Data Validation (DV) Report
for TESS ID 169461816
Sectors 15 - 15

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

21-Sep-2019 13:30:34 Z

Contents

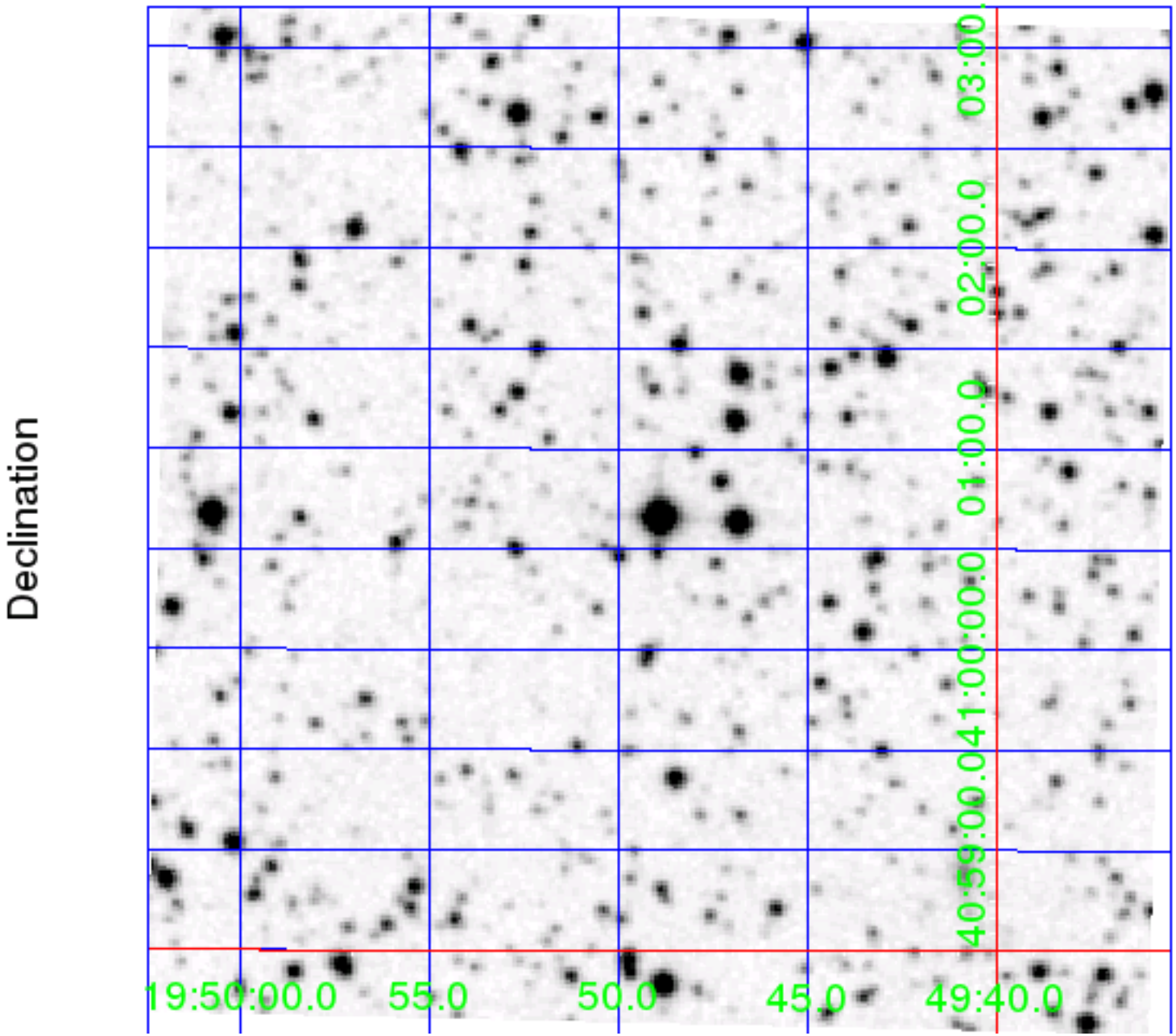
1 Summary

Target Properties	Value	Uncertainty	Units	Provenance
Catalog ID	169461816			
TOI ID	-			
TESS Name	-			
RA	297.45372285	0	degrees	TIC8
Dec	41.01100766	0	degrees	TIC8
Magnitude	10.931	0.0061		TIC8
Radius	1.491	0.067	Solar radii	TIC8
Effective Temperature	6779	106	Kelvin	TIC8
log(g)	4.254	0.088433	cm/sec^2	TIC8
[M/H]	0.081	0.0088569	Solar metallicity	TIC8
Stellar Density	0.439	0.091	Solar density	TIC8-Derived
Limb Darkening Coefficient 1	0.45874			
Limb Darkening Coefficient 2	0.51648			
Limb Darkening Coefficient 3	-0.55317			
Limb Darkening Coefficient 4	0.1846			
Number of Planet Candidates	4			
TOI Model	toi-plus-2019-09-20.csv			
TESS Names Model	-			
External TCE Model	-			
Software Revision	spoc-4.0.9-20190919			
Date Report Generated	21-Sep-2019 13:30:34 Z			

Sector	Target Table	Camera/ CCD	Crowding Metric	Flux Fraction
15	169	2:3	0.7758	0.8154

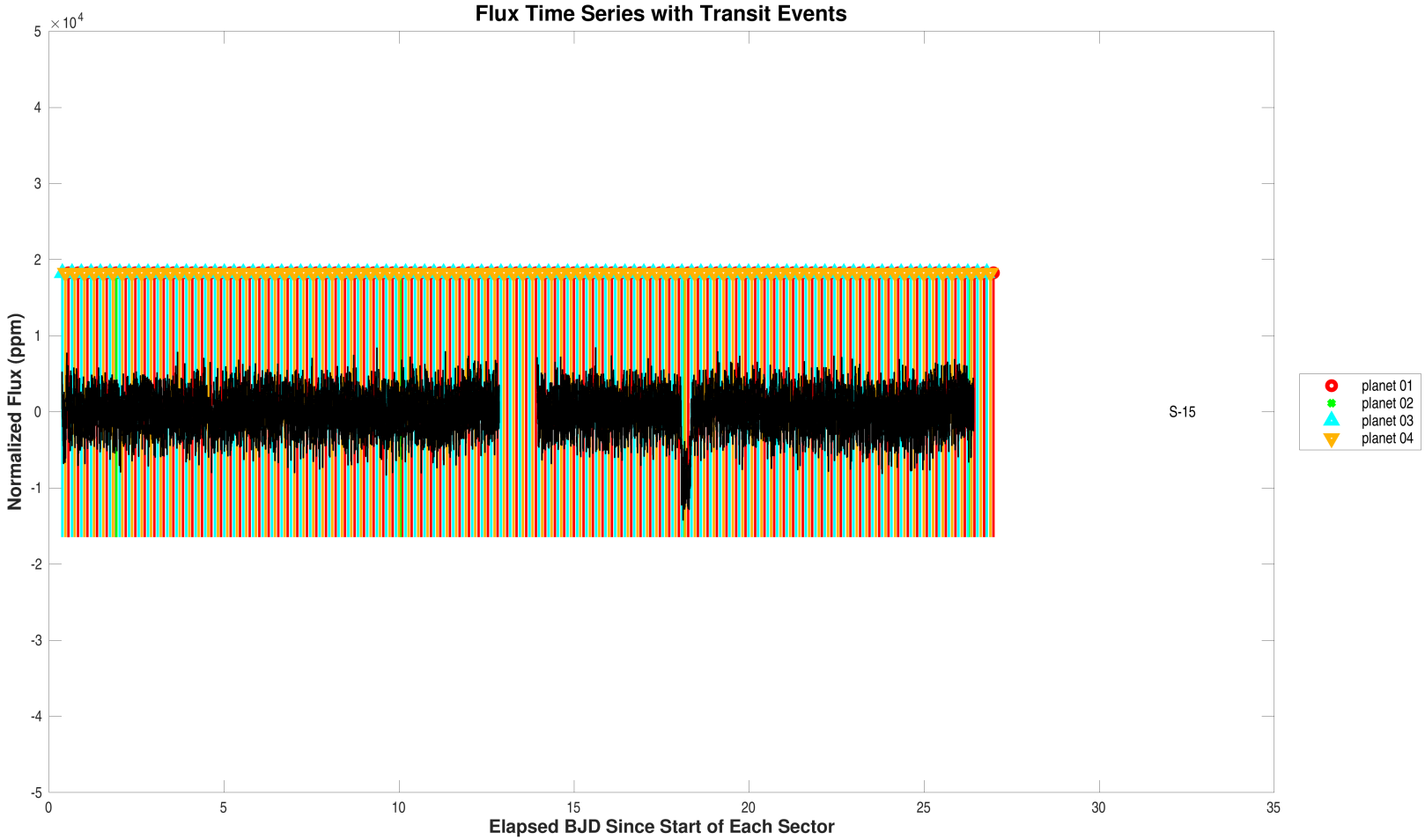
Planet Candidate	TOI ID	TESS Name	TOI Correlation	Period (days)	Period Ratio	Epoch (BTJD)	Semi-major Axis (AU)	Radius (Re)	Seff	Teq (K)	False Alarm	Suspected EB
1	-	-	-	0.272	1.00	1711.552	0.01	5.3	48407.1	3783	N/A	false
2	-	-	-	8.118	29.81	1712.923	0.09	8.5	524.1	1220	N/A	false
3	-	-	-	0.272	1.00	1711.379	0.01	9.0	48444.3	3784	N/A	false
4	-	-	-	0.272	1.00	1711.462	0.01	5.8	48404.7	3783	N/A	false

2 Survey Image

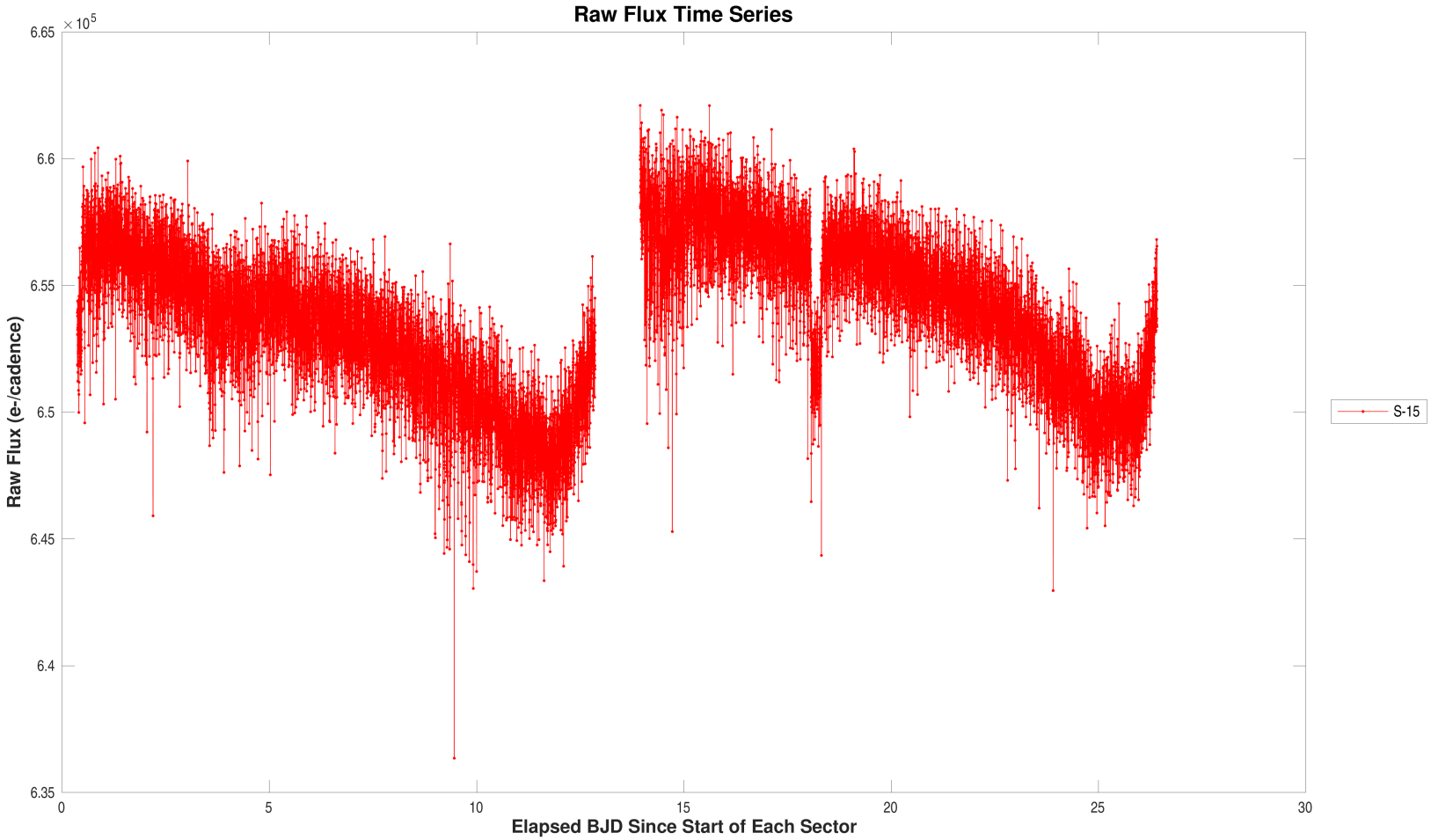


Digitized Sky Survey (DSS) red image. The 5' x 5' image is centered on the J2000 coordinates of target (169461816).

3 Flux Time Series



Summary plot of sector-stitched flux time series and transits for target 169461816, 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 15, target table 169, start BJD is 2458711.
Open `./summary-plots/0000000169461816-00-flux-dv-fit-15-169.fig`



Summary plot of raw flux time series. For the data of sector 15, target table 169, start BJD is 2458711.
Open `./summary-plots/0000000169461816-00-raw-flux-15-169.fig`

4 Dashboards

Planet Candidate 1

<table>
<tr>
<td rowspan="2">Model Fitter</td>
<td colspan="2">Stellar Radius
1.5 ± 0.1 Solar units</td>
<td rowspan="2">Core Aperture Correlation Statistic
Value = 3.93
Significance = 100.00%
Halo Aperture Correlation Statistic
Value = 15.08
Significance = 100.00%
Core/Halo Ratio
Ratio = 0.26</td>
<td rowspan="2">Ghost Diagnostic Test</td>
</tr>
<tr>
<td colspan="2">Period = 0.3 ± 0.0 days
Depth = 1221 ± 112 ppm
Planet Radius = 5.3 ± 4.5 Earth radii
Semi-major Axis = 0.0 ± 0.0 AU
Effective Stellar Flux = 48407.1 ± 7382.8
Equilibrium Temperature = 3783 ± 144 Kelvin
Chi-squared/DoF = 0.8
SNR = 12.0</td>
</tr>
<tr>
<td rowspan="2">Eclipsing Binary Discrimination Test</td>
<td colspan="2">Odd-Even Depth Comparison Statistic
Value = 1.02e+00
Significance = 31.29%</td>
<td>Offsets Relative to Out of Transit Centroid
Source RA Offset = 4.15e+01 ± 2.56e+00 arcsec (16.22 σ)
Source Dec Offset = 3.64e+01 ± 2.62e+00 arcsec (13.88 σ)
Source Offset Distance = 5.52e+01 ± 2.59e+00 arcsec (21.34 σ)
Offsets Relative to TIC Position
Source RA Offset = 3.69e+01 ± 2.56e+00 arcsec (14.44 σ)
Source Dec Offset = 3.81e+01 ± 2.62e+00 arcsec (14.51 σ)
Source Offset Distance = 5.30e+01 ± 2.59e+00 arcsec (20.46 σ)</td>
<td>Difference Image Centroid Offsets</td>
</tr>
<tr>
<td>Shorter Period Comparison Statistic
Value = 1.62e-05
Significance = 0.32%</td>
<td>Longer Period Comparison Statistic
Value = 9.96e-08
Significance = 0.03%</td>
<td>False Alarm = N/A
Transit Count = N/A
Max Multiple Event Statistic = 9.7</td>
<td>Bootstrap Test</td>
</tr>
</table>

Summary of model fitter results and validation test results for target 169461816, 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
1.5 ± 0.1 Solar units</td><td rowspan="2">Core Aperture Correlation Statistic
Value = 1.91
Significance = 97.21%
Halo Aperture Correlation Statistic
Value = 3.01
Significance = 99.87%
Core/Halo Ratio
Ratio = 0.64</td><td rowspan="2">Ghost Diagnostic Test</td></tr>
<tr><td colspan="2">Period = 8.1 ± 0.0 days
Depth = 2708 ± 252 ppm
Planet Radius = 8.5 ± 0.7 Earth radii
Semi-major Axis = 0.1 ± 0.0 AU
Effective Stellar Flux = 524.1 ± 79.9
Equilibrium Temperature = 1220 ± 47 Kelvin
Chi-squared/DoF = 0.9
SNR = 10.9</td></tr>
<tr><td rowspan="2">Eclipsing Binary Discrimination Test</td><td colspan="2">Odd-Even Depth Comparison Statistic
Value = 2.58e+01
Significance = 0.00%</td><td>Offsets Relative to Out of Transit Centroid
Source RA Offset = 7.59e+00 ± 2.63e+00 arcsec (2.89 σ)
Source Dec Offset = -2.20e+00 ± 2.81e+00 arcsec (-0.78 σ)
Source Offset Distance = 7.90e+00 ± 2.64e+00 arcsec (2.99 σ)
Offsets Relative to TIC Position
Source RA Offset = 3.03e+00 ± 2.63e+00 arcsec (1.15 σ)
Source Dec Offset = -5.45e-01 ± 2.81e+00 arcsec (-0.19 σ)
Source Offset Distance = 3.08e+00 ± 2.63e+00 arcsec (1.17 σ)</td><td>Difference Image Centroid Offsets</td></tr>
<tr><td>Shorter Period Comparison Statistic
Value = 1.12e+03
Significance = 100.00%</td><td>Longer Period Comparison Statistic
Value = N/A
Significance = N/A</td><td>False Alarm = N/A
Transit Count = N/A
Max Multiple Event Statistic = 17.8</td><td>Bootstrap Test</td></tr>
</table>

Summary of model fitter results and validation test results for target 169461816, 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
1.5 ± 0.1 Solar units</td>
<td rowspan="2">Core Aperture Correlation Statistic
Value = 7.54
Significance = 100.00%
Halo Aperture Correlation Statistic
Value = 17.09
Significance = 100.00%
Core/Halo Ratio
Ratio = 0.44</td>
<td rowspan="2">Ghost Diagnostic Test</td>
</tr>
<tr>
<td colspan="2">Period = 0.3 ± 0.0 days
Depth = 1397 ± 144 ppm
Planet Radius = 9.0 ± 15.5 Earth radii
Semi-major Axis = 0.0 ± 0.0 AU
Effective Stellar Flux = 48444.3 ± 7388.4
Equilibrium Temperature = 3784 ± 144 Kelvin
Chi-squared/DoF = 0.8
SNR = 13.4</td>
</tr>
<tr>
<td rowspan="2">Eclipsing Binary Discrimination Test</td>
<td colspan="2">Odd-Even Depth Comparison Statistic
Value = 7.12e-03
Significance = 93.28%</td>
<td>Offsets Relative to Out of Transit Centroid
Source RA Offset = 6.42e+00 ± 2.56e+00 arcsec (2.51 σ)
Source Dec Offset = 3.42e+01 ± 2.63e+00 arcsec (13.00 σ)
Source Offset Distance = 3.48e+01 ± 2.63e+00 arcsec (13.24 σ)
Offsets Relative to TIC Position
Source RA Offset = 1.80e+00 ± 2.56e+00 arcsec (0.70 σ)
Source Dec Offset = 3.58e+01 ± 2.63e+00 arcsec (13.64 σ)
Source Offset Distance = 3.59e+01 ± 2.63e+00 arcsec (13.65 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 = 1.62e-05
Significance = 0.32%</td>
<td>False Alarm = N/A
Transit Count = N/A
Max Multiple Event Statistic = 9.7</td>
<td>Bootstrap Test</td>
</tr>
</table>

Summary of model fitter results and validation test results for target 169461816, 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
1.5 ± 0.1 Solar units</td><td rowspan="2">Core Aperture Correlation Statistic
Value = 9.58
Significance = 100.00%
Halo Aperture Correlation Statistic
Value = 13.22
Significance = 100.00%
Core/Halo Ratio
Ratio = 0.72</td><td rowspan="2">Ghost Diagnostic Test</td></tr>
<tr><td colspan="2">Period = 0.3 ± 0.0 days
Depth = 1454 ± 94 ppm
Planet Radius = 5.8 ± 3.6 Earth radii
Semi-major Axis = 0.0 ± 0.0 AU
Effective Stellar Flux = 48404.7 ± 7382.4
Equilibrium Temperature = 3783 ± 144 Kelvin
Chi-squared/DoF = 1.0
SNR = 18.7</td></tr>
<tr><td rowspan="2">Eclipsing Binary Discrimination Test</td><td colspan="2">Odd-Even Depth Comparison Statistic
Value = 2.35e+00
Significance = 12.52%</td><td>Offsets Relative to Out of Transit Centroid
Source RA Offset = 2.54e+01 ± 2.55e+00 arcsec (9.97 σ)
Source Dec Offset = 4.80e+01 ± 2.61e+00 arcsec (18.39 σ)
Source Offset Distance = 5.43e+01 ± 2.60e+00 arcsec (20.91 σ)
Offsets Relative to TIC Position
Source RA Offset = 2.08e+01 ± 2.54e+00 arcsec (8.17 σ)
Source Dec Offset = 4.97e+01 ± 2.61e+00 arcsec (19.03 σ)
Source Offset Distance = 5.38e+01 ± 2.60e+00 arcsec (20.70 σ)</td><td>Difference Image Centroid Offsets</td></tr>
<tr><td>Shorter Period Comparison Statistic
Value = 9.96e-08
Significance = 0.03%</td><td>Longer Period Comparison Statistic
Value = 1.12e+03
Significance = 100.00%</td><td>False Alarm = N/A
Transit Count = N/A
Max Multiple Event Statistic = 11.3</td><td>Bootstrap Test</td></tr>
</table>

Summary of model fitter results and validation test results for target 169461816, 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

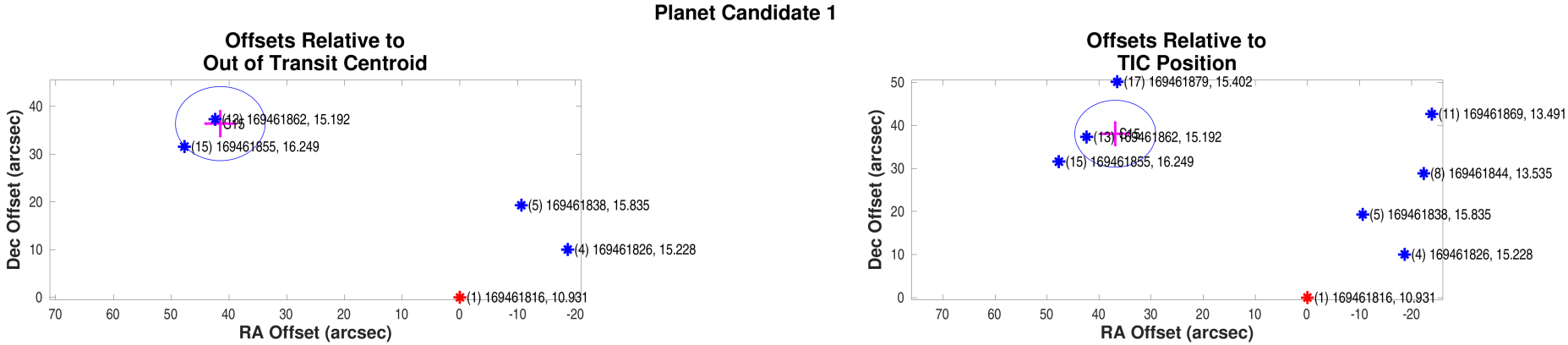
Multi-Sector Average PRF Fit of the Difference Images

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

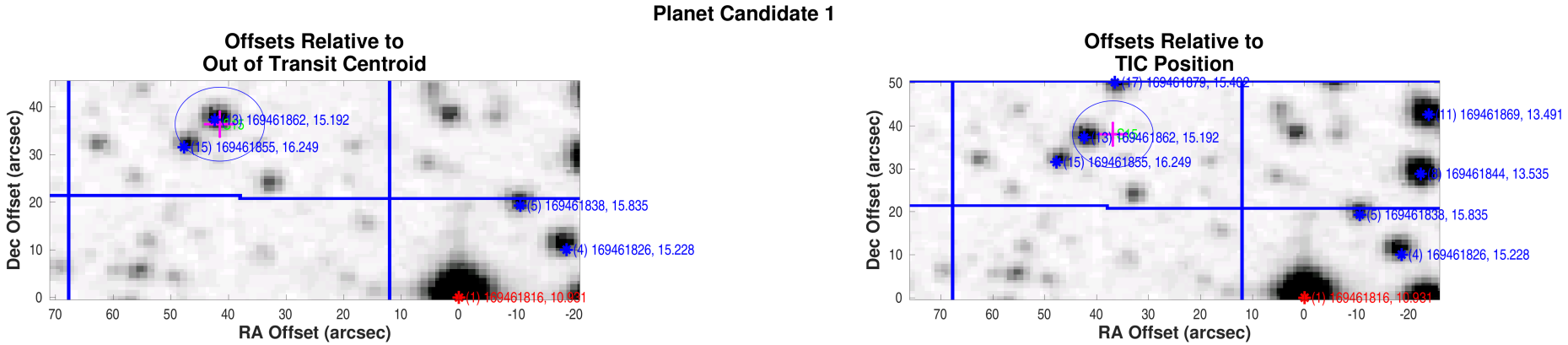
	RA	Dec	Units
Offset	$41.5020 \pm 2.56e+00$	$36.4013 \pm 2.62e+00$	arcseconds
Offset/σ	16.22	13.88	
Offset Distance	$55.2039 \pm 2.59e+00$		arcseconds
Offset Distance/σ	21.34		
3σ Radius	7.7617		arcseconds

Mean offset from the TIC RA and Dec

	RA	Dec	Units
Offset	$36.8979 \pm 2.56e+00$	$38.0620 \pm 2.62e+00$	arcseconds
Offset/σ	14.44	14.51	
Offset Distance	$53.0110 \pm 2.59e+00$		arcseconds
Offset Distance/σ	20.46		
3σ Radius	7.7723		arcseconds



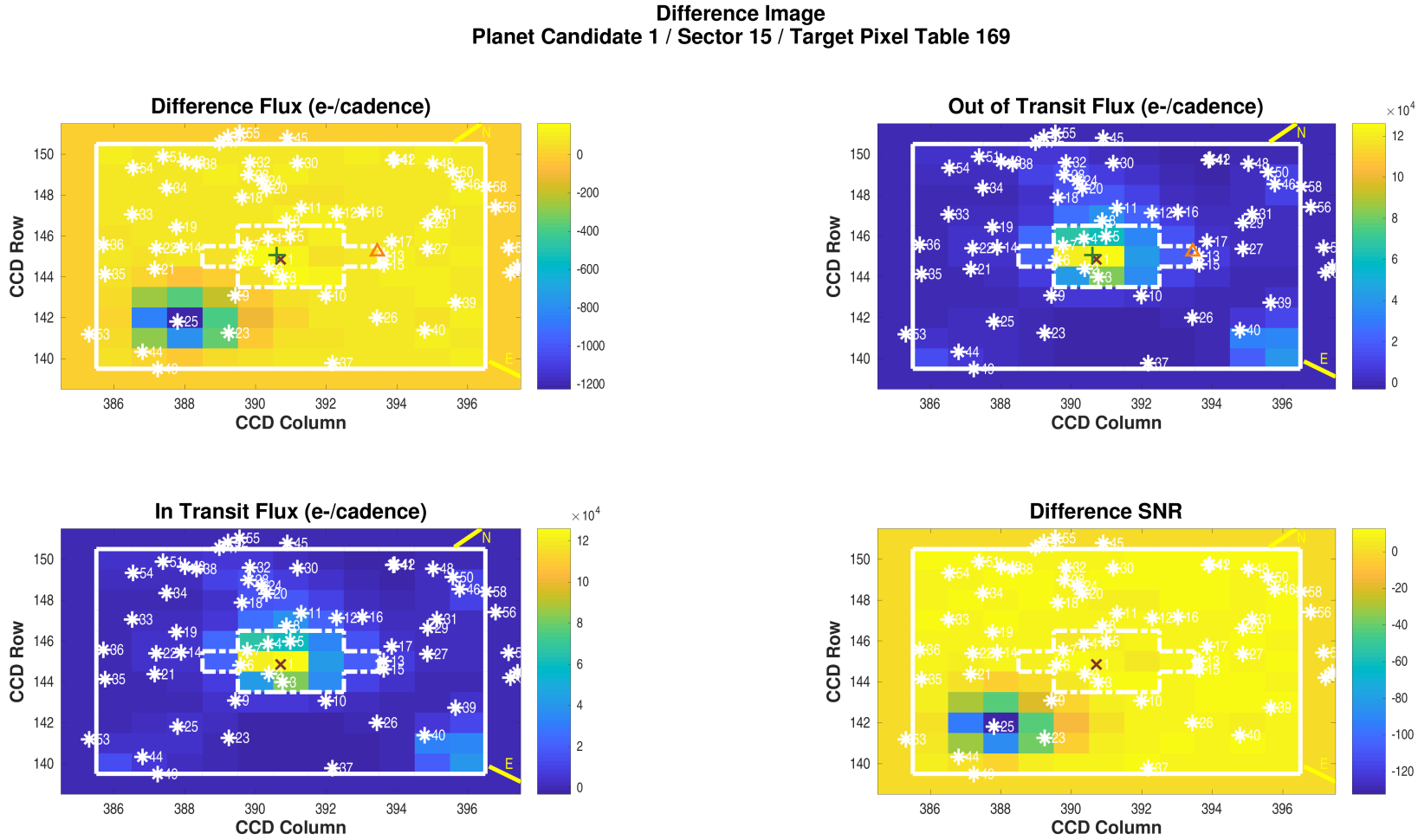
Difference image centroid offsets for target 169461816, planet candidate 1. Left: difference image PRF centroid offsets in RA and Dec with respect to the per sector out-of-transit centroids for the given target. Right: difference image PRF centroid offsets in RA and Dec with respect to the TC coordinates 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/0000000169461816-01-difference-image-centroid-offsets.fig`



Difference image centroid offsets for target 169461816, 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/0000000169461816-01-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
1	1	0	0.0000	0.70



Difference image for target 169461816, planet candidate 1, sector 15, target pixel table 169. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 90; number of valid in-transit cadences = 1129; number of in-transit cadence gaps = 10; number of valid out-of-transit cadences = 3584; number of out-of-transit cadence gaps = 22. Difference image quality metric = 0.10 (not good). Transits used to compute this difference image are overlapped by those of other candidates on this target. Open `./planet-01/difference-image/0000000169461816-01-difference-image-15-169.fig`

PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$145.07 \pm 2.87e-05$	$390.59 \pm 3.52e-05$	pixels	$297.45204986 \pm 1.03e-06$	$41.01148315 \pm 1.00e-06$	degrees
Difference Image Centroid	$145.22 \pm 3.26e-02$	$393.44 \pm 4.02e-02$	pixels	$297.46732773 \pm 1.96e-04$	$41.02159461 \pm 2.20e-04$	degrees
Offset	$0.1560 \pm 3.26e-02$	$2.8480 \pm 4.02e-02$	pixels	$41.5020 \pm 5.48e-01$	$36.4013 \pm 7.94e-01$	arcseconds
Offset/σ	4.78	70.93		75.68	45.87	
Offset Distance	$2.8523 \pm 4.04e-02$		pixels	$55.2039 \pm 7.34e-01$		arcseconds
Offset Distance/σ	70.52			75.18		

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

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$144.85 \pm 1.71e-04$	$390.71 \pm 1.79e-04$	pixels	$297.45374485 \pm 0.00e+00$	$41.01102184 \pm 0.00e+00$	degrees
Difference Image Centroid	$145.22 \pm 3.26e-02$	$393.44 \pm 4.02e-02$	pixels	$297.46732773 \pm 1.96e-04$	$41.02159461 \pm 2.20e-04$	degrees
Offset	$0.3720 \pm 3.26e-02$	$2.7311 \pm 4.02e-02$	pixels	$36.8979 \pm 5.33e-01$	$38.0620 \pm 7.94e-01$	arcseconds
Offset/σ	11.40	68.02		69.28	47.96	
Offset Distance	$2.7563 \pm 4.08e-02$		pixels	$53.0110 \pm 7.47e-01$		arcseconds
Offset Distance/σ	67.57			70.98		

5.2 Planet Candidate 2

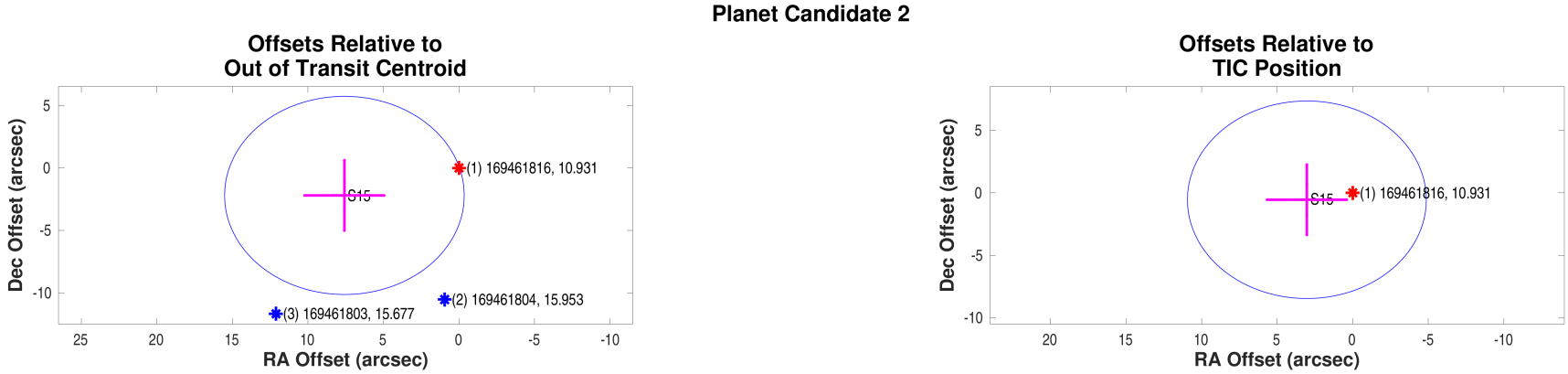
Multi-Sector Average PRF Fit of the Difference Images

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

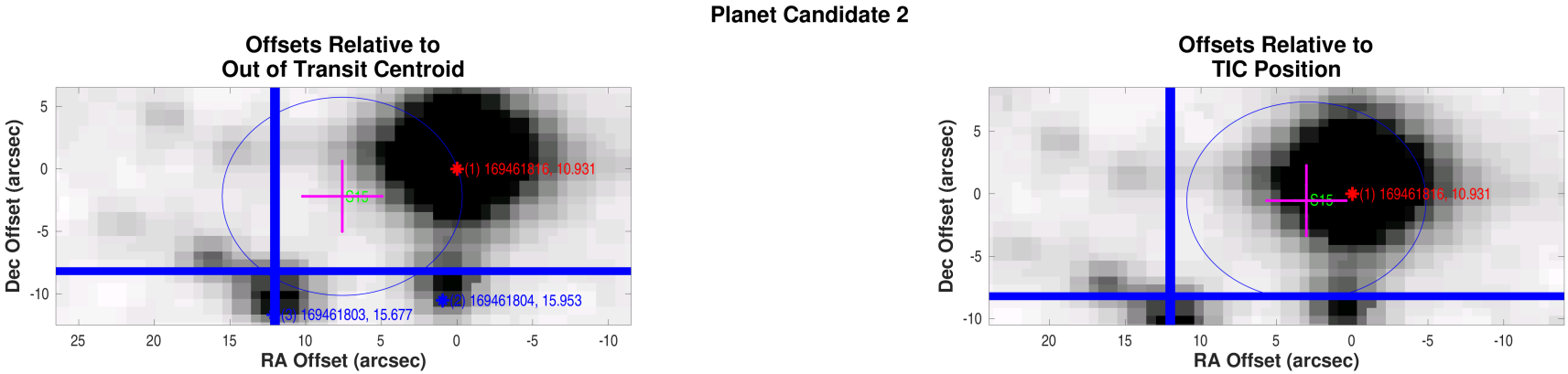
	RA	Dec	Units
Offset	$7.5857 \pm 2.63e+00$	$-2.1986 \pm 2.81e+00$	arcseconds
Offset/σ	2.89	−0.78	
Offset Distance	$7.8979 \pm 2.64e+00$		arcseconds
Offset Distance/σ	2.99		
3σ Radius	7.9294		arcseconds

Mean offset from the TIC RA and Dec

	RA	Dec	Units
Offset	$3.0316 \pm 2.63e+00$	$-0.5449 \pm 2.81e+00$	arcseconds
Offset/σ	1.15	−0.19	
Offset Distance	$3.0801 \pm 2.63e+00$		arcseconds
Offset Distance/σ	1.17		
3σ Radius	7.9034		arcseconds



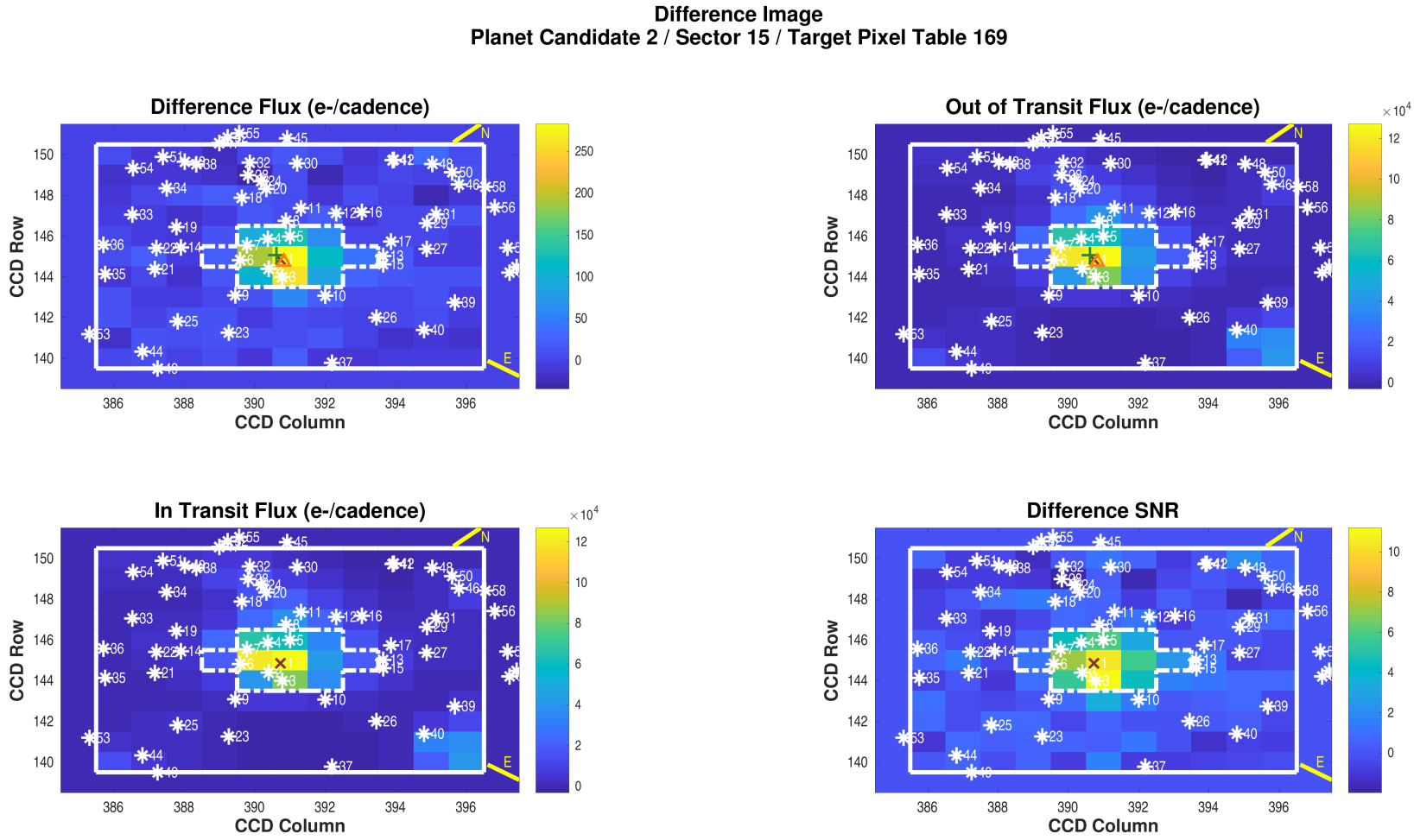
Difference image centroid offsets for target 169461816, planet candidate 2. Left: difference image PRF centroid offsets in RA and Dec with respect to the per sector out-of-transit centroids for the given target. Right: difference image PRF centroid offsets in RA and Dec with respect to the TC coordinates 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/0000000169461816-02-difference-image-centroid-offsets.fig`



Difference image centroid offsets for target 169461816, 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/0000000169461816-02-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
1	1	1	1.0000	0.70



Difference image for target 169461816, planet candidate 2, sector 15, target pixel table 169. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 3; number of valid in-transit cadences = 385; number of in-transit cadence gaps = 11; number of valid out-of-transit cadences = 1022; number of out-of-transit cadence gaps = 10. Difference image quality metric = 0.95 (good). Transits used to compute this difference image are overlapped by those of other candidates on this target.
Open `./planet-02/difference-image/0000000169461816-02-difference-image-15-169.fig`

PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$145.07 \pm 5.31e-05$	$390.61 \pm 6.58e-05$	pixels	$297.45206836 \pm 1.06e-06$	$41.01148120 \pm 1.05e-06$	degrees
Difference Image Centroid	$144.73 \pm 5.80e-02$	$390.82 \pm 5.72e-02$	pixels	$297.45486084 \pm 2.99e-04$	$41.01087049 \pm 3.55e-04$	degrees
Offset	$-0.3338 \pm 5.80e-02$	$0.2114 \pm 5.72e-02$	pixels	$7.5857 \pm 8.13e-01$	$-2.1986 \pm 1.28e+00$	arcseconds
Offset/σ	-5.76	3.69		9.33	-1.72	
Offset Distance	$0.3951 \pm 5.25e-02$		pixels	$7.8979 \pm 8.54e-01$		arcseconds
Offset Distance/σ	7.53			9.25		

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

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$144.85 \pm 1.71e-04$	$390.73 \pm 1.79e-04$	pixels	$297.45374485 \pm 0.00e+00$	$41.01102184 \pm 0.00e+00$	degrees
Difference Image Centroid	$144.73 \pm 5.80e-02$	$390.82 \pm 5.72e-02$	pixels	$297.45486084 \pm 2.99e-04$	$41.01087049 \pm 3.55e-04$	degrees
Offset	$-0.1198 \pm 5.80e-02$	$0.0961 \pm 5.72e-02$	pixels	$3.0316 \pm 8.12e-01$	$-0.5449 \pm 1.28e+00$	arcseconds
Offset/σ	-2.06	1.68		3.73	-0.43	
Offset Distance	$0.1536 \pm 5.20e-02$		pixels	$3.0801 \pm 8.28e-01$		arcseconds
Offset Distance/σ	2.96			3.72		

5.3 Planet Candidate 3

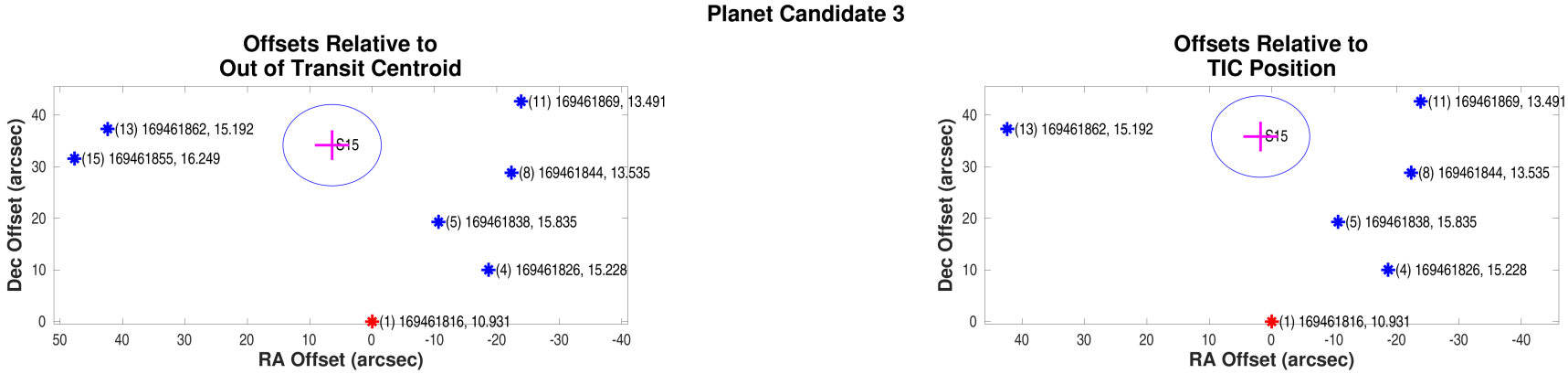
Multi-Sector Average PRF Fit of the Difference Images

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

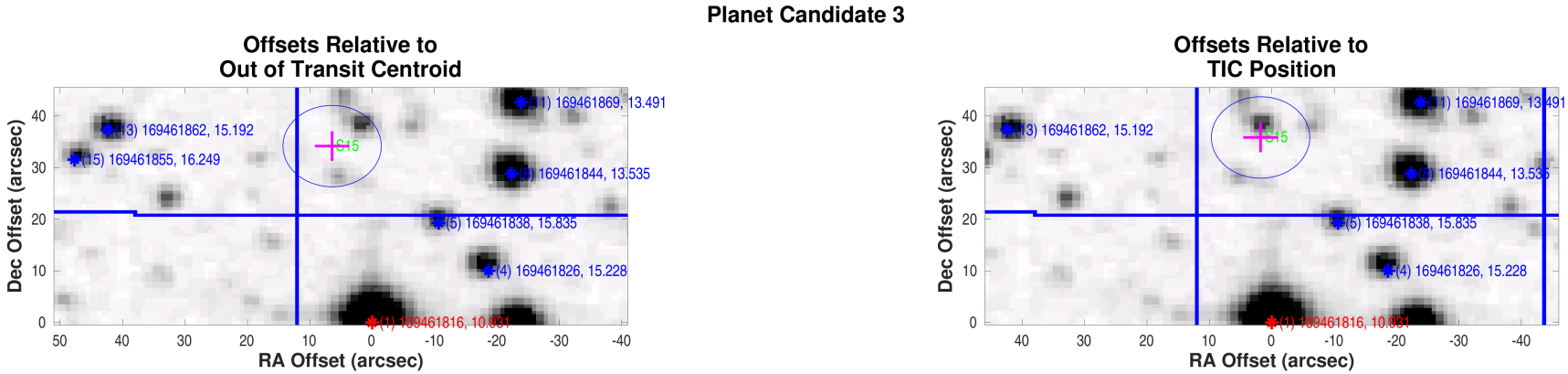
	RA	Dec	Units
Offset	$6.4151 \pm 2.56e+00$	$34.1796 \pm 2.63e+00$	arcseconds
Offset/σ	2.51	13.00	
Offset Distance	$34.7764 \pm 2.63e+00$		arcseconds
Offset Distance/σ	13.24		
3σ Radius	7.8789		arcseconds

Mean offset from the TIC RA and Dec

	RA	Dec	Units
Offset	$1.8000 \pm 2.56e+00$	$35.8450 \pm 2.63e+00$	arcseconds
Offset/σ	0.70	13.64	
Offset Distance	$35.8902 \pm 2.63e+00$		arcseconds
Offset Distance/σ	13.65		
3σ Radius	7.8854		arcseconds



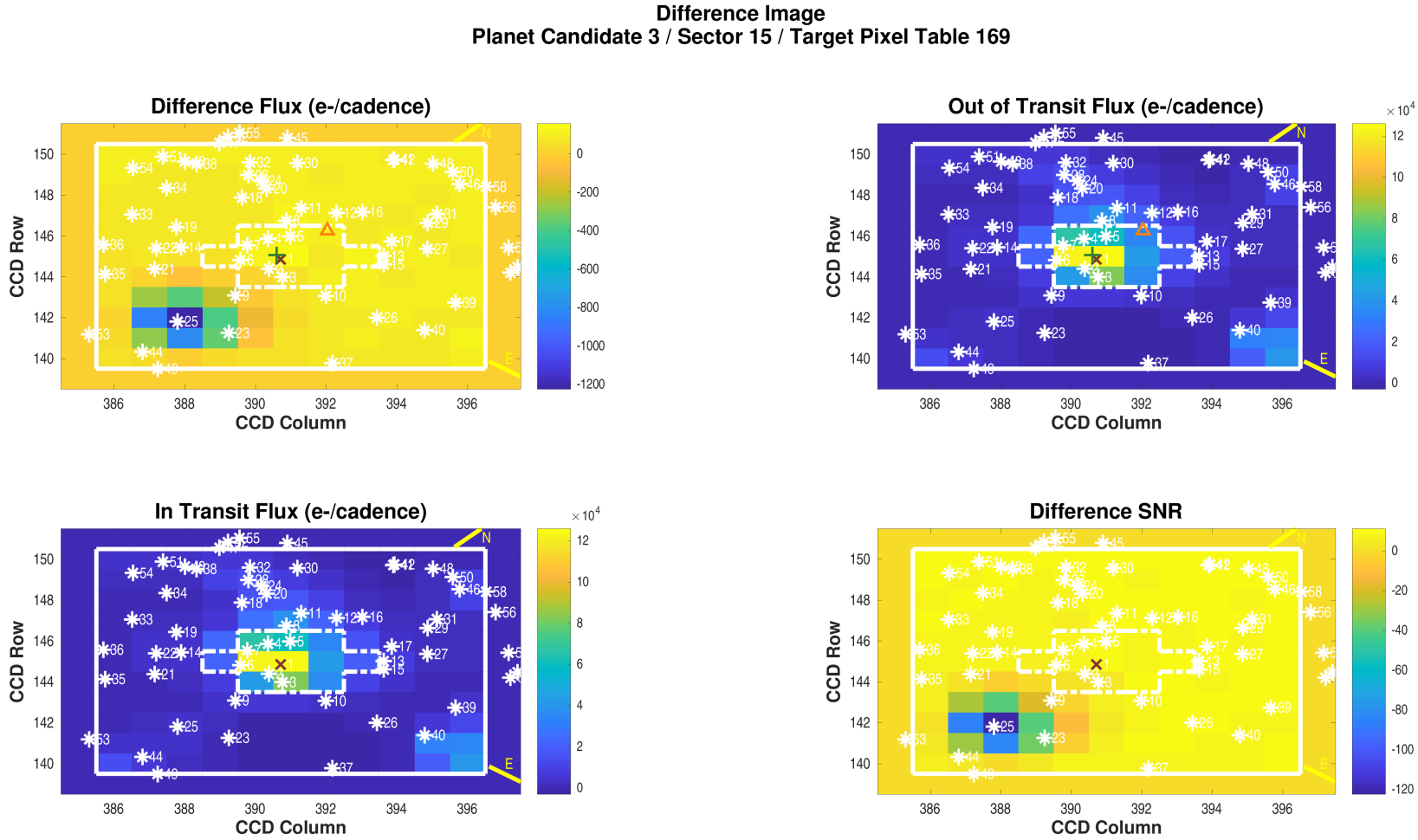
Difference image centroid offsets for target 169461816, planet candidate 3. Left: difference image PRF centroid offsets in RA and Dec with respect to the per sector out-of-transit centroids for the given target. Right: difference image PRF centroid offsets in RA and Dec with respect to the TC coordinates 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/0000000169461816-03-difference-image-centroid-offsets.fig`



Difference image centroid offsets for target 169461816, 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/0000000169461816-03-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



Difference image for target 169461816, planet candidate 3, sector 15, target pixel table 169. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 90; number of valid in-transit cadences = 872; number of in-transit cadence gaps = 4; number of valid out-of-transit cadences = 4845; number of out-of-transit cadence gaps = 29. Difference image quality metric = 0.12 (not good). Transits used to compute this difference image are overlapped by those of other candidates on this target. Open `./planet-03/difference-image/0000000169461816-03-difference-image-15-169.fig`

PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$145.07 \pm 2.47e-05$	$390.59 \pm 3.03e-05$	pixels	$297.45204593 \pm 1.02e-06$	$41.01148444 \pm 9.98e-07$	degrees
Difference Image Centroid	$146.26 \pm 3.69e-02$	$392.03 \pm 3.79e-02$	pixels	$297.45440747 \pm 2.00e-04$	$41.02097879 \pm 2.26e-04$	degrees
Offset	$1.1926 \pm 3.69e-02$	$1.4377 \pm 3.79e-02$	pixels	$6.4151 \pm 5.44e-01$	$34.1796 \pm 8.12e-01$	arcseconds
Offset/σ	32.35	37.96		11.80	42.08	
Offset Distance	$1.8680 \pm 4.01e-02$		pixels	$34.7764 \pm 8.09e-01$		arcseconds
Offset Distance/σ	46.57			42.98		

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

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$144.85 \pm 1.71e-04$	$390.71 \pm 1.79e-04$	pixels	$297.45374485 \pm 0.00e+00$	$41.01102184 \pm 0.00e+00$	degrees
Difference Image Centroid	$146.26 \pm 3.69e-02$	$392.03 \pm 3.79e-02$	pixels	$297.45440747 \pm 2.00e-04$	$41.02097879 \pm 2.26e-04$	degrees
Offset	$1.4091 \pm 3.69e-02$	$1.3206 \pm 3.79e-02$	pixels	$1.8000 \pm 5.43e-01$	$35.8450 \pm 8.12e-01$	arcseconds
Offset/σ	38.22	34.87		3.31	44.13	
Offset Distance	$1.9312 \pm 4.00e-02$		pixels	$35.8902 \pm 8.13e-01$		arcseconds
Offset Distance/σ	48.24			44.15		

5.4 Planet Candidate 4

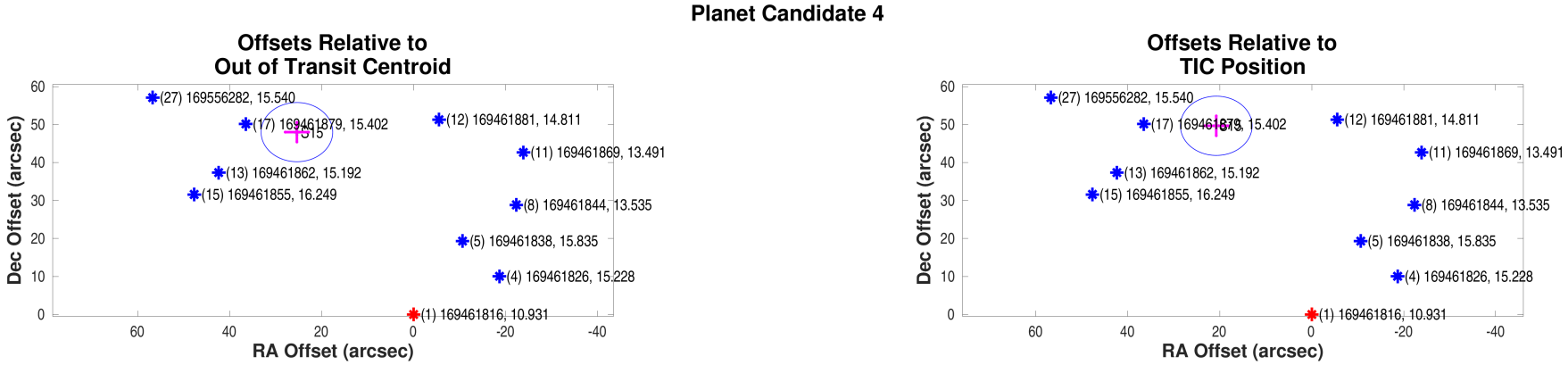
Multi-Sector Average PRF Fit of the Difference Images

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

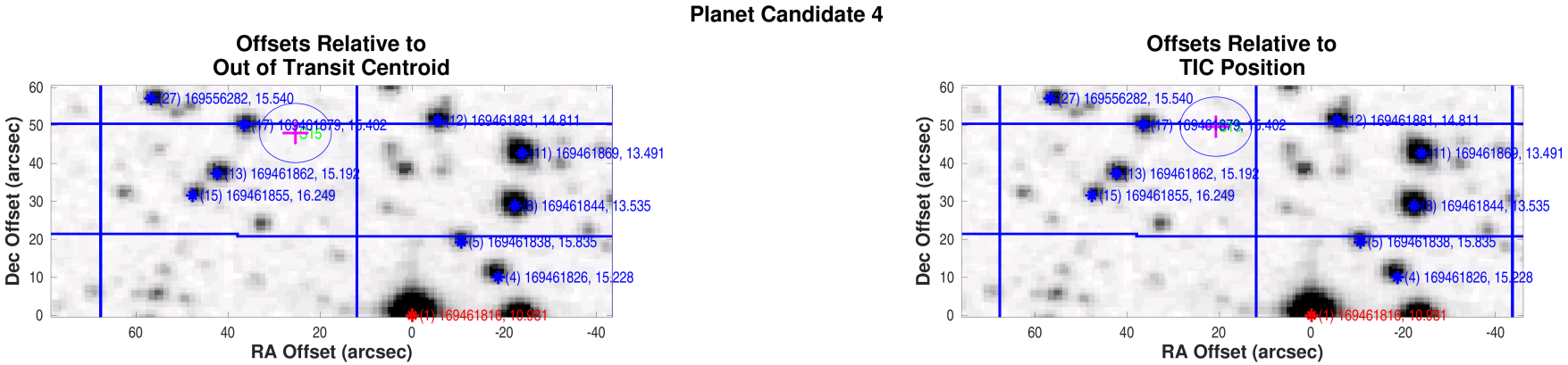
	RA	Dec	Units
Offset	$25.3921 \pm 2.55e+00$	$48.0001 \pm 2.61e+00$	arcseconds
Offset/σ	9.97	18.39	
Offset Distance	$54.3026 \pm 2.60e+00$		arcseconds
Offset Distance/σ	20.91		
3σ Radius	7.7895		arcseconds

Mean offset from the TIC RA and Dec

	RA	Dec	Units
Offset	$20.7832 \pm 2.54e+00$	$49.6637 \pm 2.61e+00$	arcseconds
Offset/σ	8.17	19.03	
Offset Distance	$53.8370 \pm 2.60e+00$		arcseconds
Offset Distance/σ	20.70		
3σ Radius	7.8023		arcseconds



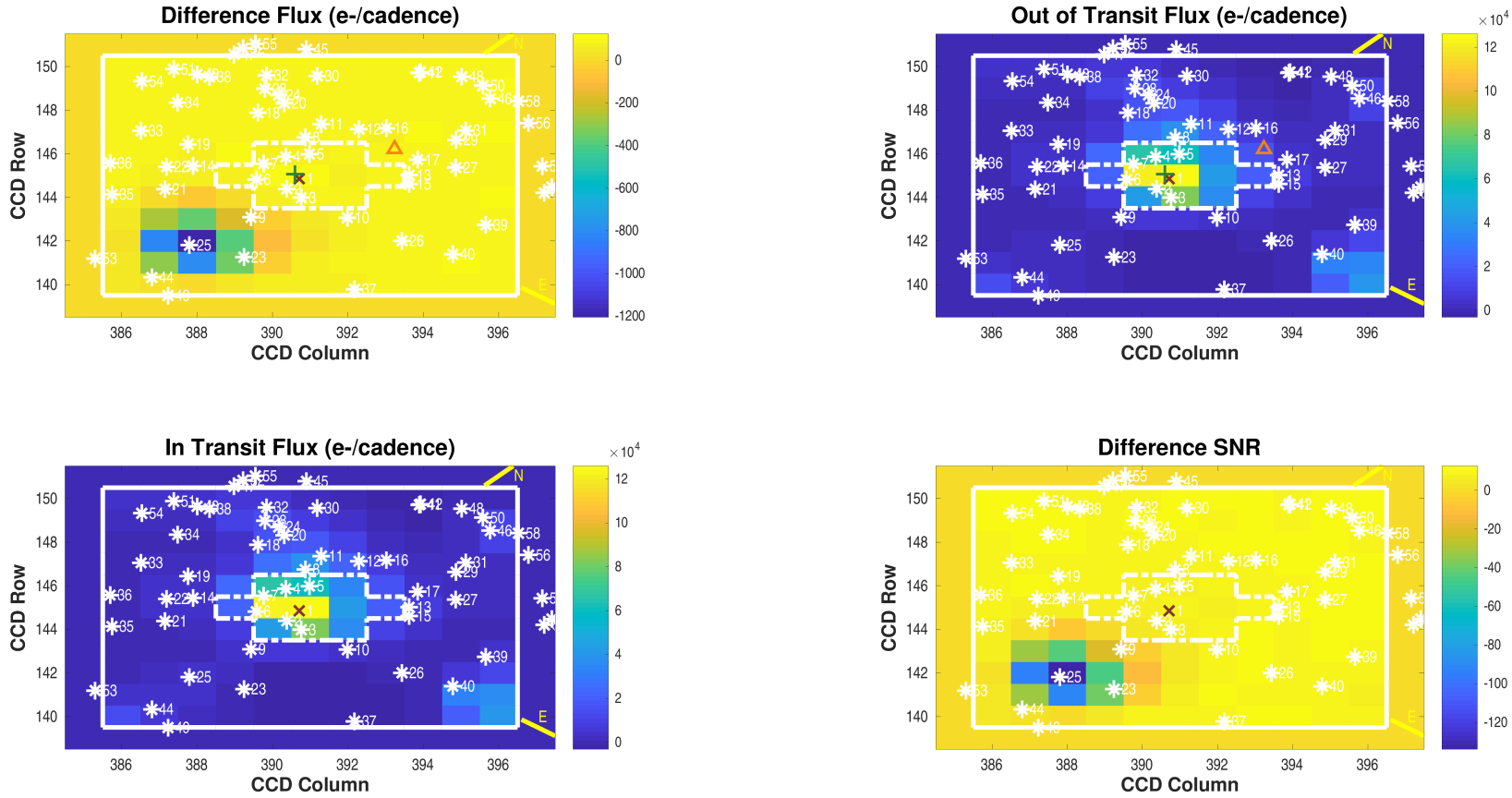
Difference image centroid offsets for target 169461816, planet candidate 4. Left: difference image PRF centroid offsets in RA and Dec with respect to the per sector out-of-transit centroids for the given target. Right: difference image PRF centroid offsets in RA and Dec with respect to the TC coordinates 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/00000000169461816-04-difference-image-centroid-offsets.fig`



Difference image centroid offsets for target 169461816, 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/0000000169461816-04-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
1	1	0	0.0000	0.70



Difference image for target 169461816, planet candidate 4, sector 15, target pixel table 169. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 89; number of valid in-transit cadences = 1199; number of in-transit cadence gaps = 8; number of valid out-of-transit cadences = 3718; number of out-of-transit cadence gaps = 36. Difference image quality metric = 0.10 (not good). Transits used to compute this difference image are overlapped by those of other candidates on this target. Open `./planet-04/difference-image/0000000169461816-04-difference-image-15-169.fig`

PRF Fit of the Difference Image

Offset from the PRF fit to the out of transit image

	Row	Column	Units	RA	Dec	Units
Out of Transit Image Centroid	$145.07 \pm 2.82e-05$	$390.59 \pm 3.46e-05$	pixels	$297.45204813 \pm 1.03e-06$	$41.01148395 \pm 1.00e-06$	degrees
Difference Image Centroid	$146.21 \pm 3.16e-02$	$393.24 \pm 3.58e-02$	pixels	$297.46139557 \pm 1.75e-04$	$41.02481732 \pm 2.09e-04$	degrees
Offset	$1.1483 \pm 3.16e-02$	$2.6411 \pm 3.58e-02$	pixels	$25.3921 \pm 4.82e-01$	$48.0001 \pm 7.51e-01$	arcseconds
Offset/σ	36.30	73.74		52.67	63.89	
Offset Distance	$2.8800 \pm 3.77e-02$		pixels	$54.3026 \pm 7.33e-01$		arcseconds
Offset Distance/σ	76.43			74.07		

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

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$144.85 \pm 1.70e-04$	$390.71 \pm 1.79e-04$	pixels	$297.45374485 \pm 0.00e+00$	$41.01102184 \pm 0.00e+00$	degrees
Difference Image Centroid	$146.21 \pm 3.16e-02$	$393.24 \pm 3.58e-02$	pixels	$297.46139557 \pm 1.75e-04$	$41.02481732 \pm 2.09e-04$	degrees
Offset	$1.3646 \pm 3.16e-02$	$2.5242 \pm 3.58e-02$	pixels	$20.7832 \pm 4.75e-01$	$49.6637 \pm 7.51e-01$	arcseconds
Offset/σ	43.13	70.47		43.71	66.11	
Offset Distance	$2.8694 \pm 3.78e-02$		pixels	$53.8370 \pm 7.44e-01$		arcseconds
Offset Distance/σ	75.96			72.39		

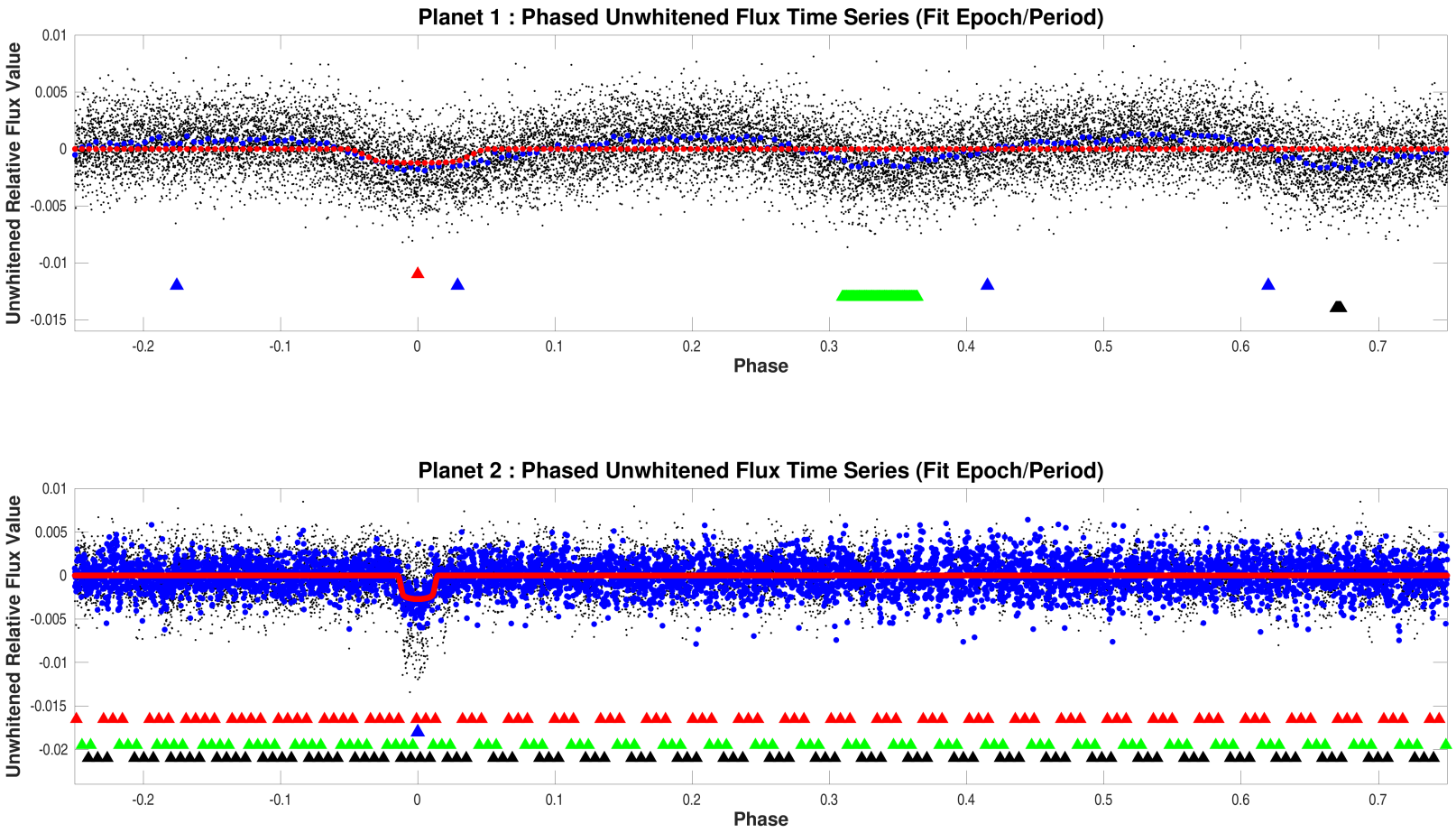
5.5 Difference Image TIC Key

Index	Catalog ID	Mag	RA (degrees)	Dec (degrees)	Distance (arcsec)
1	169461816	10.931	297.45374485	41.01102184	0.00
2	169461804	15.953	297.45409609	41.00809685	10.57
3	169461803	15.677	297.45820588	41.00778082	16.82
4	169461826	15.228	297.44687406	41.01380767	21.19
5	169461838	15.835	297.44983052	41.01638696	22.05
6	169461795	16.572	297.44749714	41.00708341	22.11
7	169461813	12.562	297.44508436	41.01059359	23.58
8	169461844	13.535	297.44552061	41.01903442	36.49
9	169461762	15.641	297.45502132	40.99979699	40.56
10	169461806	15.677	297.46949445	41.00824389	43.94
11	169461869	13.491	297.44495566	41.02286866	48.88
12	169461881	14.811	297.45170642	41.02526704	51.58
13	169461862	15.192	297.46935276	41.02138854	56.48
14	169461779	15.607	297.43506389	41.00393211	56.80
15	169461855	16.249	297.47131213	41.01979582	57.23
16	169461890	16.246	297.45557079	41.02788974	60.93
17	169461879	15.402	297.46719137	41.02494777	62.03
18	169461847	16.134	297.43304177	41.01928893	63.63
19	169461802	16.274	297.42954647	41.00743474	66.99
20	169461873	15.151	297.43483012	41.02336667	67.93
21	169461757	15.861	297.43598782	40.99726600	69.13
22	169461769	14.672	297.43131286	41.00147320	69.96
23	169461733	16.355	297.46276097	40.99196474	72.85
24	169461877	16.252	297.43220513	41.02434446	75.66
25	169461717	14.426	297.45196878	40.98932213	78.27
26	169556349	15.720	297.48273210	41.00887513	79.12
27	169556282	15.540	297.47464005	41.02687849	80.50
28	169461876	13.510	297.42875090	41.02425394	82.94
29	169461905	15.951	297.46858545	41.03190340	85.30
30	169461899	16.810	297.43375998	41.03118827	90.65
31	169461919	16.330	297.46794575	41.03449568	92.89
32	169461885	15.611	297.42605392	41.02684846	94.36
33	169461787	16.708	297.41956888	41.00569856	94.80
34	169461827	16.660	297.41878513	41.01403713	95.59
35	169461730	15.891	297.42925099	40.99164359	96.41
36	169461756	16.881	297.42207793	40.99713245	99.50
37	169556395	16.679	297.48633734	40.99592609	103.89
38	169461863	15.917	297.41787804	41.02149927	104.48

Index	Catalog ID	Mag	RA (degrees)	Dec (degrees)	Distance (arcsec)
39	169556312	15.662	297.49173032	41.01917428	107.28
40	169556340	16.190	297.49328277	41.01094114	107.41
41	169461944	16.374	297.44826800	41.04082100	108.30
42	1879946854	16.880	297.44833666	41.04103799	109.05
43	169461859	16.851	297.41547761	41.02087616	109.84
44	169461696	16.448	297.45348657	40.98017030	111.07
45	169461921	16.148	297.42625256	41.03508531	114.38
46	169461948	16.295	297.46458119	41.04241118	116.77
47	169461888	16.328	297.41655871	41.02774737	117.60
48	169461952	16.805	297.45548406	41.04387529	118.37
49	169461690	16.769	297.45988300	40.97830561	118.95
50	169461954	15.795	297.46062496	41.04412404	120.62
51	169461852	15.147	297.41084964	41.01973260	120.67
52	169461894	16.042	297.41656898	41.02963762	121.20
53	169461691	15.587	297.44087838	40.97855078	122.01
54	169461832	15.170	297.40873362	41.01473884	123.00
55	169461902	16.568	297.41742799	41.03153735	123.24
56	169556220	15.232	297.47566516	41.04138148	124.46
57	169556246	14.403	297.48724344	41.03477649	124.88
58	169461956	13.418	297.46935295	41.04446174	127.63
59	169461713	16.492	297.41874469	40.98732783	127.73
60	169556268	16.024	297.49343938	41.03013988	127.92
61	169556258	15.942	297.49325294	41.03187131	130.97
62	169556464	15.199	297.48066072	40.98043053	132.19
63	1879946734	16.319	297.49345257	41.03259158	132.91
64	169556482	16.316	297.47622886	40.97759782	134.94
65	169461903	16.726	297.41116894	41.03160497	137.36
66	169556480	16.399	297.48102904	40.97855481	138.40
67	169461701	16.825	297.42010300	40.98138400	140.48
68	10000712493	15.824	297.42001300	40.98140300	140.59
69	169461698	16.356	297.42001800	40.98044600	143.21
70	169461924	16.291	297.41188728	41.03596235	144.88
71	169556483	16.306	297.48368251	40.97720318	146.41
72	169556459	16.010	297.49641317	40.98204382	155.94
73	1879946294	16.351	297.49815005	40.97973030	165.05
74	169461953	14.590	297.41156971	41.04408873	165.22
75	169556469	16.163	297.49831700	40.97972100	165.40

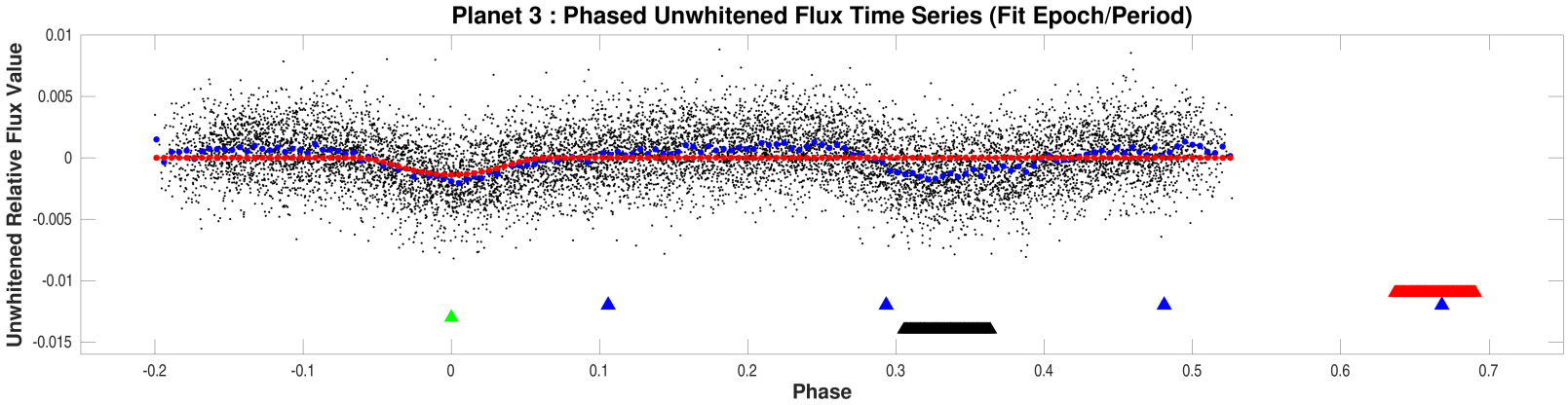
RA, Dec and Distances are corrected for proper motion. This table may not contain all of the objects shown.

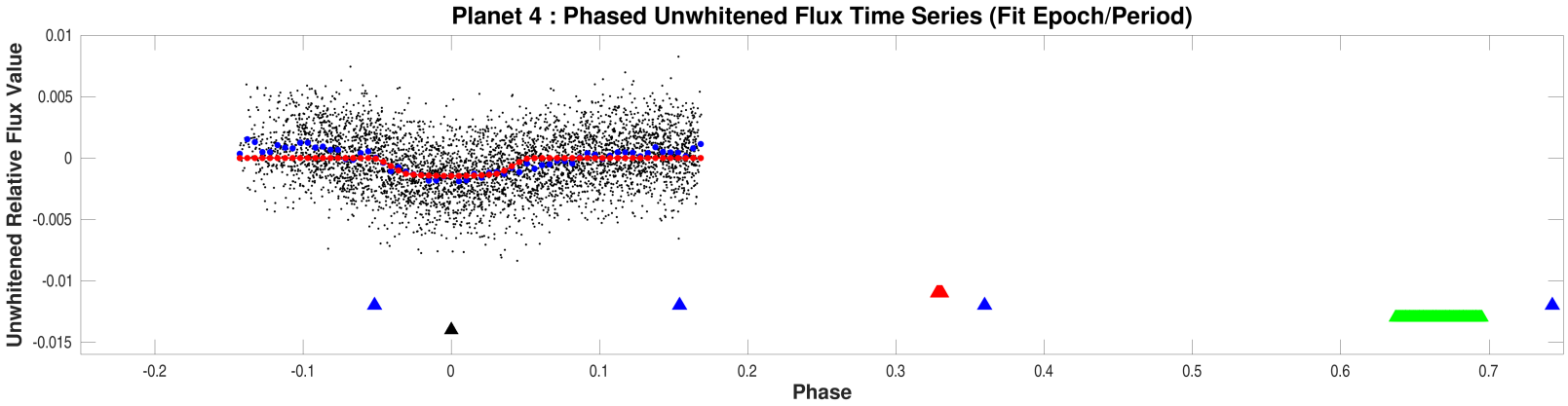
6 Phased Light Curves



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.

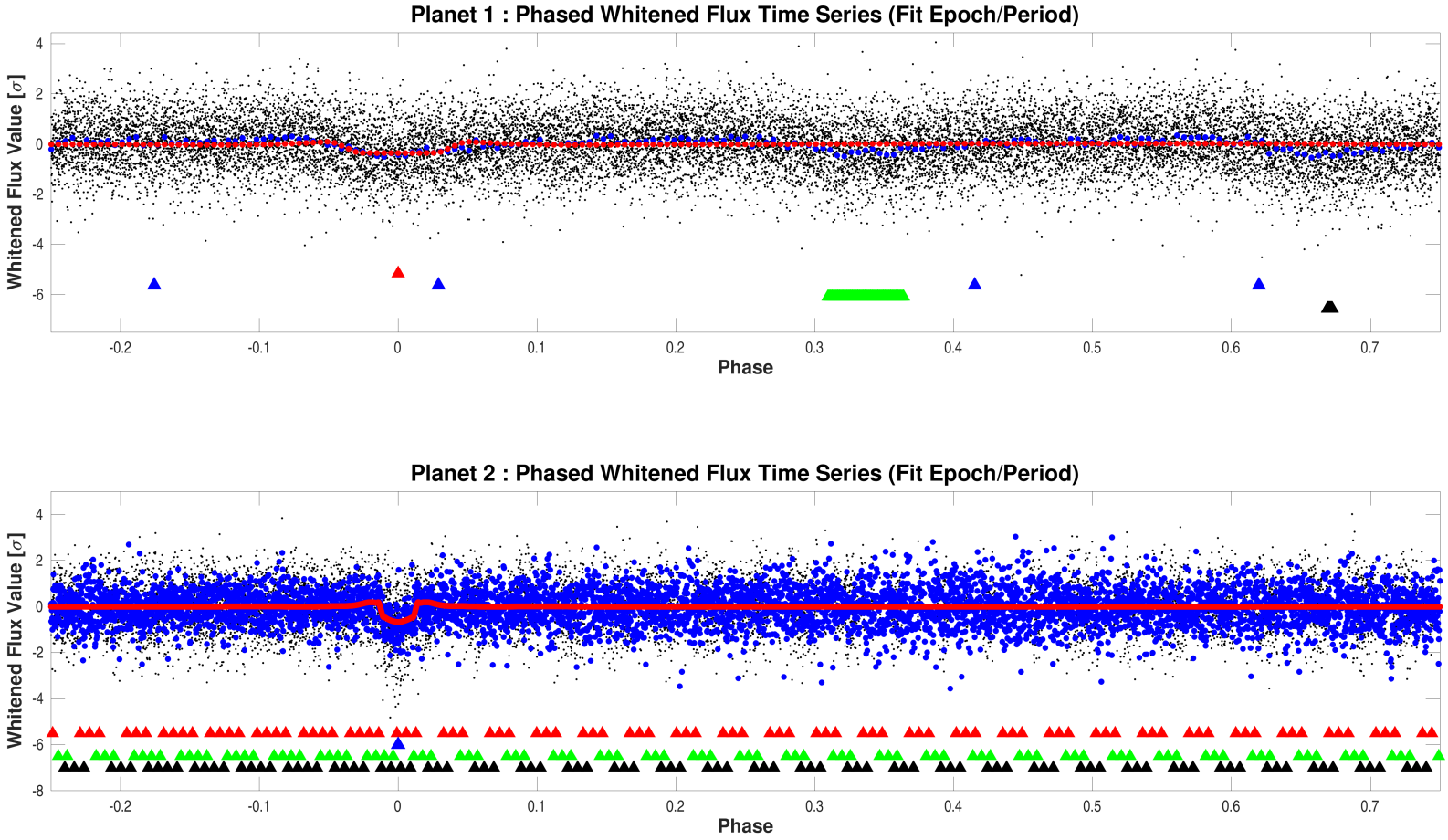
Open `./summary-plots/0000000169461816-01-phased-unwhitened-flux-time-series.fig`



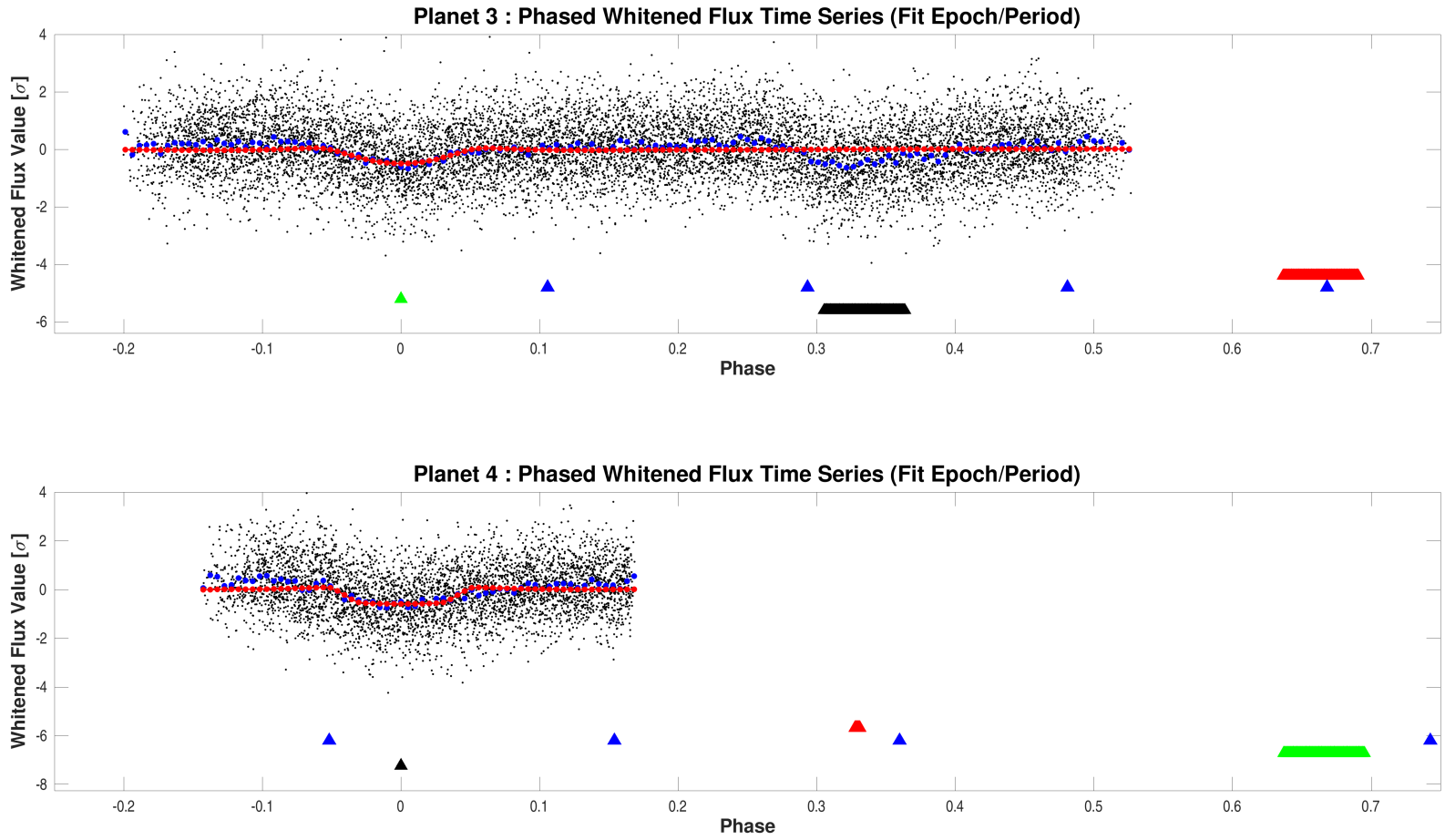


Phased unwhitened flux time series is plotted in black dots. When all transits fit completed with full or secondary convergence, the phase is determined with the fitted epoch and period; otherwise, the phase is determined with the TPS epoch and period. The values of the phased unwhitened flux time series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

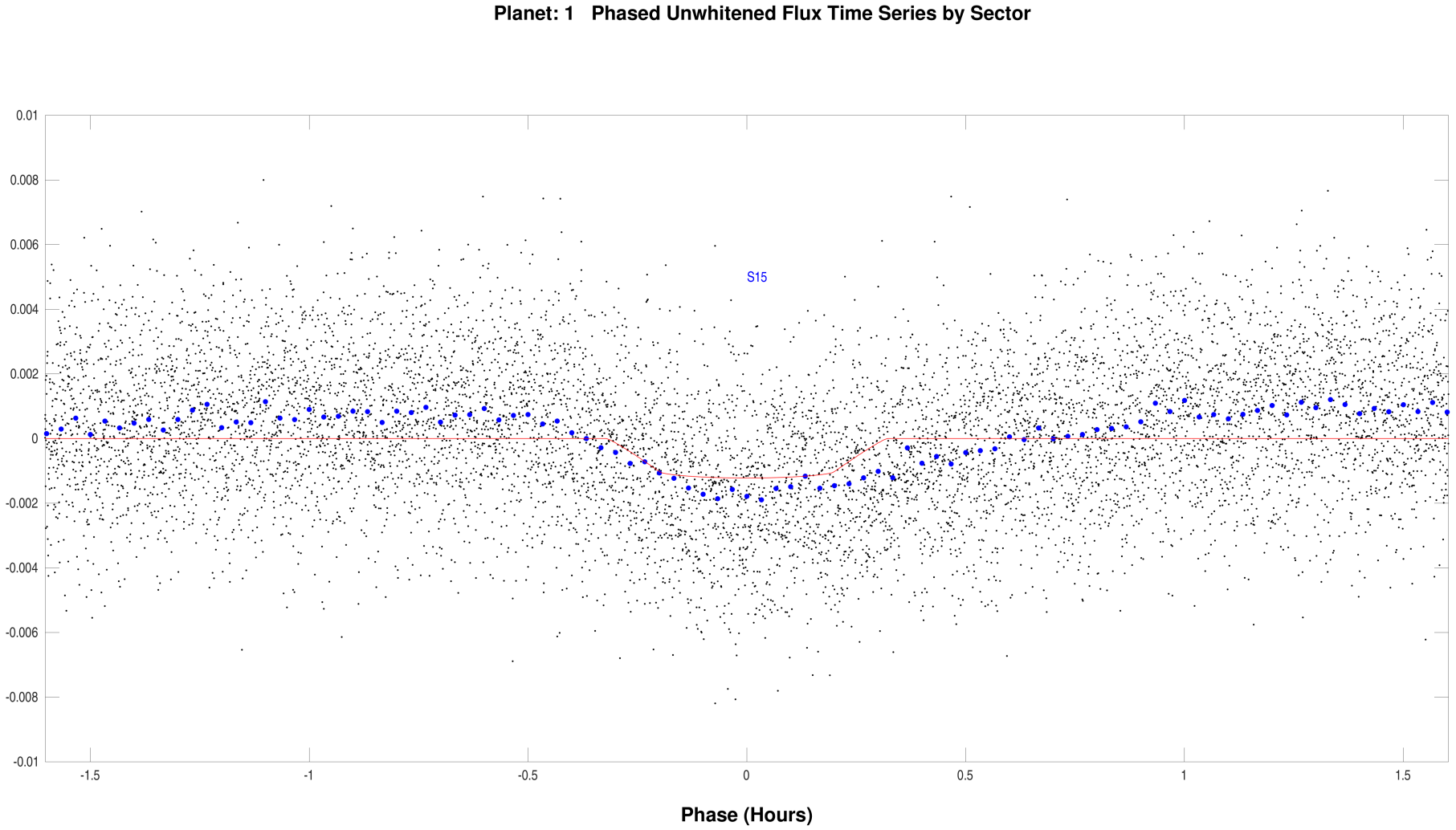
Open `./summary-plots/0000000169461816-03-phased-unwhitened-flux-time-series.fig`



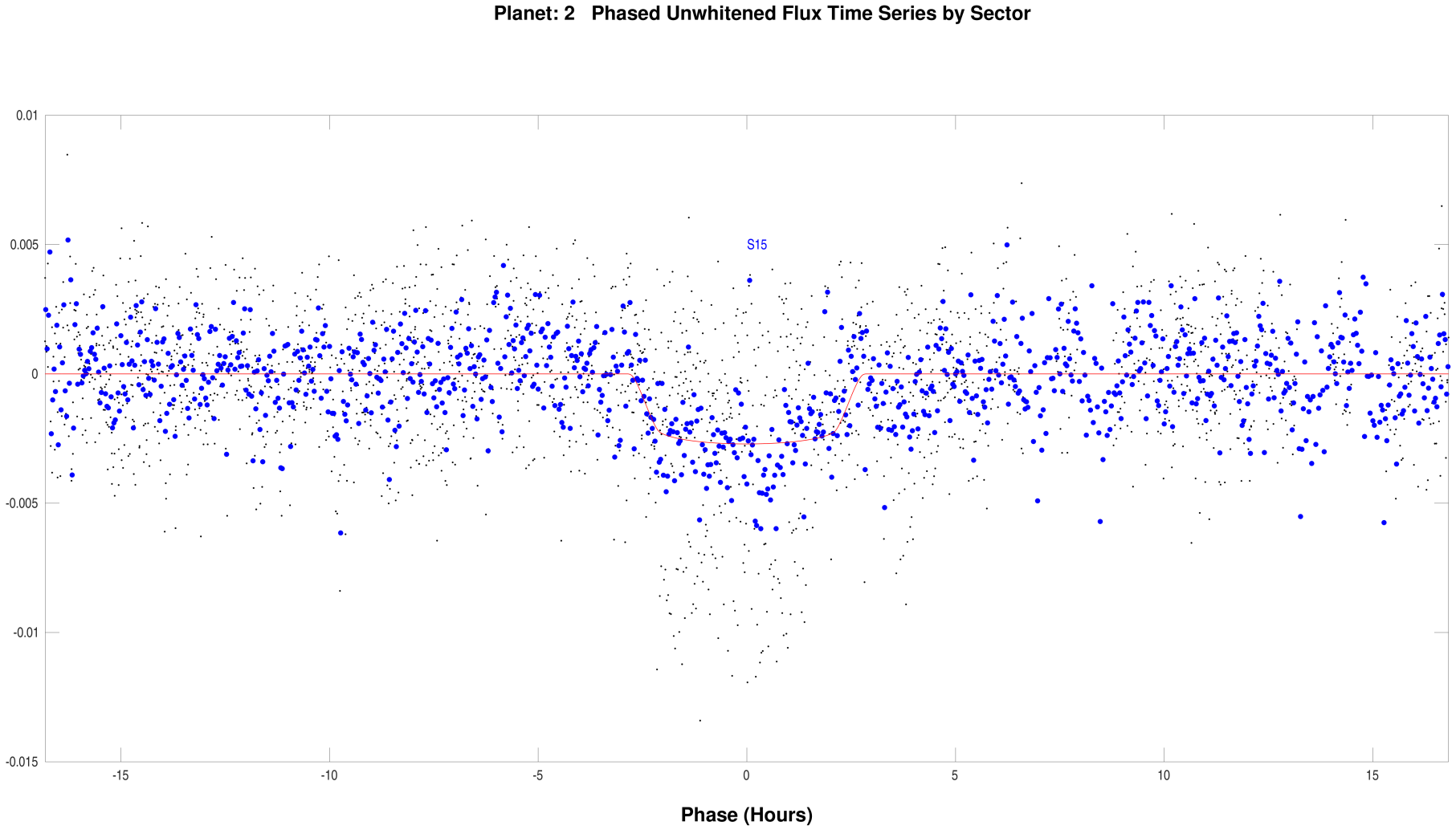
Phased whitened flux time series is plotted in black dots. When all transits fit completed with full or secondary convergence, the phase is determined with the fitted epoch and period; otherwise, the phase is determined with the TPS epoch and period. The values of the phased whitened flux time series 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/0000000169461816-01-phased-whitened-flux-time-series.fig`



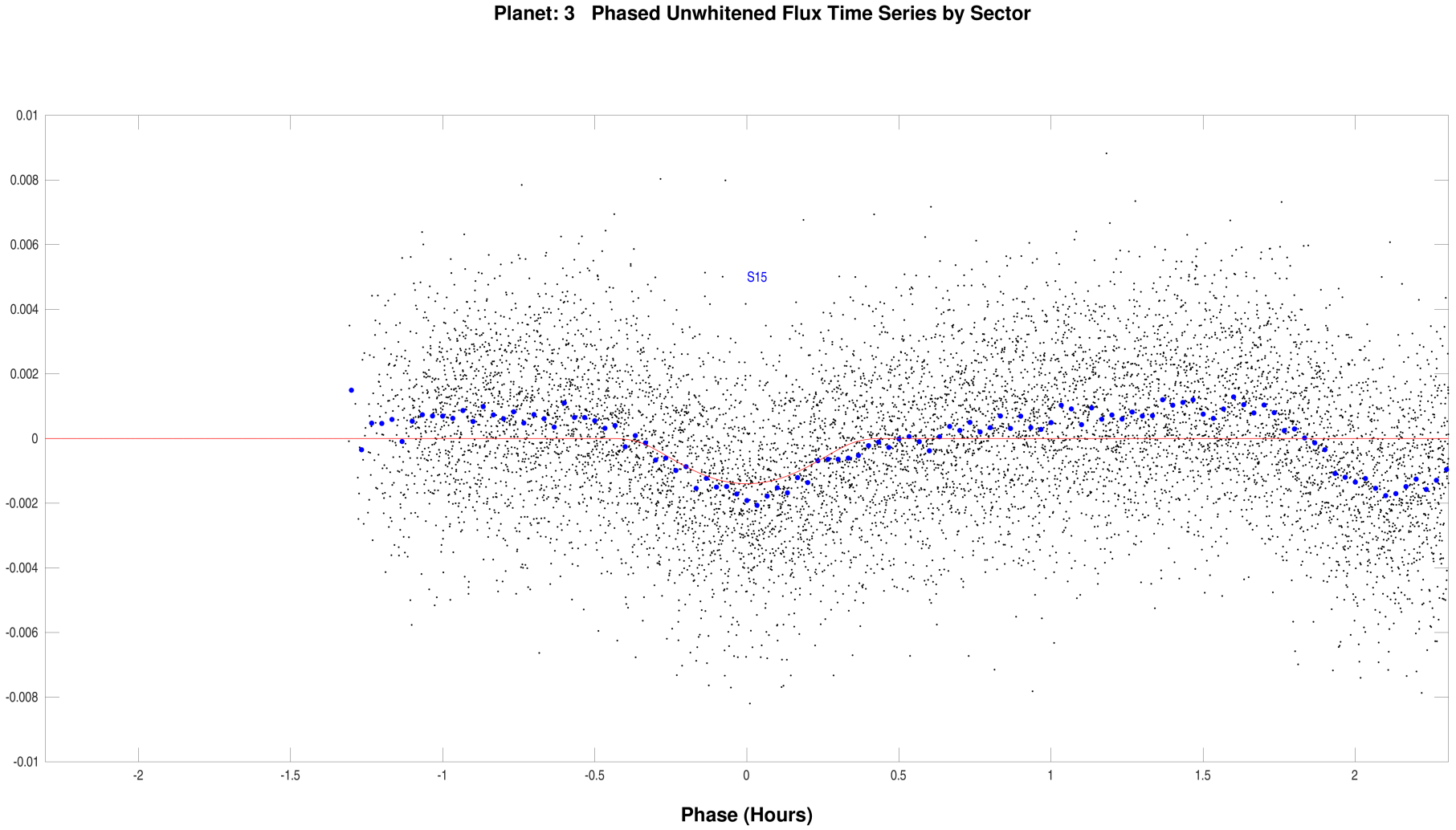
Phased whitened flux time series is plotted in black dots. When all transits fit completed with full or secondary convergence, the phase is determined with the fitted epoch and period; otherwise, the phase is determined with the TPS epoch and period. The values of the phased whitened flux time series 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/0000000169461816-03-phased-whitened-flux-time-series.fig`



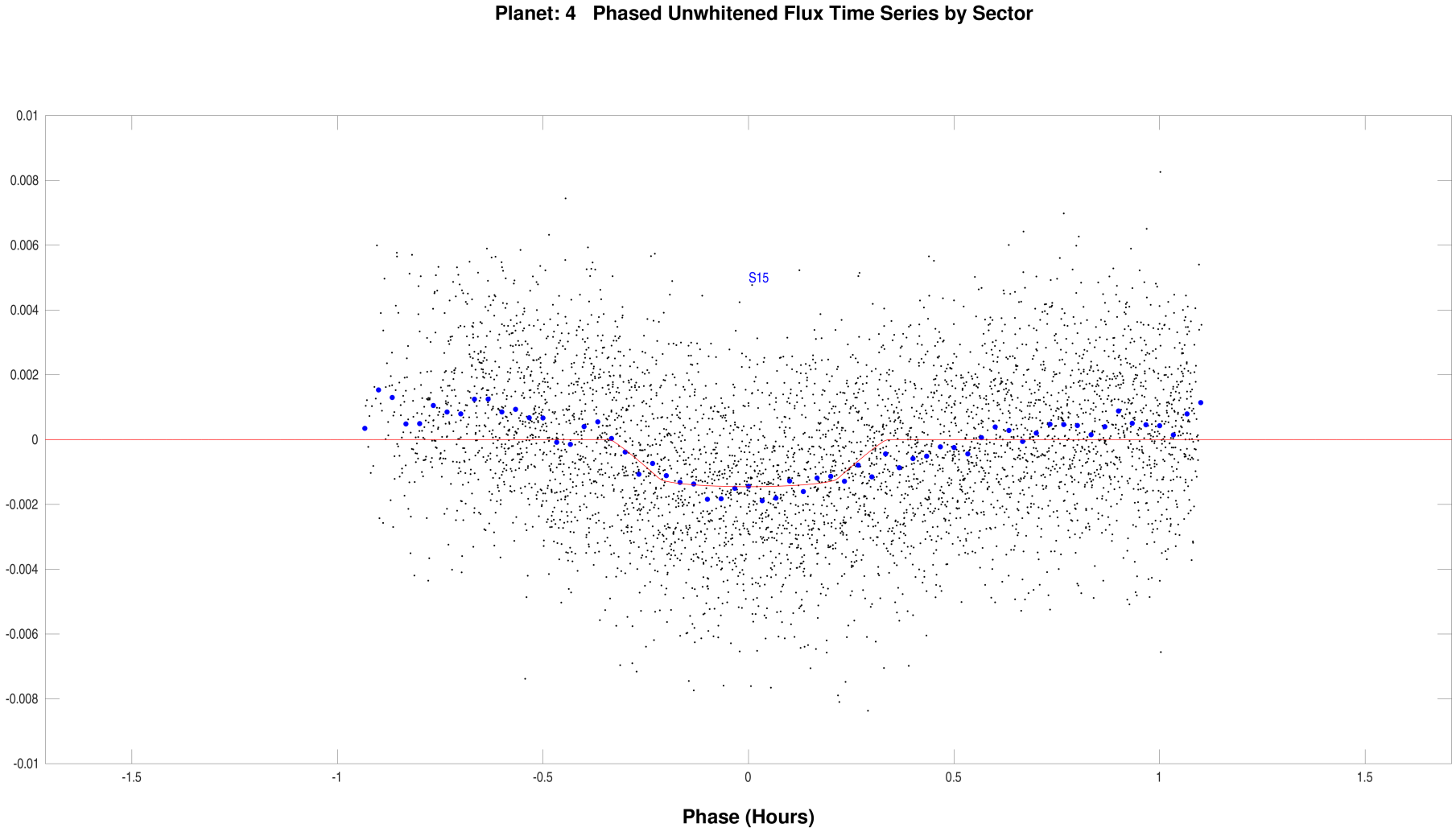
Phased unwhitened flux time series by sector for target 169461816, planet candidate 1. Period = 0.27246 days; transit epoch = 1711.5525 BTJD.
Open `./summary-plots/0000000169461816-01-phased-unwhitened-flux-time-series-by-sector.fig`



Phased unwhitened flux time series by sector for target 169461816, planet candidate 2. Period = 8.118 days; transit epoch = 1712.9226 BTJD.
Open `./summary-plots/0000000169461816-02-phased-unwhitened-flux-time-series-by-sector.fig`



Phased unwhitened flux time series by sector for target 169461816, planet candidate 3. Period = 0.2723 days; transit epoch = 1711.3792 BTJD.
Open `./summary-plots/0000000169461816-03-phased-unwhitened-flux-time-series-by-sector.fig`



Phased unwhitened flux time series by sector for target 169461816, planet candidate 4. Period = 0.27247 days; transit epoch = 1711.4623 BTJD.
Open `./summary-plots/0000000169461816-04-phased-unwhitened-flux-time-series-by-sector.fig`

7 Planet Candidate 1

7.1 Model Fitter: All Transits

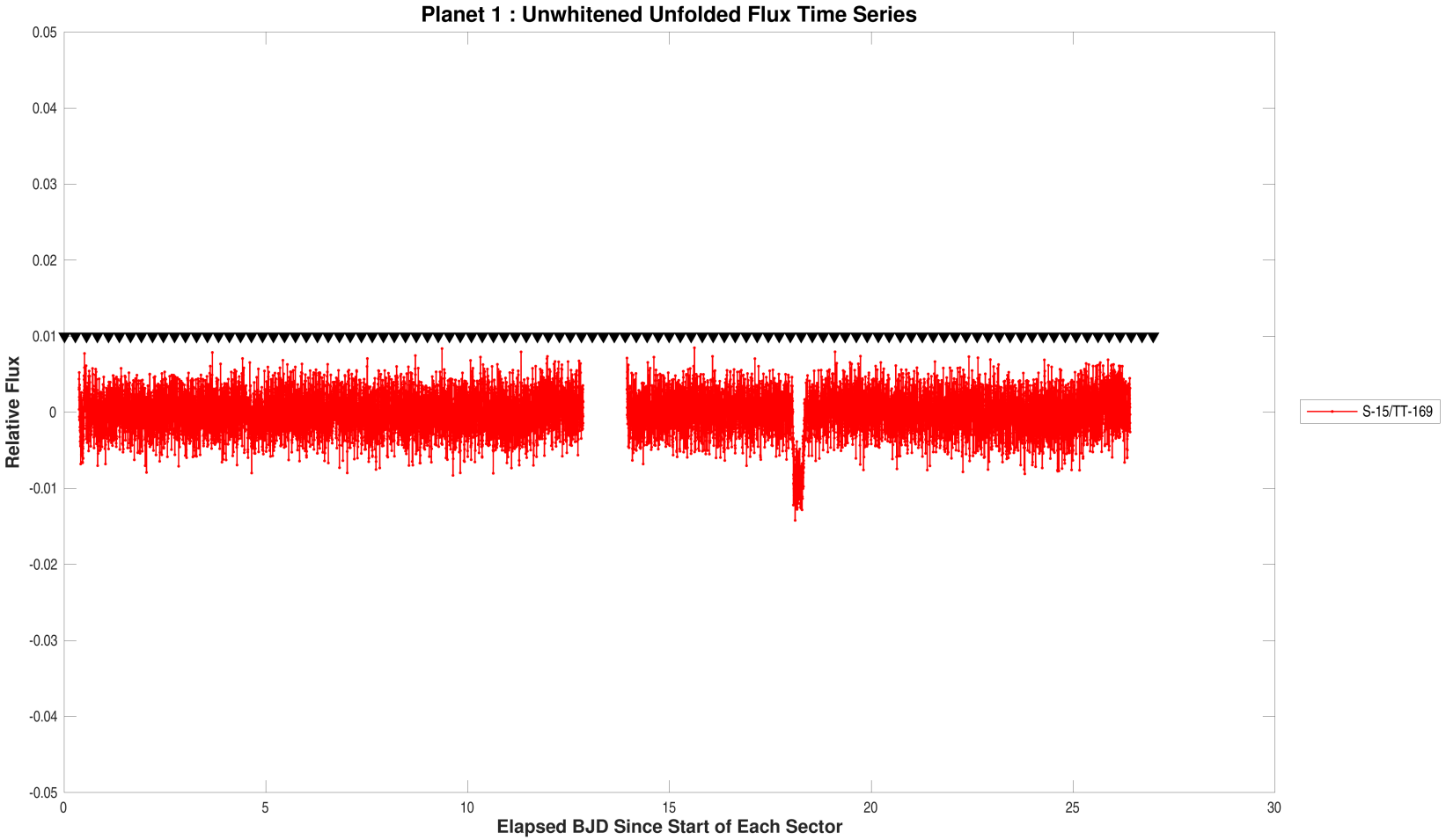
Model Characteristic	Name
Transit Model	mandel-agol_geometric_transit_model
Limb Darkening Model	claret_tess_nonlinear_limb_darkening_model

TCE Parameter	Value	Units
Trial Transit Pulse Duration	0.5	hours
Transit Epoch	1711.5521768	TJD
Orbital Period	0.2723780	days
Maximum SES	10.7	
Maximum MES	9.7	
Robust Statistic	12.4	
Chi Square Goodness of Fit Statistic (DoF)	1146.7 (1219)	
Chi Square2 Statistic (DoF)	120.9 (94.1)	
Threshold for Desired PFA		

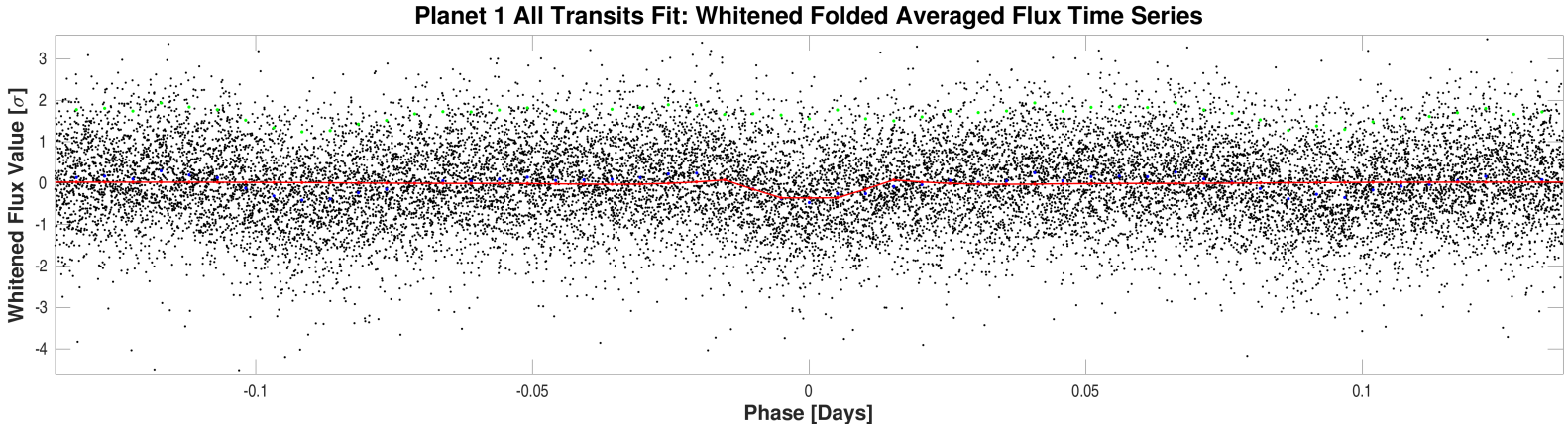
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	12.0		
Orbital Period	0.2724594	1.4417e-05	days
Transit Epoch	1711.5524637	5.4031e-04	BTJD
Impact Parameter	0.0100	5.9732e+02	
Planet Radius to Star Radius Ratio	0.0328367	2.7812e-02	
Semi-major Axis to Star Radius Ratio	4.0674	2.2719e+01	
Planet Radius	5.3454	4.5338e+00	Earth radii
Semi-major Axis	0.0093	6.9168e-04	AU
Effective Stellar Flux	48407.1314	7.3828e+03	Goldilocks
Equilibrium Temperature	3783	1.4424e+02	Kelvin
Stellar Density	12.1780	2.0407e+02	Solar density
Transit Depth	1221	1.1209e+02	ppm
Transit Duration	0.5344	2.0551e-01	hours
Transit Ingress Duration	0.0173	2.2141e-01	hours
Eccentricity	0.0000	0.0000e+00	
Peri Longitude	0.0000	0.0000e+00	degrees
Model Chi Square Statistic (DoF)	6953.2 (8509.5)		
Model Chi Square Goodness of Fit Statistic (DoF)	1033.2 (1759)		
Model Chi Square2 Statistic (DoF)	70.5 (90)		

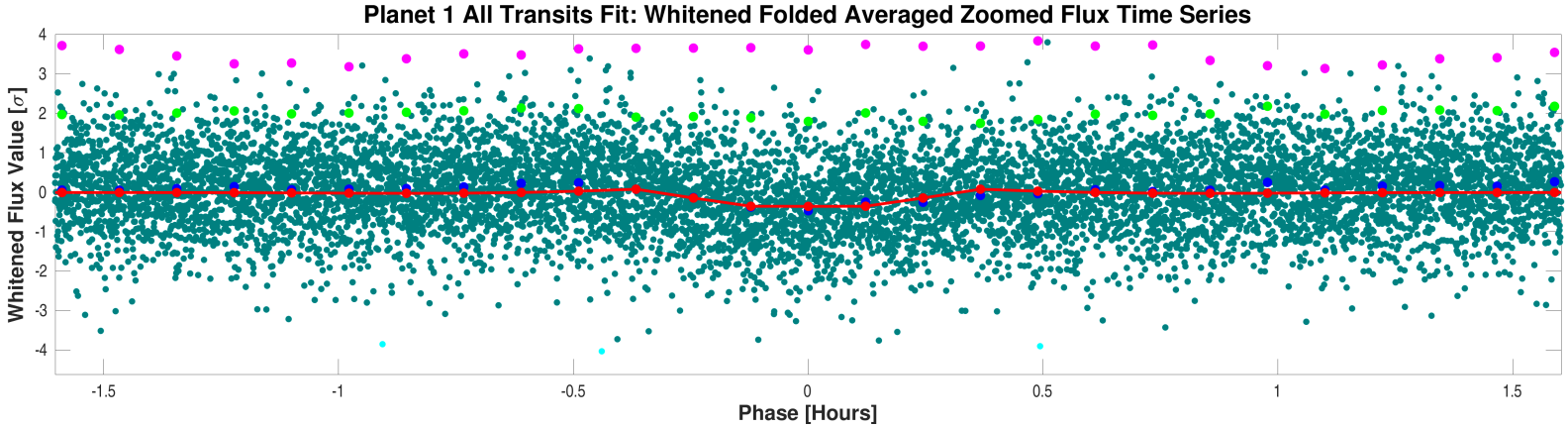
DoF: Degrees of Freedom



Flux time series for CatId 169461816, Planet candidate 1 in the unwhitened domain. For the data of Sector-15/TargetTableId-169, start BJD is 2458711. 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/0000000169461816-01-all-unwhitened-15-169.fig`



Folded flux time series for CatId 169461816, 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/0000000169461816-01-all-whitened.fig`

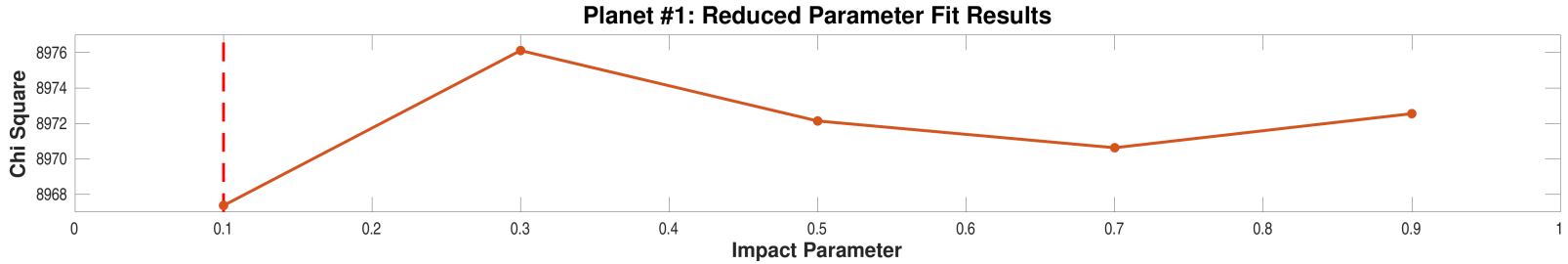


Folded flux time series for CatId 169461816, Planet candidate 1 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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/0000000169461816-01-all-whitened-zoomed.fig`

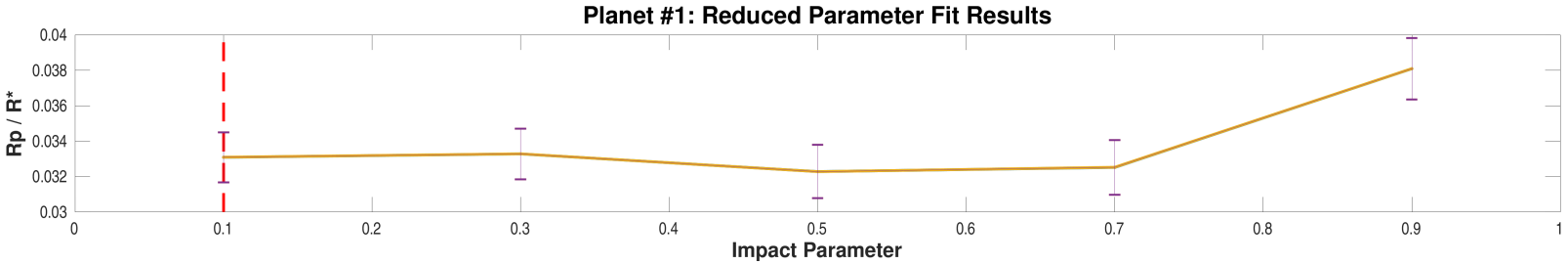
7.2 Model Fitter: Reduced Parameter Fit Results

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	12.8	8967.4	0.0330921	1.4149e-03	4.0995	1.7047e-01	1238	1.0526e+02	0.5279	2.2317e-02
0.30	12.7	8976.1	0.0332829	1.4314e-03	3.9622	1.6441e-01	1237	1.0582e+02	0.5265	2.2316e-02
0.50	11.9	8972.1	0.0322846	1.5040e-03	3.3576	1.4422e-01	1133	1.0501e+02	0.5734	2.5672e-02
0.70	11.6	8970.6	0.0325197	1.5405e-03	2.7017	1.1026e-01	1090	1.0270e+02	0.6144	2.7427e-02
0.90	12.8	8972.6	0.0380908	1.7325e-03	2.2831	1.0275e-01	1305	1.1773e+02	0.5185	2.7561e-02

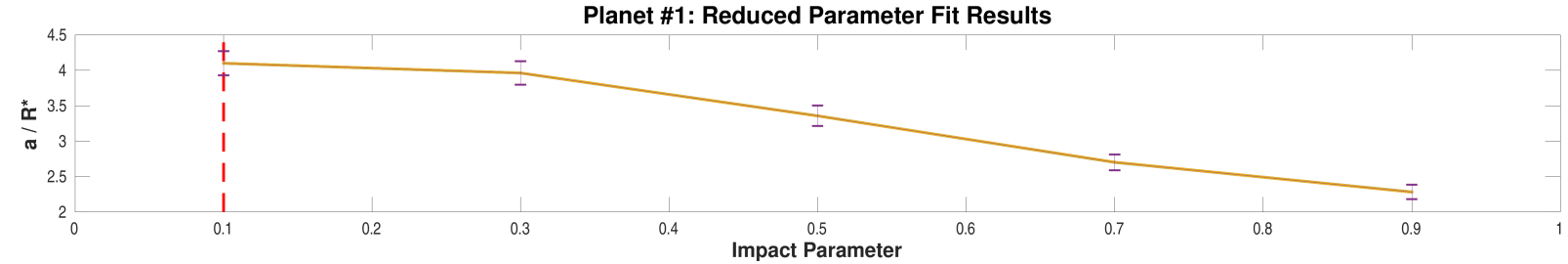
Highlighted row is the best reduced-parameter model fit.



Model chi squares of reduced parameter fits vs. impact parameter for CatId 169461816, 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/0000000169461816-01-reduced-fits-chi-square.fig`



Ratios of planet radius to star radius of reduced parameter fits vs. impact parameter for CatId 169461816, 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/0000000169461816-01-reduced-fits-rp-over-rstar.fig`



Ratios of semimajor axis to star radius of reduced parameter fits vs. impact parameter for CatId 169461816, 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/0000000169461816-01-reduced-fits-a-over-rstar.fig`

7.3 Model Fitter: Trapezoidal Fit Results

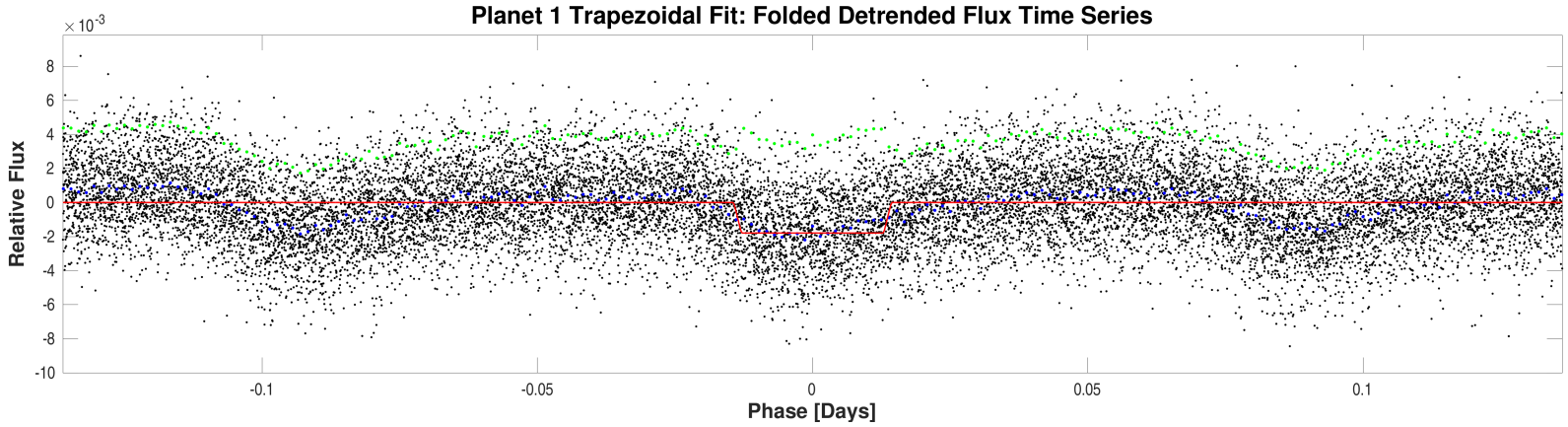
Model Characteristic	Name
Transit Model	trapezoidal_model
Limb Darkening Model	

TCE Parameter	Value	Units
Trial Transit Pulse Duration	0.5	hours
Transit Epoch	1711.5521768	TJD
Orbital Period	0.2723780	days
Maximum SES	10.7	
Maximum MES	9.7	
Robust Statistic	12.4	
Chi Square Goodness of Fit Statistic (DoF)	1146.7 (1219)	
Chi Square2 Statistic (DoF)	120.9 (94.1)	
Threshold for Desired PFA		

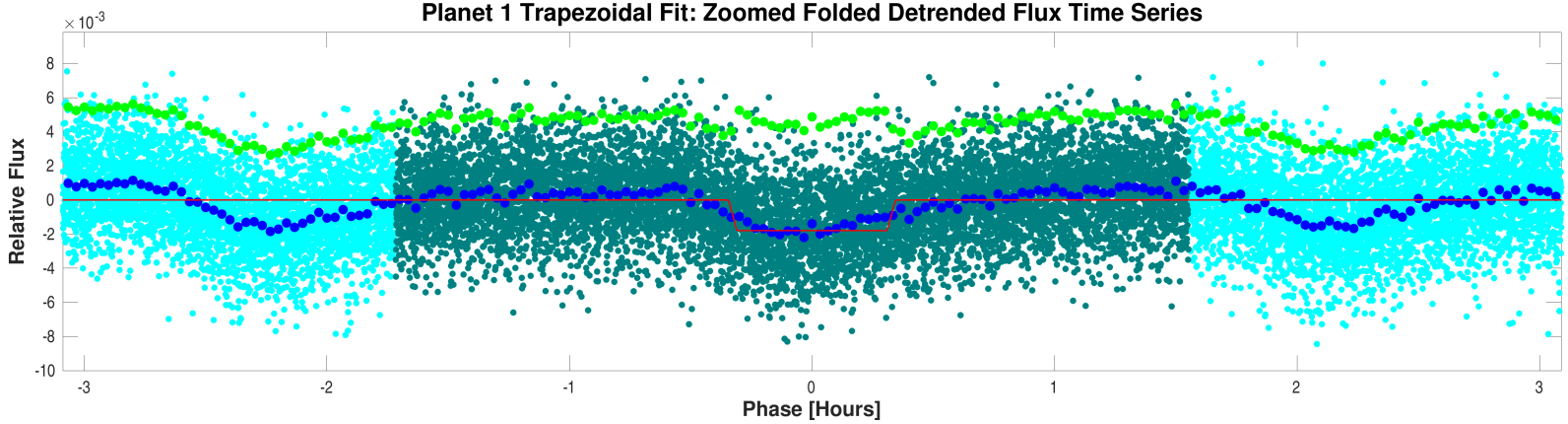
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	27.6		
Orbital Period	0.2723780		days
Transit Epoch	1711.5583967		BTJD
Transit Depth	1793		ppm
Transit Duration	1.0296		hours
Transit Ingress Duration	0.3758		hours
Model Chi Square Statistic (DoF)	18351.3 (8891)		

DoF: Degrees of Freedom



Folded detrended flux time series for CatId 169461816, Planet candidate 1 and folded trapezoidal model light curve.
Open `./planet-01/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000169461816-01-all-trapezoidal.fig`



Zoomed folded detrended flux time series for CatId 169461816, Planet candidate 1 and folded trapezoidal model light curve.
Open `./planet-01/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000169461816-01-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	0.27238		days		
Transit Duration	0.5		hours		
Maximum MES	9.7				
Secondary Phase	0.18175		days		
Secondary MES	10.6				
Minimum Phase	0.15988		days		
Minimum MES	-7.1				
Median MES	-1.1				
MAD MES	3.1812				
Robust Statistic	10.7				
Secondary Depth	1177.4	1.0169e+02	ppm		
Geometric Albedo	2.0	3.3535e+00		0.2894	38.61
Planet Effective Temperature	6930	2.9406e+03	Kelvin	1.0689	14.26

7.4.2 Eclipsing Binary Discrimination Test

Result	Value	Value in Sigmas	Significance (%)
Odd Even Transit Depth Comparison Statistic	1.0183e+00	1.0091	31.29
Shorter Period Comparison Statistic	1.6193e-05	0.0040	0.32
Longer Period Comparison Statistic	9.9613e-08	0.0003	0.03

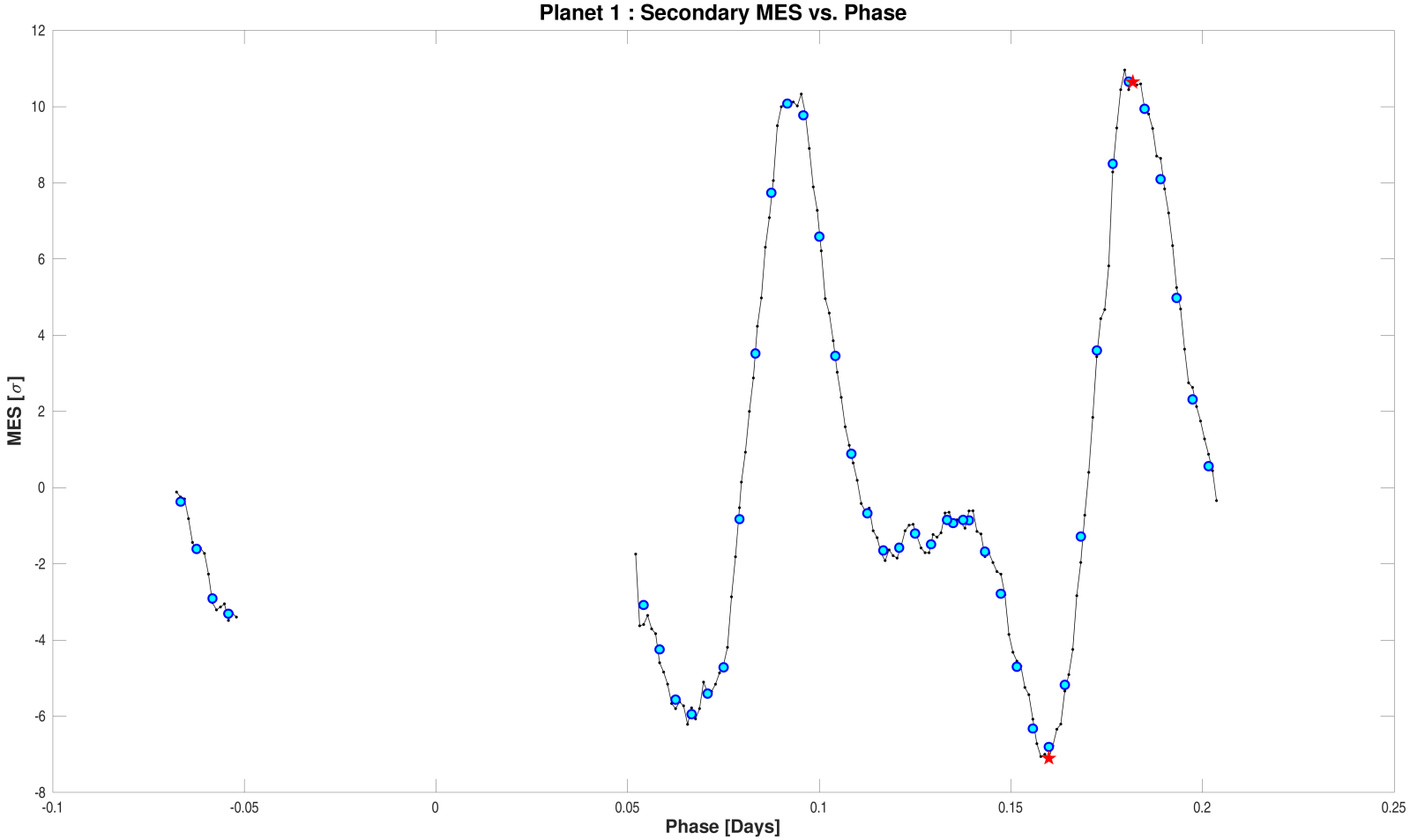
7.4.3 Bootstrap Test

No bootstrap results available.

7.4.4 Ghost Diagnostic Test

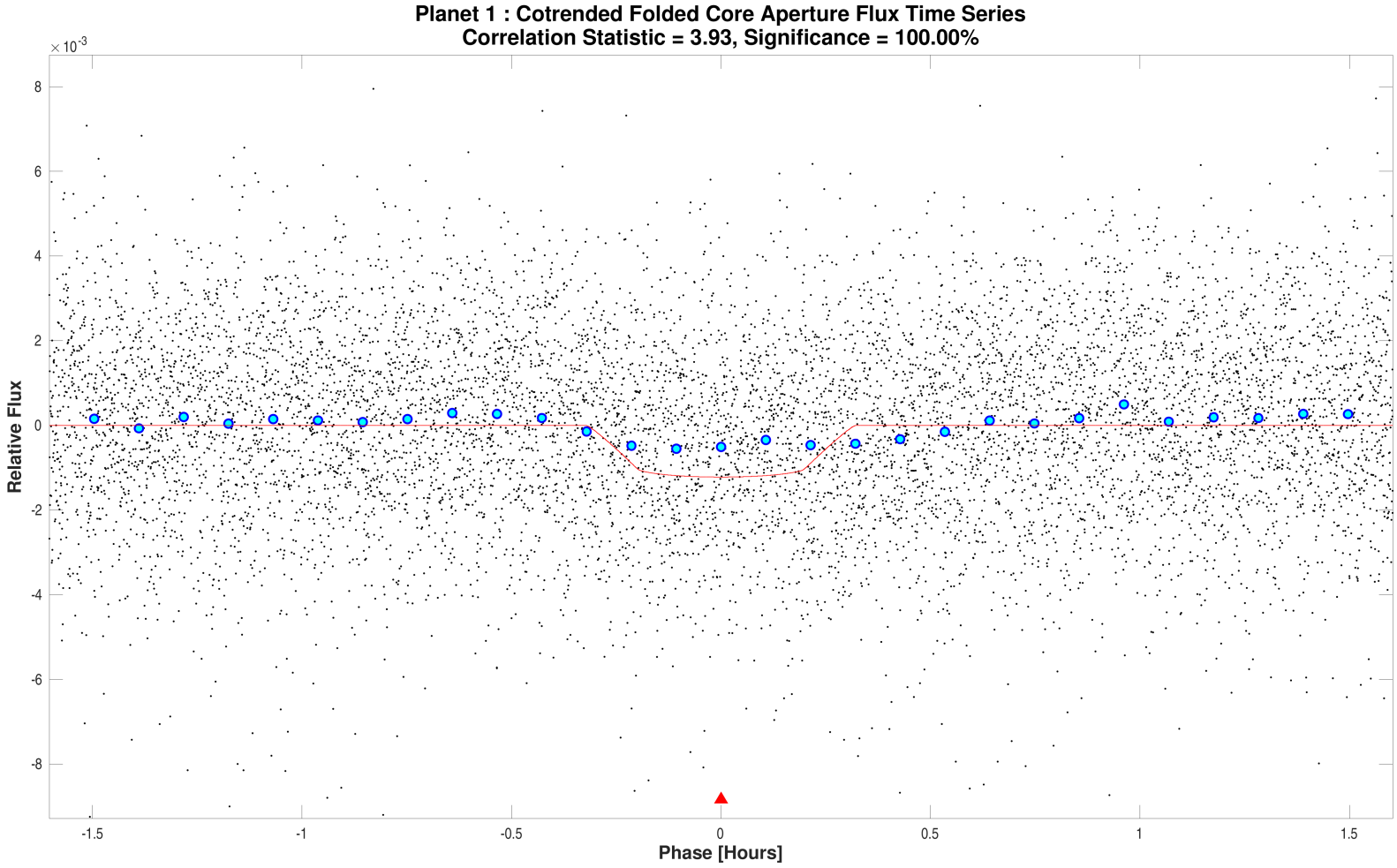
Result	Value	Significance (%)
Maximum MES	9.7	
SNR	12.0	
Core Aperture Statistic	3.9311e+00	100.00
Halo Aperture Statistic	1.5082e+01	100.00
Ratio of Core/Halo Aperture Statistics	2.6065e-01	

7.4.5 Validation Test Figures



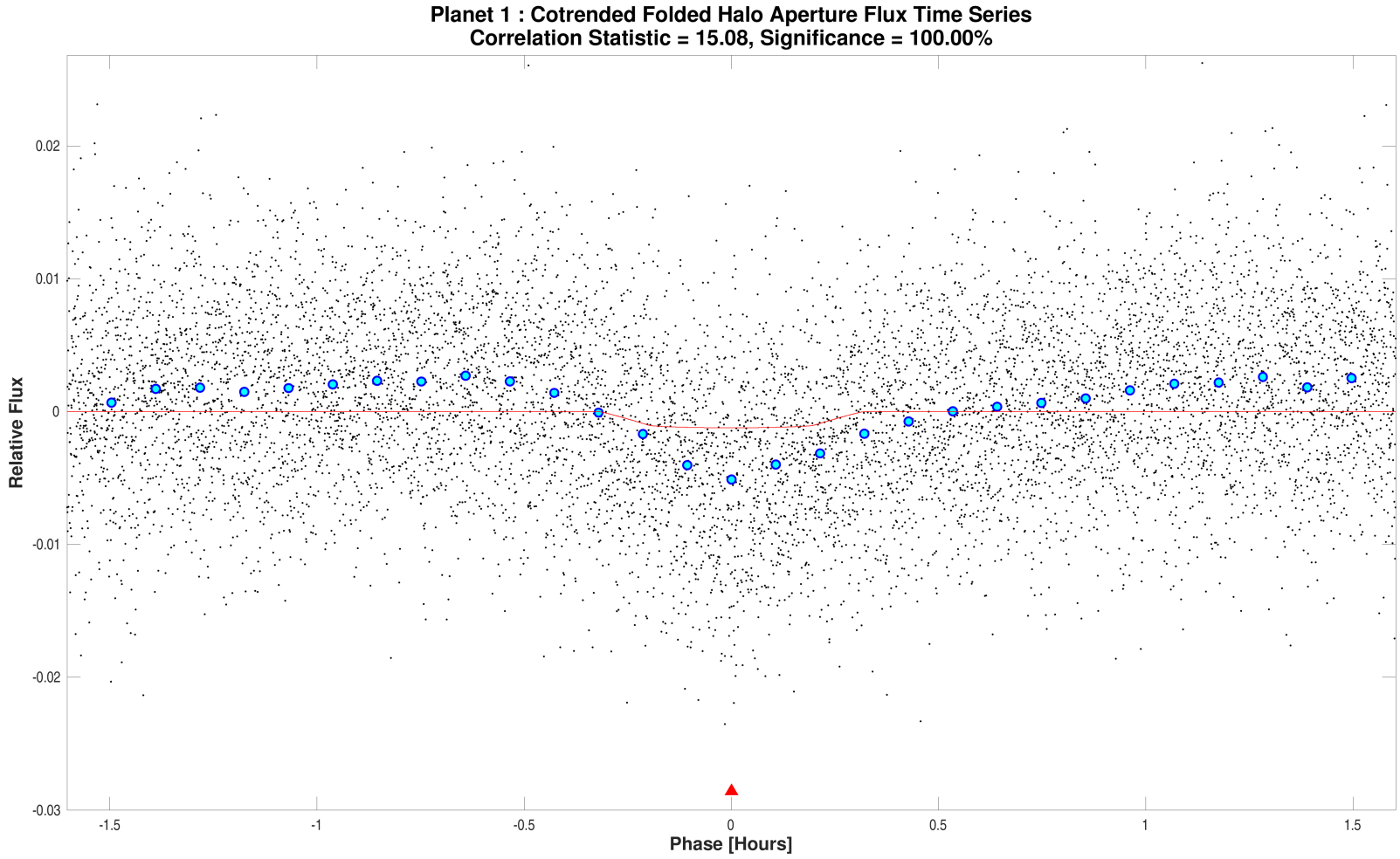
The primary event has been set to zero and both the max and min of the resulting MES vs. Phase are marked with a red star. The best matched pulse duration in hours is 0.5. The maximum secondary MES and corresponding phase are 10.6449 and 0.18175 days respectively. The minimum secondary MES and corresponding phase are -7.1035 and 0.15988 days respectively.
Open `./planet-01/report-summary/0000000169461816-01-weak-secondary-diagnostic.fig`

No figures named 0000000169461816-01-bootstrap-false-alarm.fig are available.



Optical ghost diagnostic core aperture flux time series for target 169461816, 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/0000000169461816-01-core-unwhitened-cotrended-zoomed-model.fig`



Optical ghost diagnostic halo aperture flux time series for target 169461816, 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/0000000169461816-01-halo-unwhitened-cotrended-zoomed-model.fig`

8 Planet Candidate 2

8.1 Model Fitter: All Transits

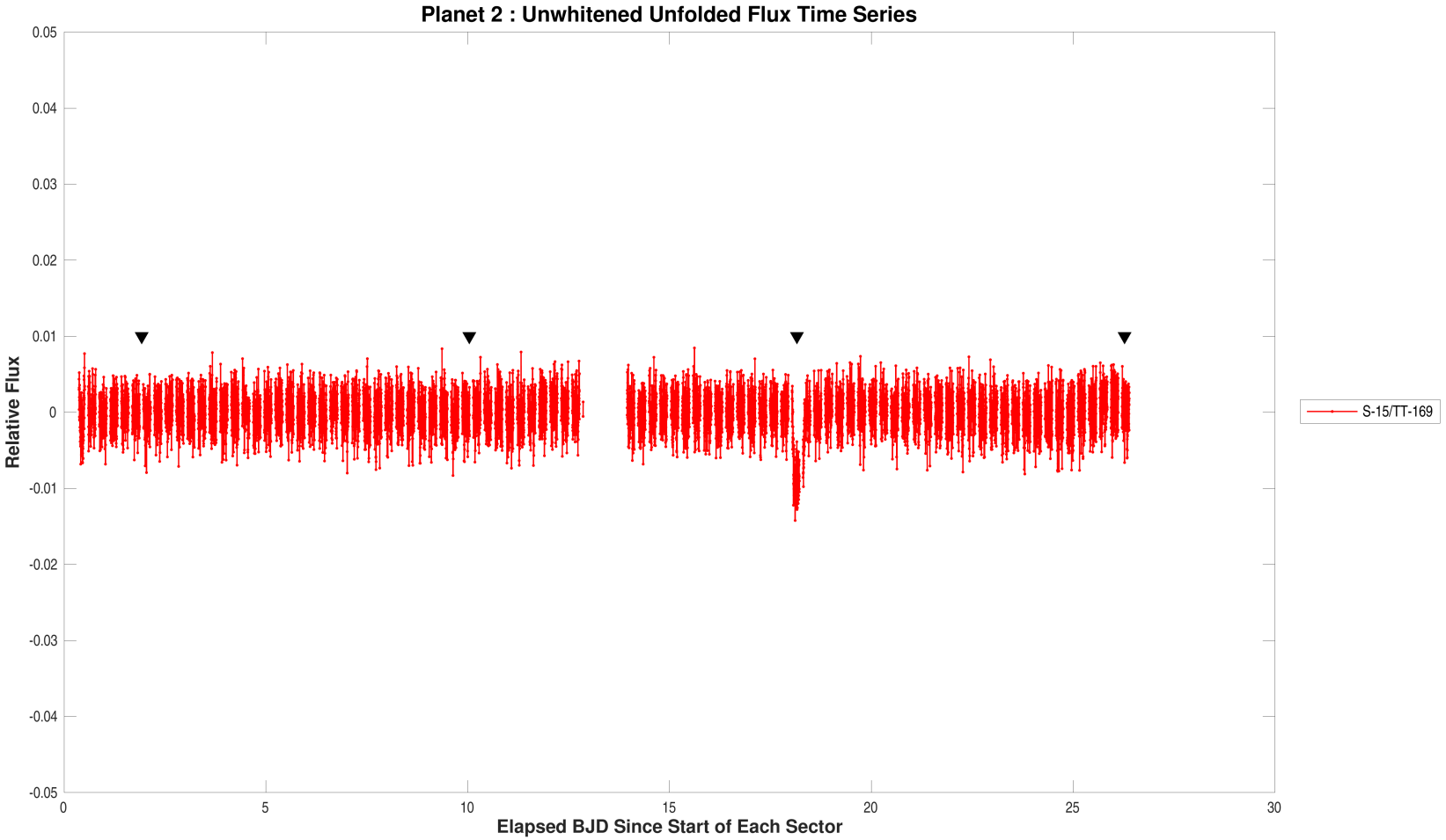
Model Characteristic	Name
Transit Model	mandel-agol_geometric_transit_model
Limb Darkening Model	claret_tess_nonlinear_limb_darkening_model

TCE Parameter	Value	Units
Trial Transit Pulse Duration	4.5	hours
Transit Epoch	1712.9275233	TJD
Orbital Period	8.1055520	days
Maximum SES	22.9	
Maximum MES	17.8	
Robust Statistic	19.9	
Chi Square Goodness of Fit Statistic (DoF)	370.3 (193)	
Chi Square2 Statistic (DoF)	179.1 (37.6)	
Threshold for Desired PFA		

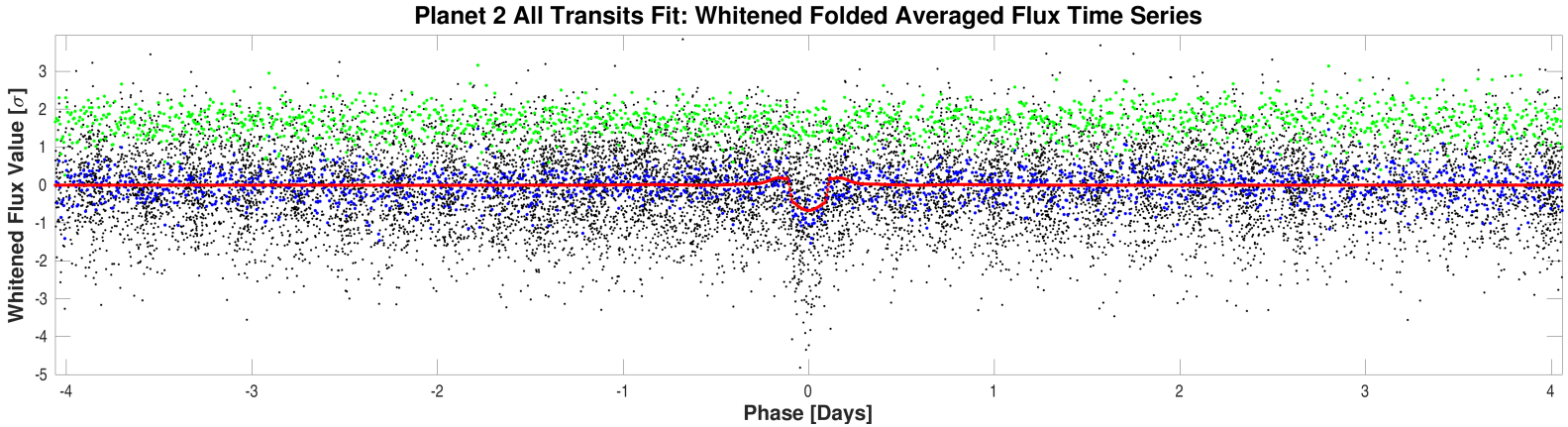
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	10.9		
Orbital Period	8.1180356	3.6767e-03	days
Transit Epoch	1712.9226370	5.8030e-03	BTJD
Impact Parameter	0.7939	1.2257e-01	
Planet Radius to Star Radius Ratio	0.0523632	3.2361e-03	
Semi-major Axis to Star Radius Ratio	7.6965	1.9699e+00	
Planet Radius	8.5241	6.5126e-01	Earth radii
Semi-major Axis	0.0896	6.6477e-03	AU
Effective Stellar Flux	524.0554	7.9926e+01	Goldilocks
Equilibrium Temperature	1220	4.6528e+01	Kelvin
Stellar Density	0.0929	7.1366e-02	Solar density
Transit Depth	2708	2.5165e+02	ppm
Transit Duration	5.6042	3.9911e-01	hours
Transit Ingress Duration	0.7043	4.0414e-01	hours
Eccentricity	0.0000	0.0000e+00	
Peri Longitude	0.0000	0.0000e+00	degrees
Model Chi Square Statistic (DoF)	1770.9 (1993.9)		
Model Chi Square Goodness of Fit Statistic (DoF)	333.2 (687)		
Model Chi Square2 Statistic (DoF)	135.8 (3)		

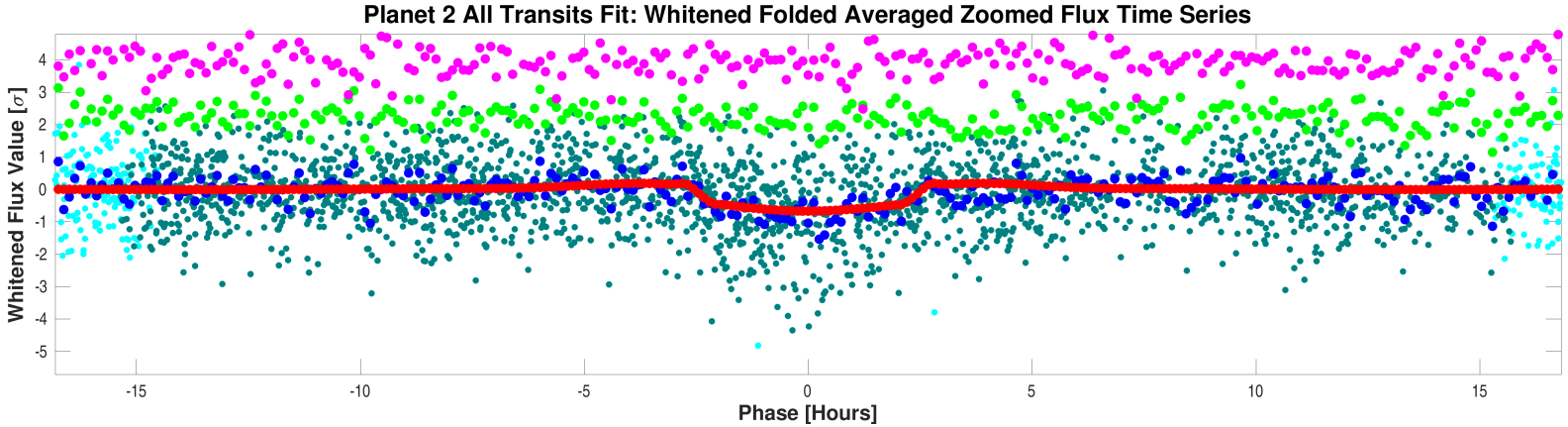
DoF: Degrees of Freedom



Flux time series for CatId 169461816, Planet candidate 2 in the unwhitened domain. For the data of Sector-15/TargetTableId-169, start BJD is 2458711. 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/0000000169461816-02-all-unwhitened-15-169.fig`



Folded flux time series for CatId 169461816, 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/0000000169461816-02-all-whitened.fig`

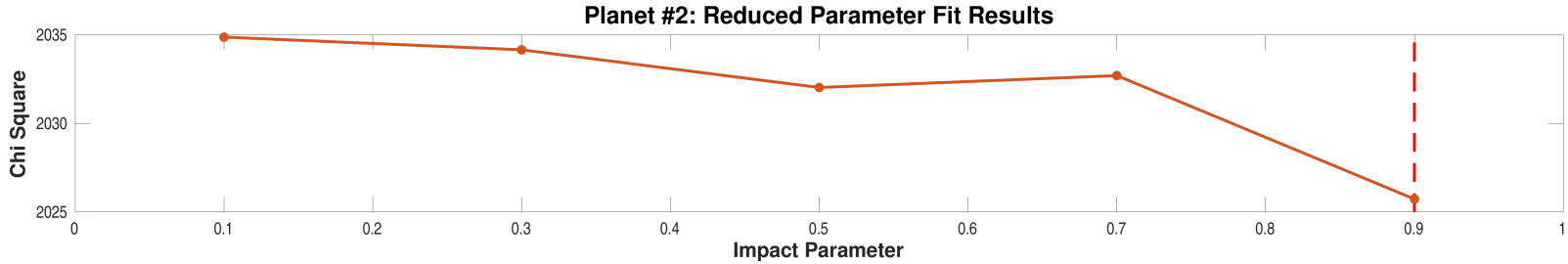


Folded flux time series for CatId 169461816, Planet candidate 2 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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/0000000169461816-02-all-whitened-zoomed.fig`

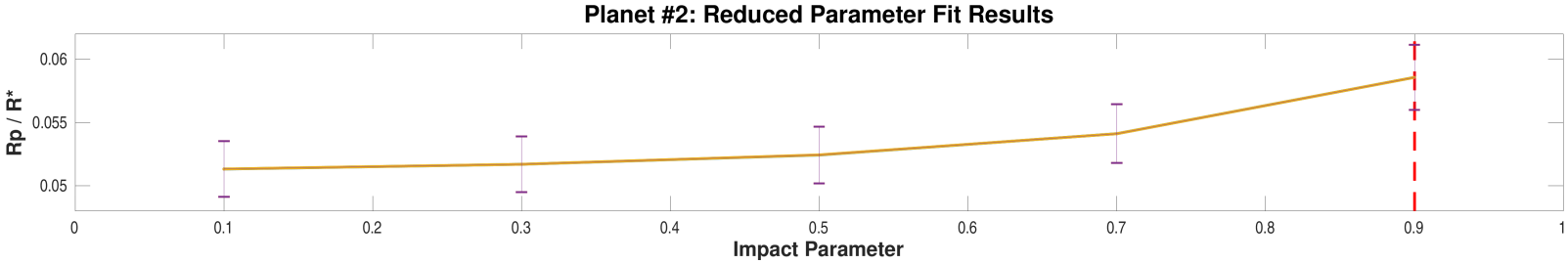
8.2 Model Fitter: Reduced Parameter Fit Results

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	12.7	2034.9	0.0513222	2.2077e-03	15.1439	3.8205e-01	2985	2.5549e+02	4.2792	1.0829e-01
0.30	12.7	2034.2	0.0516971	2.2059e-03	14.5872	3.8420e-01	2993	2.5408e+02	4.2803	1.1340e-01
0.50	12.7	2032.0	0.0524294	2.2372e-03	13.2544	3.8129e-01	2995	2.5428e+02	4.3299	1.2599e-01
0.70	12.7	2032.7	0.0541156	2.3214e-03	10.7825	3.8586e-01	3024	2.5800e+02	4.5351	1.6632e-01
0.90	12.7	2025.7	0.0585672	2.5806e-03	5.9300	3.2937e-01	3087	2.6982e+02	5.8928	3.5656e-01

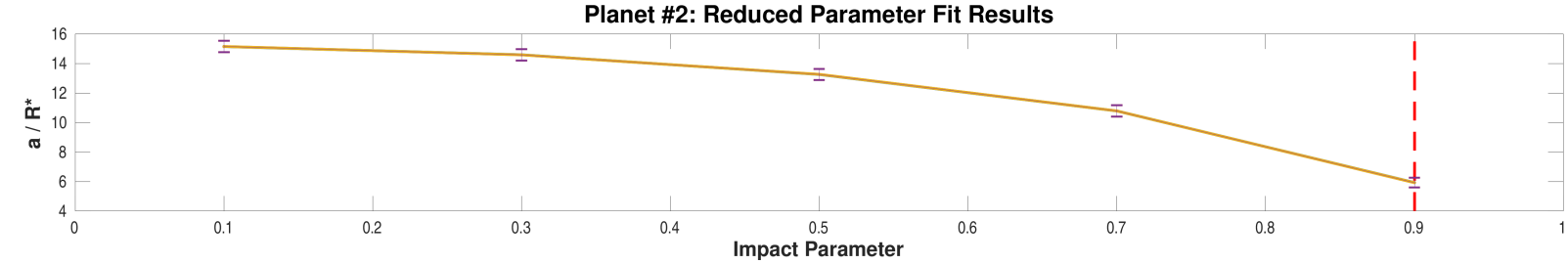
Highlighted row is the best reduced-parameter model fit.



Model chi squares of reduced parameter fits vs. impact parameter for CatId 169461816, 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/0000000169461816-02-reduced-fits-chi-square.fig`



Ratios of planet radius to star radius of reduced parameter fits vs. impact parameter for CatId 169461816, 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/0000000169461816-02-reduced-fits-rp-over-rstar.fig`



Ratios of semimajor axis to star radius of reduced parameter fits vs. impact parameter for CatId 169461816, 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/0000000169461816-02-reduced-fits-a-over-rstar.fig`

8.3 Model Fitter: Trapezoidal Fit Results

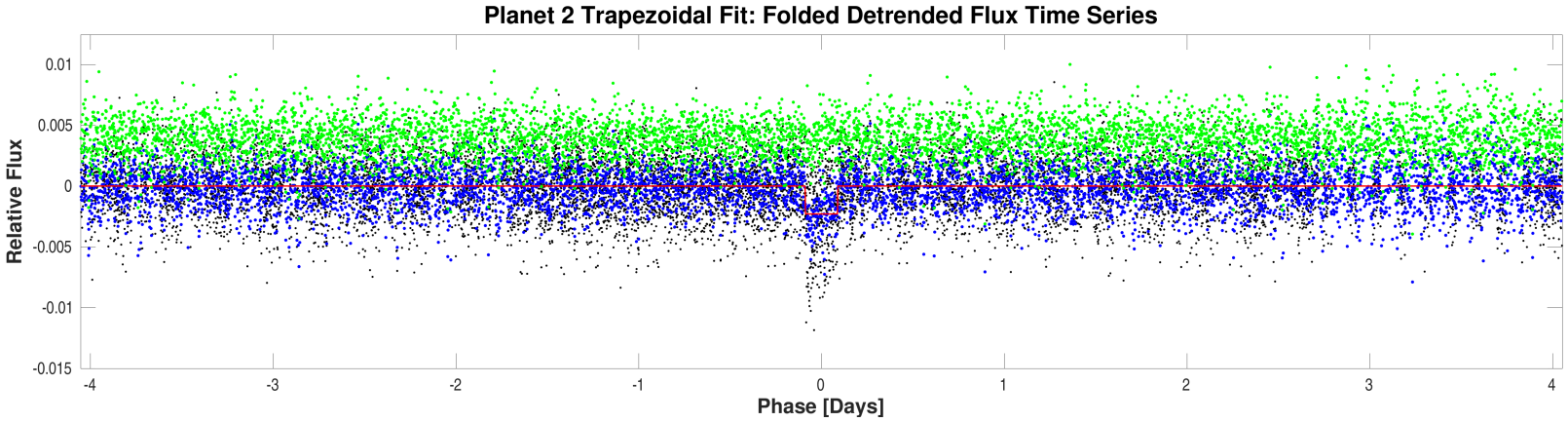
Model Characteristic	Name
Transit Model	trapezoidal_model
Limb Darkening Model	

TCE Parameter	Value	Units
Trial Transit Pulse Duration	4.5	hours
Transit Epoch	1712.9275233	TJD
Orbital Period	8.1055520	days
Maximum SES	22.9	
Maximum MES	17.8	
Robust Statistic	19.9	
Chi Square Goodness of Fit Statistic (DoF)	370.3 (193)	
Chi Square2 Statistic (DoF)	179.1 (37.6)	
Threshold for Desired PFA		

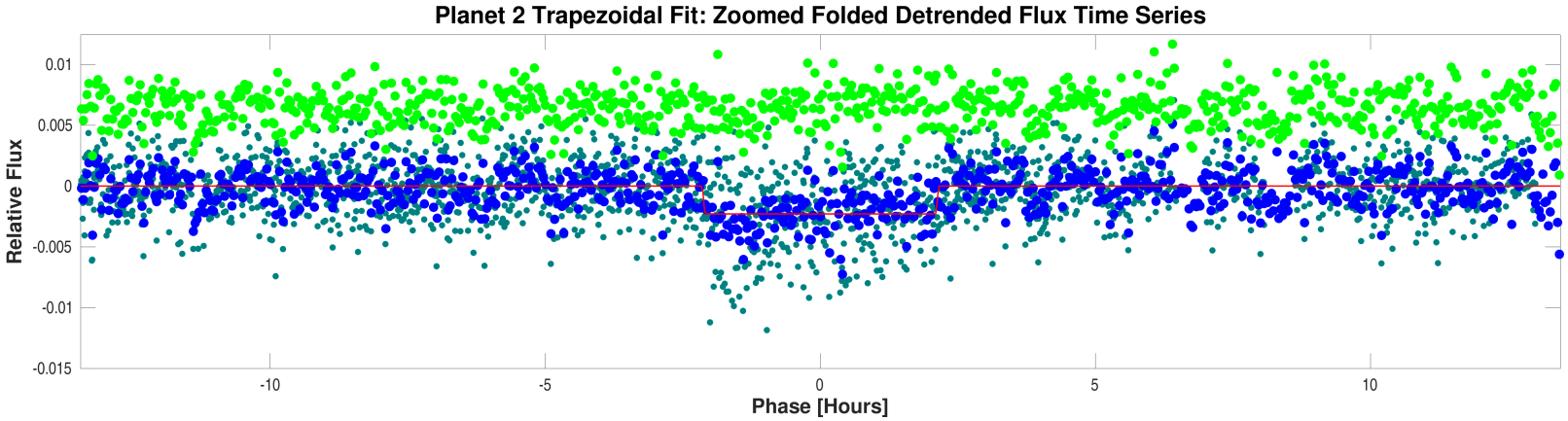
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	18.4		
Orbital Period	8.1055520		days
Transit Epoch	1712.9415631		BTJD
Transit Depth	2295		ppm
Transit Duration	4.4835		hours
Transit Ingress Duration	0.2340		hours
Model Chi Square Statistic (DoF)	12851.4 (2634)		

DoF: Degrees of Freedom



Folded detrended flux time series for CatId 169461816, Planet candidate 2 and folded trapezoidal model light curve.
Open `./planet-02/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000169461816-02-all-trapezoidal.fig`



Zoomed folded detrended flux time series for CatId 169461816, Planet candidate 2 and folded trapezoidal model light curve.
Open `./planet-02/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000169461816-02-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	8.1056		days		
Transit Duration	4.5		hours		
Maximum MES	17.8				
Secondary Phase	0.54861		days		
Secondary MES	2.3				
Minimum Phase	-0.84306		days		
Minimum MES	-2.1				
Median MES	0.0				
MAD MES	0.53155				
Robust Statistic	1.5				
Secondary Depth	490.4	3.2119e+02	ppm		
Geometric Albedo	29.8	2.0298e+01		1.4194	7.79
Planet Effective Temperature	4409	7.3789e+02	Kelvin	4.3122	0.00

8.4.2 Eclipsing Binary Discrimination Test

Result	Value	Value in Sigmas	Significance (%)
Odd Even Transit Depth Comparison Statistic	2.5838e+01	5.0831	0.00
Shorter Period Comparison Statistic	1.1173e+03	33.4263	100.00

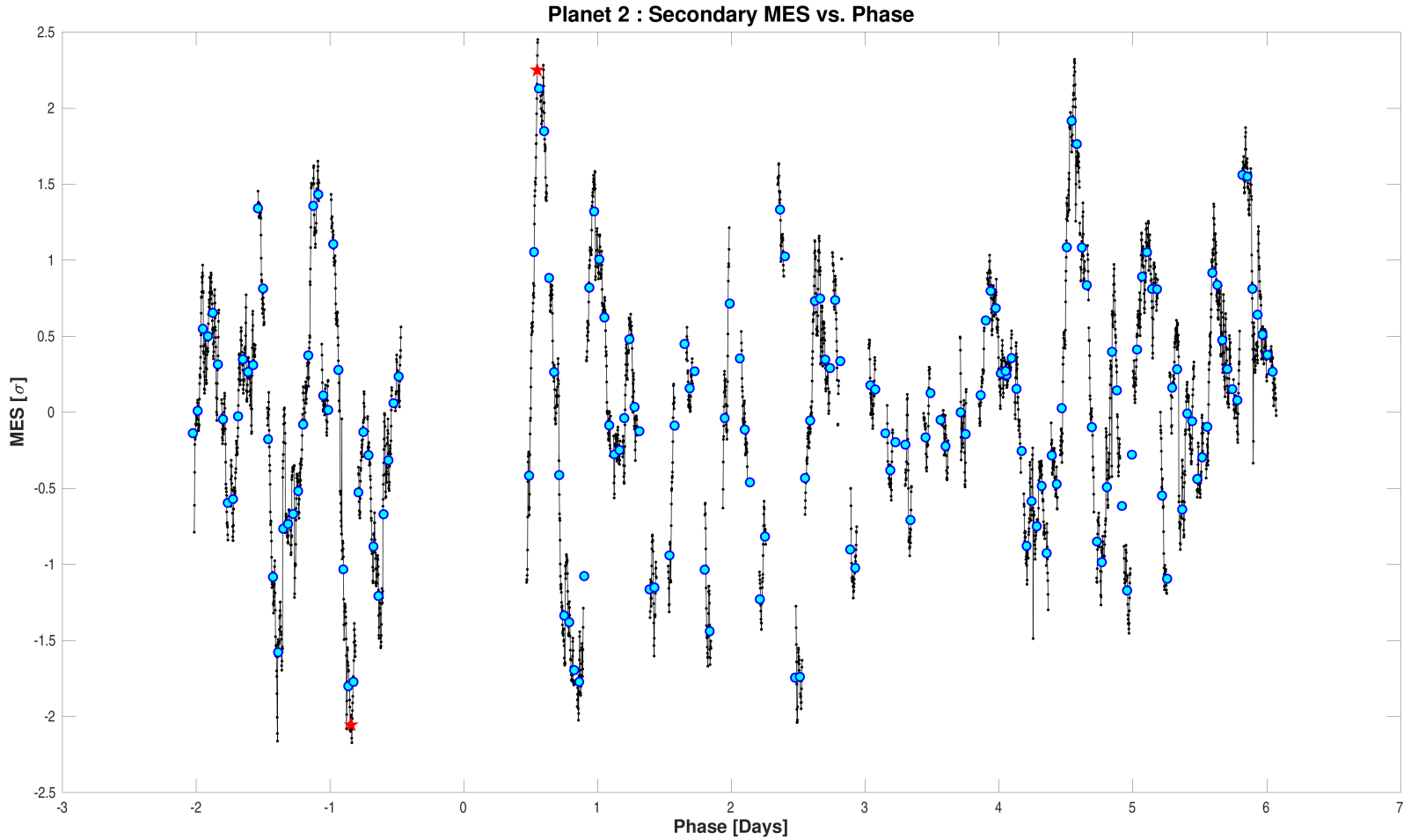
8.4.3 Bootstrap Test

```
No bootstrap results available.
```

8.4.4 Ghost Diagnostic Test

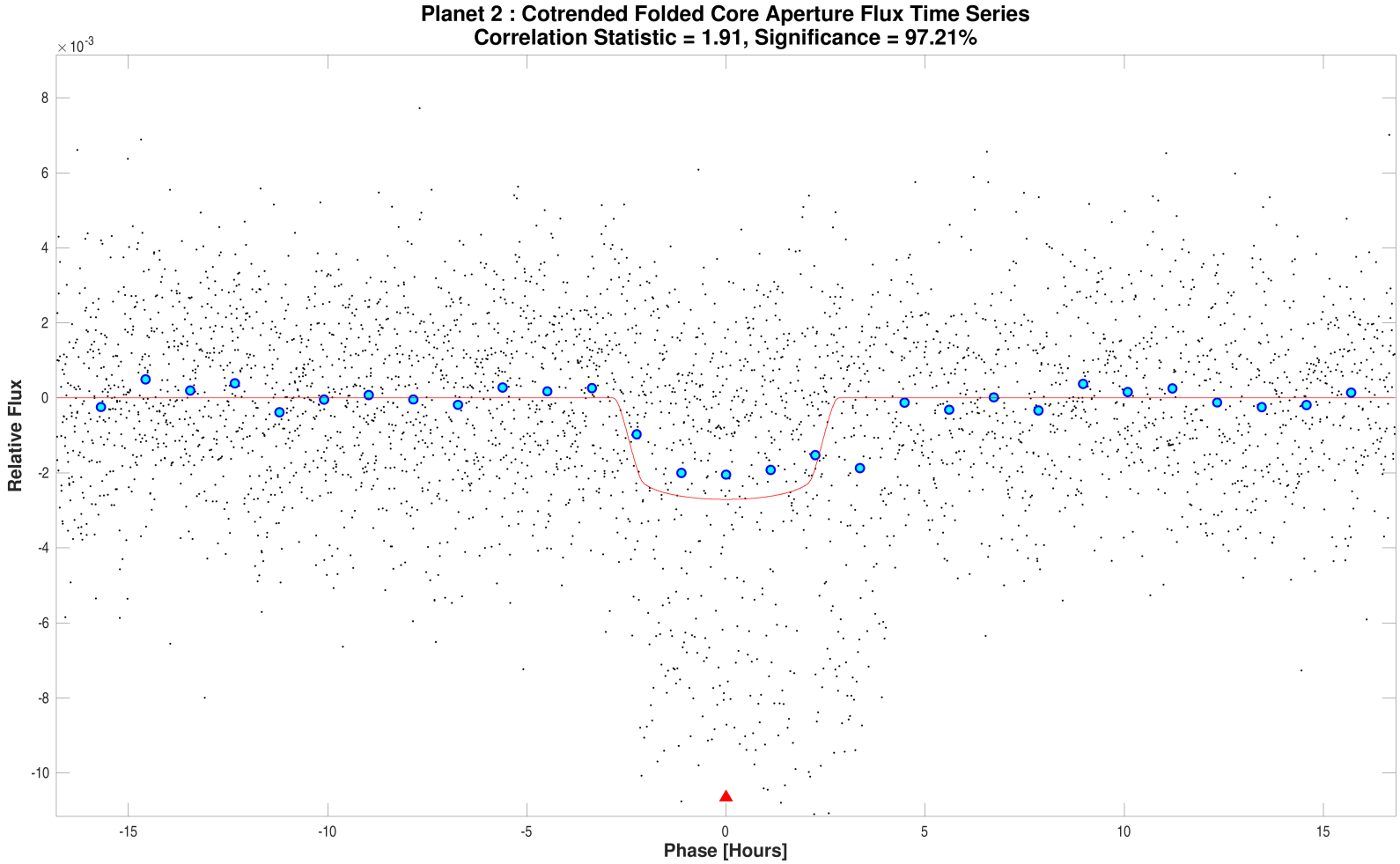
Result	Value	Significance (%)
Maximum MES	17.8	
SNR	10.9	
Core Aperture Statistic	1.9127e+00	97.21
Halo Aperture Statistic	3.0060e+00	99.87
Ratio of Core/Halo Aperture Statistics	6.3631e-01	

8.4.5 Validation Test Figures



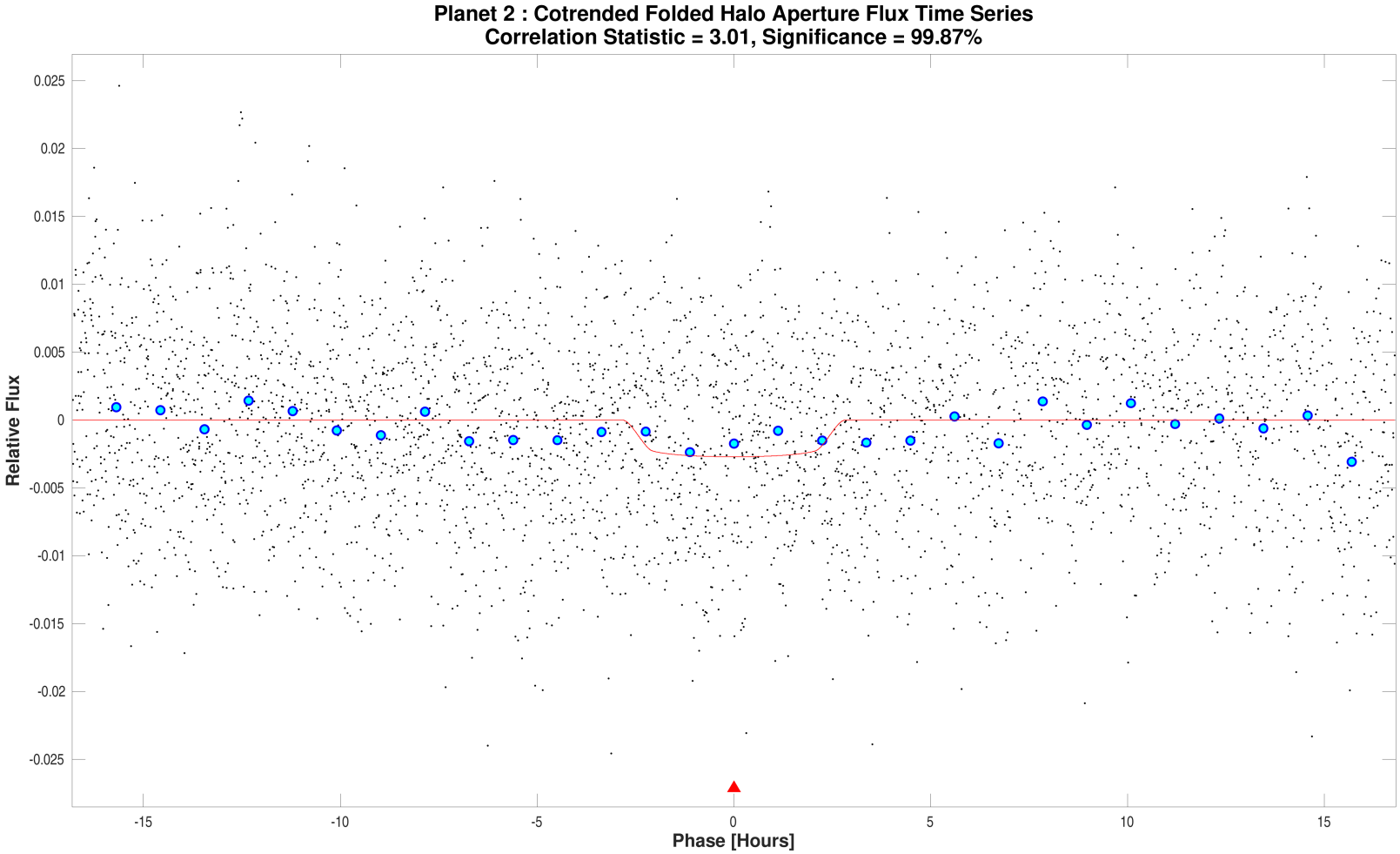
The primary event has been set to zero and both the max and min of the resulting MES vs. Phase are marked with a red star. The best matched pulse duration in hours is 4.5. The maximum secondary MES and corresponding phase are 2.2501 and 0.54861 days respectively. The minimum secondary MES and corresponding phase are -2.0557 and -0.84306 days respectively.
Open `./planet-02/report-summary/0000000169461816-02-weak-secondary-diagnostic.fig`

No figures named 0000000169461816-02-bootstrap-false-alarm.fig are available.



Optical ghost diagnostic core aperture flux time series for target 169461816, 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/0000000169461816-02-core-unwhitened-cotrended-zoomed-model.fig`



Optical ghost diagnostic halo aperture flux time series for target 169461816, 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/0000000169461816-02-halo-unwhitened-cotrended-zoomed-model.fig`

9 Planet Candidate 3

9.1 Model Fitter: All Transits

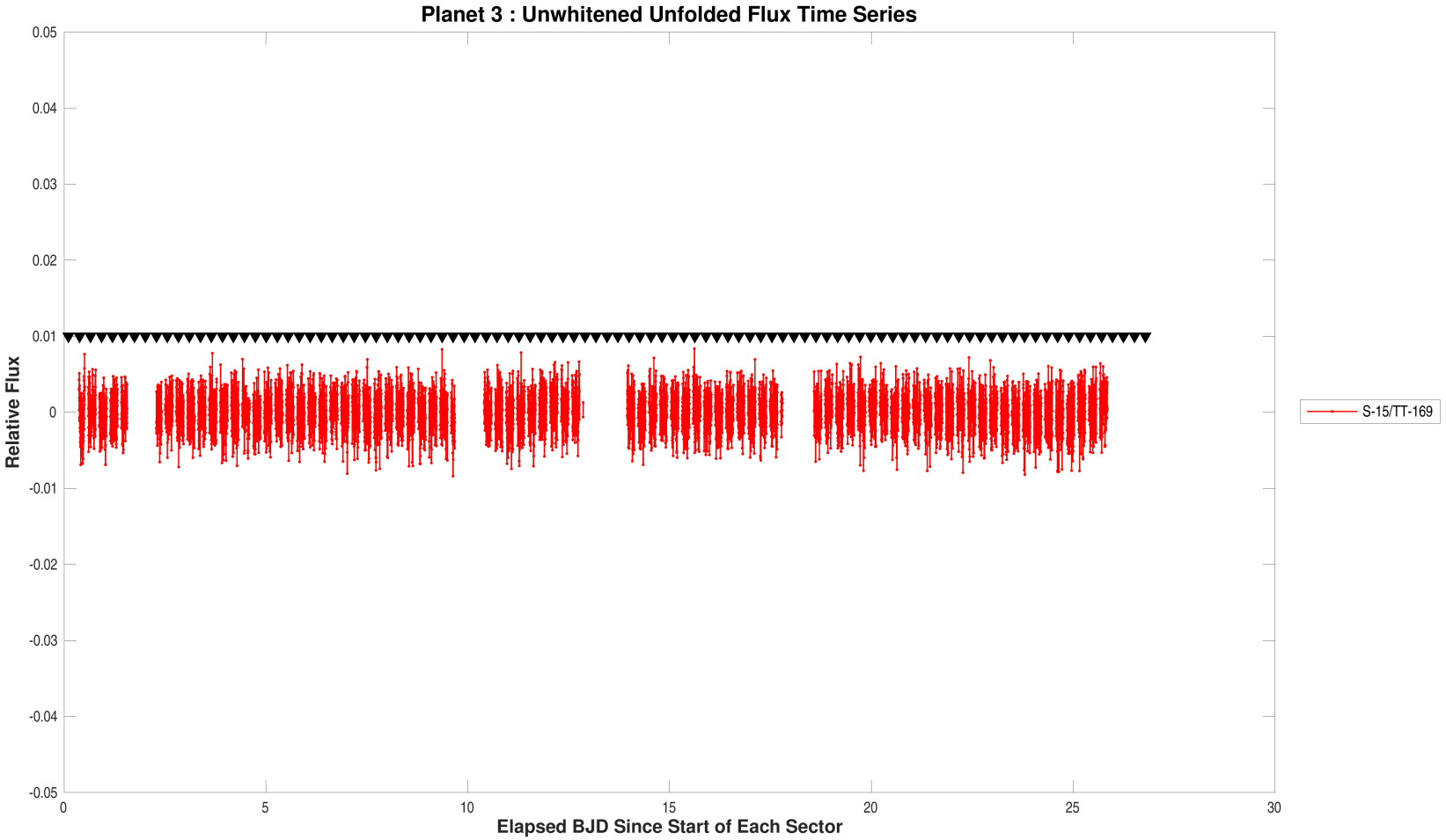
Model Characteristic	Name
Transit Model	mandel-agol_geometric_transit_model
Limb Darkening Model	claret_tess_nonlinear_limb_darkening_model

TCE Parameter	Value	Units
Trial Transit Pulse Duration	0.5	hours
Transit Epoch	1711.3740518	TJD
Orbital Period	0.2723346	days
Maximum SES	4.9	
Maximum MES	9.7	
Robust Statistic	12.3	
Chi Square Goodness of Fit Statistic (DoF)	970.0 (1119)	
Chi Square2 Statistic (DoF)	52.2 (87.0)	
Threshold for Desired PFA		

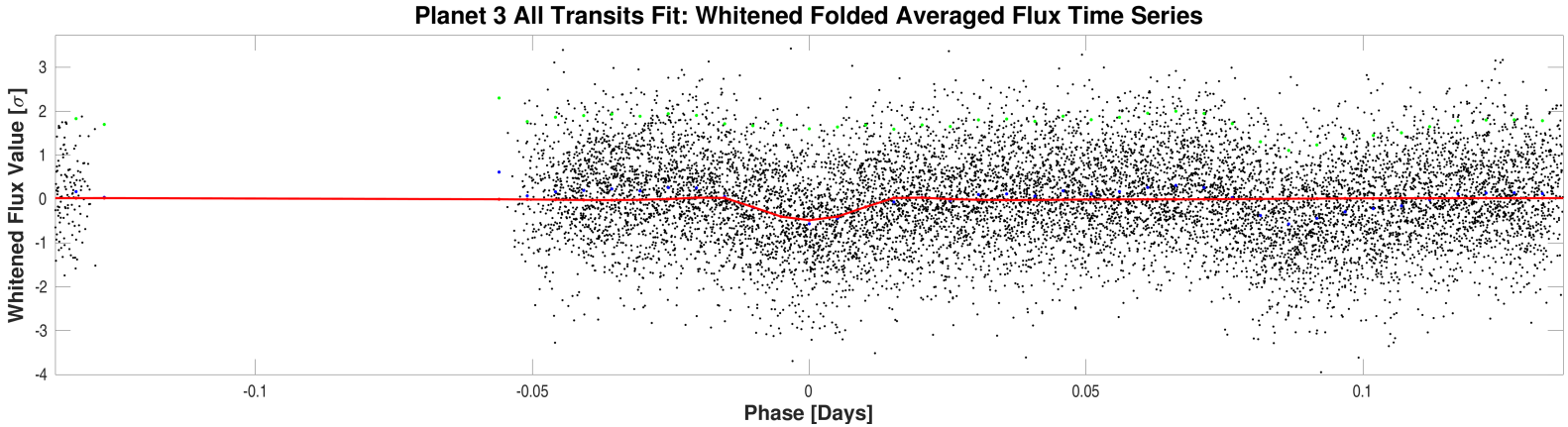
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	13.4		
Orbital Period	0.2723024	2.1726e-05	days
Transit Epoch	1711.3791829	9.8154e-04	BTJD
Impact Parameter	0.9901	1.5577e-01	
Planet Radius to Star Radius Ratio	0.0554278	9.5008e-02	
Semi-major Axis to Star Radius Ratio	1.4157	2.6679e-01	
Planet Radius	9.0229	1.5471e+01	Earth radii
Semi-major Axis	0.0093	6.9141e-04	AU
Effective Stellar Flux	48444.3450	7.3884e+03	Goldilocks
Equilibrium Temperature	3784	1.4427e+02	Kelvin
Stellar Density	0.5141	2.9064e-01	Solar density
Transit Depth	1397	1.4394e+02	ppm
Transit Duration	0.7688	1.0223e-01	hours
Transit Ingress Duration	0.3844	5.1114e-02	hours
Eccentricity	0.0000	0.0000e+00	
Peri Longitude	0.0000	0.0000e+00	degrees
Model Chi Square Statistic (DoF)	5374.9 (6489.6)		
Model Chi Square Goodness of Fit Statistic (DoF)	1275.7 (2210)		
Model Chi Square2 Statistic (DoF)	40.6 (83)		

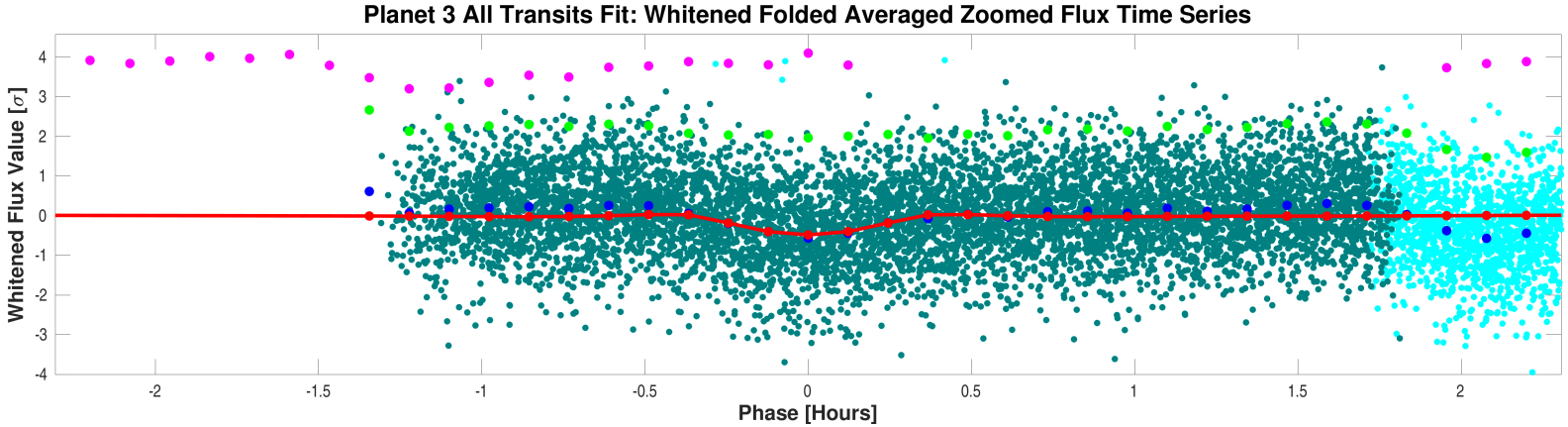
DoF: Degrees of Freedom



Flux time series for CatId 169461816, Planet candidate 3 in the unwhitened domain. For the data of Sector-15/TargetTableId-169, start BJD is 2458711. 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/0000000169461816-03-all-unwhitened-15-169.fig`



Folded flux time series for CatId 169461816, 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/0000000169461816-03-all-whitened.fig`

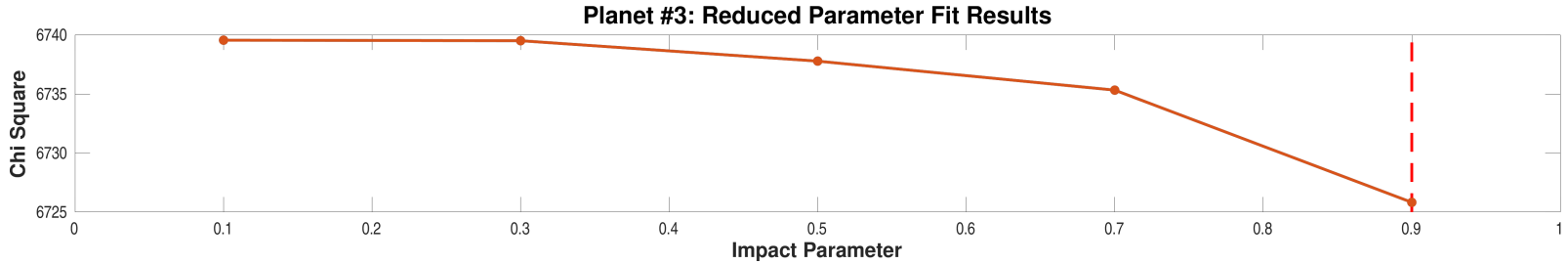


Folded flux time series for CatId 169461816, Planet candidate 3 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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/0000000169461816-03-all-whitened-zoomed.fig`

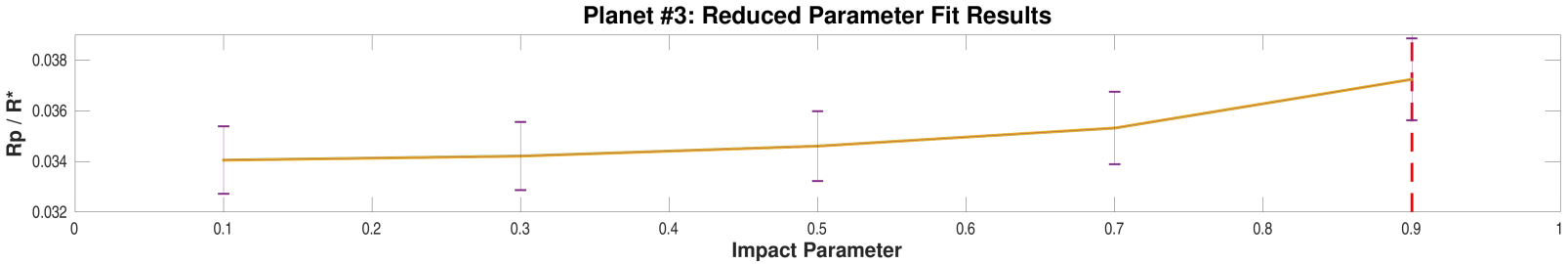
9.2 Model Fitter: Reduced Parameter Fit Results

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	14.5	6739.6	0.0340530	1.3326e-03	4.1756	1.7592e-01	1311	1.0198e+02	0.5183	2.2158e-02
0.30	14.4	6739.5	0.0342134	1.3465e-03	4.0378	1.7053e-01	1307	1.0229e+02	0.5167	2.2236e-02
0.50	14.3	6737.8	0.0346074	1.3763e-03	3.7276	1.5942e-01	1301	1.0290e+02	0.5155	2.2711e-02
0.70	14.0	6735.3	0.0353182	1.4337e-03	3.1598	1.3581e-01	1285	1.0365e+02	0.5205	2.3722e-02
0.90	13.4	6725.8	0.0372434	1.6217e-03	2.1444	9.2657e-02	1249	1.0783e+02	0.5578	2.9161e-02

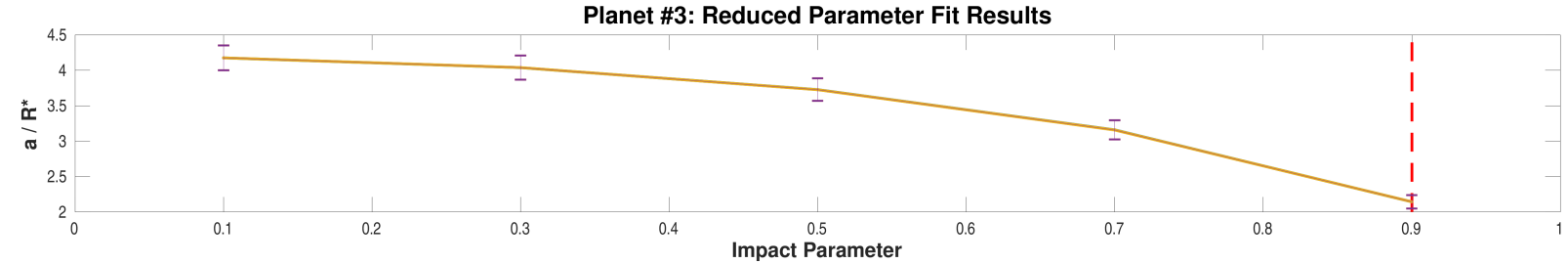
Highlighted row is the best reduced-parameter model fit.



Model chi squares of reduced parameter fits vs. impact parameter for CatId 169461816, 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/0000000169461816-03-reduced-fits-chi-square.fig`



Ratios of planet radius to star radius of reduced parameter fits vs. impact parameter for CatId 169461816, 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/0000000169461816-03-reduced-fits-rp-over-rstar.fig`



Ratios of semimajor axis to star radius of reduced parameter fits vs. impact parameter for CatId 169461816, 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/0000000169461816-03-reduced-fits-a-over-rstar.fig`

9.3 Model Fitter: Trapezoidal Fit Results

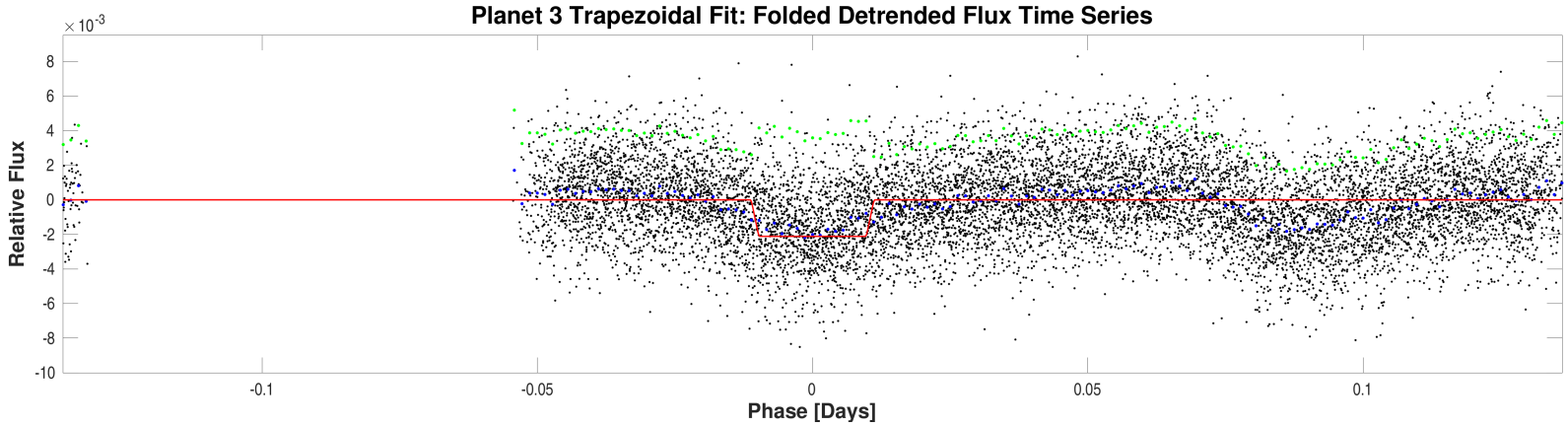
Model Characteristic	Name
Transit Model	trapezoidal_model
Limb Darkening Model	

TCE Parameter	Value	Units
Trial Transit Pulse Duration	0.5	hours
Transit Epoch	1711.3740518	TJD
Orbital Period	0.2723346	days
Maximum SES	4.9	
Maximum MES	9.7	
Robust Statistic	12.3	
Chi Square Goodness of Fit Statistic (DoF)	970.0 (1119)	
Chi Square2 Statistic (DoF)	52.2 (87.0)	
Threshold for Desired PFA		

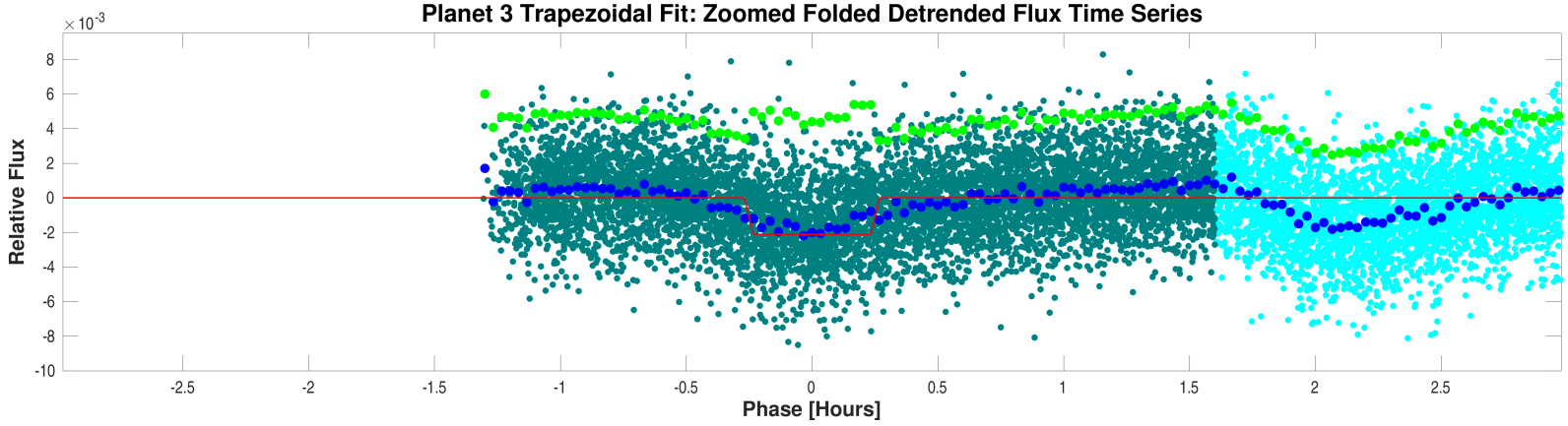
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	24.6		
Orbital Period	0.2723346		days
Transit Epoch	1711.3789924		BTJD
Transit Depth	2111		ppm
Transit Duration	0.9923		hours
Transit Ingress Duration	0.4903		hours
Model Chi Square Statistic (DoF)	11271.7 (6805)		

DoF: Degrees of Freedom



Folded detrended flux time series for CatId 169461816, Planet candidate 3 and folded trapezoidal model light curve.
Open `./planet-03/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000169461816-03-all-trapezoidal.fig`



Zoomed folded detrended flux time series for CatId 169461816, Planet candidate 3 and folded trapezoidal model light curve.
Open `./planet-03/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000169461816-03-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	0.27233		days		
Transit Duration	0.5		hours		
Maximum MES	9.7				
Secondary Phase	0.090625		days		
Secondary MES	11.9				
Minimum Phase	0.064583		days		
Minimum MES	-8.0				
Median MES	-1.7				
MAD MES	3.4205				
Robust Statistic	12.1				
Secondary Depth	1257.7	9.0886e+01	ppm		
Geometric Albedo	0.7	2.5334e+00		-0.1033	54.12
Planet Effective Temperature	5423	4.6493e+03	Kelvin	0.3523	36.23

9.4.2 Eclipsing Binary Discrimination Test

Result	Value	Value in Sigmas	Significance (%)
Odd Even Transit Depth Comparison Statistic	7.1190e-03	0.0844	93.28
Longer Period Comparison Statistic	1.6193e-05	0.0040	0.32

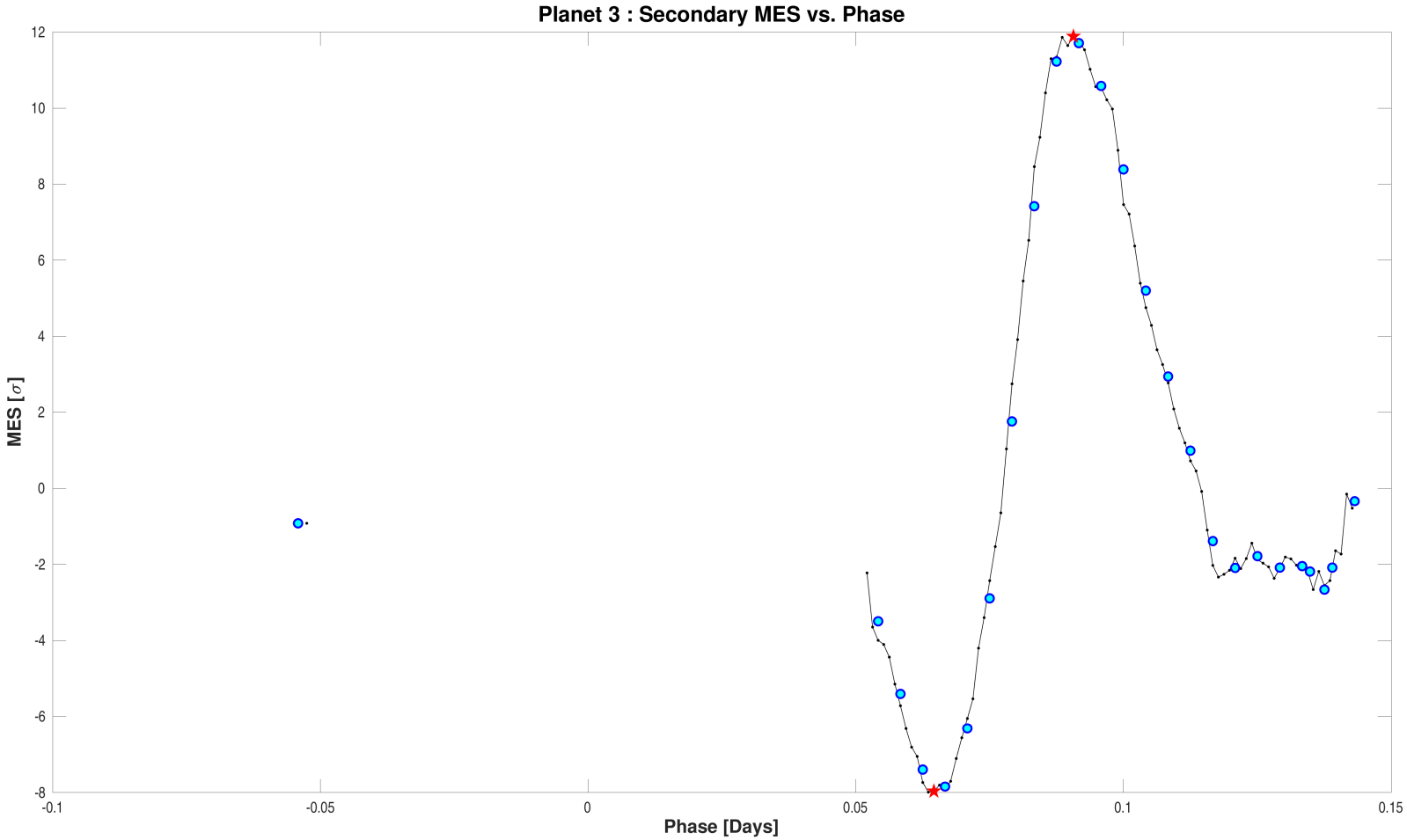
9.4.3 Bootstrap Test

```
No bootstrap results available.
```

9.4.4 Ghost Diagnostic Test

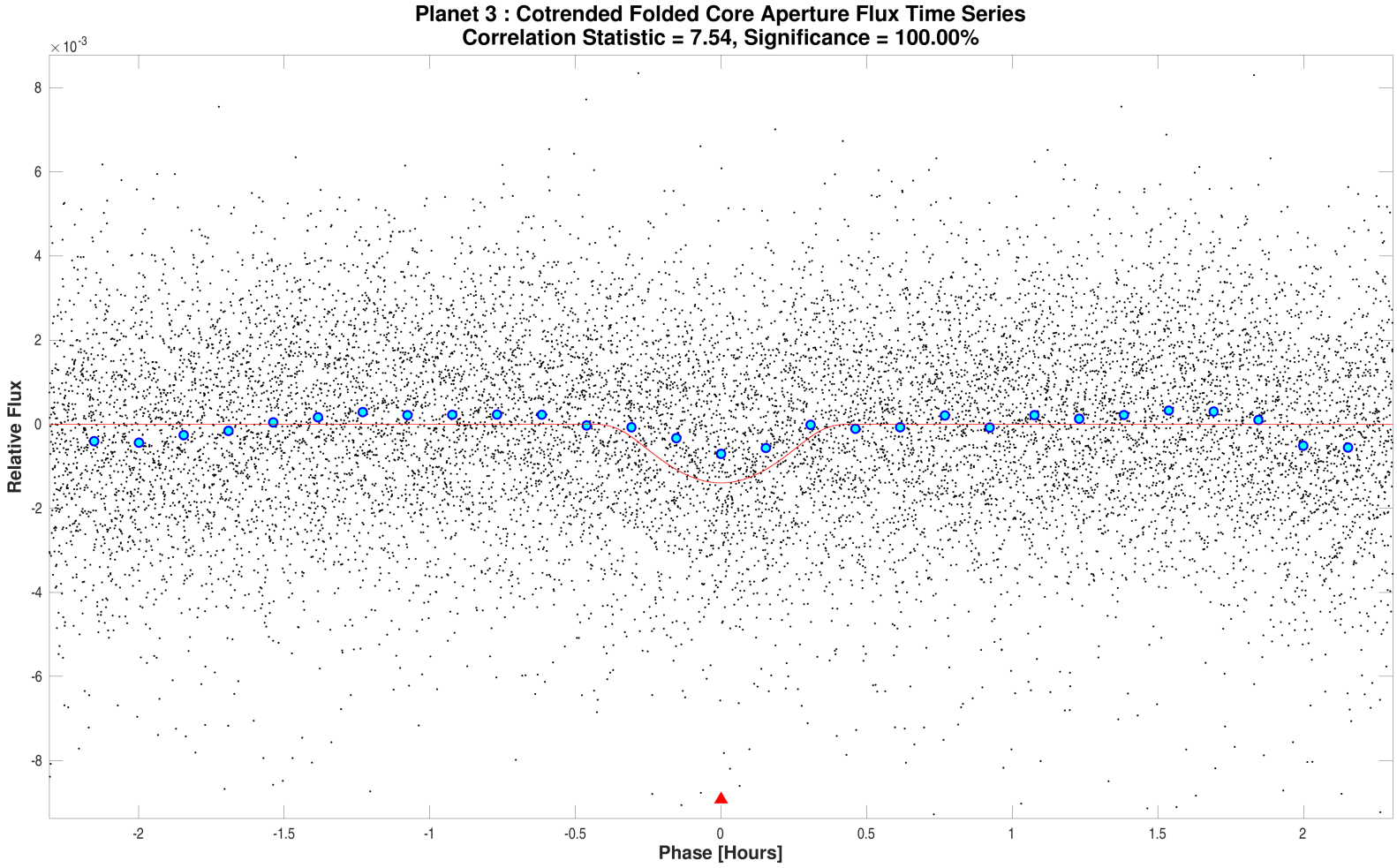
Result	Value	Significance (%)
Maximum MES	9.7	
SNR	13.4	
Core Aperture Statistic	7.5366e+00	100.00
Halo Aperture Statistic	1.7089e+01	100.00
Ratio of Core/Halo Aperture Statistics	4.4102e-01	

9.4.5 Validation Test Figures



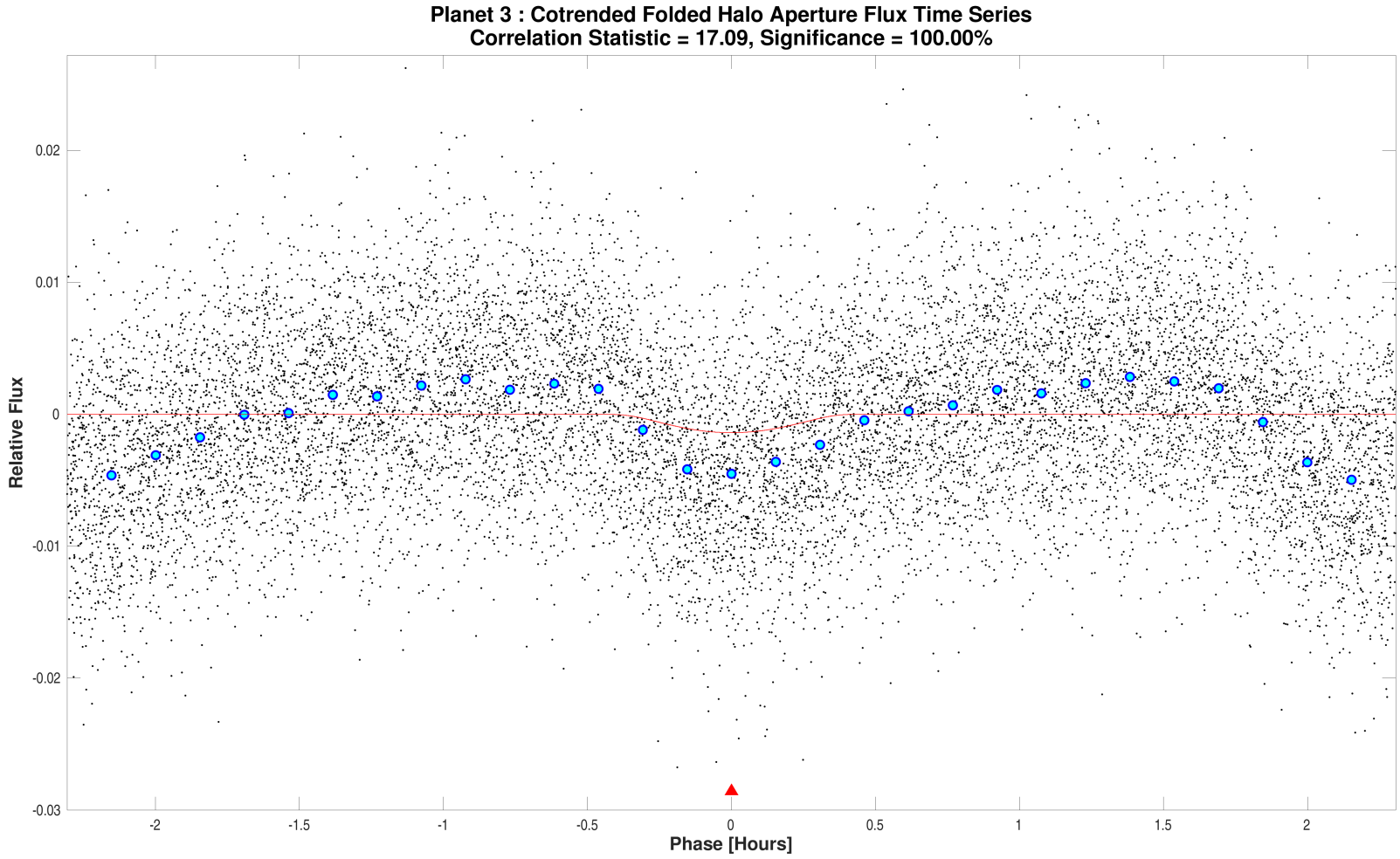
The primary event has been set to zero and both the max and min of the resulting MES vs. Phase are marked with a red star. The best matched pulse duration in hours is 0.5. The maximum secondary MES and corresponding phase are 11.8882 and 0.090625 days respectively. The minimum secondary MES and corresponding phase are -7.9614 and 0.064583 days respectively.
Open `./planet-03/report-summary/0000000169461816-03-weak-secondary-diagnostic.fig`

No figures named 0000000169461816-03-bootstrap-false-alarm.fig are available.



Optical ghost diagnostic core aperture flux time series for target 169461816, 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/0000000169461816-03-core-unwhitened-cotrended-zoomed-model.fig`



Optical ghost diagnostic halo aperture flux time series for target 169461816, 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/0000000169461816-03-halo-unwhitened-cotrended-zoomed-model.fig`

10 Planet Candidate 4

10.1 Model Fitter: All Transits

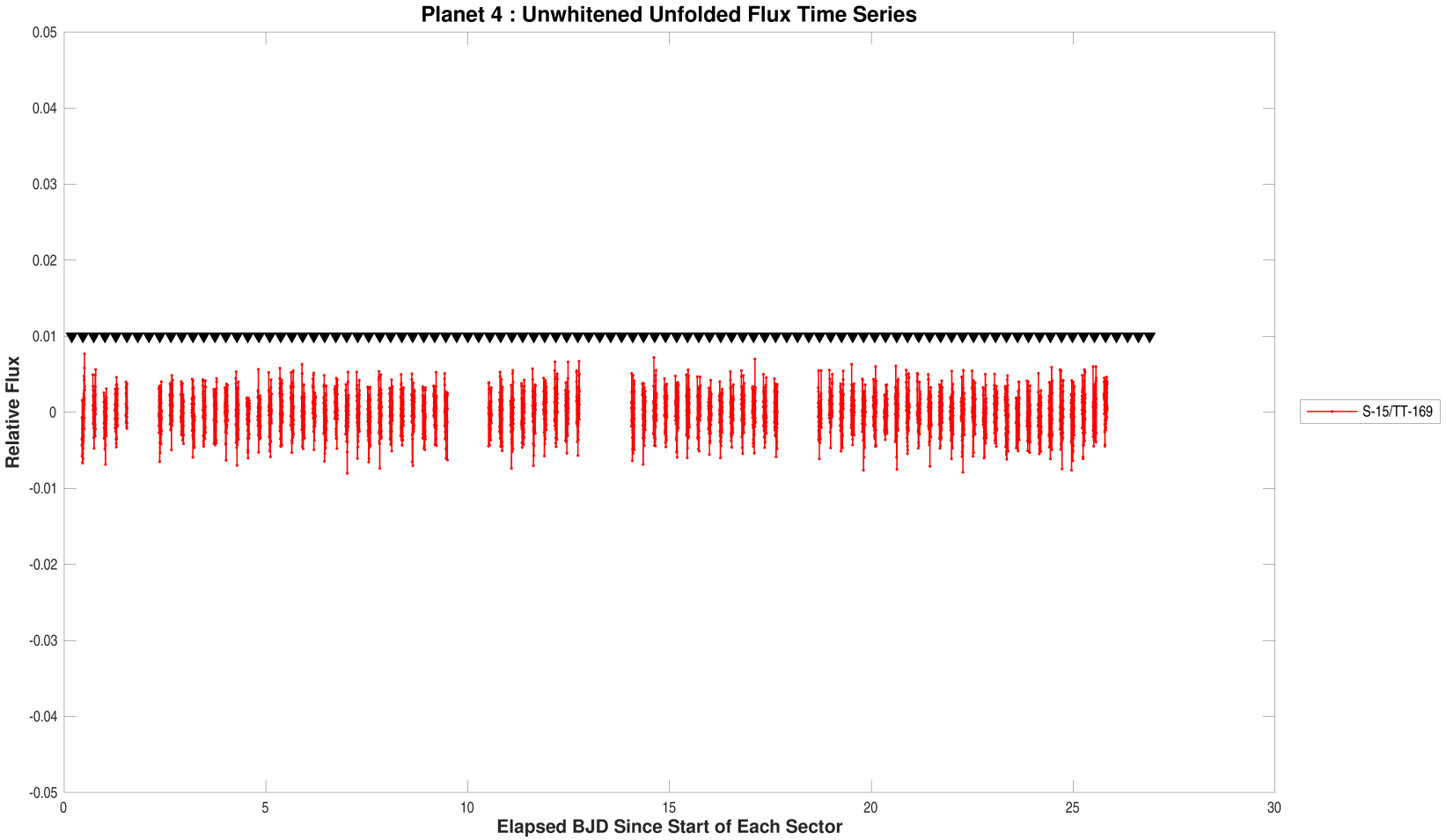
Model Characteristic	Name
Transit Model	mandel-agol_geometric_transit_model
Limb Darkening Model	claret_tess_nonlinear_limb_darkening_model

TCE Parameter	Value	Units
Trial Transit Pulse Duration	0.5	hours
Transit Epoch	1711.4636351	TJD
Orbital Period	0.2723346	days
Maximum SES	6.0	
Maximum MES	11.3	
Robust Statistic	13.8	
Chi Square Goodness of Fit Statistic (DoF)	1065.9 (1084)	
Chi Square2 Statistic (DoF)	76.3 (90.8)	
Threshold for Desired PFA		

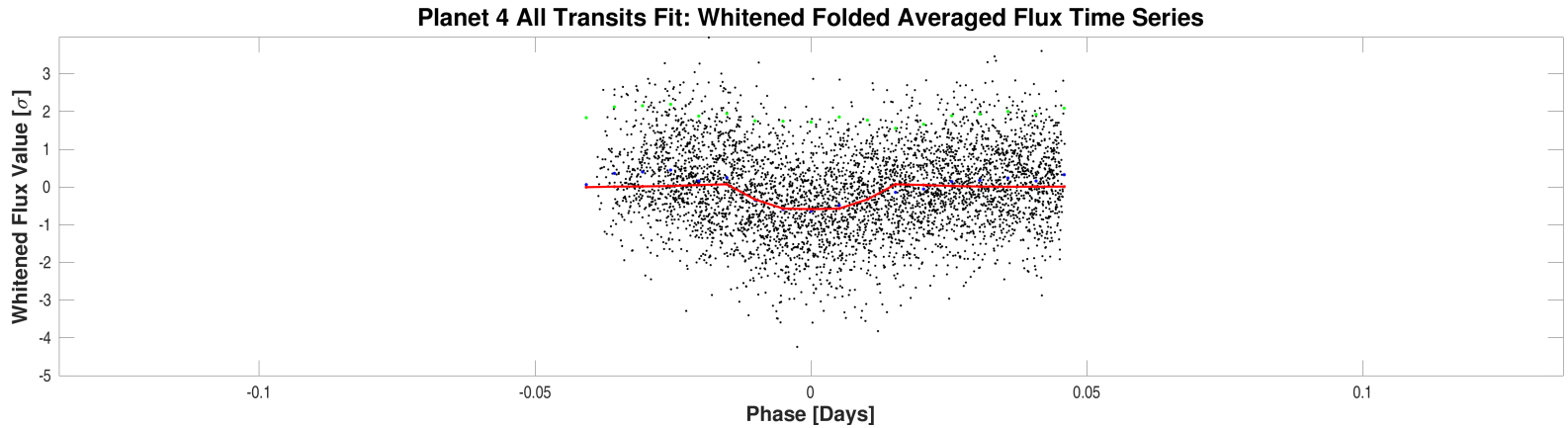
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	18.7		
Orbital Period	0.2724697	1.1875e-05	days
Transit Epoch	1711.4622664	4.6859e-04	BTJD
Impact Parameter	0.1054	4.0406e+01	
Planet Radius to Star Radius Ratio	0.0358649	2.1911e-02	
Semi-major Axis to Star Radius Ratio	3.8109	1.5208e+01	
Planet Radius	5.8384	3.5764e+00	Earth radii
Semi-major Axis	0.0093	6.9169e-04	AU
Effective Stellar Flux	48404.6972	7.3824e+03	Goldilocks
Equilibrium Temperature	3783	1.4424e+02	Kelvin
Stellar Density	10.0156	1.1991e+02	Solar density
Transit Depth	1454	9.3648e+01	ppm
Transit Duration	0.5702	1.7554e-01	hours
Transit Ingress Duration	0.0204	1.8798e-01	hours
Eccentricity	0.0000	0.0000e+00	
Peri Longitude	0.0000	0.0000e+00	degrees
Model Chi Square Statistic (DoF)	3909.6 (4114.6)		
Model Chi Square Goodness of Fit Statistic (DoF)	1150.6 (1677)		
Model Chi Square2 Statistic (DoF)	50.1 (81)		

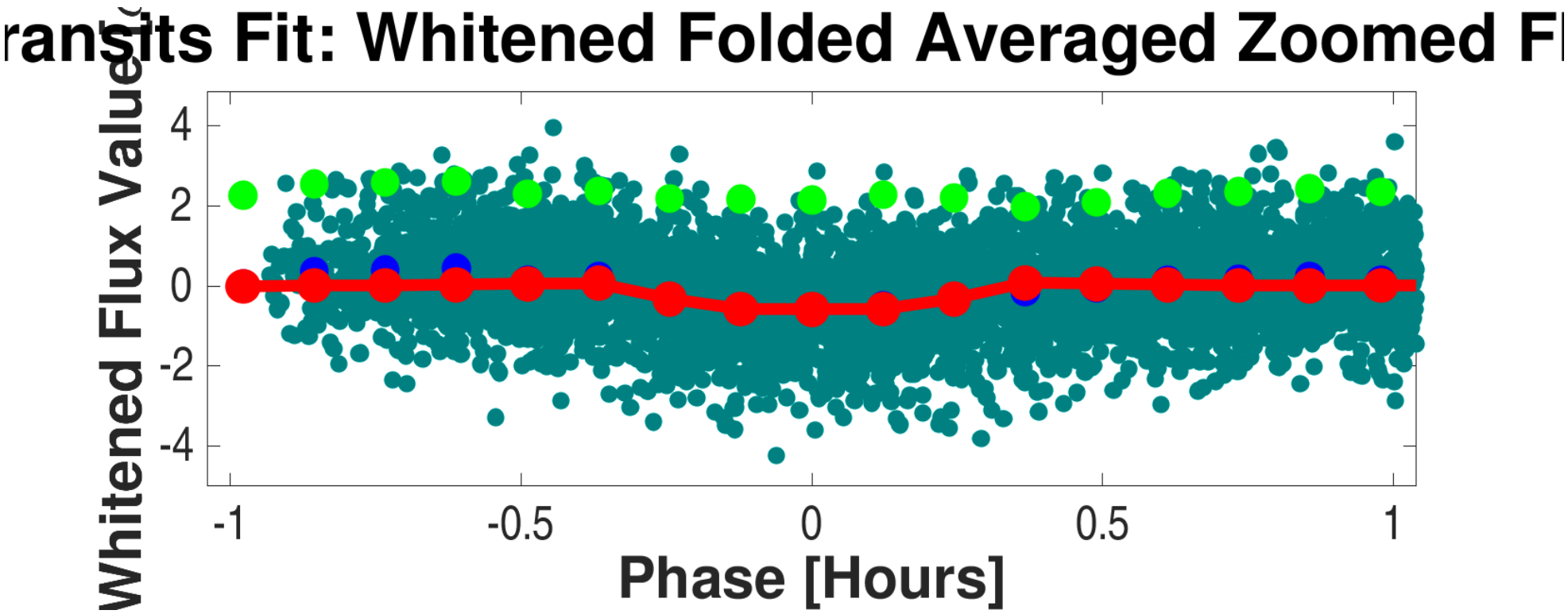
DoF: Degrees of Freedom



Flux time series for CatId 169461816, Planet candidate 4 in the unwhitened domain. For the data of Sector-15/TargetTableId-169, start BJD is 2458711. 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/0000000169461816-04-all-unwhitened-15-169.fig`



Folded flux time series for CatId 169461816, 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/0000000169461816-04-all-whitened.fig`



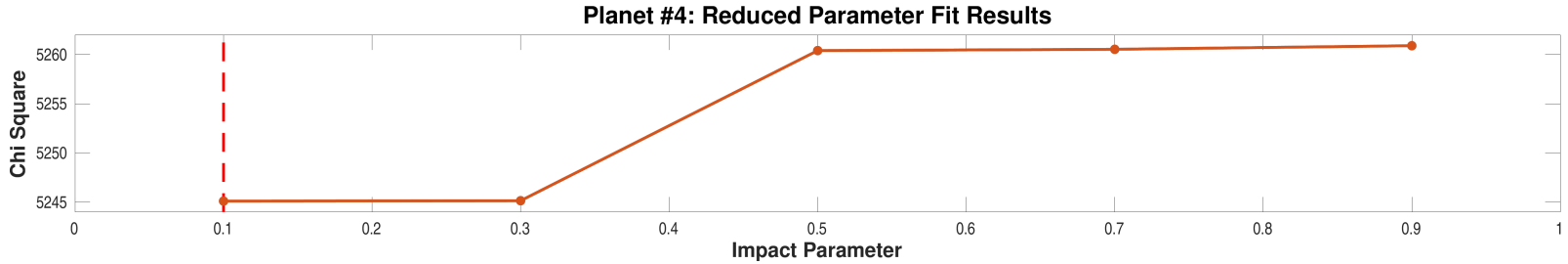
Folded flux time series for CatId 169461816, Planet candidate 4 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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/0000000169461816-04-all-whitened-zoomed.fig`

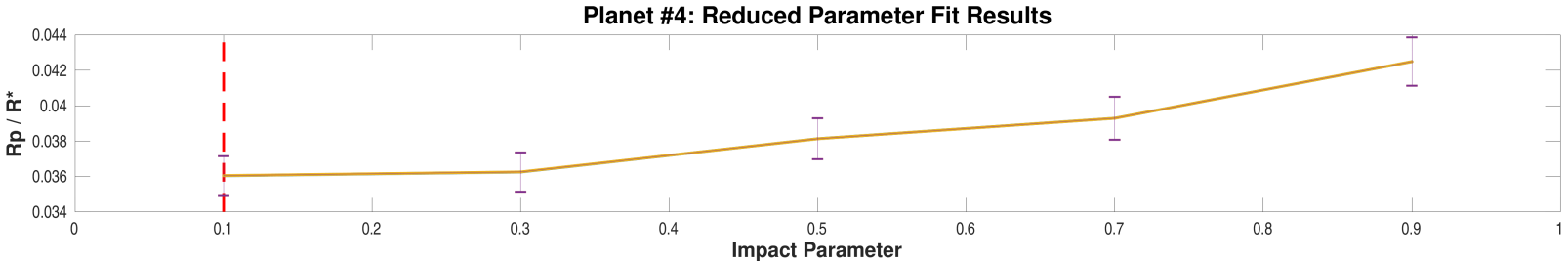
10.2 Model Fitter: Reduced Parameter Fit Results

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	19.8	5245.1	0.0360484	1.0971e-03	3.8149	1.3630e-01	1469	8.8916e+01	0.5699	2.0743e-02
0.30	19.8	5245.2	0.0362565	1.1043e-03	3.6682	1.3124e-01	1469	8.8941e+01	0.5719	2.0959e-02
0.50	20.6	5260.4	0.0381399	1.1589e-03	3.7247	1.4164e-01	1581	9.5449e+01	0.5183	2.0280e-02
0.70	20.6	5260.5	0.0392959	1.2062e-03	3.1696	1.2135e-01	1590	9.6976e+01	0.5227	2.1167e-02
0.90	20.6	5260.9	0.0424927	1.3607e-03	2.1447	8.2805e-02	1624	1.0303e+02	0.5695	2.6472e-02

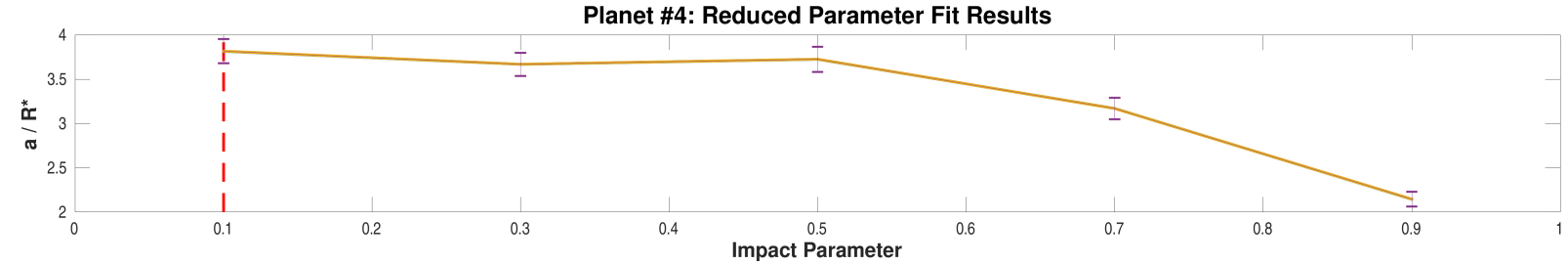
Highlighted row is the best reduced-parameter model fit.



Model chi squares of reduced parameter fits vs. impact parameter for CatId 169461816, 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/0000000169461816-04-reduced-fits-chi-square.fig`



Ratios of planet radius to star radius of reduced parameter fits vs. impact parameter for CatId 169461816, 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/0000000169461816-04-reduced-fits-rp-over-rstar.fig`



Ratios of semimajor axis to star radius of reduced parameter fits vs. impact parameter for CatId 169461816, 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/0000000169461816-04-reduced-fits-a-over-rstar.fig`

10.3 Model Fitter: Trapezoidal Fit Results

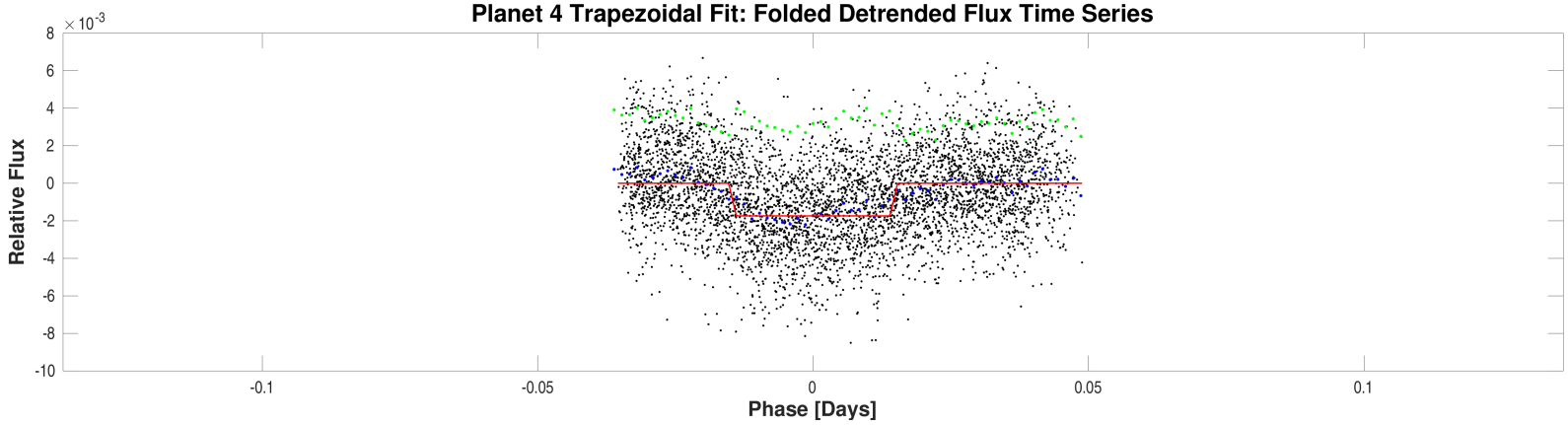
Model Characteristic	Name
Transit Model	trapezoidal_model
Limb Darkening Model	

TCE Parameter	Value	Units
Trial Transit Pulse Duration	0.5	hours
Transit Epoch	1711.4636351	TJD
Orbital Period	0.2723346	days
Maximum SES	6.0	
Maximum MES	11.3	
Robust Statistic	13.8	
Chi Square Goodness of Fit Statistic (DoF)	1065.9 (1084)	
Chi Square2 Statistic (DoF)	76.3 (90.8)	
Threshold for Desired PFA		

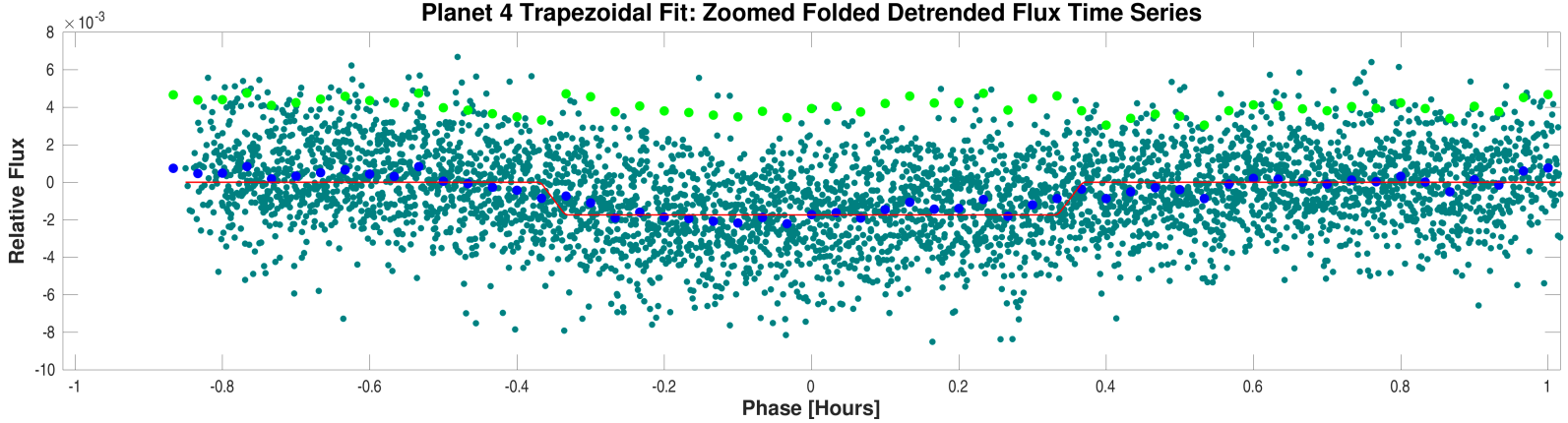
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	29.3		
Orbital Period	0.2723346		days
Transit Epoch	1711.4707762		BTJD
Transit Depth	1742		ppm
Transit Duration	0.9919		hours
Transit Ingress Duration	0.2896		hours
Model Chi Square Statistic (DoF)	4929.4 (4512)		

DoF: Degrees of Freedom



Folded detrended flux time series for CatId 169461816, Planet candidate 4 and folded trapezoidal model light curve.
Open `./planet-04/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000169461816-04-all-trapezoidal.fig`



Zoomed folded detrended flux time series for CatId 169461816, Planet candidate 4 and folded trapezoidal model light curve.
Open `./planet-04/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000169461816-04-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	0.27233		days		
Transit Duration	0.5		hours		
Maximum MES	11.3				
Secondary Phase	0.13542		days		
Secondary MES	0.0				
Minimum Phase	0.053125		days		
Minimum MES	-1.2				
Median MES	-1.2				
MAD MES	0				
Robust Statistic	0.0				
Secondary Depth	N/A	N/A	ppm		
Geometric Albedo	N/A	N/A		N/A	N/A
Planet Effective Temperature	N/A	N/A	Kelvin	N/A	N/A

10.4.2 Eclipsing Binary Discrimination Test

Result	Value	Value in Sigmas	Significance (%)
Odd Even Transit Depth Comparison Statistic	2.3513e+00	1.5334	12.52
Shorter Period Comparison Statistic	9.9613e-08	0.0003	0.03
Longer Period Comparison Statistic	1.1173e+03	33.4263	100.00

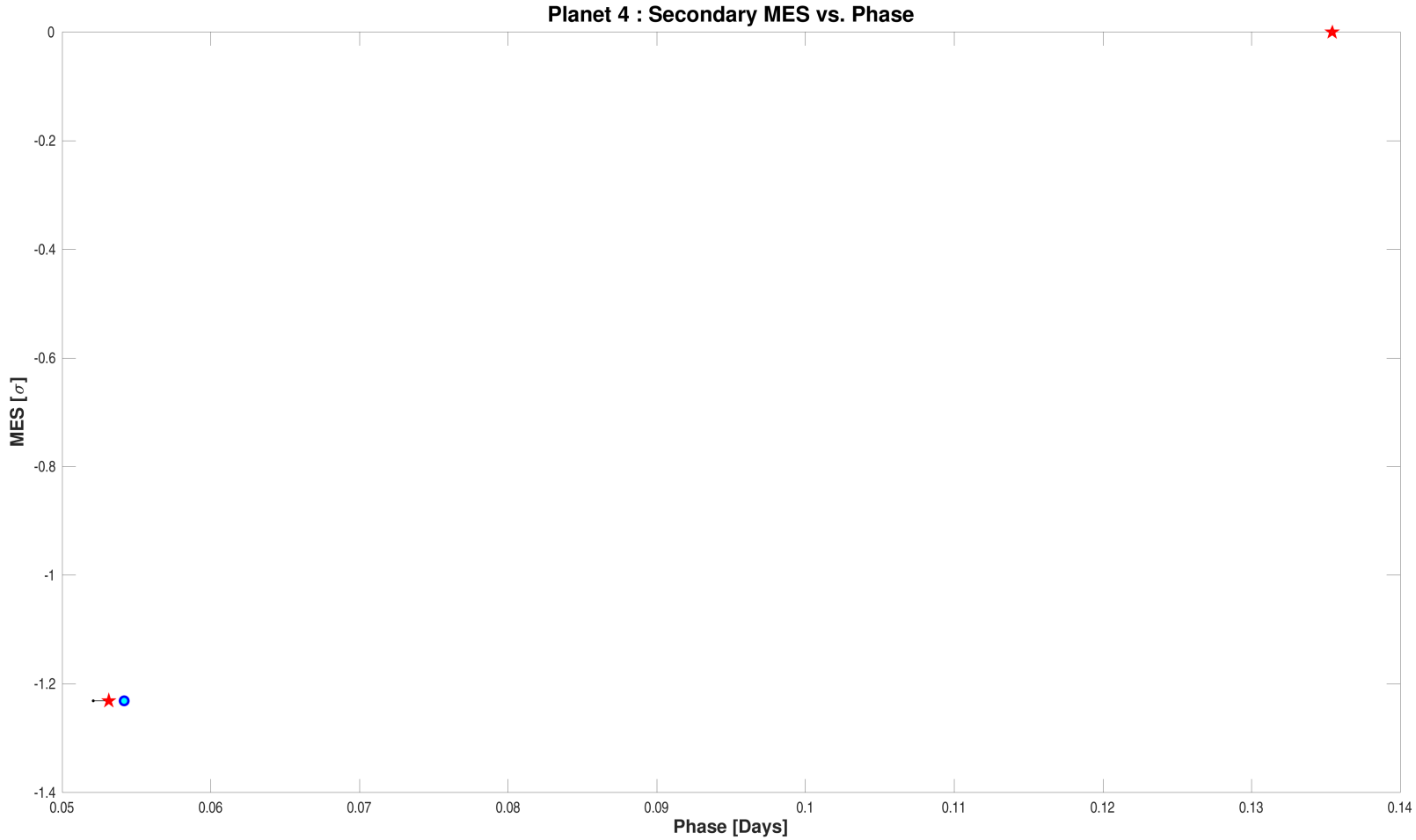
10.4.3 Bootstrap Test

```
No bootstrap results available.
```

10.4.4 Ghost Diagnostic Test

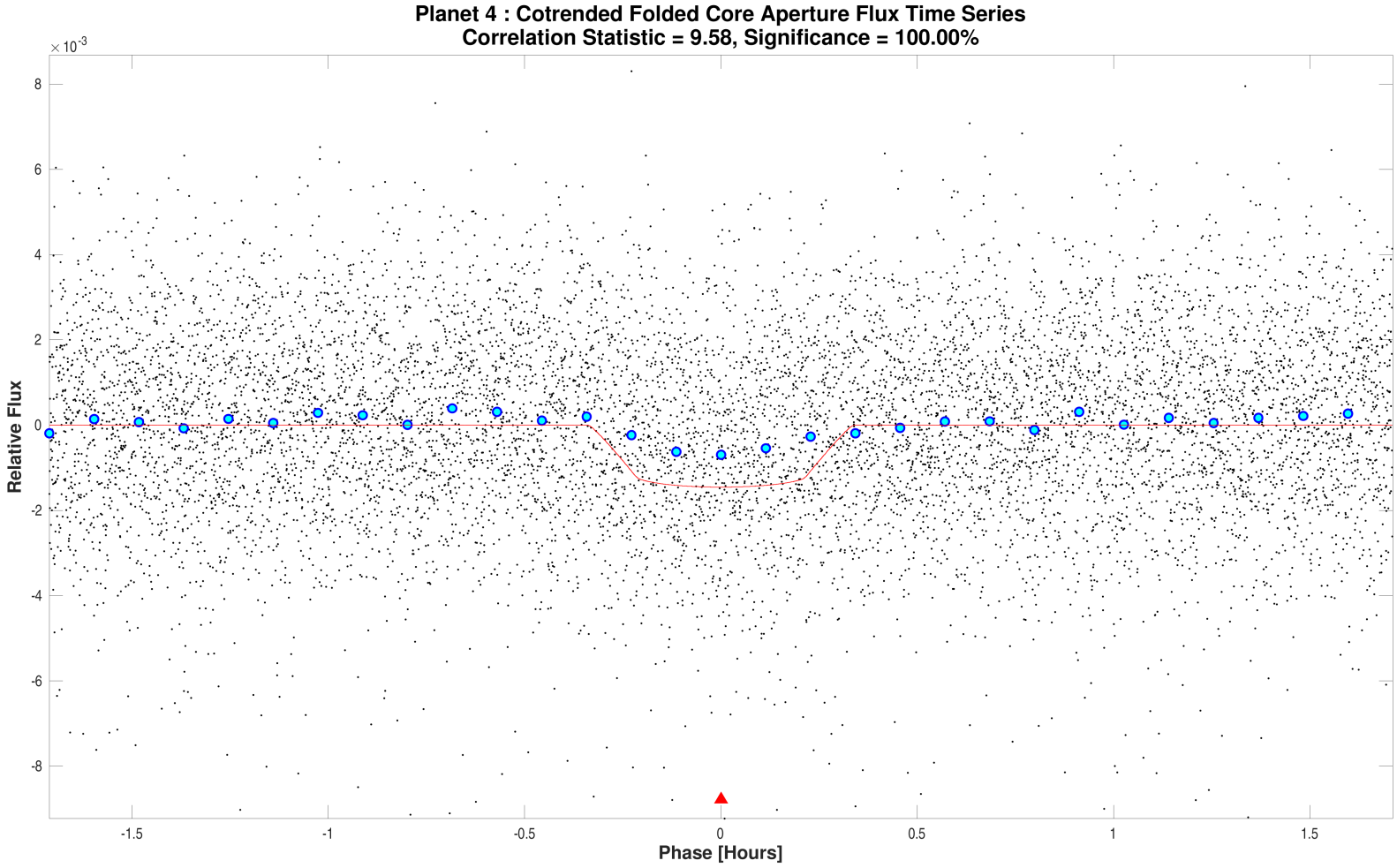
Result	Value	Significance (%)
Maximum MES	11.3	
SNR	18.7	
Core Aperture Statistic	9.5804e+00	100.00
Halo Aperture Statistic	1.3217e+01	100.00
Ratio of Core/Halo Aperture Statistics	7.2483e-01	

10.4.5 Validation Test Figures



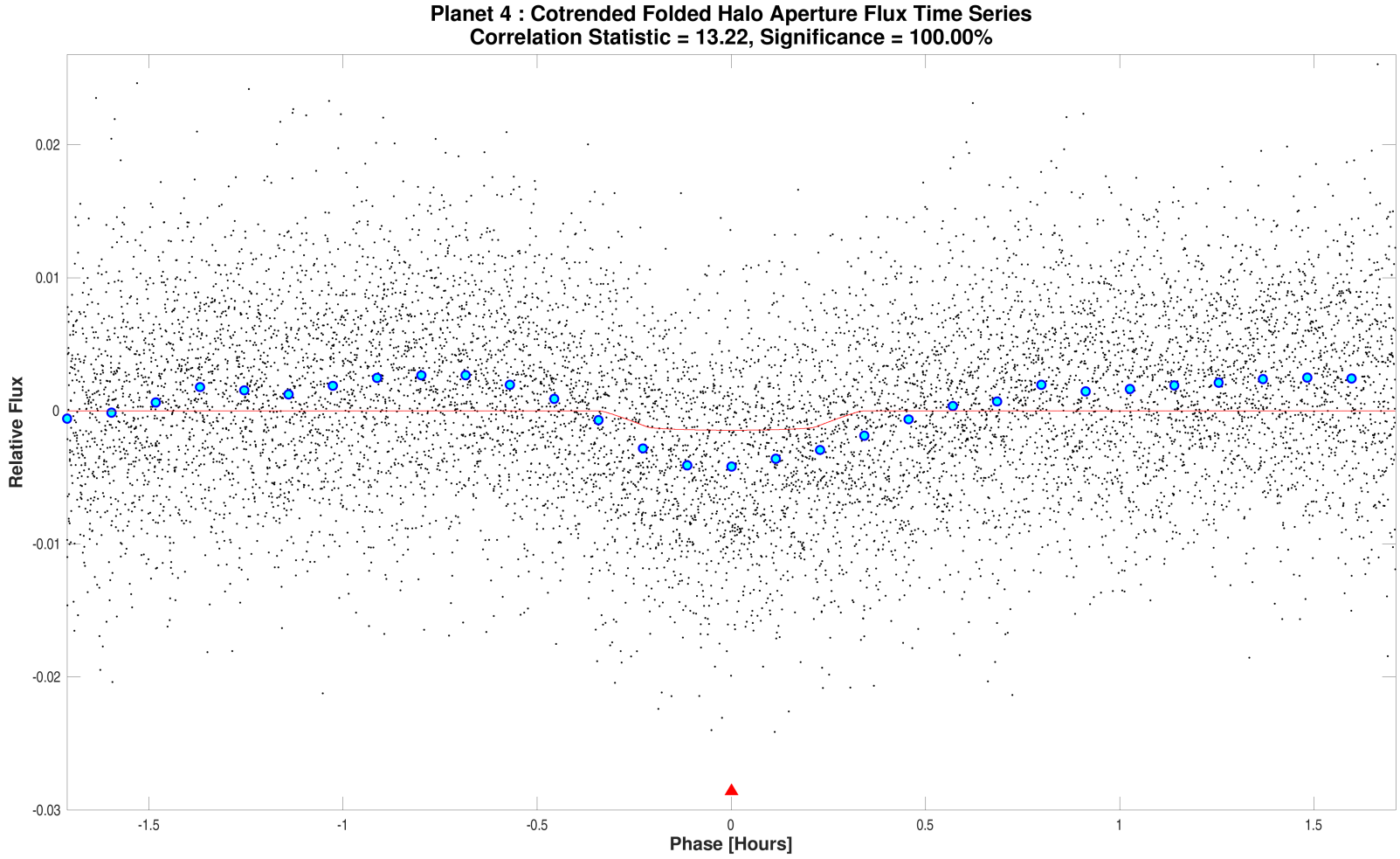
The primary event has been set to zero and both the max and min of the resulting MES vs. Phase are marked with a red star. The best matched pulse duration in hours is 0.5. The maximum secondary MES and corresponding phase are 0 and 0.13542 days respectively. The minimum secondary MES and corresponding phase are -1.2311 and 0.053125 days respectively.
Open `./planet-04/report-summary/0000000169461816-04-weak-secondary-diagnostic.fig`

No figures named 0000000169461816-04-bootstrap-false-alarm.fig are available.



Optical ghost diagnostic core aperture flux time series for target 169461816, 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/0000000169461816-04-core-unwhitened-cotrended-zoomed-model.fig`

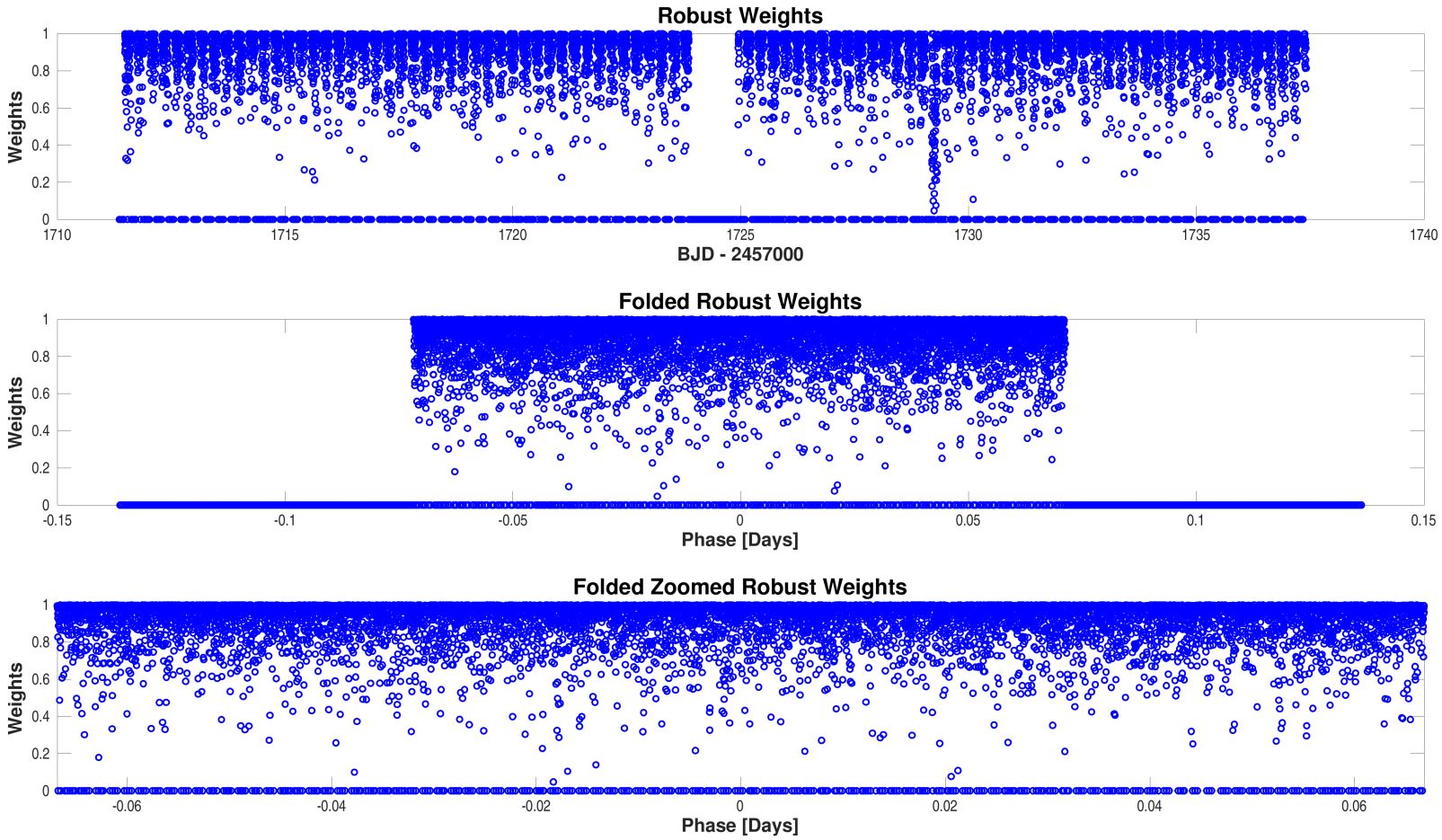


Optical ghost diagnostic halo aperture flux time series for target 169461816, planet candidate 4. The unwhitened time series is phase folded at the orbital period associated with the planet candidate and centered on the epoch of the first transit. The time series was first cotrended against spacecraft 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.

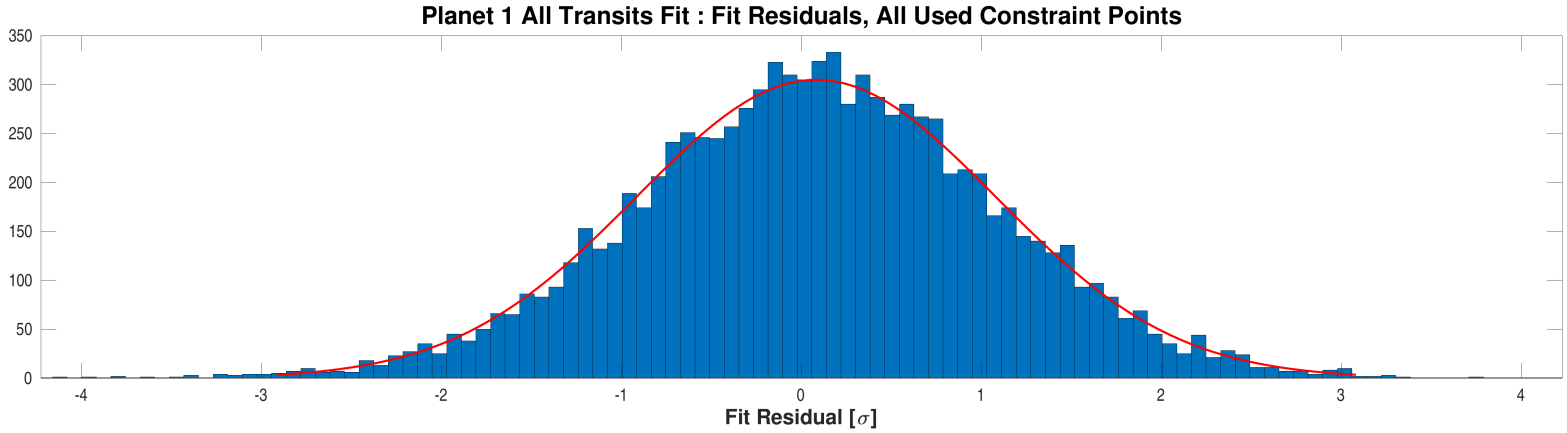
Open `./planet-04/ghost-diagnostic-results/0000000169461816-04-halo-unwhitened-cotrended-zoomed-model.fig`

Appendix A Planet Candidate 1

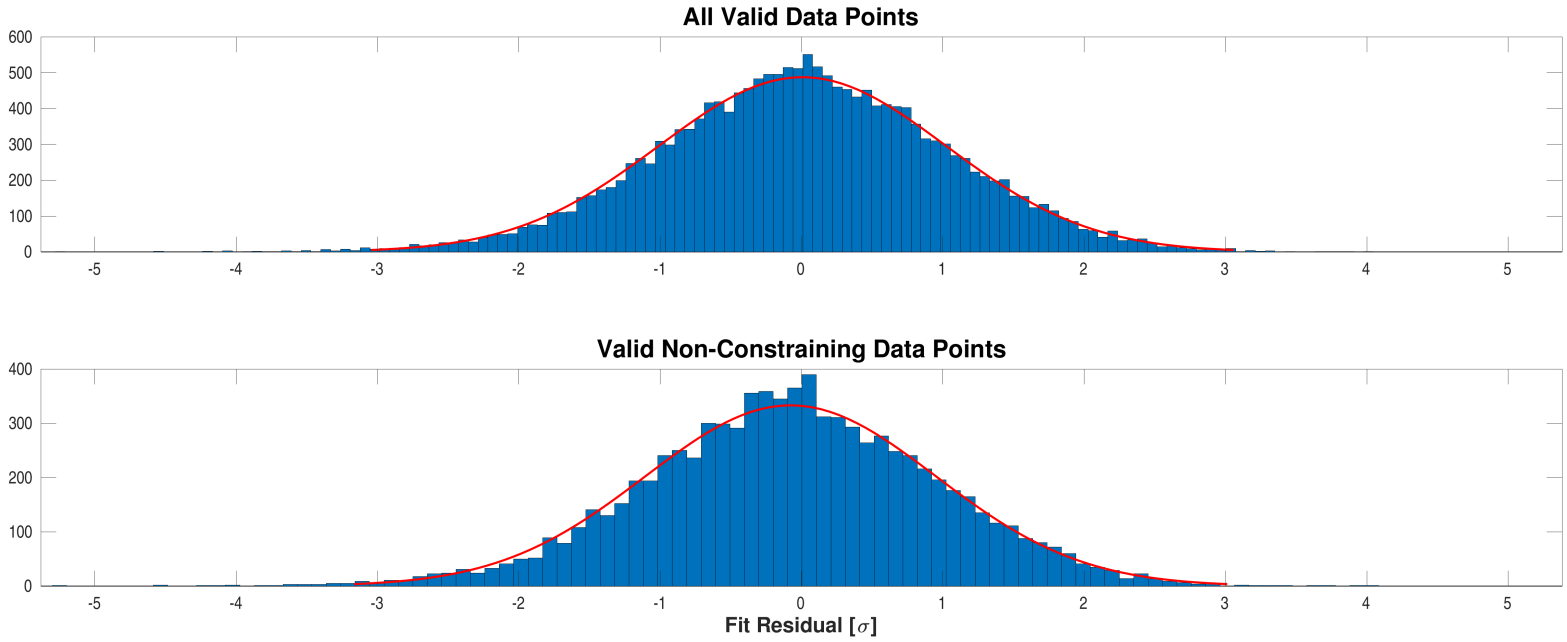
A.1 Model Fitter: All Transits



Robust weights distribution for CatId 169461816, 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/0000000169461816-01-all-robust-weights.fig`



Fit residuals distribution for CatId 169461816, 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/0000000169461816-01-all-histo-used.fig`

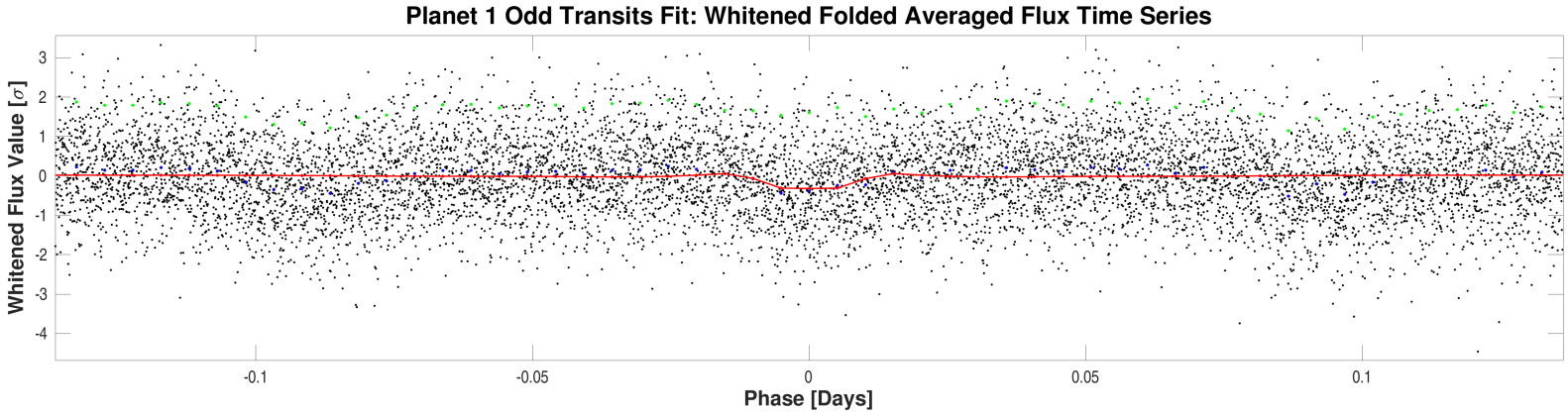


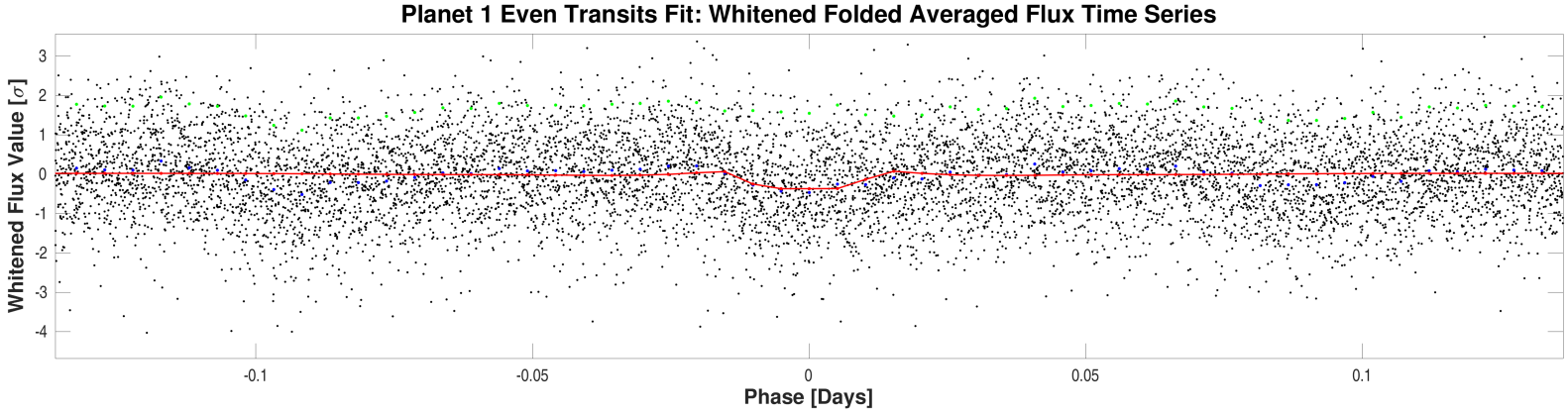
Fit residuals distribution for CatId 169461816, Planet candidate 1. Top plot: all valid data. Bottom plot: valid data not used to constrain fit (due to distance from a transit). Gaussian fits to the histograms are shown in red.
Open `./planet-01/planet-search-and-model-fitting-results/all-transits-fit/0000000169461816-01-all-histo-all-and-unused.fig`

A.2 Model Fitter: Odd & Even Transits

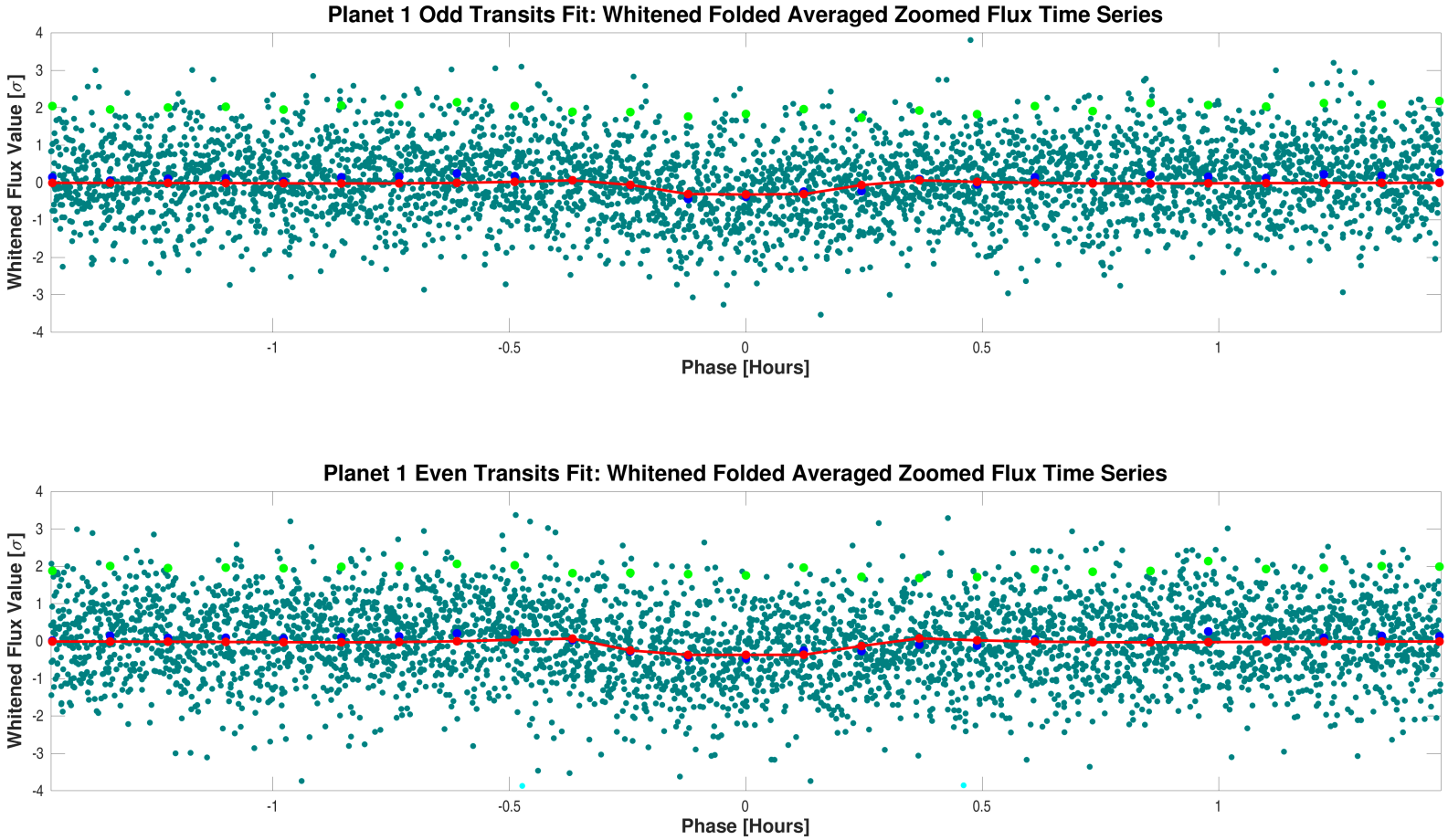
Parameter	Odd Transits Value	Odd Transits Uncertainty	Even Transits Value	Even Transits Uncertainty	Units	Difference / Uncertainty
SNR	7.2		8.9			
Orbital Period	0.2724757	2.3474e-05	0.2724720	1.9822e-05	days	1.2068e-01
Transit Epoch	1711.5527941	8.7564e-04	1711.8246292	7.3547e-04	BTJD	5.4596e-01
Impact Parameter	0.3650	2.1850e+01	0.0104	7.7821e+02		4.5543e-04
Planet Radius to Star Radius Ratio	0.0306920	3.9771e-02	0.0335485	3.8622e-02		5.1526e-02
Semi-major Axis to Star Radius Ratio	4.1501	3.5775e+01	3.8887	2.9311e+01		5.6528e-03
Planet Radius	4.9963	6.4781e+00	5.4613	6.2919e+00	Earth radii	5.1491e-02
Semi-major Axis	0.0093	6.9170e-04	0.0093	6.9170e-04	AU	8.6464e-05
Effective Stellar Flux	48403.2806	7.3822e+03	48404.1588	7.3823e+03	Goldilocks	8.4119e-05
Equilibrium Temperature	3783	1.4424e+02	3783	1.4424e+02	Kelvin	8.4119e-05
Stellar Density	12.9348	3.3451e+02	10.6413	2.4063e+02	Solar density	5.5658e-03
Transit Depth	1044	1.6411e+02	1274	1.5812e+02	ppm	1.0091e+00
Transit Duration	0.4899	3.0925e-01	0.5599	2.9907e-01	hours	1.6292e-01
Transit Ingress Duration	0.0170	3.3495e-01	0.0186	3.2227e-01	hours	3.3257e-03
Eccentricity	0.0000	0.0000e+00	0.0000	0.0000e+00		
Peri Longitude	0.0000	0.0000e+00	0.0000	0.0000e+00	degrees	
Model Chi Square Statistic (DoF)	6947.6 (8507.9)		6947.6 (8507.9)			

DoF: Degrees of Freedom

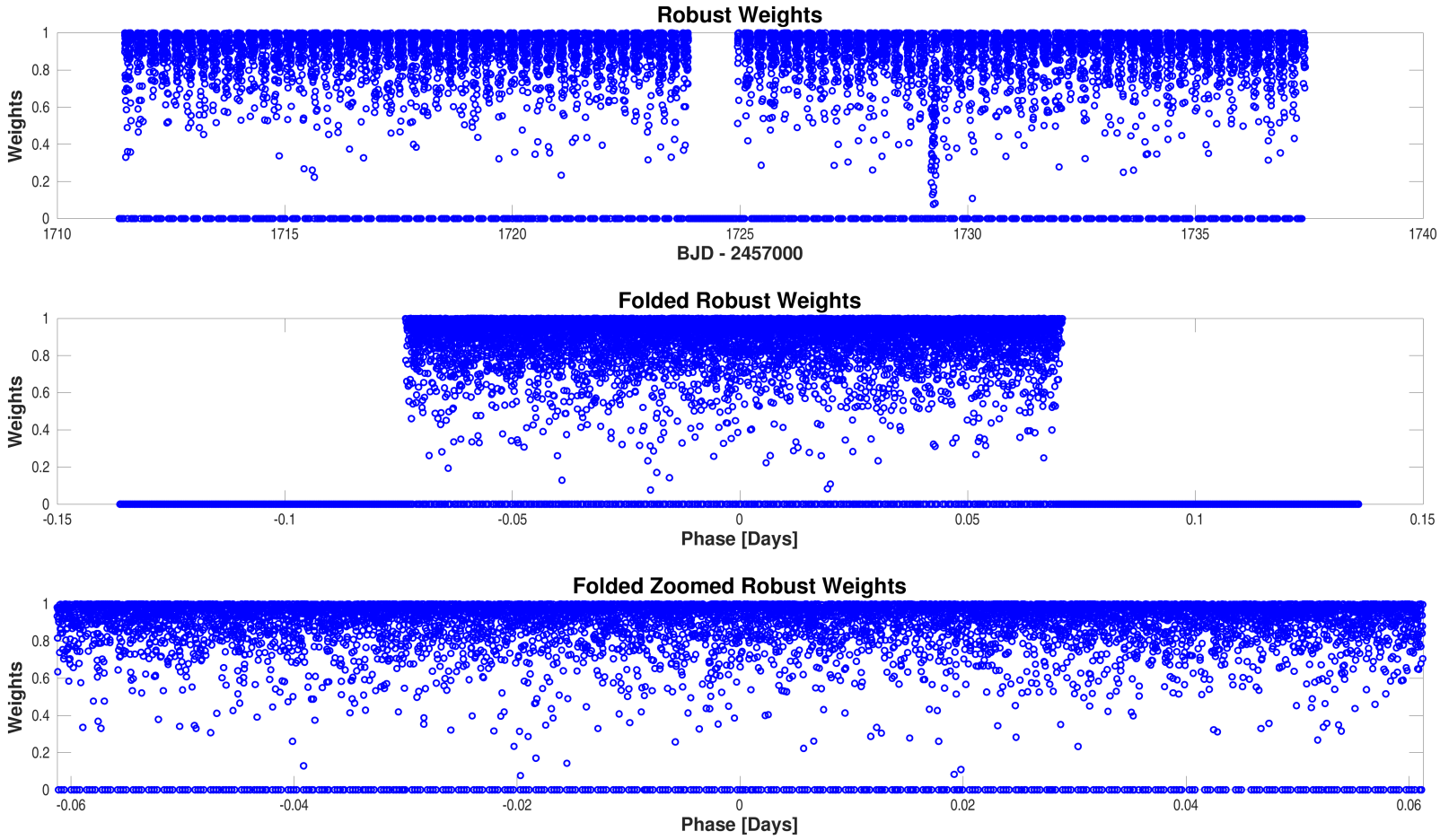




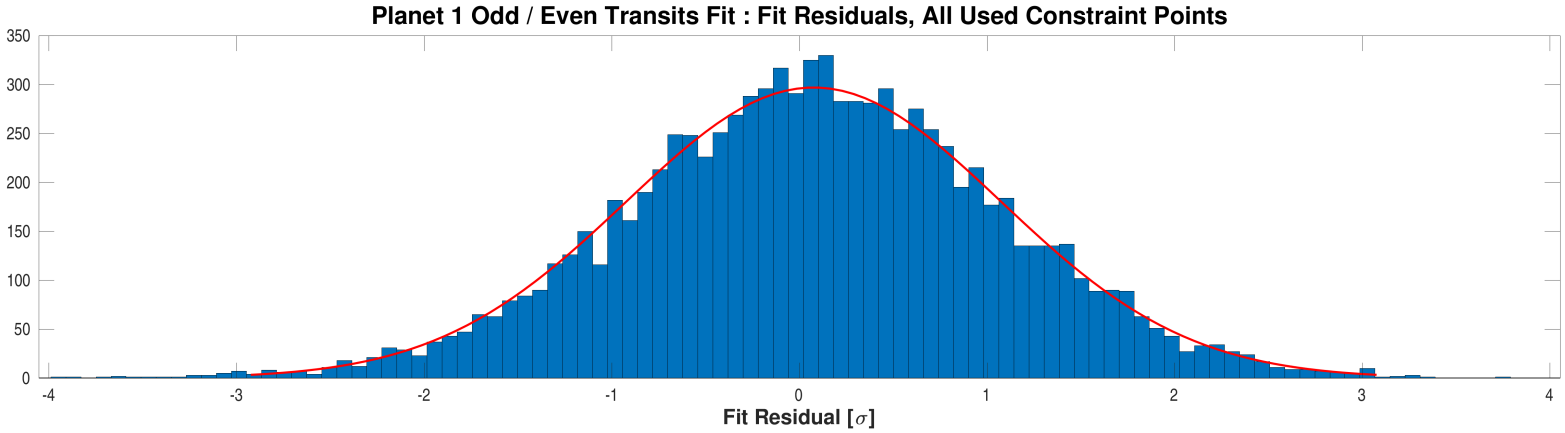
Folded flux time series for CatId 169461816, Planet candidate 1 in the whitened domain is plotted in black dots. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged values of the folded flux time series; the red dots represent the averaged values of the folded model light 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/0000000169461816-01-odd-even-whitened.fig`



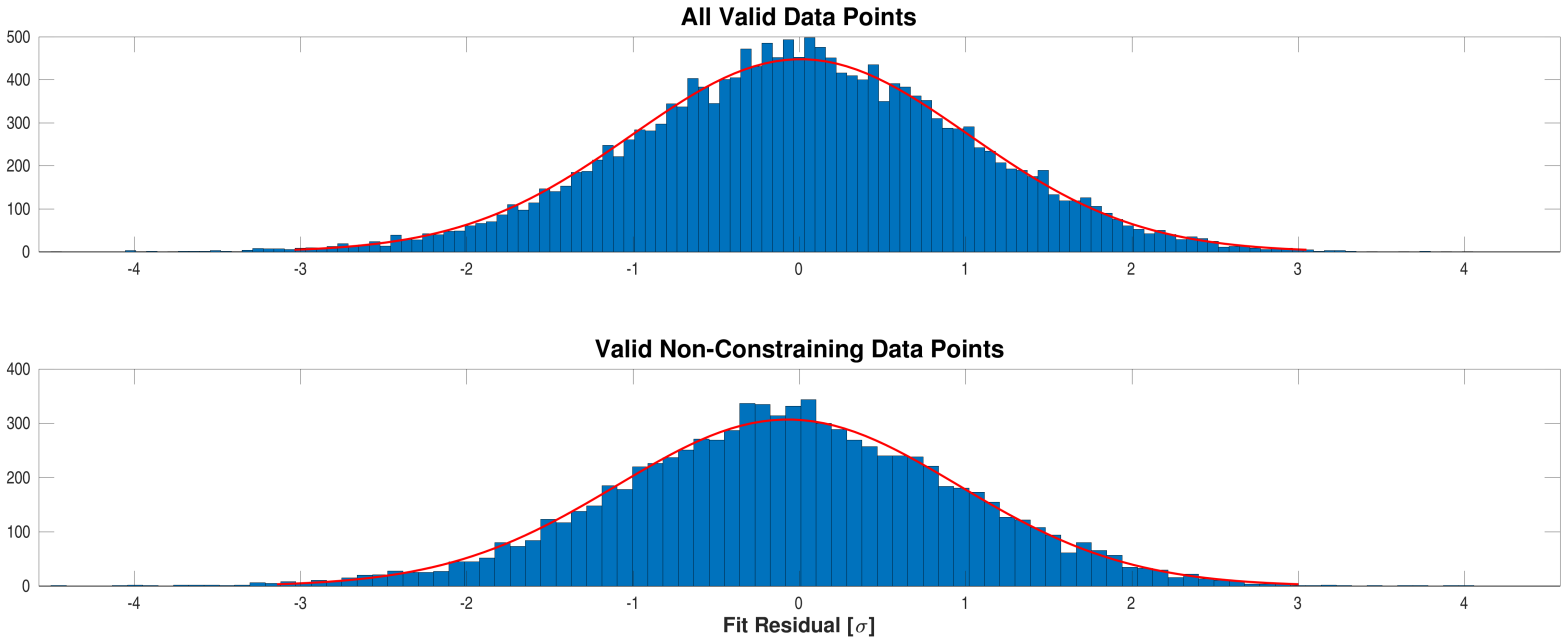
Folded flux time series for CatId 169461816, Planet candidate 1 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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/0000000169461816-01-odd-even-whitened-zoomed.fig`



Robust weights distribution for CatId 169461816, 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/0000000169461816-01-odd-even-robust-weights.fig`

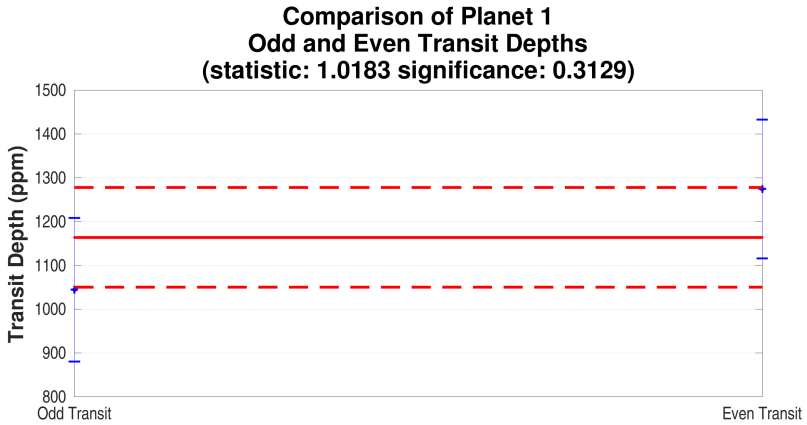


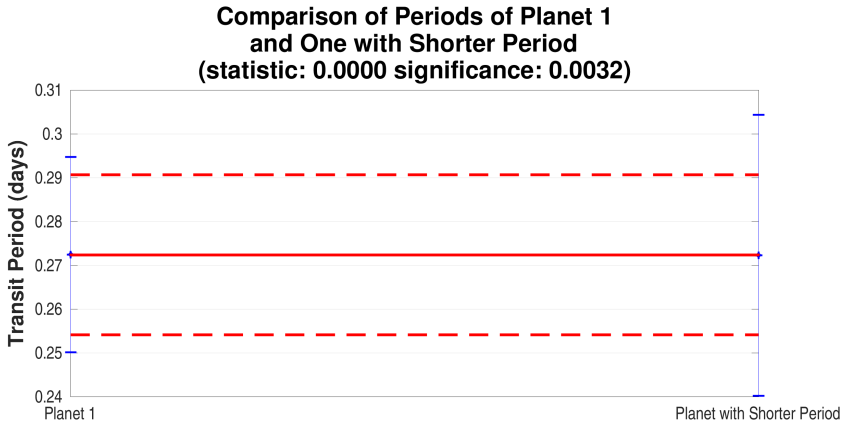
Fit residuals distribution for CatId 169461816, Planet candidate 1. Only the valid data points used to constrain the fit are shown here. A Gaussian fit to the histogram is shown in red.
Open `./planet-01/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000169461816-01-odd-even-histo-used.fig`

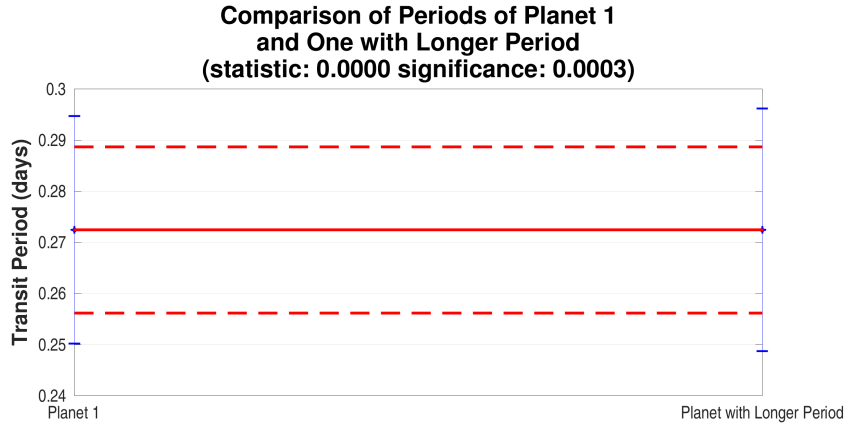


Fit residuals distribution for CatId 169461816, Planet candidate 1. Top plot: all valid data. Bottom plot: valid data not used to constrain fit (due to distance from a transit). Gaussian fits to the histograms are shown in red.
Open `./planet-01/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000169461816-01-odd-even-histo-all-and-unused.fig`

A.3 Eclipsing Binary Discrimination Test



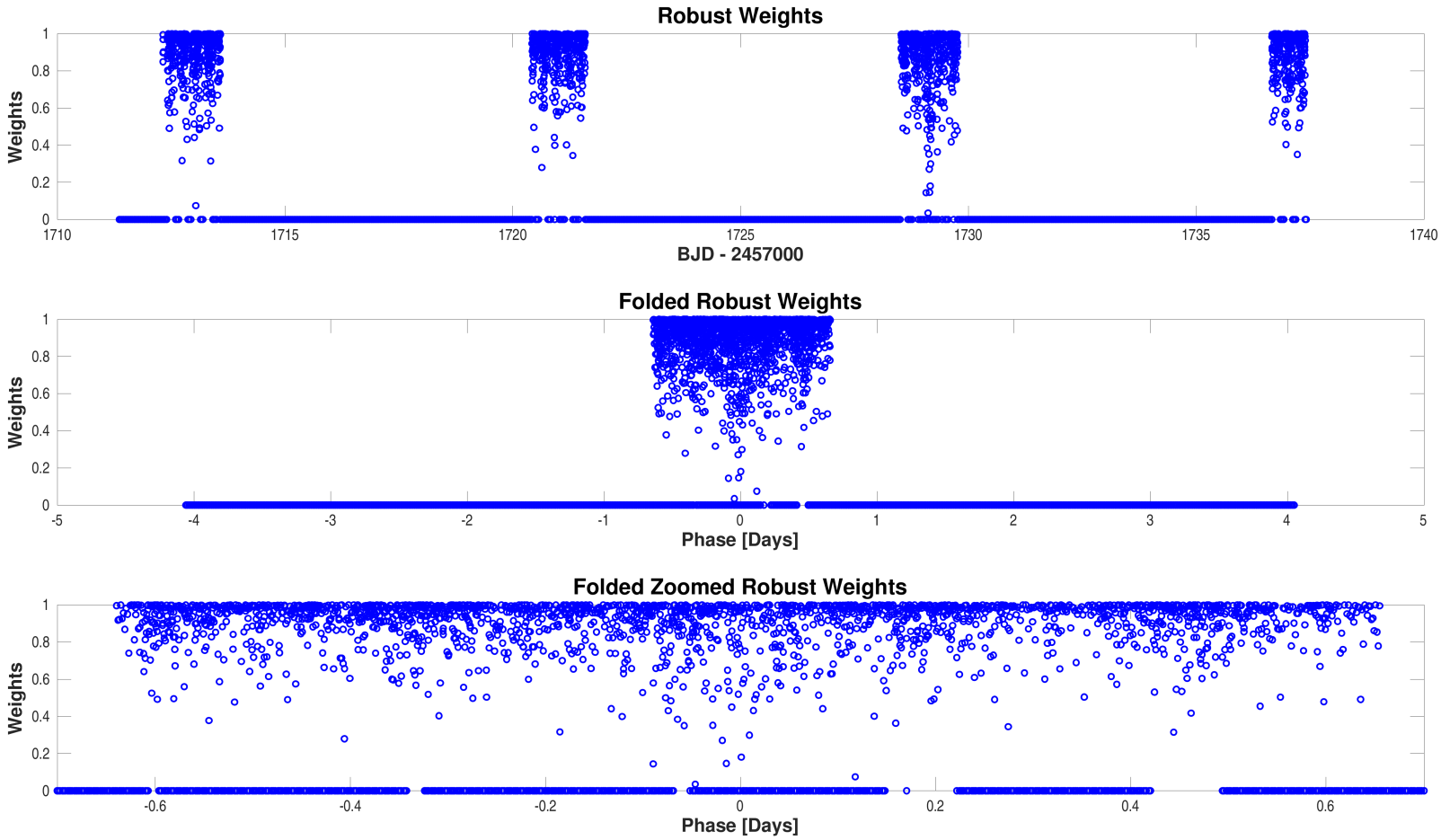




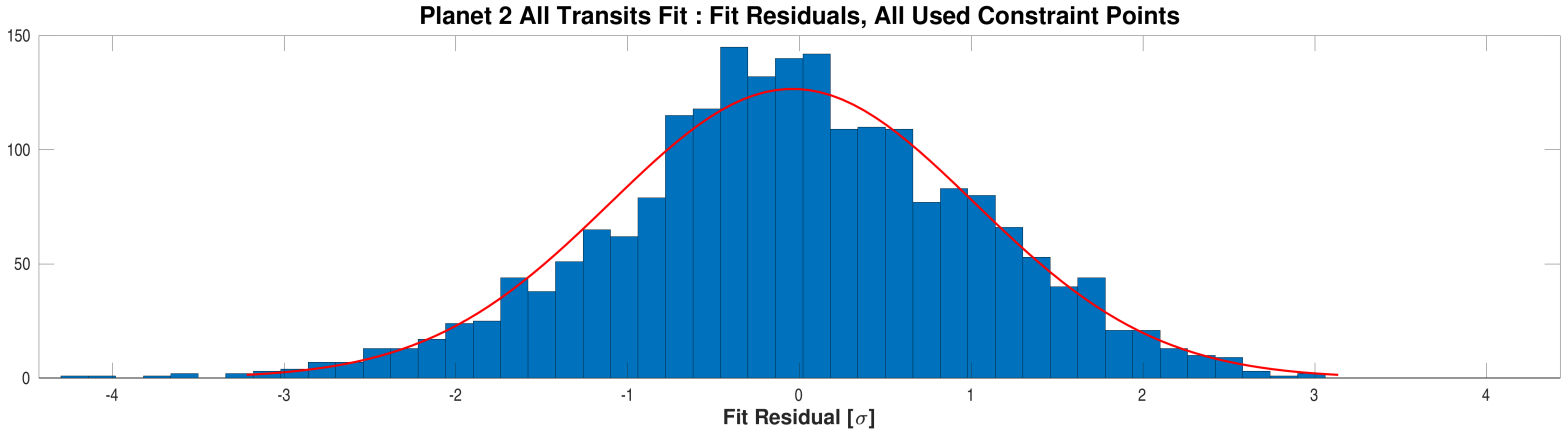
Top-left: Diagnostic plot of Odd/Even Transit Depth Test for catId 169461816, planet 1. A significance level close to 1/0 favors a transiting planet/an eclipsing binary. Top-right: Diagnostic plot of Orbital Period Test for catId 169461816. Orbital periods of planet 1 and the planet with shorter period are compared. A significance level close to 1/0 favors a transiting planet/an eclipsing binary. Bottom-left: Diagnostic plot of Orbital Period Test for catId 169461816. 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/0000000169461816-01-eclipsing-binary-discrimination-tests.fig`

Appendix B Planet Candidate 2

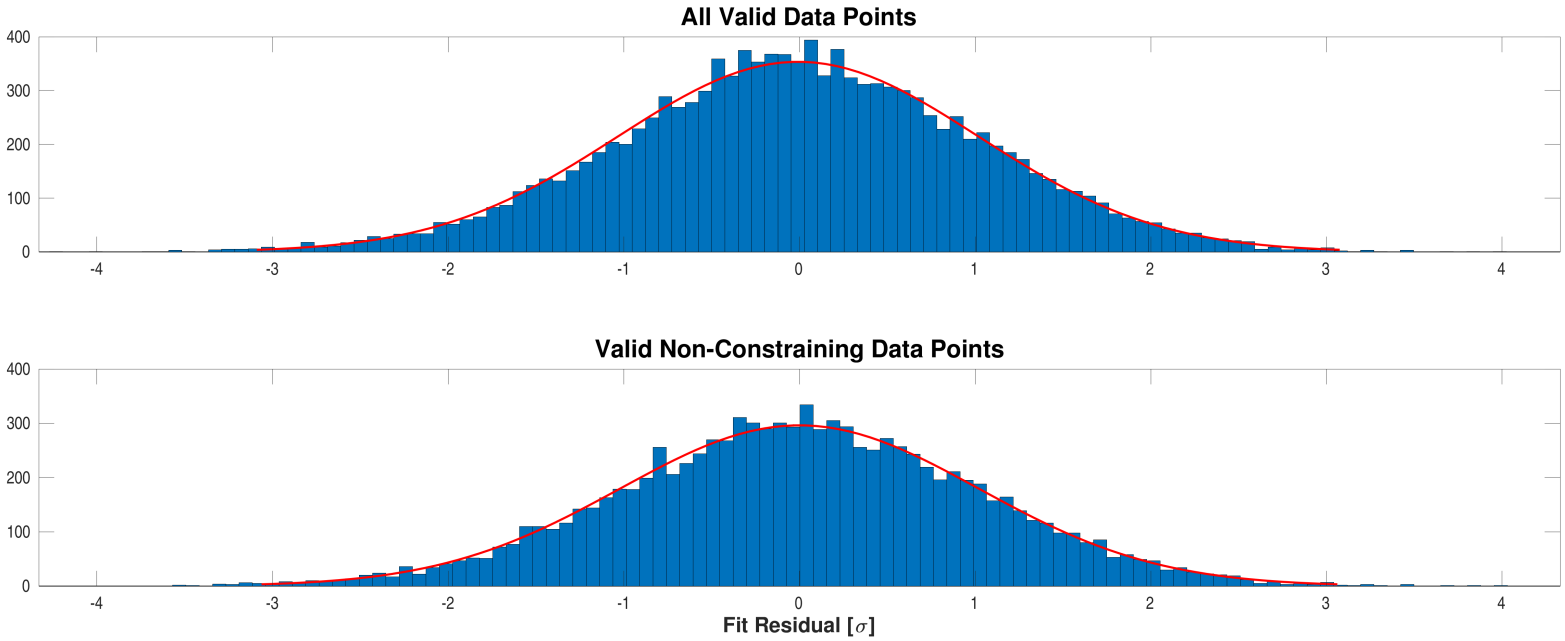
B.1 Model Fitter: All Transits



Robust weights distribution for CatId 169461816, 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/0000000169461816-02-all-robust-weights.fig`



Fit residuals distribution for CatId 169461816, 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/0000000169461816-02-all-histo-used.fig`

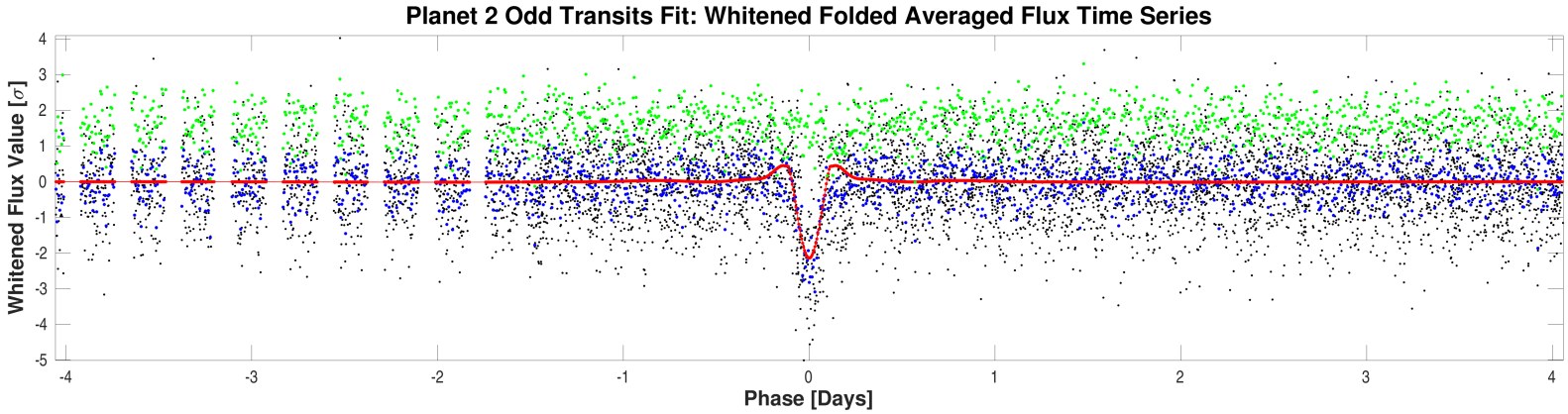


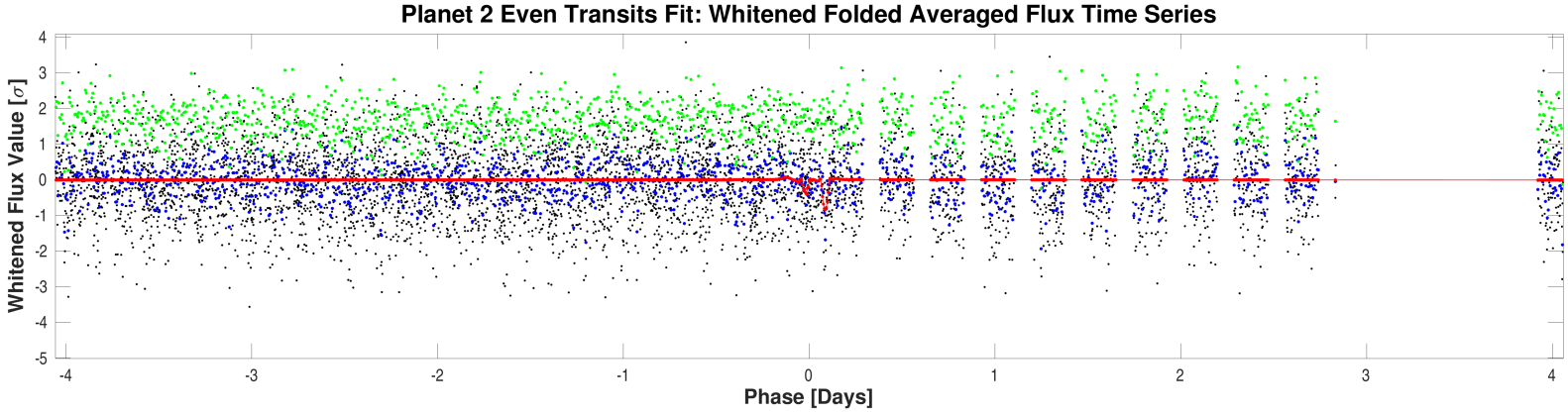
Fit residuals distribution for CatId 169461816, Planet candidate 2. Top plot: all valid data. Bottom plot: valid data not used to constrain fit (due to distance from a transit). Gaussian fits to the histograms are shown in red.
Open `./planet-02/planet-search-and-model-fitting-results/all-transits-fit/0000000169461816-02-all-histo-all-and-unused.fig`

B.2 Model Fitter: Odd & Even Transits

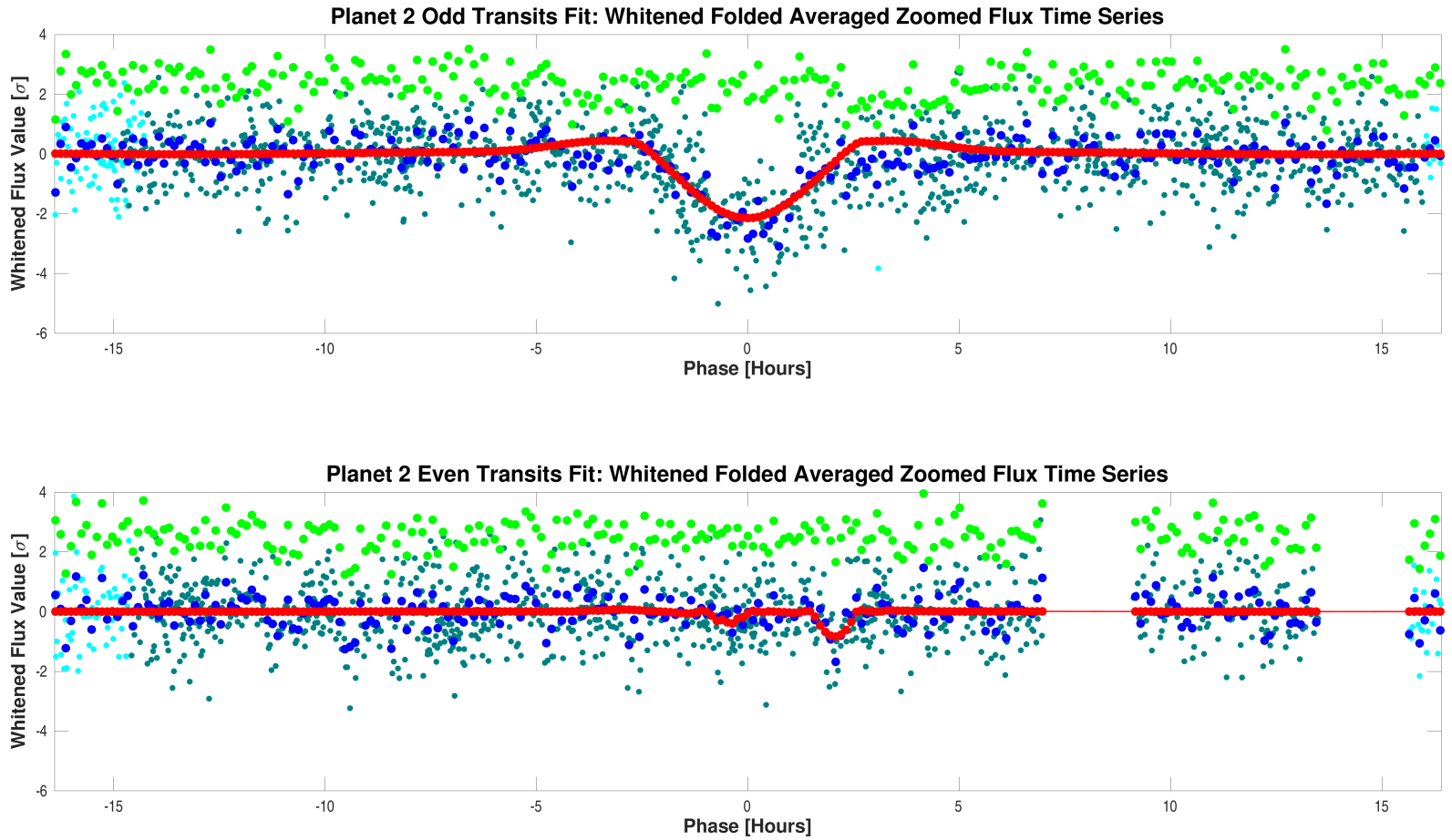
Parameter	Odd Transits Value	Odd Transits Uncertainty	Even Transits Value	Even Transits Uncertainty	Units	Difference / Uncertainty
SNR	18.1		4.5			
Orbital Period	8.1149404	2.6512e-03	8.1675504	3.2908e-03	days	1.2450e+01
Transit Epoch	1712.9115880	3.6202e-03	1721.0068642	4.8612e-03	BTJD	3.7550e+00
Impact Parameter	0.9901	4.1868e-01	0.9901	6.0972e-01		0.0000e+00
Planet Radius to Star Radius Ratio	0.1299487	2.7895e-01	0.0795557	3.8818e-01		1.0542e-01
Semi-major Axis to Star Radius Ratio	6.2616	2.4877e+00	22.0761	2.7733e+01		5.6797e-01
Planet Radius	21.1540	4.5420e+01	12.9507	6.3193e+01	Earth radii	1.0541e-01
Semi-major Axis	0.0896	6.6460e-03	0.0900	6.6747e-03	AU	4.1061e-02
Effective Stellar Flux	524.3219	7.9967e+01	519.8237	7.9281e+01	Goldilocks	3.9947e-02
Equilibrium Temperature	1220	4.6534e+01	1218	4.6434e+01	Kelvin	3.9948e-02
Stellar Density	0.0501	5.9701e-02	2.1668	8.1660e+00	Solar density	2.5921e-01
Transit Depth	7441	5.4105e+02	2819	7.3098e+02	ppm	5.0831e+00
Transit Duration	5.4666	5.1633e-01	1.2174	3.7427e-01	hours	6.6631e+00
Transit Ingress Duration	2.7333	2.5817e-01	0.6087	1.8714e-01	hours	6.6631e+00
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)	1698.6 (1991.3)		1698.6 (1991.3)			

DoF: Degrees of Freedom

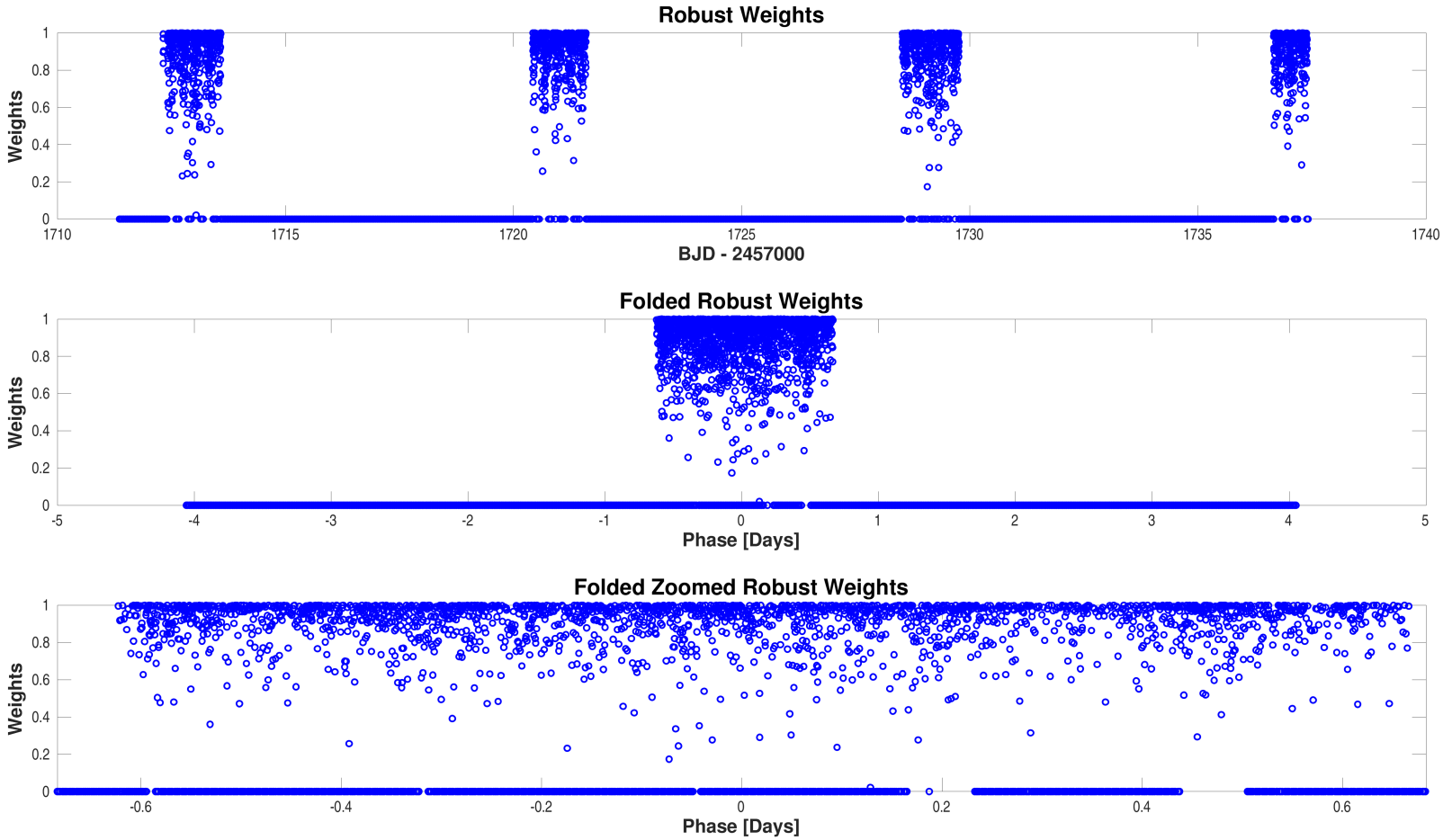




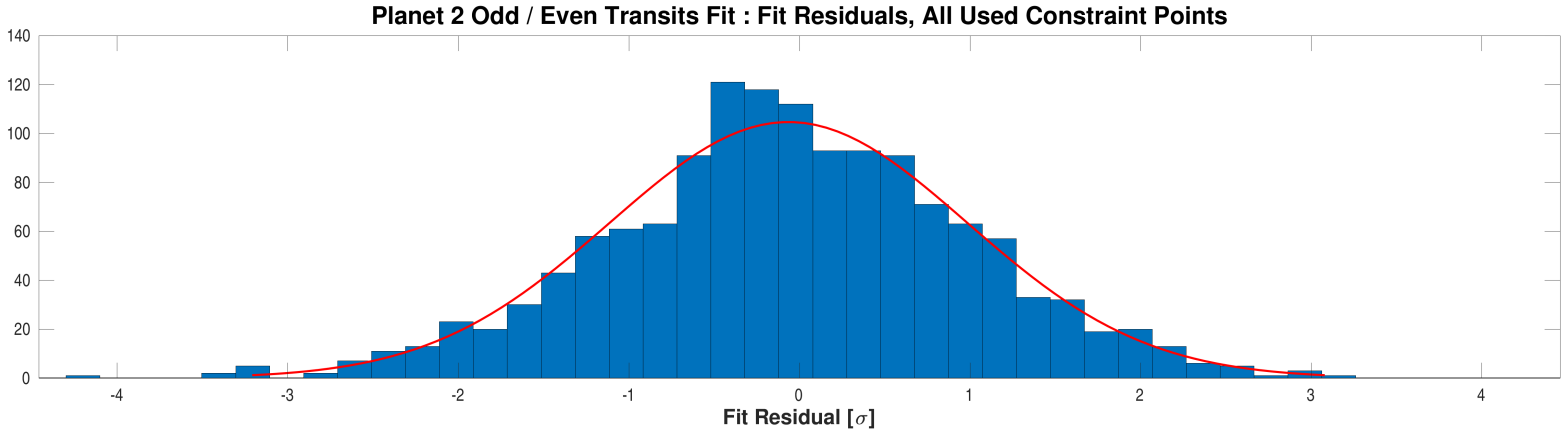
Folded flux time series for CatId 169461816, Planet candidate 2 in the whitened domain is plotted in black dots. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged values of the folded flux time series; the red dots represent the averaged values of the folded model light 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/0000000169461816-02-odd-even-whitened.fig`



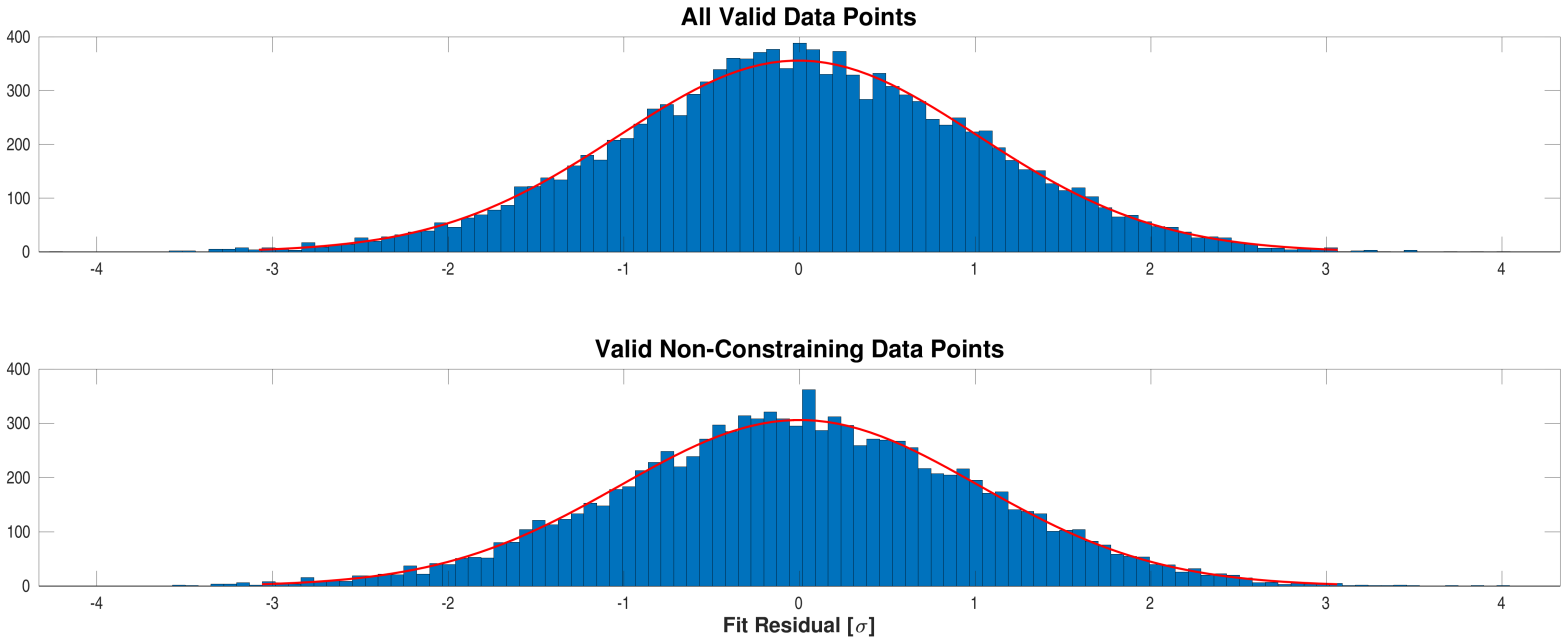
Folded flux time series for CatId 169461816, Planet candidate 2 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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/0000000169461816-02-odd-even-whitened-zoomed.fig`



Robust weights distribution for CatId 169461816, 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/0000000169461816-02-odd-even-robust-weights.fig`

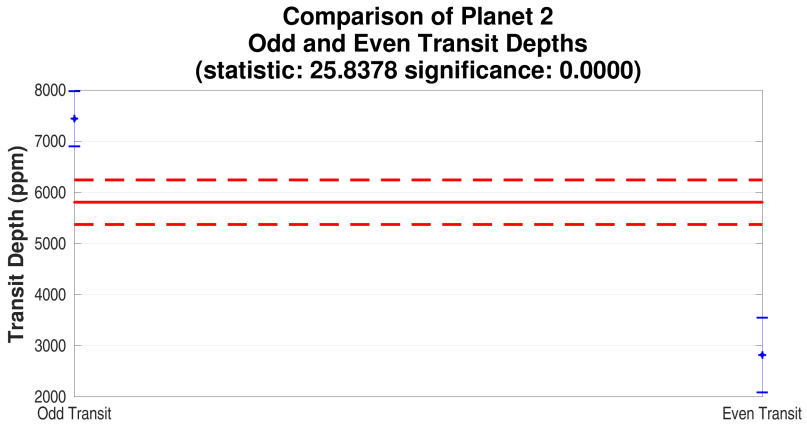


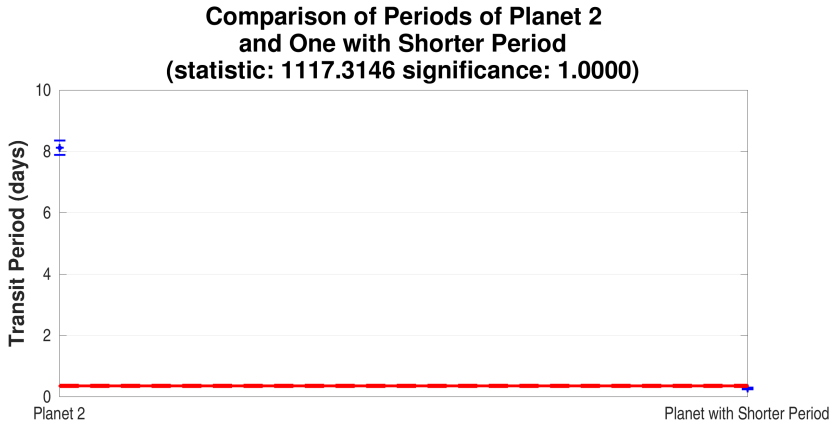
Fit residuals distribution for CatId 169461816, Planet candidate 2. Only the valid data points used to constrain the fit are shown here. A Gaussian fit to the histogram is shown in red.
Open `./planet-02/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000169461816-02-odd-even-histo-used.fig`



Fit residuals distribution for CatId 169461816, 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/0000000169461816-02-odd-even-histo-all-and-unused.fig`

B.3 Eclipsing Binary Discrimination Test

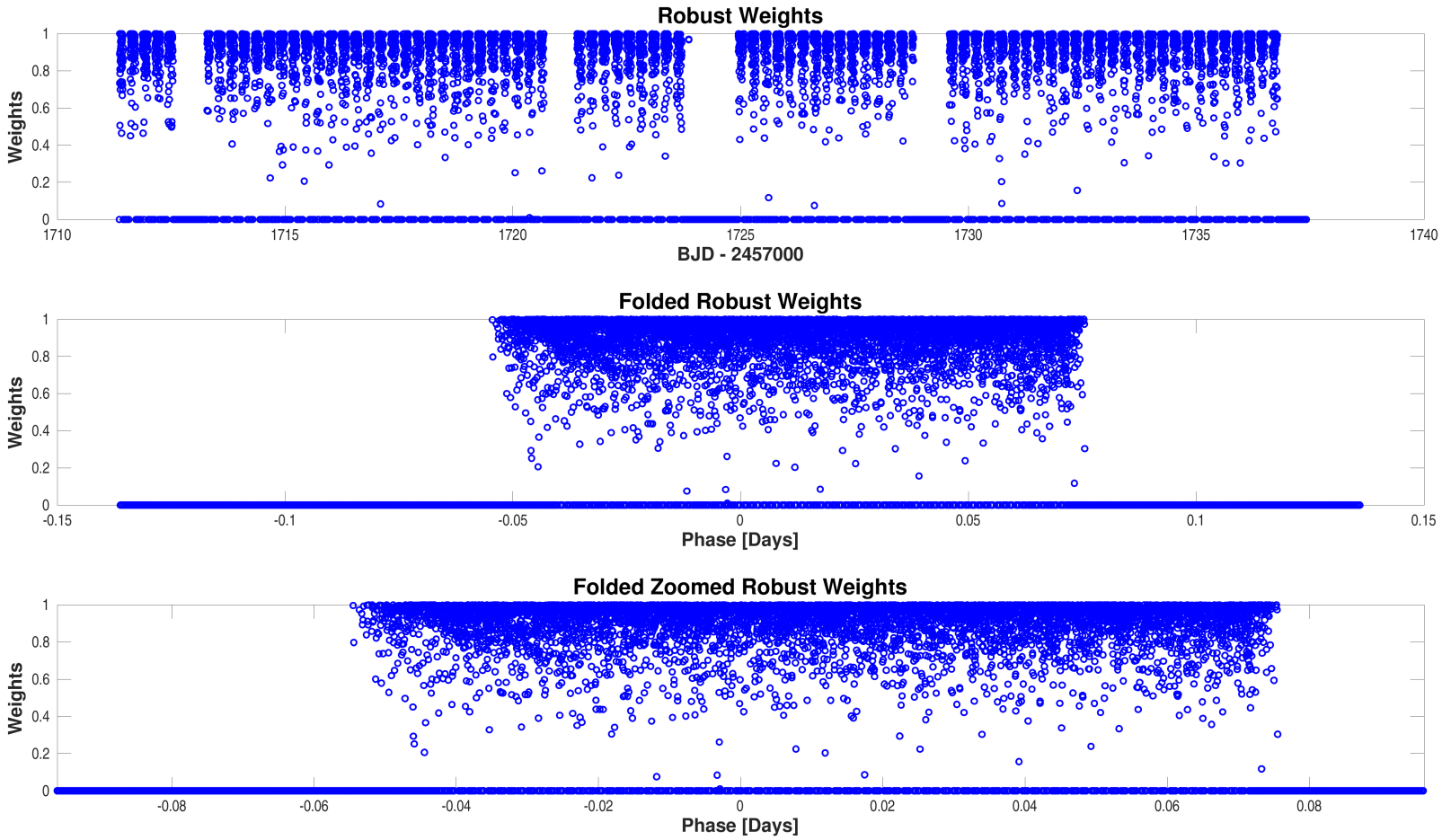




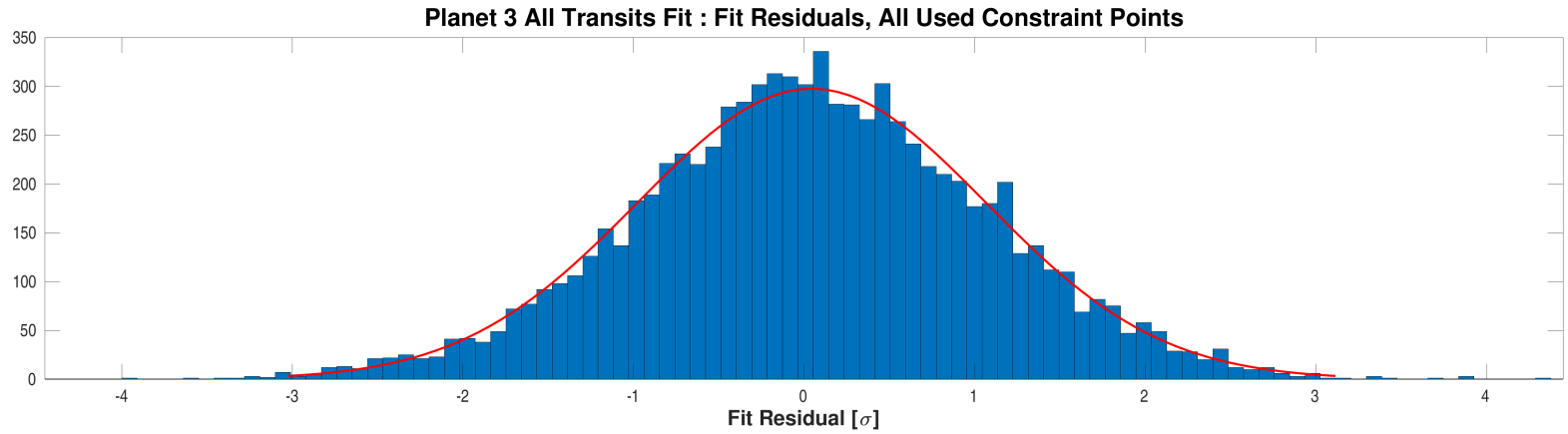
Top-left: Diagnostic plot of Odd/Even Transit Depth Test for catId 169461816, planet 2. A significance level close to 1/0 favors a transiting planet/an eclipsing binary. Top-right: Diagnostic plot of Orbital Period Test for catId 169461816. Orbital periods of planet 2 and the planet with shorter period are compared. A significance level close to 1/0 favors a transiting planet/an eclipsing binary.
Open `./planet-02/binary-discrimination-test-results/0000000169461816-02-eclipsing-binary-discrimination-tests.fig`

Appendix C Planet Candidate 3

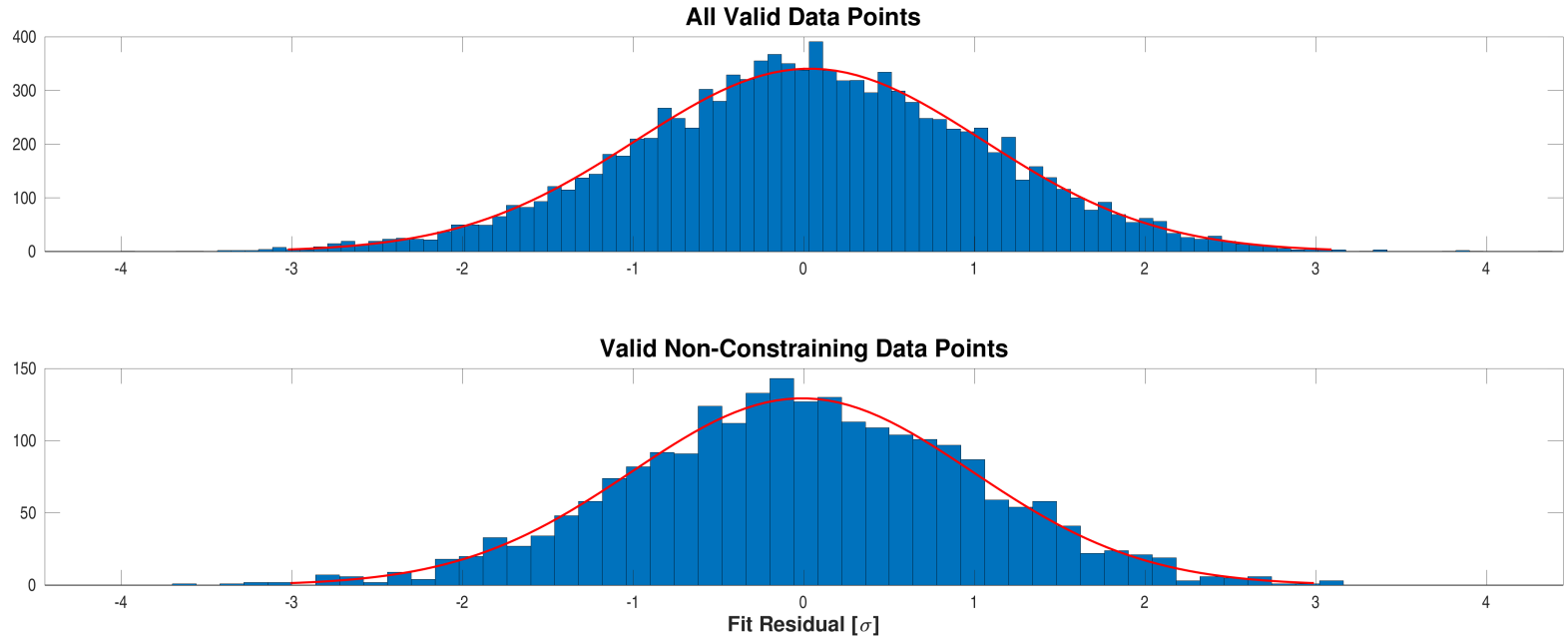
C.1 Model Fitter: All Transits



Robust weights distribution for CatId 169461816, 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/0000000169461816-03-all-robust-weights.fig`



Fit residuals distribution for CatId 169461816, 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/0000000169461816-03-all-histo-used.fig`

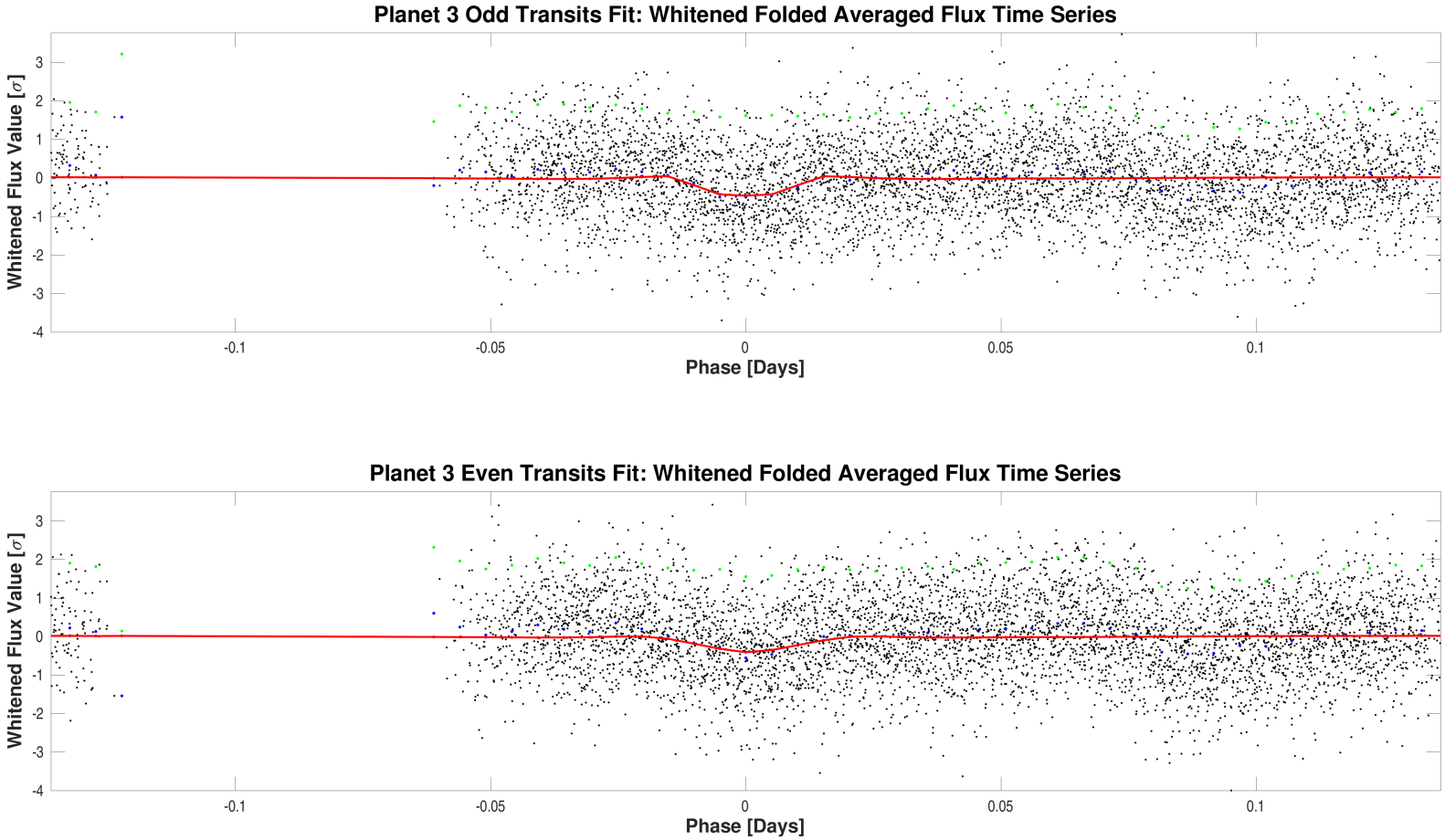


Fit residuals distribution for CatId 169461816, Planet candidate 3. Top plot: all valid data. Bottom plot: valid data not used to constrain fit (due to distance from a transit). Gaussian fits to the histograms are shown in red.
Open `./planet-03/planet-search-and-model-fitting-results/all-transits-fit/0000000169461816-03-all-histo-all-and-unused.fig`

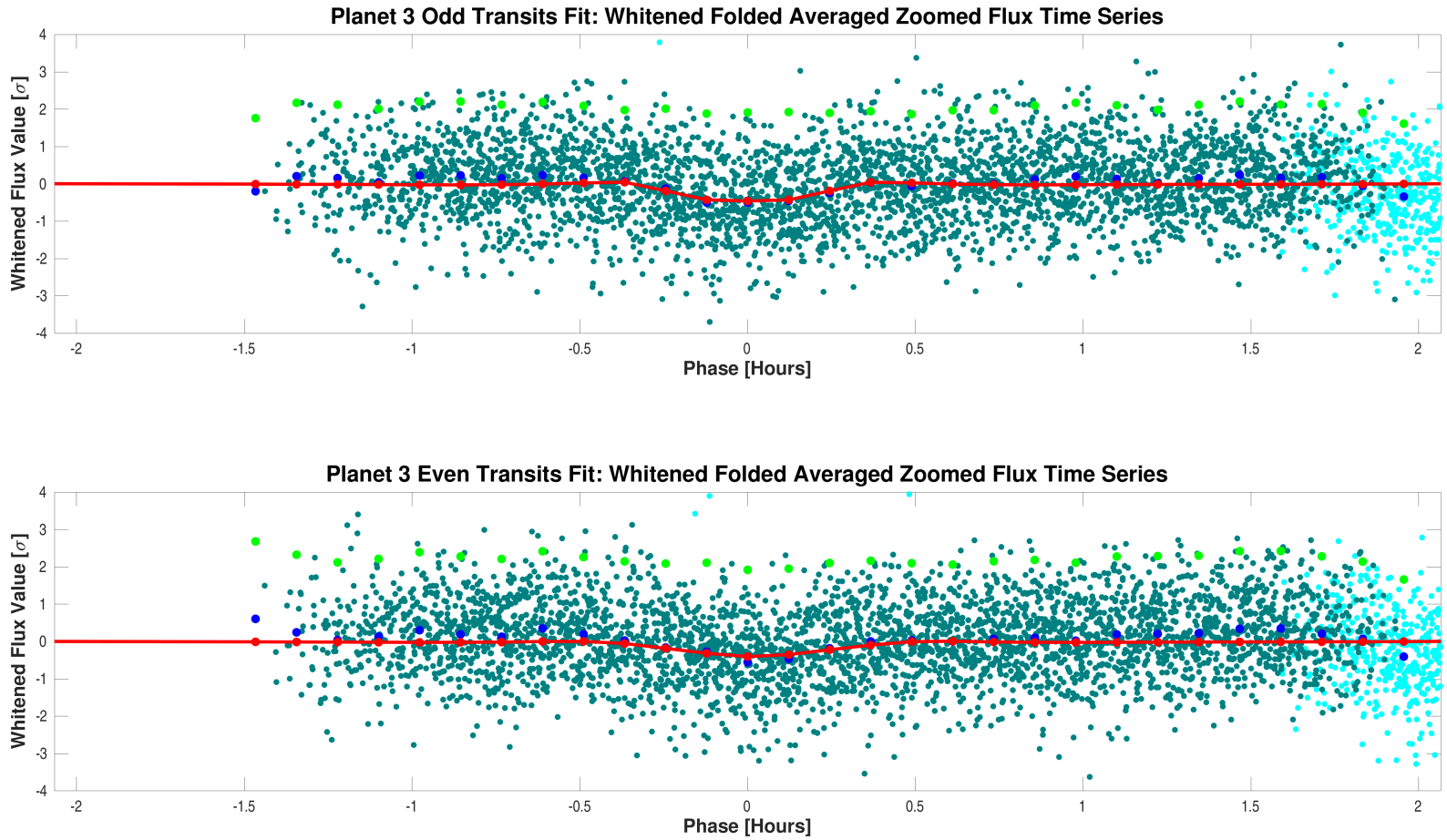
C.2 Model Fitter: Odd & Even Transits

Parameter	Odd Transits Value	Odd Transits Uncertainty	Even Transits Value	Even Transits Uncertainty	Units	Difference / Uncertainty
SNR	9.6		9.6			
Orbital Period	0.2721854	2.6263e-05	0.2723743	2.9005e-05	days	4.8295e+00
Transit Epoch	1711.3848494	1.1018e-03	1711.6491361	1.2774e-03	BTJD	4.7517e+00
Impact Parameter	0.9471	3.1861e-02	0.9565	2.3190e-02		2.3797e-01
Planet Radius to Star Radius Ratio	0.0400716	3.5685e-03	0.0410164	4.3834e-03		1.6715e-01
Semi-major Axis to Star Radius Ratio	1.6264	2.8165e-01	1.5023	1.8085e-01		3.7070e-01
Planet Radius	6.5231	6.5063e-01	6.6770	7.7404e-01	Earth radii	1.5210e-01
Semi-major Axis	0.0093	6.9121e-04	0.0093	6.9153e-04	AU	4.4100e-03
Effective Stellar Flux	48472.1326	7.3927e+03	48427.2984	7.3858e+03	Goldilocks	4.2904e-03
Equilibrium Temperature	3784	1.4429e+02	3783	1.4426e+02	Kelvin	4.2904e-03
Stellar Density	0.7801	4.0524e-01	0.6140	2.2169e-01	Solar density	3.5965e-01
Transit Depth	1329	1.7465e+02	1352	2.1338e+02	ppm	8.4374e-02
Transit Duration	0.6886	1.0074e-01	0.7546	9.5497e-02	hours	4.7581e-01
Transit Ingress Duration	0.2209	1.7547e-01	0.3148	3.5486e-01	hours	2.3713e-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)	5369.6 (6485.8)		5369.6 (6485.8)			

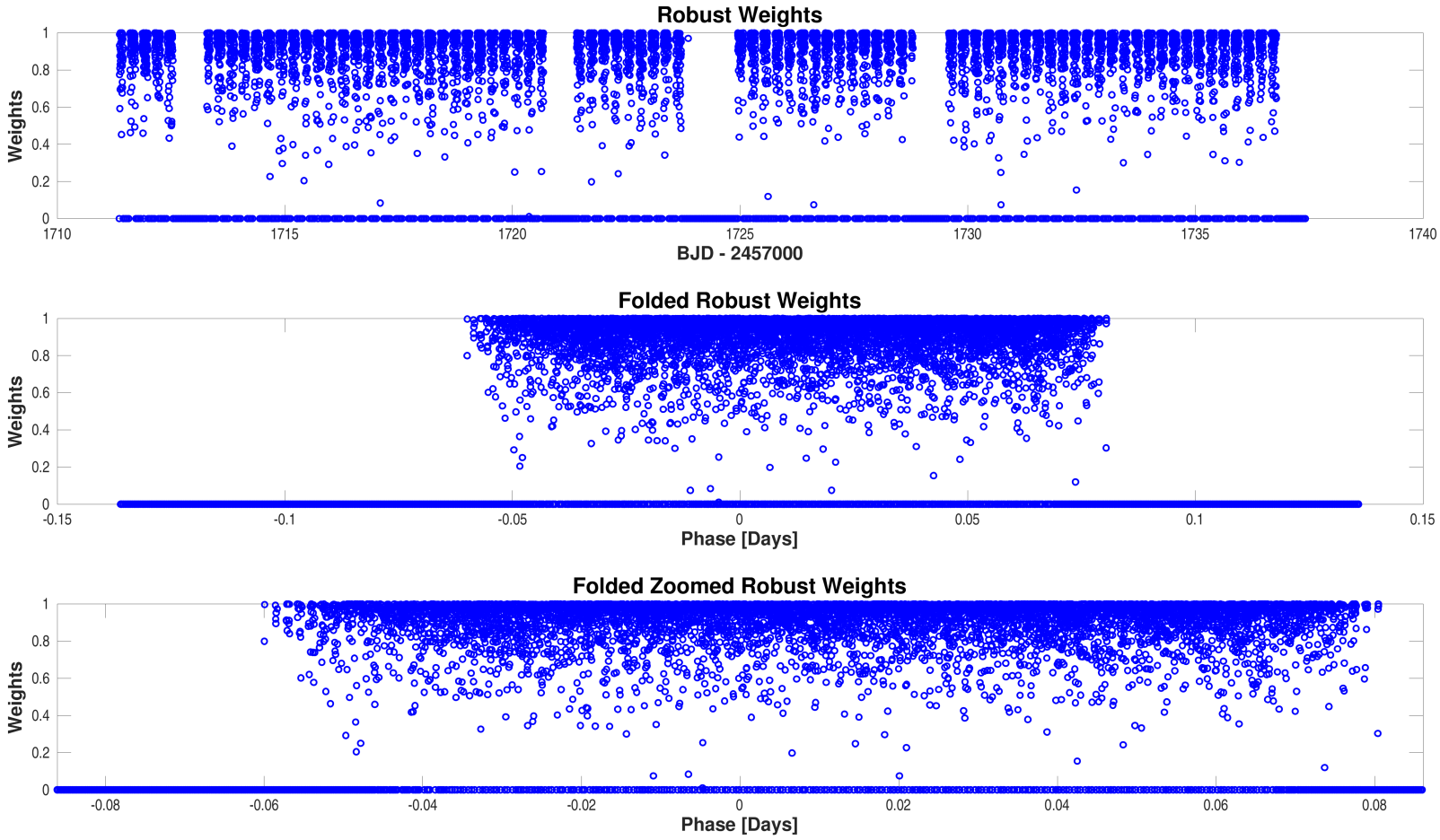
DoF: Degrees of Freedom



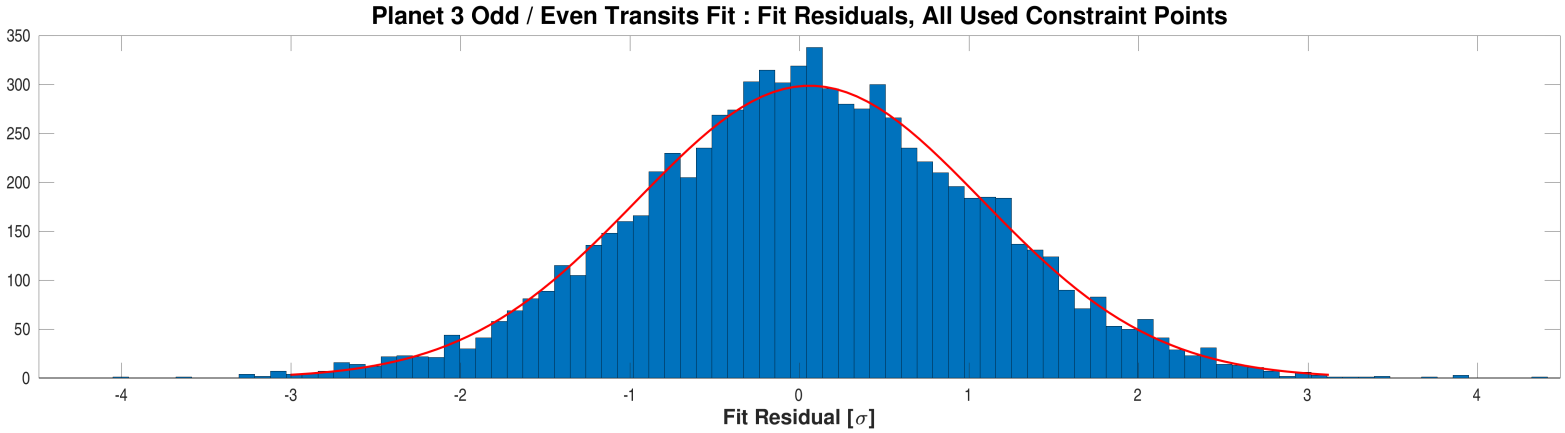
Folded flux time series for CatId 169461816, Planet candidate 3 in the whitened domain is plotted in black dots. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged values of the folded flux time series; the red dots represent the averaged values of the folded model light 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/0000000169461816-03-odd-even-whitened.fig`



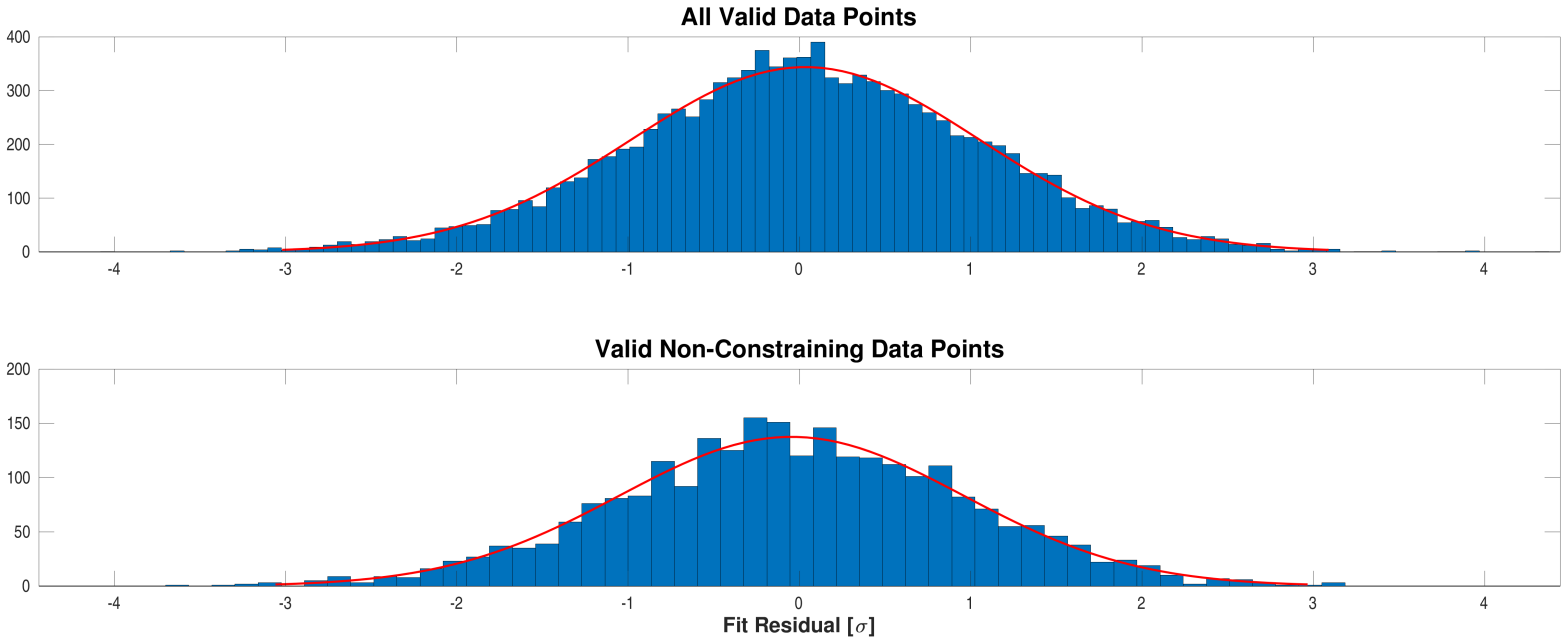
Folded flux time series for CatId 169461816, Planet candidate 3 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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/0000000169461816-03-odd-even-whitened-zoomed.fig`



Robust weights distribution for CatId 169461816, 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/0000000169461816-03-odd-even-robust-weights.fig`

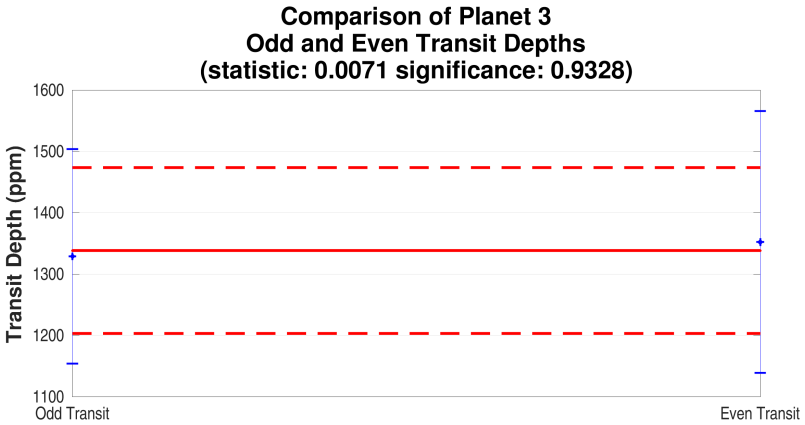


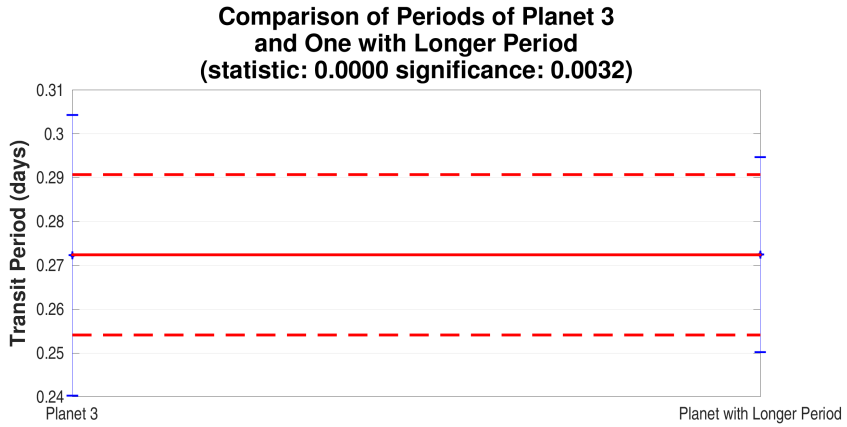
Fit residuals distribution for CatId 169461816, Planet candidate 3. Only the valid data points used to constrain the fit are shown here. A Gaussian fit to the histogram is shown in red.
Open `./planet-03/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000169461816-03-odd-even-histo-used.fig`



Fit residuals distribution for CatId 169461816, 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/0000000169461816-03-odd-even-histo-all-and-unused.fig`

C.3 Eclipsing Binary Discrimination Test

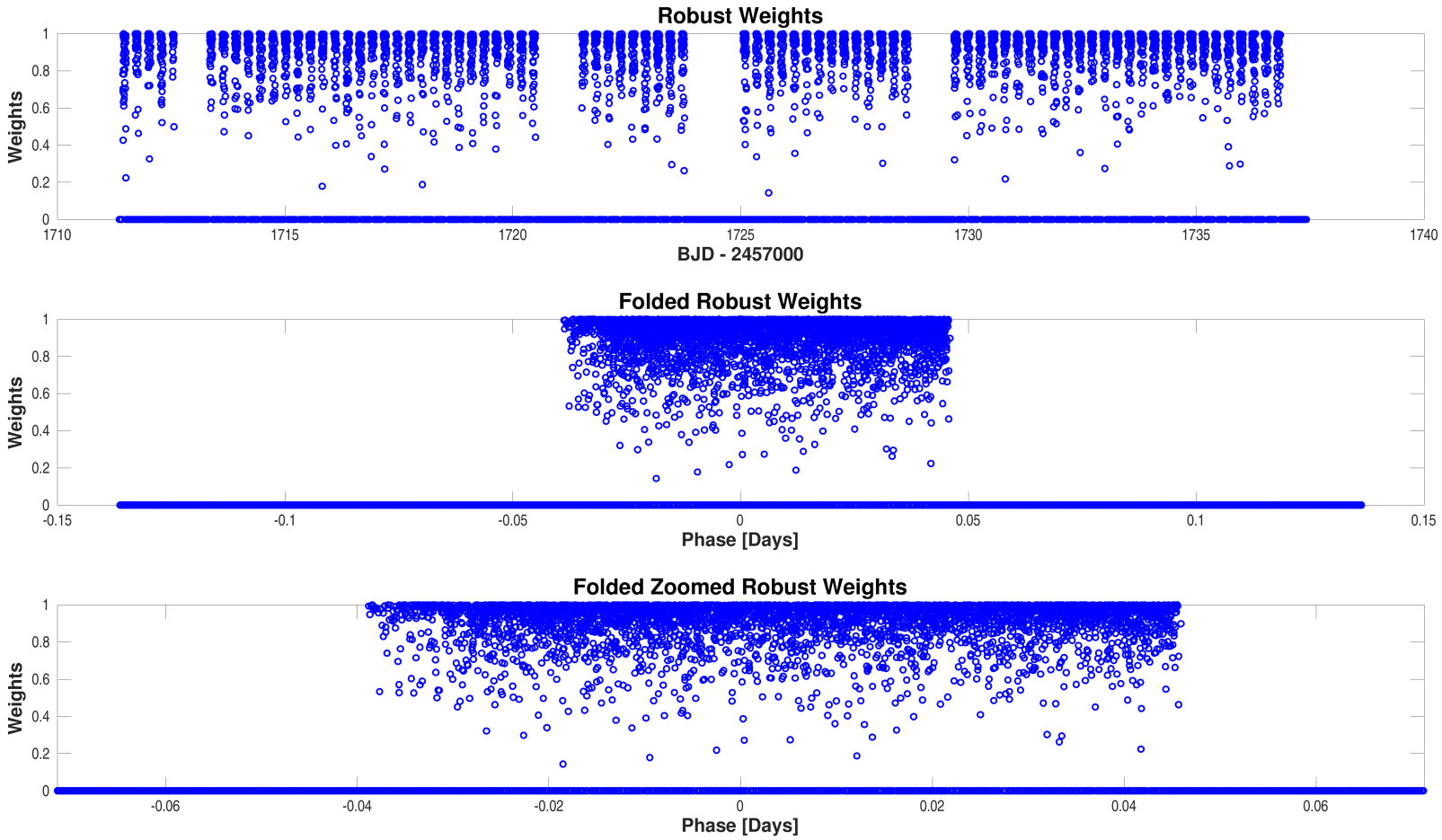




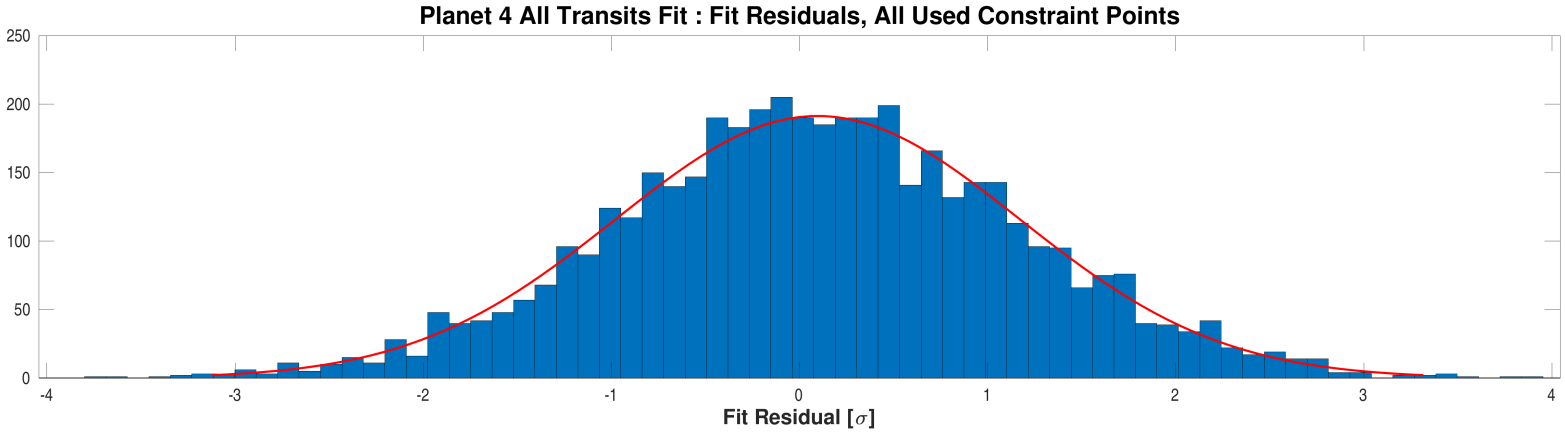
Top-left: Diagnostic plot of Odd/Even Transit Depth Test for catId 169461816, planet 3. A significance level close to 1/0 favors a transiting planet/an eclipsing binary. Bottom-left: Diagnostic plot of Orbital Period Test for catId 169461816. Orbital periods of planet 3 and the planet with longer period are compared. A significance level close to 1/0 favors a transiting planet/an eclipsing binary.
Open `./planet-03/binary-discrimination-test-results/0000000169461816-03-eclipsing-binary-discrimination-tests.fig`

Appendix D Planet Candidate 4

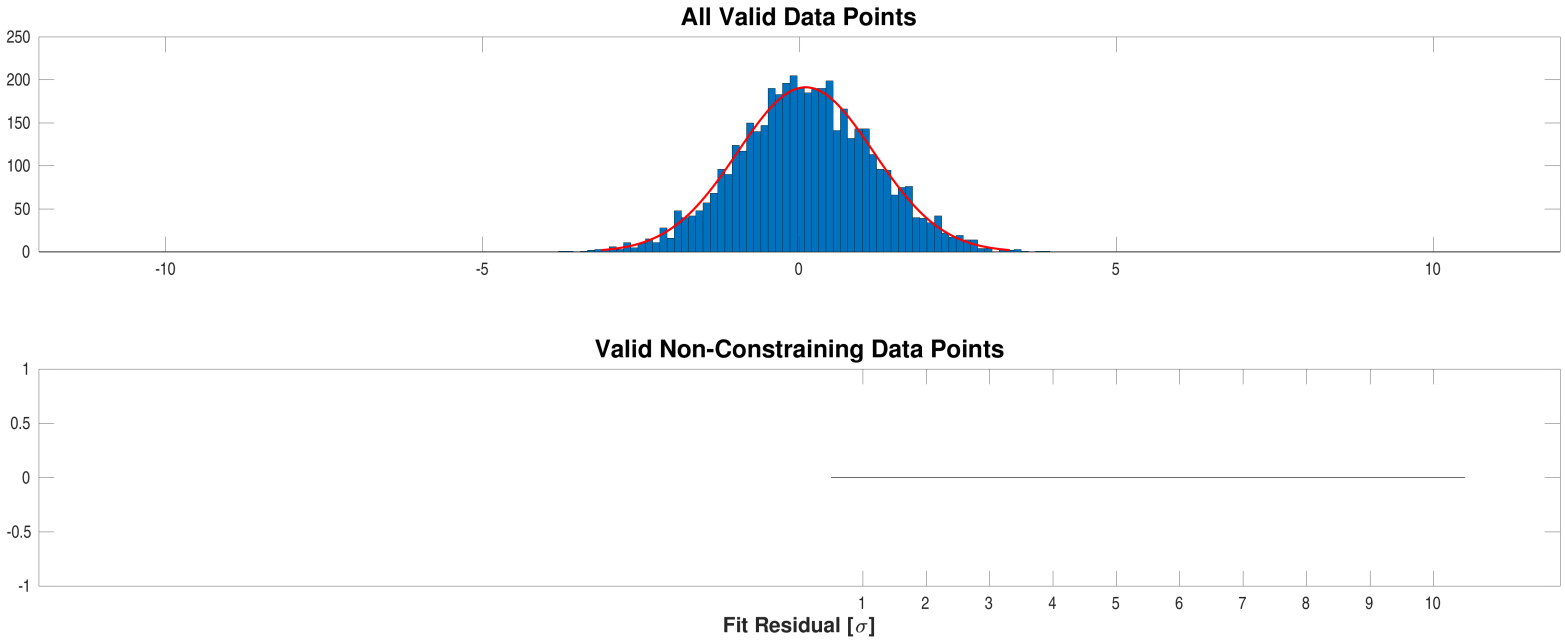
D.1 Model Fitter: All Transits



Robust weights distribution for CatId 169461816, 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/0000000169461816-04-all-robust-weights.fig`



Fit residuals distribution for CatId 169461816, 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/0000000169461816-04-all-histo-used.fig`

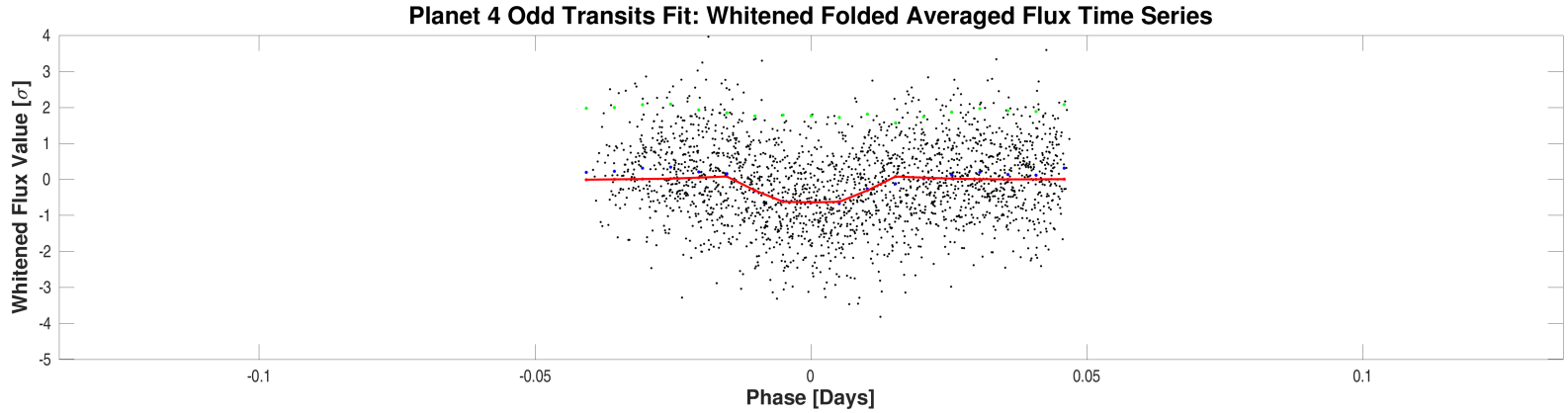


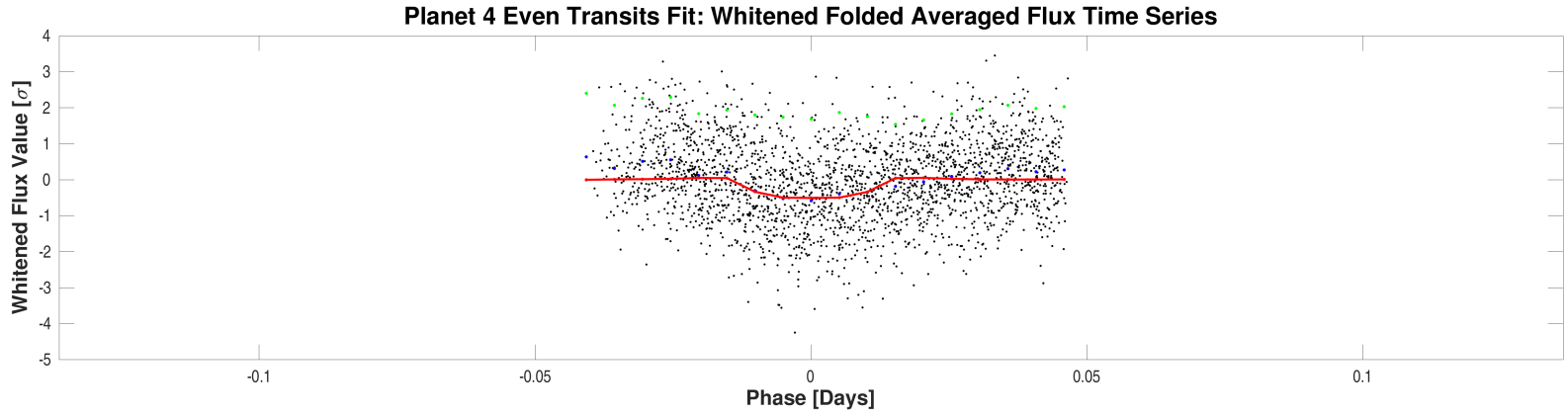
Fit residuals distribution for CatId 169461816, Planet candidate 4. Top plot: all valid data. Bottom plot: valid data not used to constrain fit (due to distance from a transit). Gaussian fits to the histograms are shown in red.
Open `./planet-04/planet-search-and-model-fitting-results/all-transits-fit/0000000169461816-04-all-histo-all-and-unused.fig`

D.2 Model Fitter: Odd & Even Transits

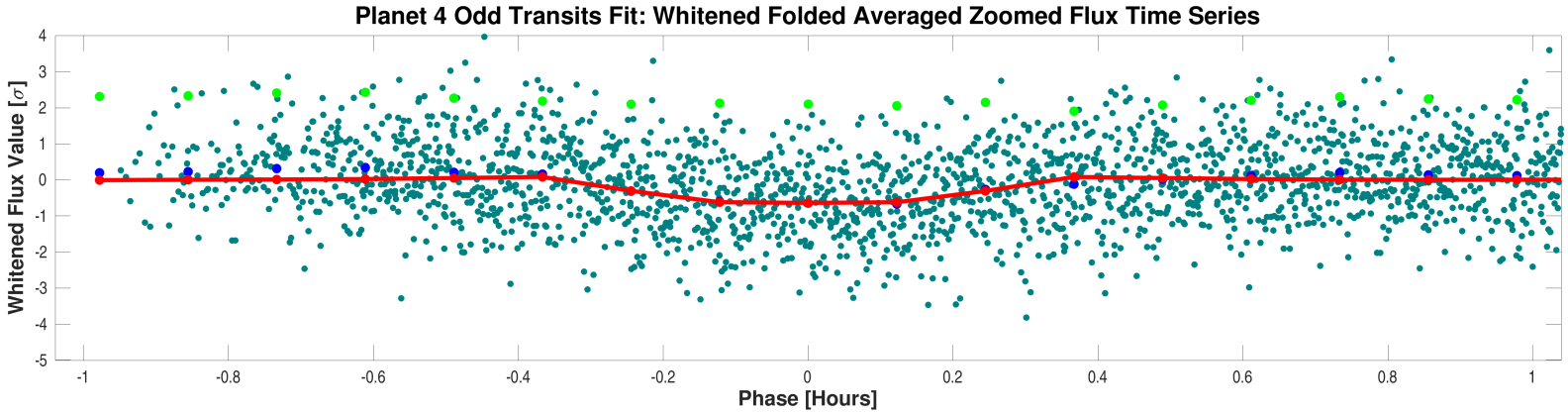
Parameter	Odd Transits Value	Odd Transits Uncertainty	Even Transits Value	Even Transits Uncertainty	Units	Difference / Uncertainty
SNR	13.9		11.9			
Orbital Period	0.2724878	1.5845e-05	0.2724679	1.8848e-05	days	8.0840e-01
Transit Epoch	1711.4614020	6.2440e-04	1711.7348253	7.3566e-04	BTJD	9.8824e-01
Impact Parameter	0.3010	1.3370e+01	0.1647	3.8610e+01		3.3343e-03
Planet Radius to Star Radius Ratio	0.0373906	2.3437e-02	0.0336967	3.1198e-02		9.4664e-02
Semi-major Axis to Star Radius Ratio	3.8252	1.5686e+01	3.5713	2.1410e+01		9.5640e-03
Planet Radius	6.0867	3.8251e+00	5.4854	5.0847e+00	Earth radii	9.4505e-02
Semi-major Axis	0.0093	6.9173e-04	0.0093	6.9169e-04	AU	4.6420e-04
Effective Stellar Flux	48400.4189	7.3817e+03	48405.1337	7.3825e+03	Goldilocks	4.5161e-04
Equilibrium Temperature	3783	1.4424e+02	3783	1.4424e+02	Kelvin	4.5161e-04
Stellar Density	10.1274	1.2459e+02	8.2433	1.4825e+02	Solar density	9.7295e-03
Transit Depth	1562	1.3405e+02	1281	1.2443e+02	ppm	1.5334e+00
Transit Duration	0.5483	1.9520e-01	0.6038	2.6915e-01	hours	1.6717e-01
Transit Ingress Duration	0.0221	2.0914e-01	0.0207	2.8989e-01	hours	3.8214e-03
Eccentricity	0.0000	0.0000e+00	0.0000	0.0000e+00		
Peri Longitude	0.0000	0.0000e+00	0.0000	0.0000e+00	degrees	
Model Chi Square Statistic (DoF)	3910.0 (4110.0)		3910.0 (4110.0)			

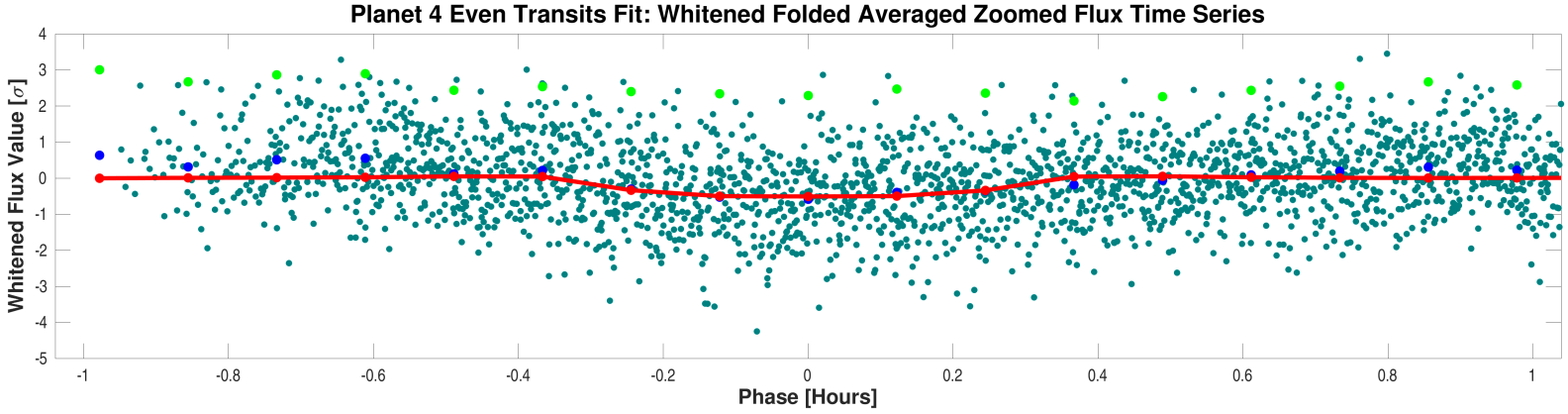
DoF: Degrees of Freedom



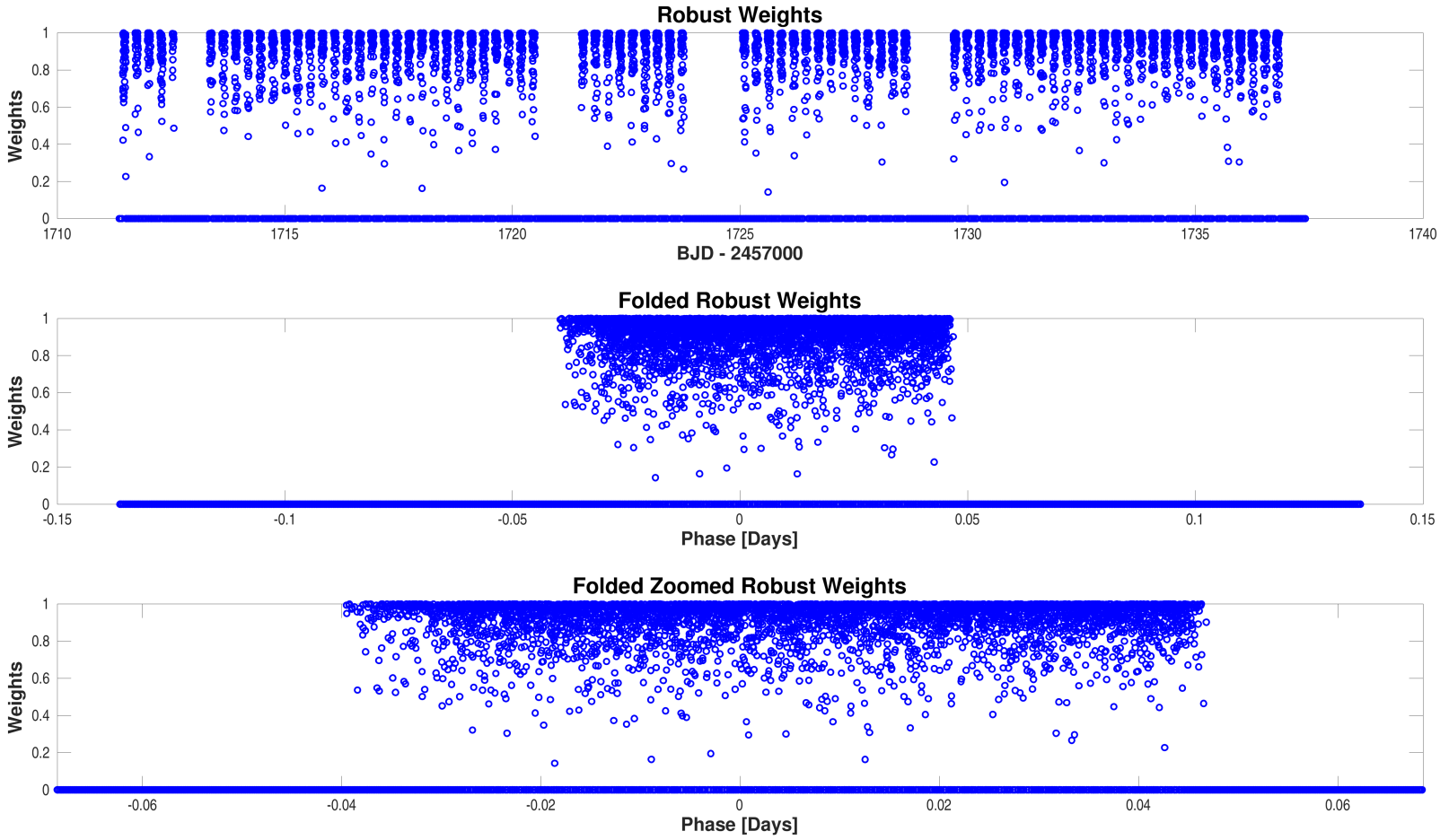


Folded flux time series for CatId 169461816, Planet candidate 4 in the whitened domain is plotted in black dots. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged values of the folded flux time series; the red dots represent the averaged values of the folded model light 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/0000000169461816-04-odd-even-whitened.fig`

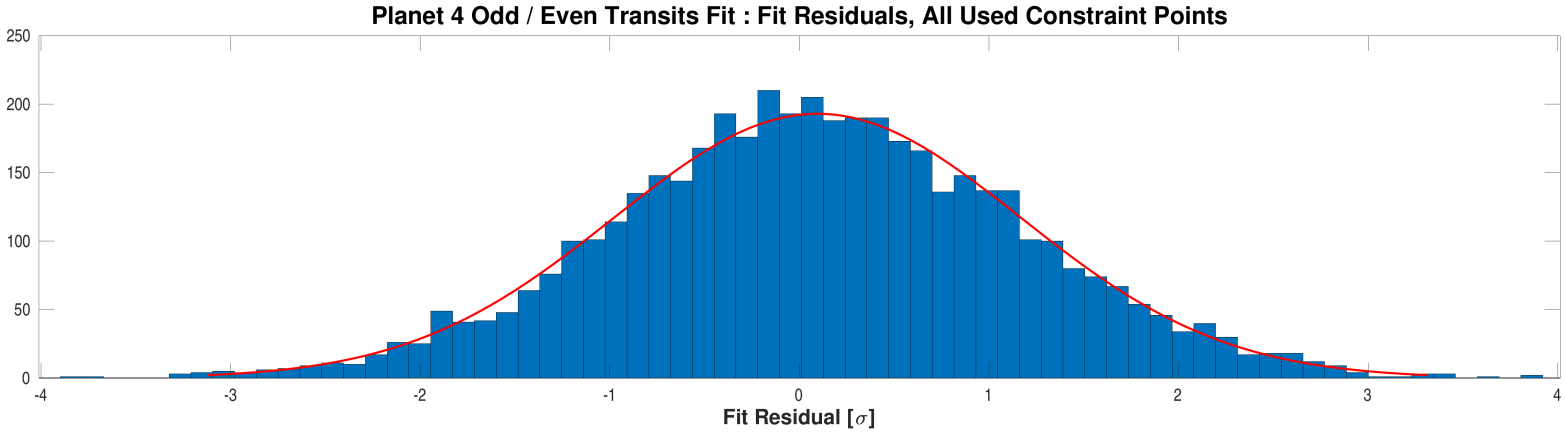




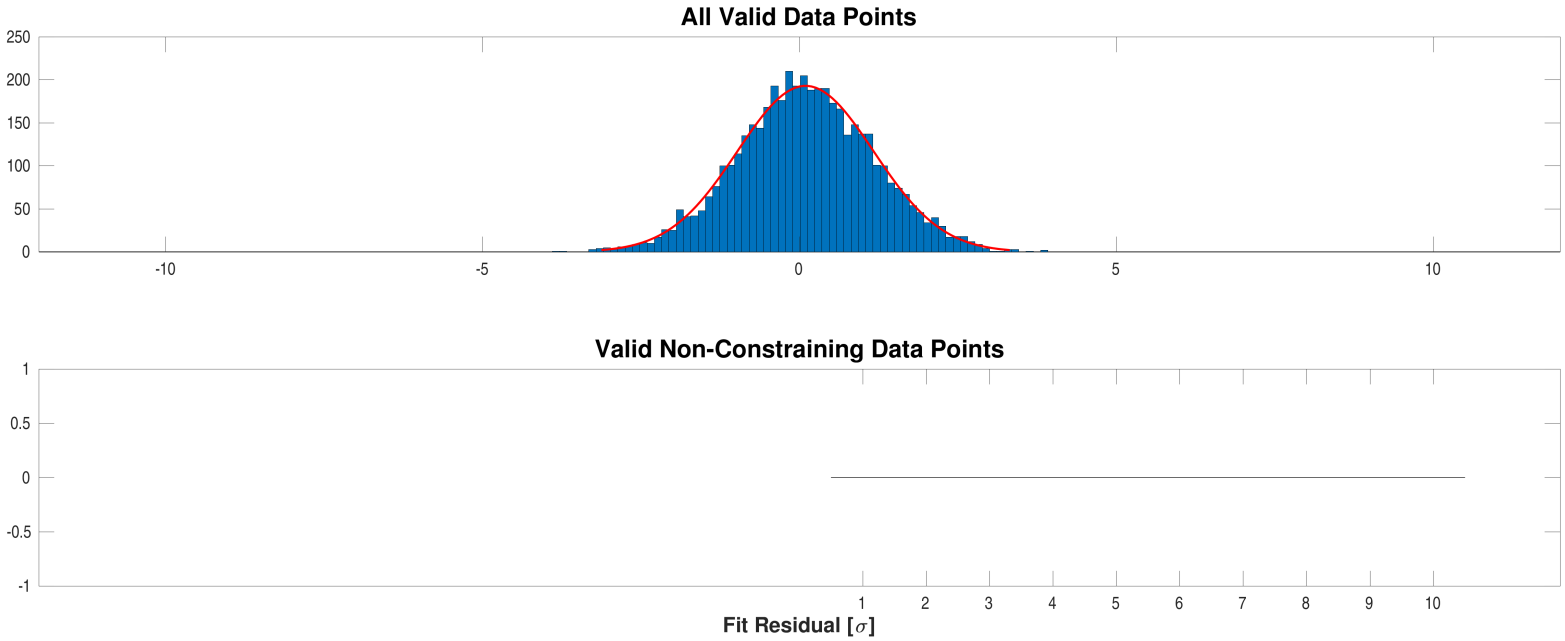
Folded flux time series for CatId 169461816, Planet candidate 4 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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/0000000169461816-04-odd-even-whitened-zoomed.fig`



Robust weights distribution for CatId 169461816, 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/0000000169461816-04-odd-even-robust-weights.fig`

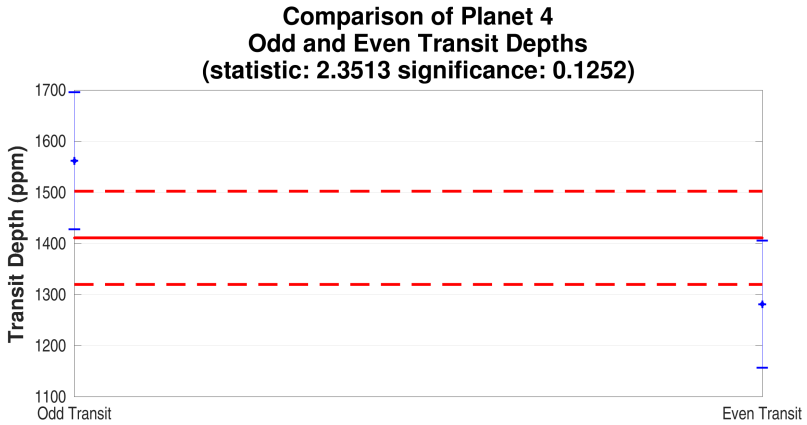


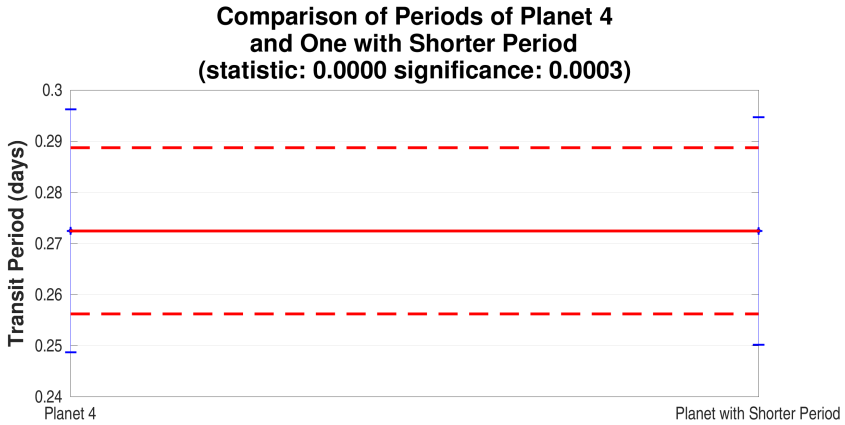
Fit residuals distribution for CatId 169461816, Planet candidate 4. Only the valid data points used to constrain the fit are shown here. A Gaussian fit to the histogram is shown in red.
Open `./planet-04/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000169461816-04-odd-even-histo-used.fig`

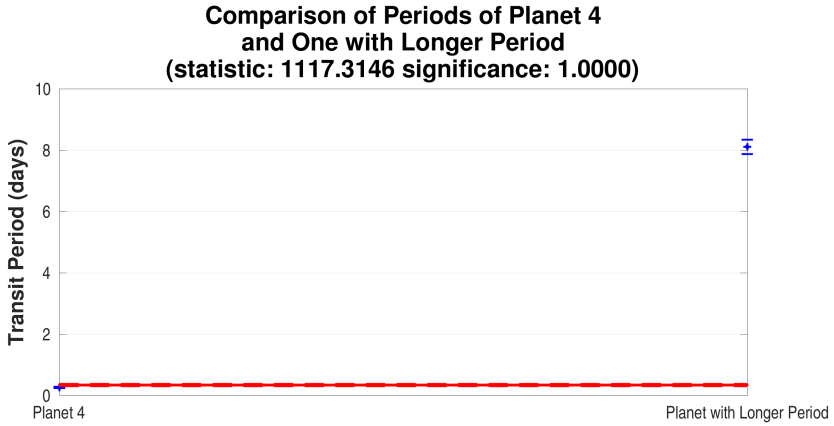


Fit residuals distribution for CatId 169461816, Planet candidate 4. Top plot: all valid data. Bottom plot: valid data not used to constrain fit (due to distance from a transit). Gaussian fits to the histograms are shown in red.
Open `./planet-04/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000169461816-04-odd-even-histo-all-and-unused.fig`

D.3 Eclipsing Binary Discrimination Test







Top-left: Diagnostic plot of Odd/Even Transit Depth Test for catId 169461816, 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 169461816. 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 169461816. 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/0000000169461816-04-eclipsing-binary-discrimination-tests.fig`

Appendix E Alerts

Time	Severity	Message
1748.0618	warning	Additional-planet search algorithm failed, identifier = tps:validateTpsInputStructure:noValidCadences (target=1, catId=169461816, planet=4, component=Multi-planet-search)
1748.0620	warning	Not excluding transits that overlap those of another candidate in S15 (target=1, catId=169461816, planet=1, targetTable=169, component=generateDvDifferenceImages)
1748.0620	warning	Not excluding transits that overlap those of another candidate in S15 (target=1, catId=169461816, planet=2, targetTable=169, component=generateDvDifferenceImages)
1748.0620	warning	Not excluding transits that overlap those of another candidate in S15 (target=1, catId=169461816, planet=3, targetTable=169, component=generateDvDifferenceImages)
1748.0620	warning	Not excluding transits that overlap those of another candidate in S15 (target=1, catId=169461816, planet=4, targetTable=169, component=generateDvDifferenceImages)
1748.0632	warning	Null statistics are empty! Will not proceed with bootstrap (target=1, catId=169461816, planet=1, component=bootstrap)
1748.0632	warning	Null statistics are empty! Will not proceed with bootstrap (target=1, catId=169461816, planet=2, component=bootstrap)
1748.0632	warning	Null statistics are empty! Will not proceed with bootstrap (target=1, catId=169461816, planet=3, component=bootstrap)
1748.0632	warning	Null statistics are empty! Will not proceed with bootstrap (target=1, catId=169461816, planet=4, component=bootstrap)