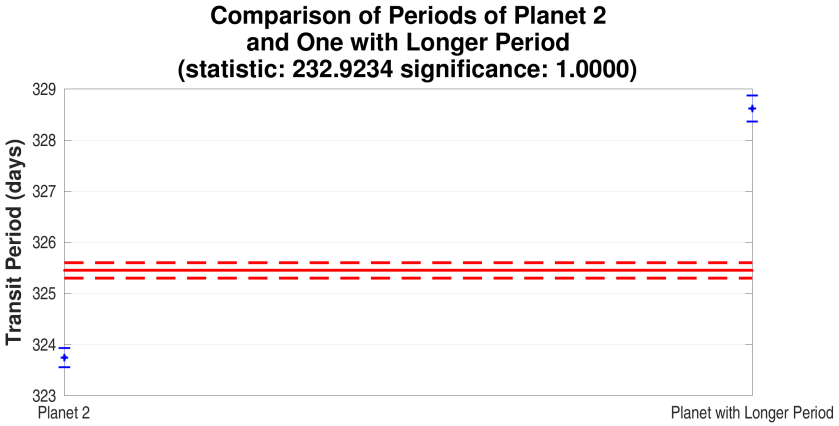
Fit residuals distribution for CatId 299096355, Planet candidate 2. Only the valid data points used to constrain the fit are shown here. A Gaussian fit to the histogram is shown in red.
Open `./planet-02/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000299096355-02-odd-even-histo-used.fig`



Fit residuals distribution for CatId 299096355, 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/0000000299096355-02-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 299096355, planet 2. A significance level close to 1/0 favors a transiting planet/an eclipsing binary. Bottom-left: Diagnostic plot of Orbital Period Test for catId 299096355. 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/0000000299096355-02-eclipsing-binary-discrimination-tests.fig`

Appendix C Alerts

Time	Severity	Message
2064.8144	warning	Difference image cannot be generated because there were no transits for this planet candidate and target pixel table (target=1, catId=299096355, planet=1, targetTable=169, component=generateDvDifferenceImages)
2064.8156	warning	Difference image cannot be generated because there were no transits for this planet candidate and target pixel table (target=1, catId=299096355, planet=2, targetTable=169, component=generateDvDifferenceImages)