Data Validation (DV) Report
for TESS ID 268301217
Sectors 34 - 34

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

19-Feb-2021 21:28:20 Z

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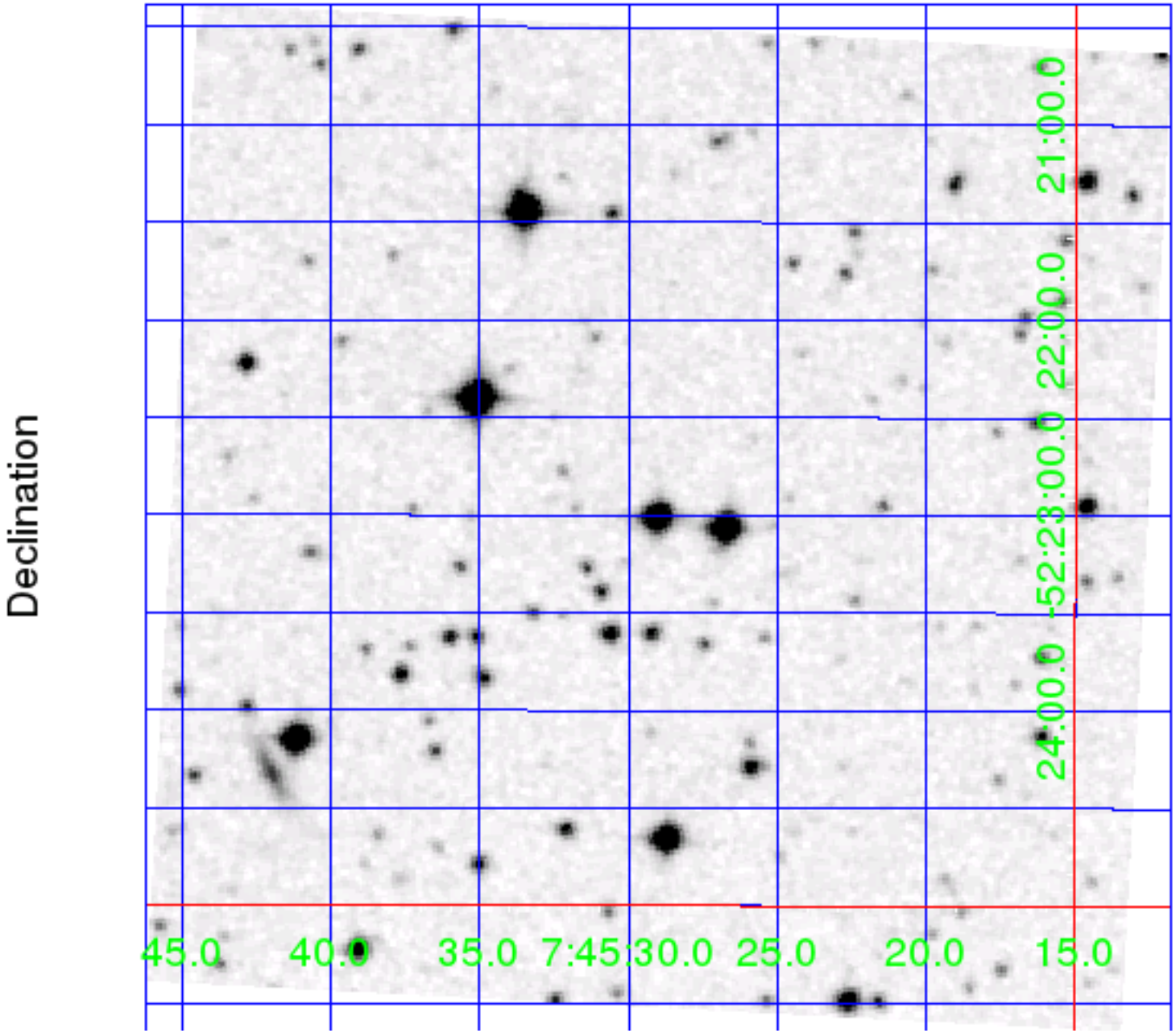
1 Summary

Target Properties	Value	Uncertainty	Units	Provenance
Catalog ID	268301217			
TOI ID	1937			
TESS Name	-			
RA	116.37076139	0	degrees	TIC8.1
Dec	-52.38330736	0	degrees	TIC8.1
Magnitude	12.4933	0.0061		TIC8.1
Radius	1.070	0.055	Solar radii	TIC8.1
Effective Temperature	5707	136	Kelvin	TIC8.1
log(g)	4.388	0.080073	cm/sec^2	TIC8.1
[M/H]	0.000	0	Solar metallicity	Solar
Stellar Density	0.832	0.159	Solar density	TIC8.1-Derived
Limb Darkening Coefficient 1	0.58623			
Limb Darkening Coefficient 2	-0.14244			
Limb Darkening Coefficient 3	0.49684			
Limb Darkening Coefficient 4	-0.26937			
Number of Planet Candidates	1			
TOI Model	csv-file-toi-catalog-02-18-21-edited.csv			
TESS Names Model	-			
External TCE Model	-			
Software Revision	spoc-5.0.23-20210212			
Date Report Generated	19-Feb-2021 21:28:20 Z			

Sector	Target Table	Camera/ CCD	Crowding Metric	Flux Fraction
34	288	3:4	0.6181	0.6844

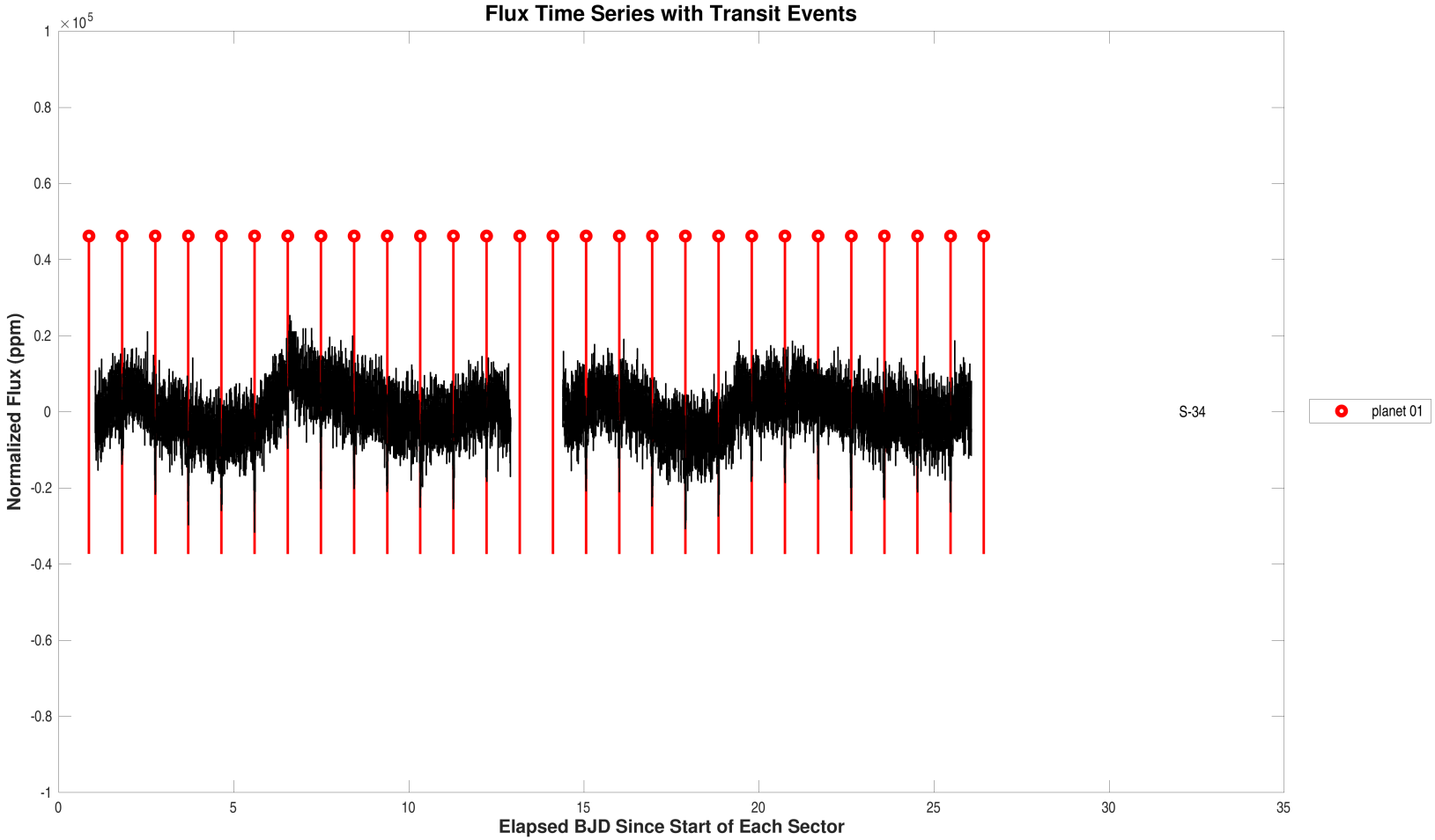
Planet Candidate	TOI ID	TESS Name	TOI Correlation	Period (days)	Period Ratio	Epoch (BTJD)	Semi-major Axis (AU)	Radius (Re)	Seff	Teq (K)	False Alarm	Suspected EB
1	1937.01	-	0.83	0.947	1.00	2228.859	0.02	16.0	3013.8	1890	9.61e-261	false

2 Survey Image

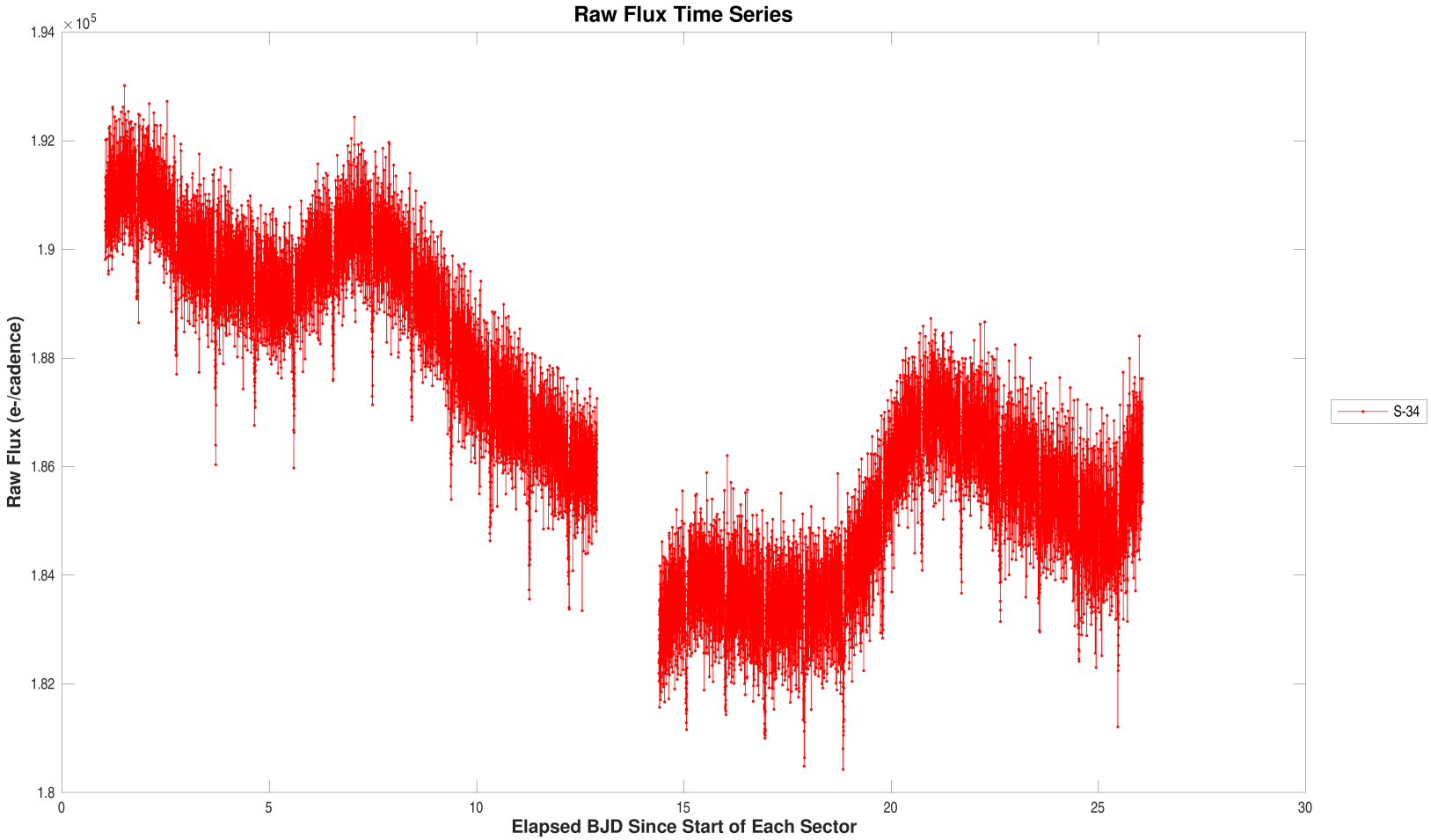


Digitized Sky Survey (DSS) red image. The 5' x 5' image is centered on the J2000 coordinates of target (268301217).

3 Flux Time Series



Summary plot of sector-stitched flux time series and transits for target 268301217, 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 34, target table 288, start BJD is 2459228.
Open `./summary-plots/0000000268301217-00-flux-dv-fit-34-288.fig`



Summary plot of raw flux time series. For the data of sector 34, target table 288, start BJD is 2459228.
Open `./summary-plots/0000000268301217-00-raw-flux-34-288.fig`

4 Dashboards

Planet Candidate 1

<table>
<tr><td rowspan="2">Model Fitter</td><td colspan="2">Stellar Radius
1.1 ± 0.1 Solar units</td><td rowspan="2">Core Aperture Correlation Statistic
Value = 35.82
Significance = 100.00%
Halo Aperture Correlation Statistic
Value = 8.44
Significance = 100.00%
Core/Halo Ratio
Ratio = 4.24</td><td rowspan="2">Ghost Diagnostic Test</td></tr>
<tr><td colspan="2">Period = 0.9 ± 0.0 days
Depth = 16004 ± 515 ppm
Planet Radius = 16.0 ± 1.3 Earth radii
Semi-major Axis = 0.0 ± 0.0 AU
Effective Stellar Flux = 3013.8 ± 479.7
Equilibrium Temperature = 1890 ± 75 Kelvin
Chi-squared/DoF = 0.8
SNR = 55.4</td></tr>
<tr><td rowspan="2">Eclipsing Binary Discrimination Test</td><td colspan="2">Odd-Even Depth Comparison Statistic
Value = 1.08e+01
Significance = 0.10%</td><td>Offsets Relative to Out of Transit Centroid
Source RA Offset = 7.00e+00 ± 2.51e+00 arcsec (2.79 σ)
Source Dec Offset = 2.64e+00 ± 2.52e+00 arcsec (1.05 σ)
Source Offset Distance = 7.48e+00 ± 2.51e+00 arcsec (2.98 σ)
Offsets Relative to TIC Position
Source RA Offset = -6.46e-01 ± 2.51e+00 arcsec (-0.26 σ)
Source Dec Offset = 9.00e-01 ± 2.52e+00 arcsec (0.36 σ)
Source Offset Distance = 1.11e+00 ± 2.51e+00 arcsec (0.44 σ)</td><td>Difference Image Centroid Offsets</td></tr>
<tr><td>Shorter Period Comparison Statistic
Value = N/A
Significance = N/A</td><td>Longer Period Comparison Statistic
Value = N/A
Significance = N/A</td><td>False Alarm = 9.61e-261
Transit Count = 27
Max Multiple Event Statistic = 39.0</td><td>Bootstrap Test</td></tr>
</table>

Summary of model fitter results and validation test results for target 268301217, planet candidate 1. In general, green denotes that the candidate is likely a planet, while red denotes that the candidate is unlikely to be a planet. Cyan denotes that no data is available. The color of the Model Fitter block is: green, when the SNR of the fit is greater than or equal to 10; yellow, if the SNR is greater than or equal to 7.1 but less than 10; red, if the SNR is less than 7.1 or if the fitter failed. The color of the Ghost Diagnostic Test and Eclipsing Binary Discrimination Test blocks are: green, when the significance is within 2-sigma; yellow, when the significance is between 2- and 3-sigma; red when the significance is greater than 3-sigma. The color of the Difference Image Centroid Offsets block is: green, when the max offset distance sigma is less than or equal to 2; yellow, when the max sigma is between 2 and 3; red when the max sigma is greater than 3. The color of the Bootstrap Test block is green whenever the false alarm probability is less than 10^{-12}, low enough to limit the total number of false alarms from a four year mission to less than one. If the false alarm probability is greater than 10^{-12}, the color of the Bootstrap Test block is: green, when the false alarm probability is less than or equal to the CCDF of a Gaussian distribution at the observed maximum multiple event statistic; yellow when the false alarm probability is between 1 and 2 times that of a Gaussian distribution at the max multiple event statistic; and red when the false alarm probability is more than 2 times that of a Gaussian distribution at the max multiple event statistic.

5 Pixel Level Diagnostics

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

5.1 Planet Candidate 1

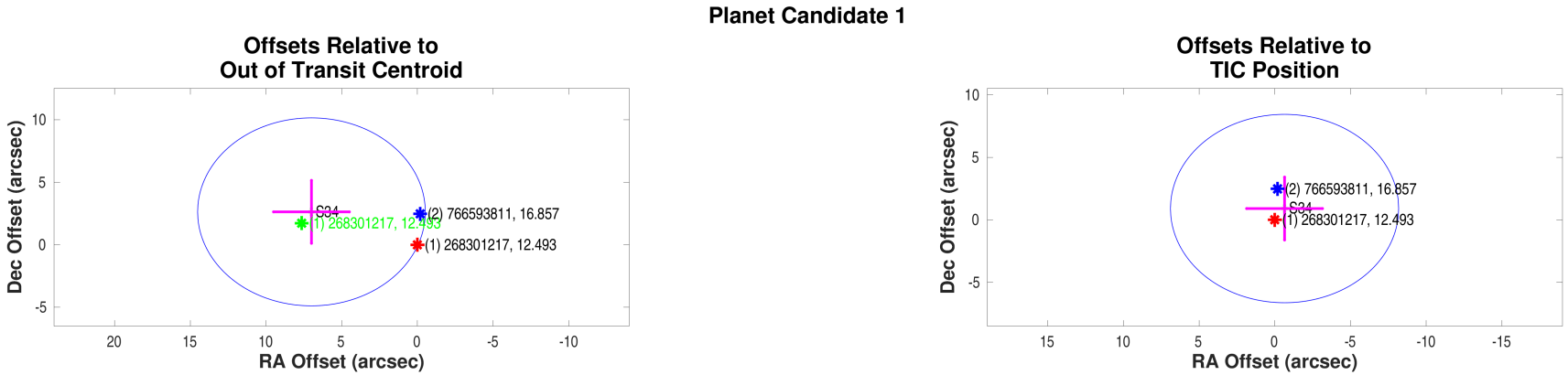
Multi-Sector Average PRF Fit of the Difference Images

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

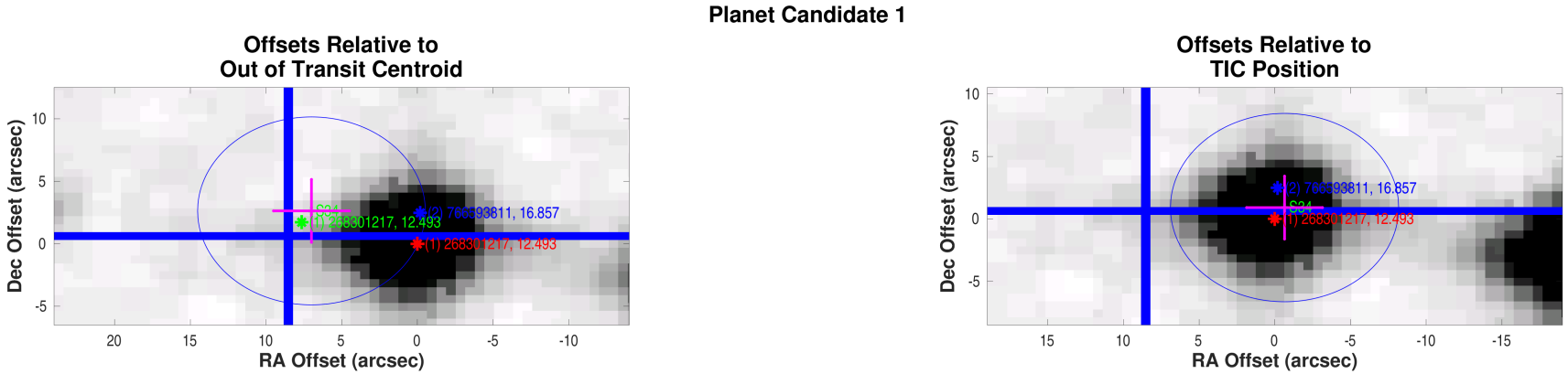
	RA	Dec	Units
Offset	$7.0004 \pm 2.51e+00$	$2.6358 \pm 2.52e+00$	arcseconds
Offset/σ	2.79	1.05	
Offset Distance	$7.4802 \pm 2.51e+00$		arcseconds
Offset Distance/σ	2.98		
3σ Radius	7.5193		arcseconds

Mean offset from the TIC RA and Dec

	RA	Dec	Units
Offset	$-0.6463 \pm 2.51e+00$	$0.9004 \pm 2.52e+00$	arcseconds
Offset/σ	-0.26	0.36	
Offset Distance	$1.1083 \pm 2.51e+00$		arcseconds
Offset Distance/σ	0.44		
3σ Radius	7.5360		arcseconds



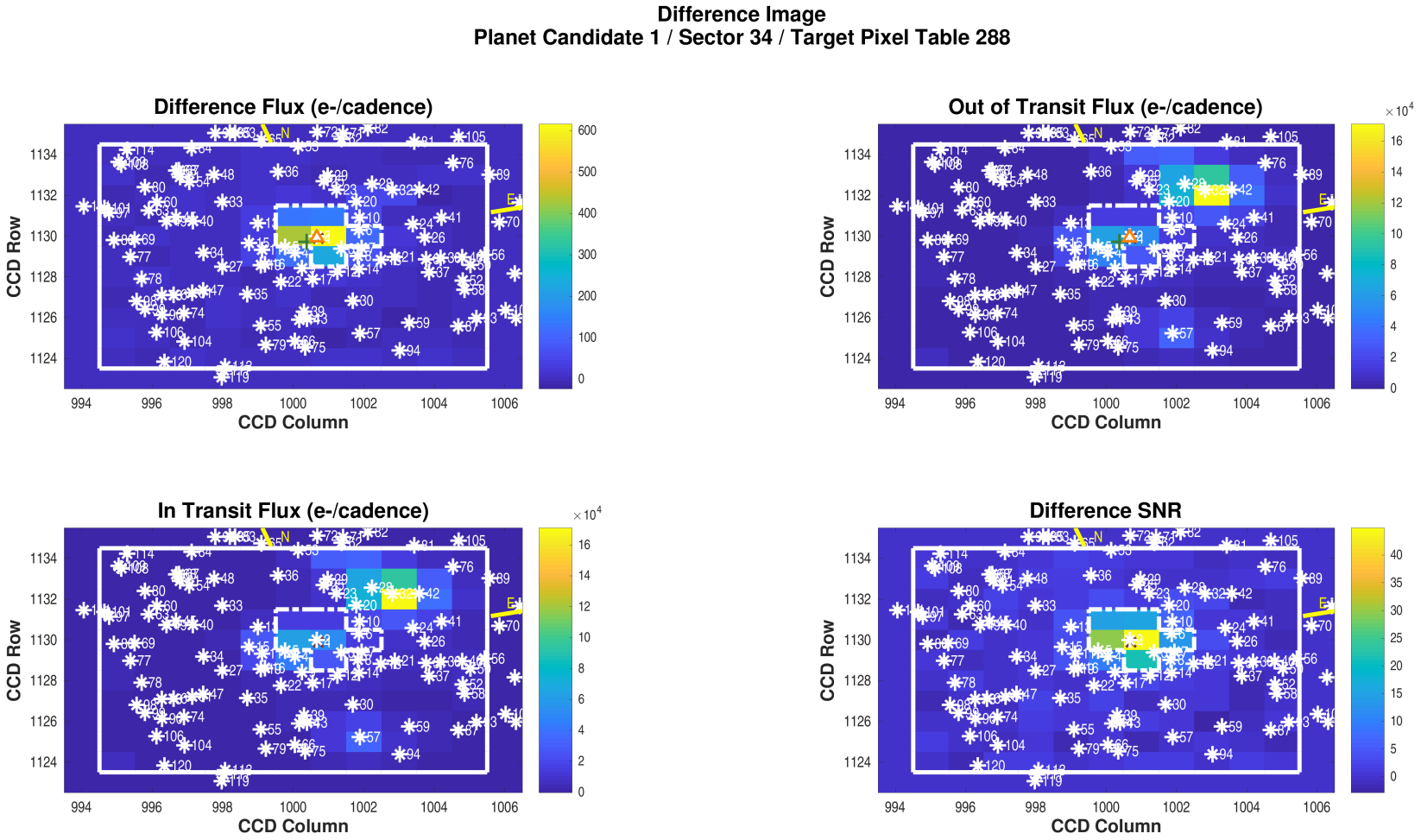
Difference image centroid offsets for target 268301217, planet candidate 1. Left: difference image PRF centroid offsets in RA and Dec with respect to the per sector out-of-transit centroids for the given target. Right: difference image PRF centroid offsets in RA and Dec with respect to the TC coordinates of the given target. Symbol key: green cross: per sector centroid offsets with 1-sigma error bars in RA and Dec; magenta cross: robust weighted mean offset over all sectors with 1-sigma error bars in RA and Dec; blue circle: 3-sigma radius of confusion for weighted mean offset; red asterisk: location of target star (out-of-transit centroid in left panel and TIC position in right panel); green asterisk: TIC location of target star with respect to out-of-transit centroid; blue asterisk: location of other TIC objects in the neighborhood. TIC ID and magnitude are noted in the text associated with each marked object. A constant error term of 2.5000 arcseconds has been added in quadrature to the computed uncertainty in the RA and Dec components of the robust mean offset.
Open `./planet-01/difference-image/0000000268301217-01-difference-image-centroid-offsets.fig`



Difference image centroid offsets for target 268301217, planet candidate 1, diplayed on survey image for given target. Left: difference image PRF centroid offsets in RA and Dec with respect to the per sector out-of-transit centroids for the given target. Right: difference image PRF centroid offsets in RA and Dec with respect to the TIC coordinates of the given target. Symbol key: green cross: per sector centroid offsets with 1-sigma error bars in RA and Dec; magenta cross: robust weighted mean offset over all sectors with 1-sigma error bars in RA and Dec; blue circle: 3-sigma radius of confusion for weighted mean offset; red asterisk: location of target star (out-of-transit centroid in left panel and TIC position in right panel); green asterisk: TIC location of target star with respect to out-of-transit centroid; blue asterisk: location of other TIC objects in the neighborhood. TIC ID and magnitude are noted in the text associated with each marked object. A constant error term of 2.5000 arcseconds has been added in quadrature to the computed uncertainty in the RA and Dec components of the robust mean offset.
Open `./planet-01/difference-image/0000000268301217-01-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	1	1.0000	0.70



Difference image for target 268301217, planet candidate 1, sector 34, target pixel table 288. 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 = 24; number of valid in-transit cadences = 456; number of in-transit cadence gaps = 0; number of valid out-of-transit cadences = 2239; number of out-of-transit cadence gaps = 4. Difference image quality metric = 0.99 (good).
Open `./planet-01/difference-image/0000000268301217-01-difference-image-34-288.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	$1129.71 \pm 4.47e-05$	$1000.37 \pm 4.38e-05$	pixels	$116.36722700 \pm 5.93e-07$	$-52.38372328 \pm 5.72e-07$	degrees
Difference Image Centroid	$1129.92 \pm 1.38e-02$	$1000.66 \pm 1.24e-02$	pixels	$116.37041286 \pm 7.23e-05$	$-52.38299113 \pm 7.76e-05$	degrees
Offset	$0.2093 \pm 1.38e-02$	$0.2913 \pm 1.24e-02$	pixels	$7.0004 \pm 1.60e-01$	$2.6358 \pm 2.80e-01$	arcseconds
Offset/σ	15.17	23.50		43.74	9.43	
Offset Distance	$0.3587 \pm 1.30e-02$		pixels	$7.4802 \pm 1.86e-01$		arcseconds
Offset Distance/σ	27.56			40.12		

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

	Row	Column	Units	RA	Dec	Units
TIC Reference Centroid	$1129.89 \pm 8.99e-05$	$1000.71 \pm 9.36e-05$	pixels	$116.37070697 \pm 0.00e+00$	$-52.38324124 \pm 0.00e+00$	degrees
Difference Image Centroid	$1129.92 \pm 1.38e-02$	$1000.66 \pm 1.24e-02$	pixels	$116.37041286 \pm 7.23e-05$	$-52.38299113 \pm 7.76e-05$	degrees
Offset	$0.0342 \pm 1.38e-02$	$-0.0420 \pm 1.24e-02$	pixels	$-0.6463 \pm 1.59e-01$	$0.9004 \pm 2.80e-01$	arcseconds
Offset/σ	2.48	−3.39		−4.07	3.22	
Offset Distance	$0.0542 \pm 1.28e-02$		pixels	$1.1083 \pm 2.37e-01$		arcseconds
Offset Distance/σ	4.22			4.67		

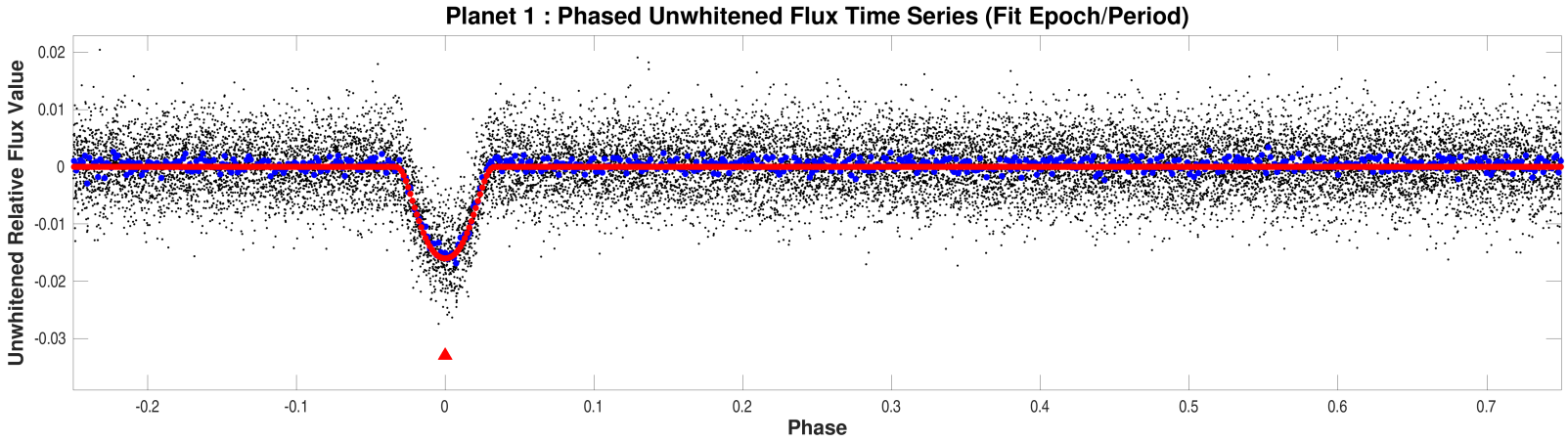
5.2 Difference Image TIC Key

Index	Catalog ID	Mag	RA (degrees)	Dec (degrees)	Distance (arcsec)
1	268301217	12.493	116.37070697	-52.38324124	0.00
2	766593811	16.857	116.37062476	-52.38255343	2.48
3	268301209	18.373	116.37532103	-52.38699340	16.89
4	766593823	19.871	116.36287140	-52.38616830	20.19
5	268301215	12.354	116.36111165	-52.38416254	21.34
6	766593849	19.036	116.38225335	-52.38261173	25.47
7	268301202	17.269	116.38070808	-52.38761933	27.04
8	268301198	16.508	116.37869406	-52.38963490	28.94
9	766593809	18.523	116.36275871	-52.39067294	31.95
10	766593852	18.385	116.38395718	-52.37932977	32.34
11	766593824	19.713	116.35478981	-52.38399351	35.08
12	268301181	15.937	116.37147075	-52.39303202	35.29
13	766593821	20.436	116.35704877	-52.37663777	38.29
14	268301179	15.097	116.37732502	-52.39323974	38.82
15	766593820	18.912	116.35225092	-52.38163877	40.96
16	766593822	20.039	116.35367589	-52.38805845	41.25
17	268301172	17.372	116.36411060	-52.39407836	41.62
18	268301185	18.411	116.38415895	-52.39168104	42.39
19	766593819	20.048	116.35252251	-52.38810610	43.63
20	766593850	19.428	116.38520198	-52.37480227	44.02
21	268301190	17.299	116.38814033	-52.39141516	48.30
22	268301174	17.720	116.35562596	-52.39346930	49.54
23	766593856	19.232	116.38152485	-52.37080650	50.68
24	766593831	19.224	116.39687876	-52.38326549	57.51
25	766593857	18.184	116.37934640	-52.36795754	58.20
26	268301204	17.118	116.39826531	-52.38738473	62.37
27	766593814	19.477	116.34242055	-52.38694573	63.57
28	766593851	18.917	116.39145433	-52.37067991	64.21
29	766593858	19.534	116.38104089	-52.36654700	64.25
30	766593778	19.116	116.37175459	-52.40156435	66.00
31	268301178	15.518	116.39594115	-52.39330998	66.25
32	268301234	10.943	116.39594260	-52.37312839	66.33
33	766595151	19.131	116.35056877	-52.36934790	66.78
34	268293433	17.629	116.33927210	-52.38236304	69.15
35	766593818	19.187	116.34534143	-52.39544155	70.96
36	766595197	20.141	116.36872543	-52.36351561	71.15
37	268301164	16.247	116.39505311	-52.39698152	72.86
38	268301176	16.143	116.39982439	-52.39354037	73.95

Index	Catalog ID	Mag	RA (degrees)	Dec (degrees)	Distance (arcsec)
39	766593805	18.242	116.35779157	-52.40248271	74.86
40	766595150	19.256	116.34056296	-52.37336079	75.18
41	766593833	18.326	116.40511047	-52.38266940	75.62
42	766593854	18.893	116.40288533	-52.37418944	77.86
43	268301147	15.581	116.35768952	-52.40454208	81.84
44	766593806	19.000	116.35555782	-52.40449816	83.45
45	766595149	19.129	116.33669694	-52.37159544	85.69
46	766593832	18.243	116.40544690	-52.39428552	86.07
47	766593813	19.916	116.33447598	-52.39252941	86.35
48	268301264	17.418	116.35187520	-52.36165119	88.05
49	766595147	19.433	116.33375906	-52.37233383	90.18
50	268301166	15.888	116.40666032	-52.39665803	92.60
51	766593812	19.415	116.33130954	-52.39277375	93.12
52	268301157	17.772	116.40265091	-52.40059477	93.97
53	268301268	16.747	116.37715240	-52.35743189	93.99
54	268293373	17.246	116.34460382	-52.36252999	94.07
55	766593804	19.628	116.34489075	-52.40451036	95.29
56	766593825	17.990	116.41153302	-52.39452652	98.48
57	268301125	12.794	116.36951178	-52.41066561	98.76
58	268301149	16.731	116.40198358	-52.40317438	99.36
59	268301129	16.020	116.38357806	-52.40985454	99.90
60	766595155	19.386	116.33367530	-52.36671203	100.81
61	766595160	19.319	116.34280486	-52.36089678	101.14
62	268301270	11.948	116.38925473	-52.35722627	102.14
63	766595152	19.219	116.33050657	-52.36864410	102.78
64	766593802	18.968	116.32627667	-52.39256768	103.24
65	766595194	19.070	116.36854818	-52.35408412	105.07
66	766593807	19.332	116.35172635	-52.41008612	105.26
67	268293358	17.617	116.34333405	-52.35902461	105.92
68	766595159	19.851	116.34264020	-52.35897781	106.93
69	268293412	17.510	116.32324173	-52.37590853	107.59
70	268301211	17.613	116.41946683	-52.38625306	107.69
71	268301272	16.929	116.39036244	-52.35577312	107.91
72	766595198	18.590	116.38388468	-52.35433270	108.02
73	766595133	20.244	116.32313501	-52.39216667	109.36
74	766593803	20.270	116.32664941	-52.39794521	110.34
75	766593776	18.931	116.35358699	-52.41226596	111.05
76	766593853	18.127	116.41496399	-52.36833395	111.07

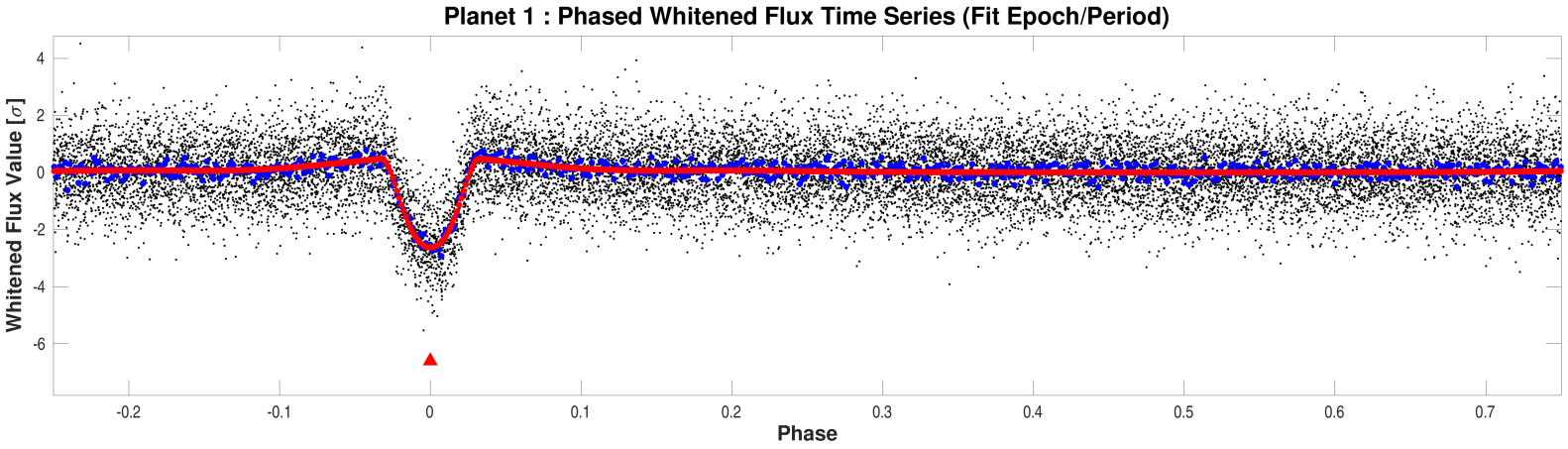
RA, Dec and Distances are corrected for proper motion. This table may not contain all of the objects shown.

6 Phased Light Curves

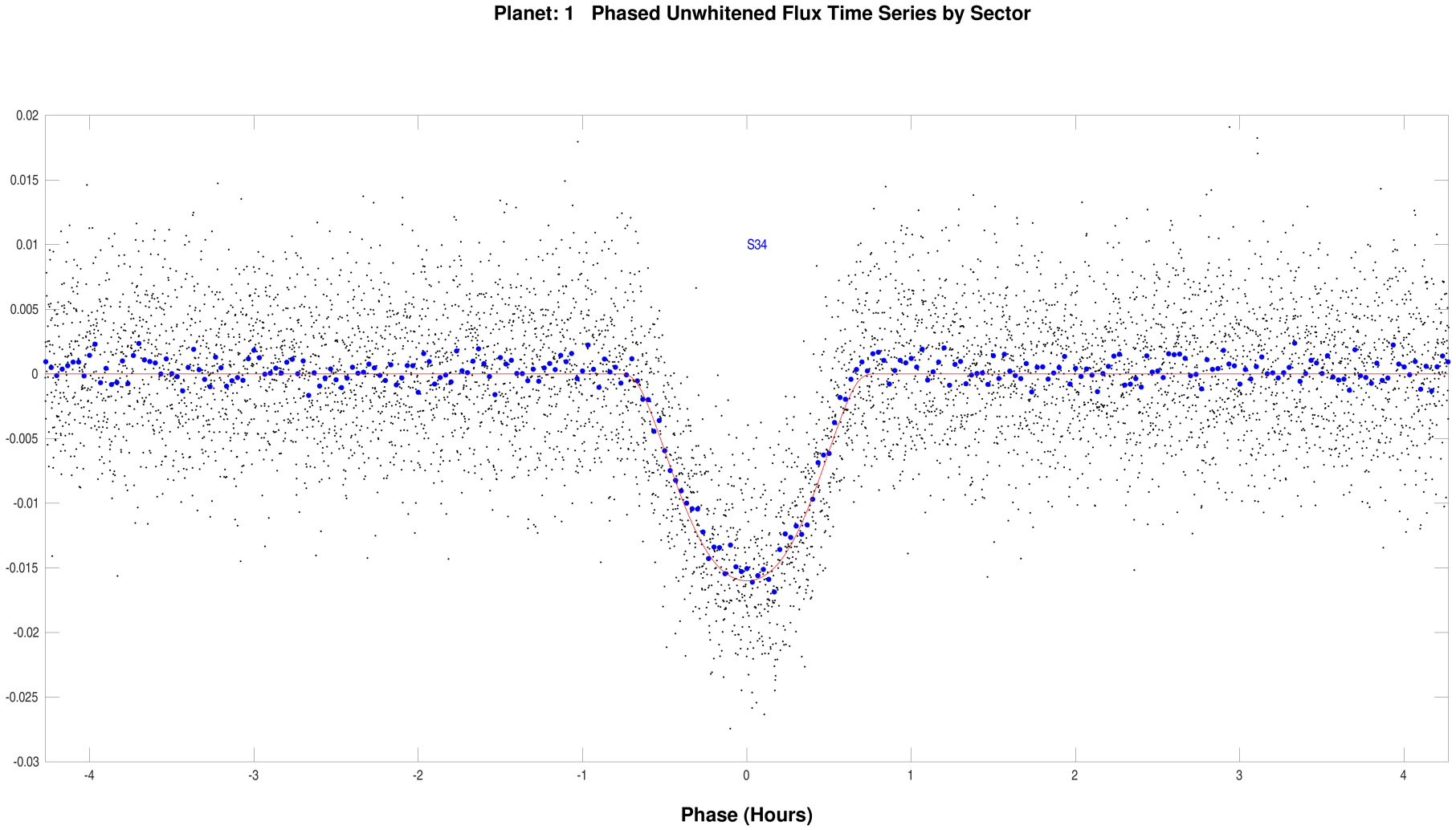


Phased unwhitened flux time series is plotted in black dots. When all transits fit completed with full or secondary convergence, the phase is determined with the fitted epoch and period; otherwise, the phase is determined with the TPS epoch and period. The values of the phased unwhitened flux time series 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/0000000268301217-01-phased-unwhitened-flux-time-series.fig`



Phased whitened flux time series is plotted in black dots. When all transits fit completed with full or secondary convergence, the phase is determined with the fitted epoch and period; otherwise, the phase is determined with the TPS epoch and period. The values of the phased whitened flux time series averaged in one cadence wide bins are plotted in bigger blue dots. When all transits fit completes with full or secondary convergence, the averaged values of the phased whitened fitted model light curve are plotted in red dots. Transit event markers in different colors indicate the locations of the transits of all planet candidates. The transits of the same planet candidate are labeled with the markers of the same color, for example, blue markers for transits of plane candidate #1, red markers for transits of planet candidate #2, etc.
Open `./summary-plots/0000000268301217-01-phased-whitened-flux-time-series.fig`



Phased unwhitened flux time series by sector in year 3 for target 268301217, planet candidate 1. Period = 0.94669 days; transit epoch = 2228.8595 BTJD.
Open `./summary-plots/0000000268301217-01-phased-unwhitened-flux-time-series-by-sector-03.fig`

7 Planet Candidate 1

7.1 Model Fitter: All Transits

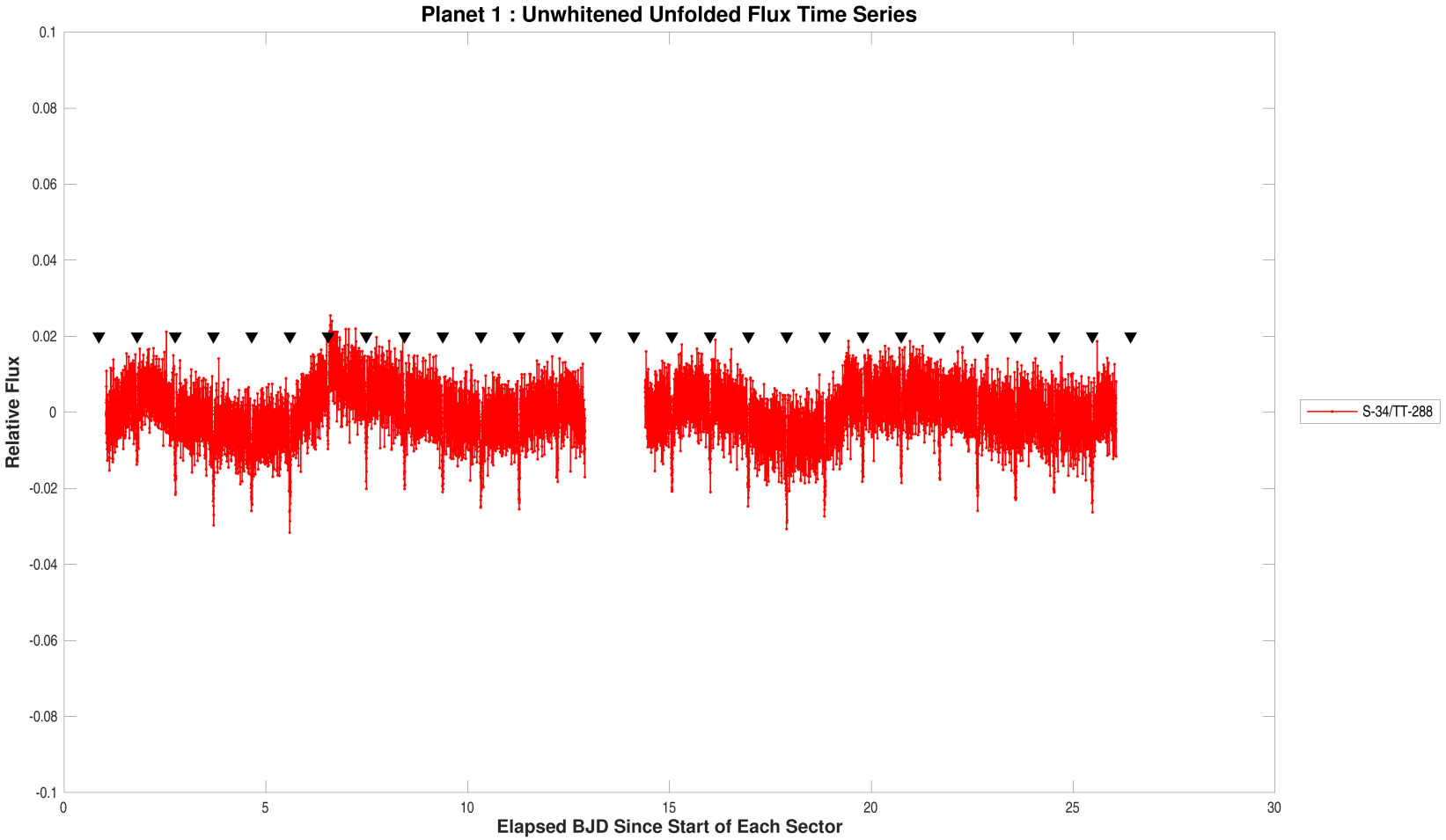
Model Characteristic	Name
Transit Model	mandel-agol_geometric_transit_model
Limb Darkening Model	claret_tess_nonlinear_limb_darkening_model

TCE Parameter	Value	Units
Trial Transit Pulse Duration	1.0	hours
Transit Epoch	2228.8557689	TJD
Orbital Period	0.9468400	days
Maximum SES	10.0	
Maximum MES	39.0	
Robust Statistic	51.1	
Chi Square Goodness of Fit Statistic (DoF)	704.4 (689)	
Chi Square2 Statistic (DoF)	36.4 (259.0)	
Threshold for Desired PFA		

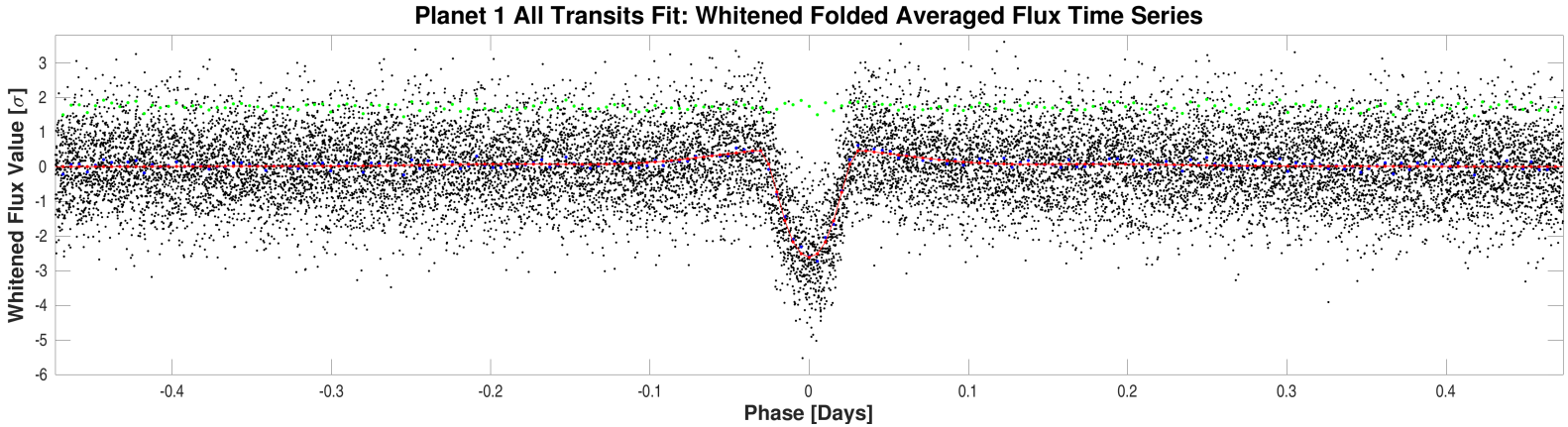
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	55.4		
Orbital Period	0.9466919	3.4952e-05	days
Transit Epoch	2228.8594772	5.3058e-04	BTJD
Impact Parameter	0.8790	2.5080e-02	
Planet Radius to Star Radius Ratio	0.1367953	8.3757e-03	
Semi-major Axis to Star Radius Ratio	3.7904	1.5464e-01	
Planet Radius	15.9815	1.2744e+00	Earth radii
Semi-major Axis	0.0190	1.3353e-03	AU
Effective Stellar Flux	3013.7534	4.7974e+02	Goldilocks
Equilibrium Temperature	1890	7.5203e+01	Kelvin
Stellar Density	0.8163	9.9907e-02	Solar density
Transit Depth	16004	5.1459e+02	ppm
Transit Duration	1.4233	3.3378e-02	hours
Transit Ingress Duration	0.7116	1.6689e-02	hours
Eccentricity	0.0000	0.0000e+00	
Peri Longitude	0.0000	0.0000e+00	degrees
Model Chi Square Statistic (DoF)	4286.6 (5248.1)		
Model Chi Square Goodness of Fit Statistic (DoF)	650.0 (1103)		
Model Chi Square2 Statistic (DoF)	25.1 (23)		

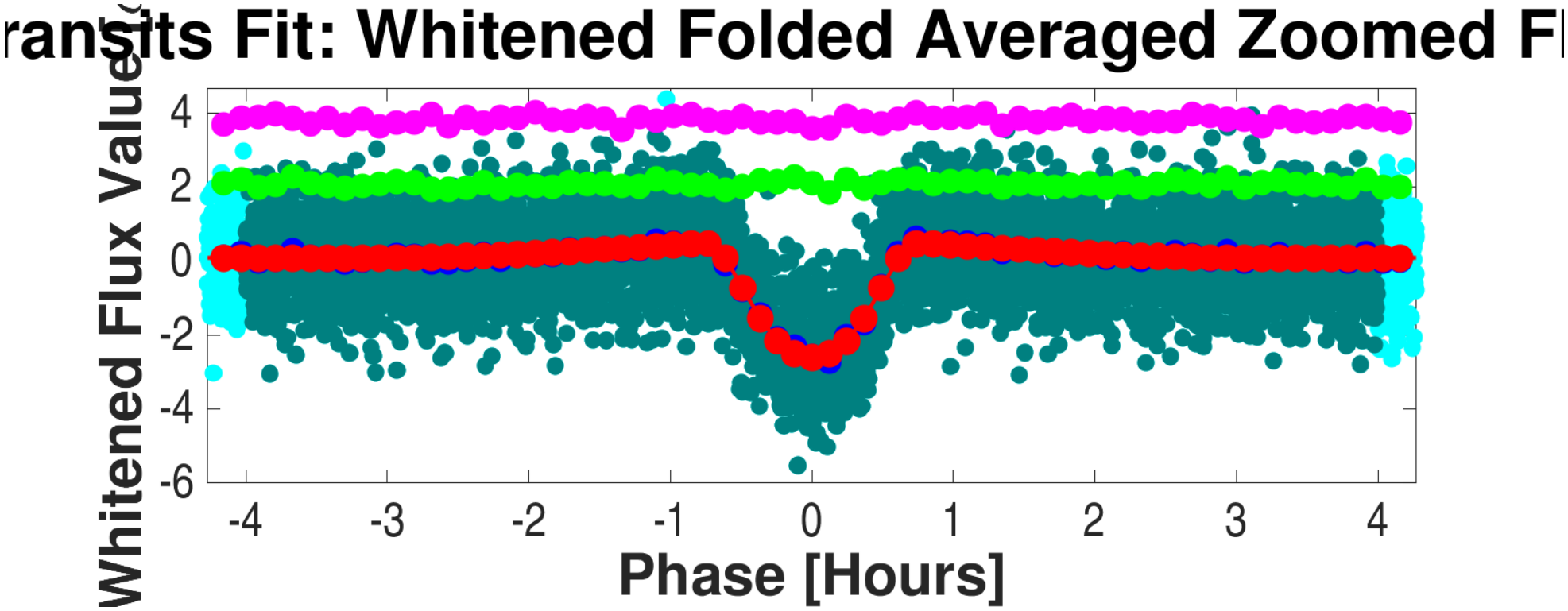
DoF: Degrees of Freedom



Flux time series for CatId 268301217, Planet candidate 1 in the unwhitened domain. For the data of Sector-34/TargetTableId-288, start BJD is 2459228. 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/0000000268301217-01-all-unwhitened-34-288.fig`



Folded flux time series for CatId 268301217, 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/0000000268301217-01-all-whitened.fig`



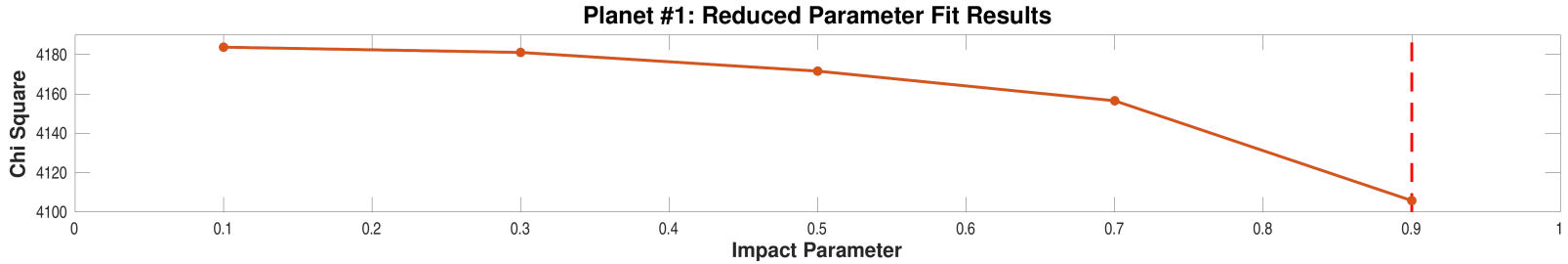
Folded flux time series for CatId 268301217, Planet candidate 1 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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/0000000268301217-01-all-whitened-zoomed.fig`

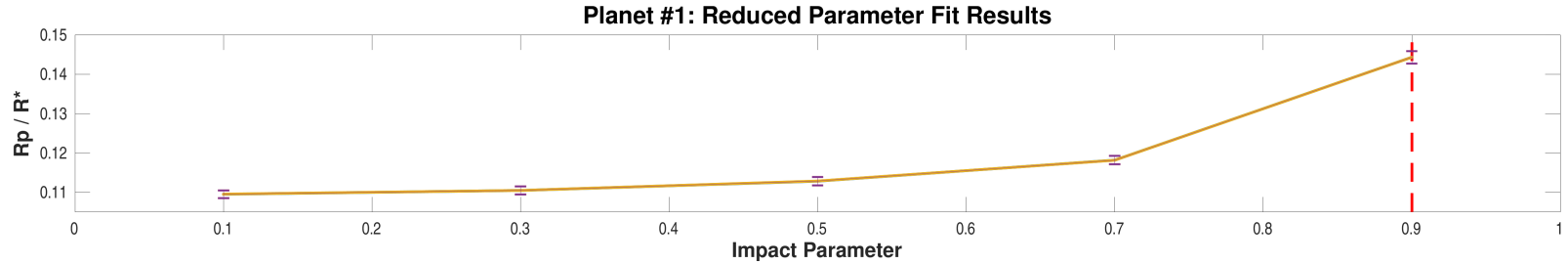
7.2 Model Fitter: Reduced Parameter Fit Results

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	56.0	4183.8	0.1095296	1.0065e-03	7.0353	7.1023e-02	14028	2.5622e+02	1.1409	1.1479e-02
0.30	56.2	4181.1	0.1104975	1.0133e-03	6.7542	6.8902e-02	14059	2.5619e+02	1.1510	1.1716e-02
0.50	56.4	4171.6	0.1128496	1.0338e-03	6.1559	6.4857e-02	14149	2.5737e+02	1.1772	1.2416e-02
0.70	57.1	4156.5	0.1181889	1.0838e-03	5.1412	5.9509e-02	14431	2.6207e+02	1.2444	1.4536e-02
0.90	57.6	4105.8	0.1443337	1.5796e-03	3.6838	5.8903e-02	16073	2.9286e+02	1.4404	2.3118e-02

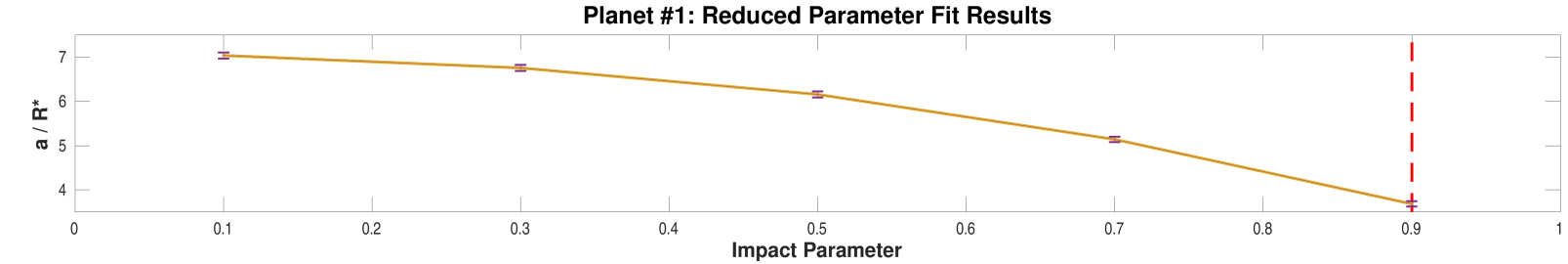
Highlighted row is the best reduced-parameter model fit.



Model chi squares of reduced parameter fits vs. impact parameter for CatId 268301217, 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/0000000268301217-01-reduced-fits-chi-square.fig`



Ratios of planet radius to star radius of reduced parameter fits vs. impact parameter for CatId 268301217, 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/0000000268301217-01-reduced-fits-rp-over-rstar.fig`



Ratios of semimajor axis to star radius of reduced parameter fits vs. impact parameter for CatId 268301217, 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/0000000268301217-01-reduced-fits-a-over-rstar.fig`

7.3 Model Fitter: Trapezoidal Fit Results

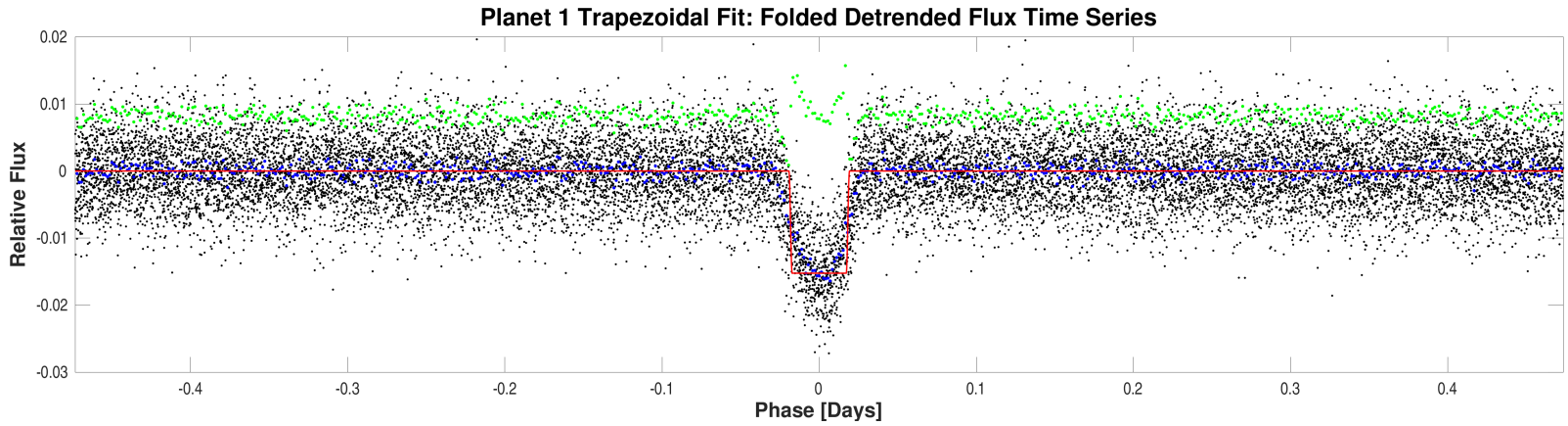
Model Characteristic	Name
Transit Model	trapezoidal_model
Limb Darkening Model	

TCE Parameter	Value	Units
Trial Transit Pulse Duration	1.0	hours
Transit Epoch	2228.8557689	TJD
Orbital Period	0.9468400	days
Maximum SES	10.0	
Maximum MES	39.0	
Robust Statistic	51.1	
Chi Square Goodness of Fit Statistic (DoF)	704.4 (689)	
Chi Square2 Statistic (DoF)	36.4 (259.0)	
Threshold for Desired PFA		

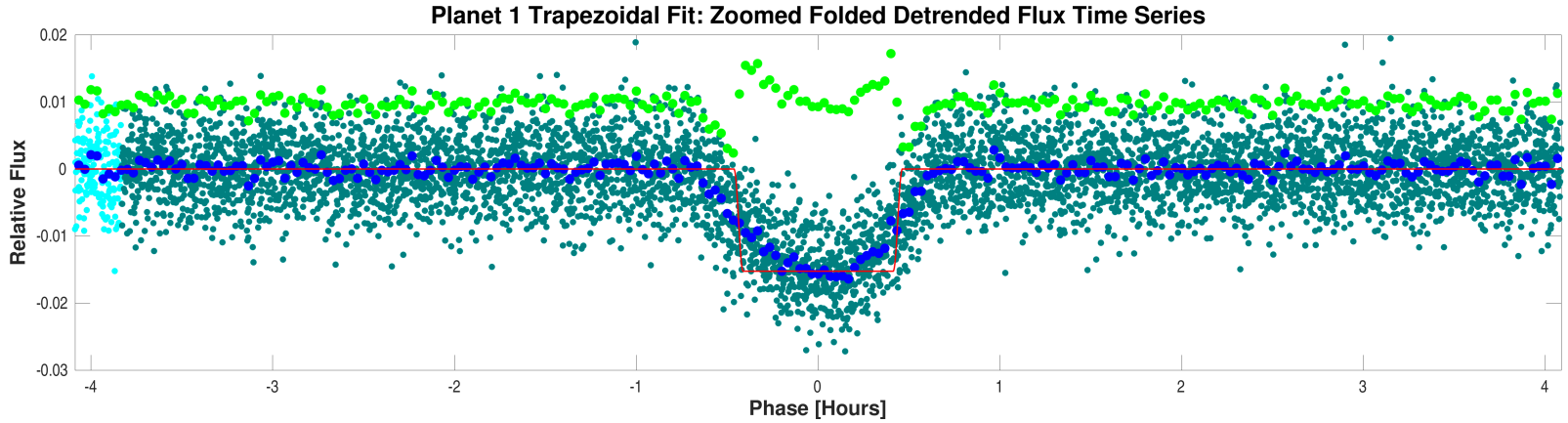
DoF: Degrees of Freedom

Parameter	Value	Uncertainty	Units
SNR	65.6		
Orbital Period	0.9468400		days
Transit Epoch	2228.8572667		BTJD
Transit Depth	15245		ppm
Transit Duration	1.3625		hours
Transit Ingress Duration	0.4864		hours
Model Chi Square Statistic (DoF)	17028.9 (5746)		

DoF: Degrees of Freedom



Folded detrended flux time series for CatId 268301217, Planet candidate 1 and folded trapezoidal model light curve.
Open `./planet-01/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000268301217-01-all-trapezoidal.fig`



Zoomed folded detrended flux time series for CatId 268301217, Planet candidate 1 and folded trapezoidal model light curve.
Open `./planet-01/planet-search-and-model-fitting-results/trapezoidal-model-fit/0000000268301217-01-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	0.94684		days		
Transit Duration	1		hours		
Maximum MES	39.0				
Secondary Phase	0.475		days		
Secondary MES	2.8				
Minimum Phase	0.5125		days		
Minimum MES	-2.3				
Median MES	-0.1				
MAD MES	0.54652				
Robust Statistic	1.8				
Secondary Depth	509.9	2.5720e+02	ppm		
Geometric Albedo	0.4	2.1202e-01		-2.8457	99.78
Planet Effective Temperature	2319	3.0593e+02	Kelvin	1.3616	8.67

7.4.2 Eclipsing Binary Discrimination Test

Result	Value	Value in Sigmas	Significance (%)
Odd Even Transit Depth Comparison Statistic	1.0832e+01	3.2912	0.10

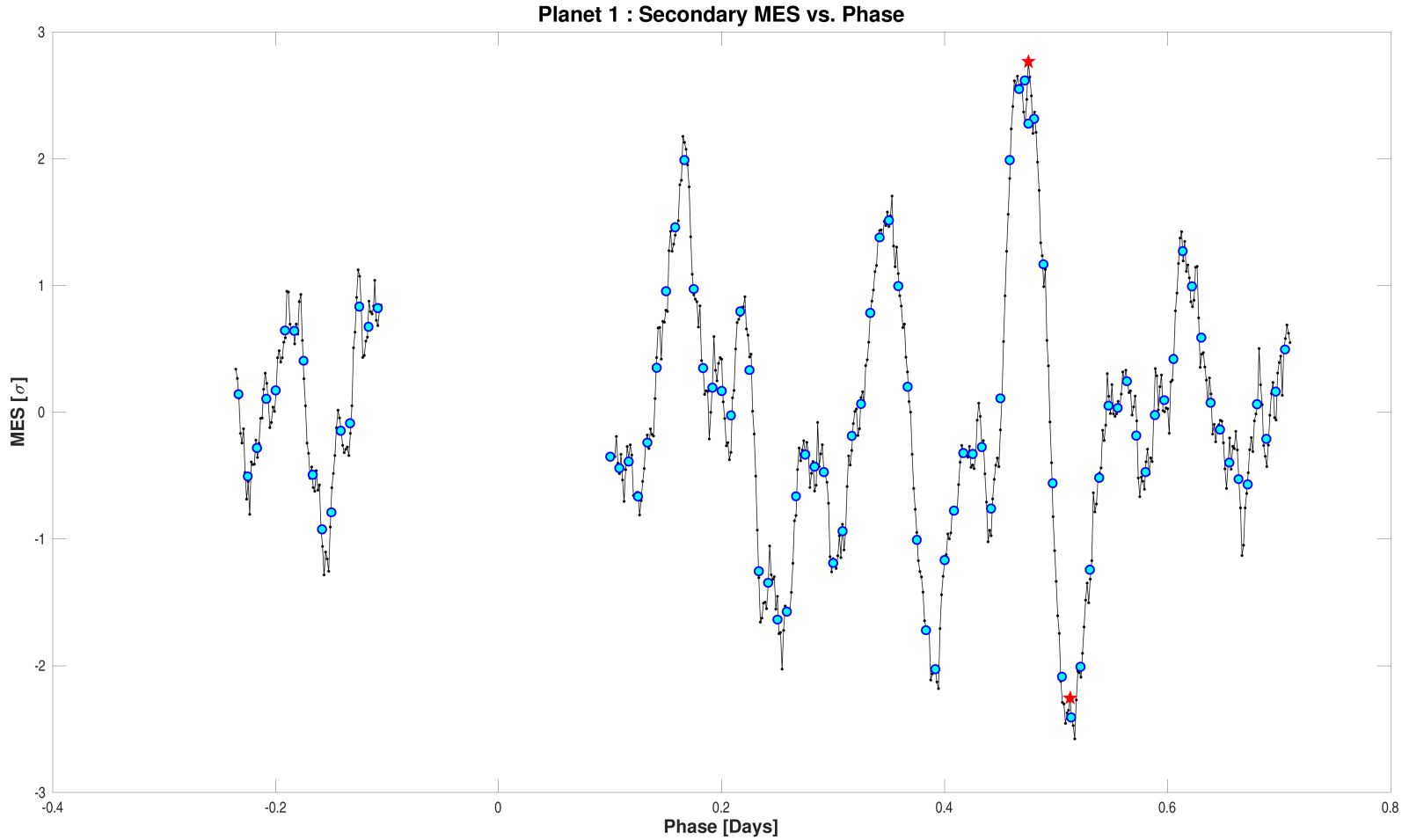
7.4.3 Bootstrap Test

Result	Value
False Alarm Probability	9.6123e-261
Bootstrap Threshold for Desired PFA	7.7
MES Mean	-0.44
MES Standard Deviation	1.15
Transit Count	27

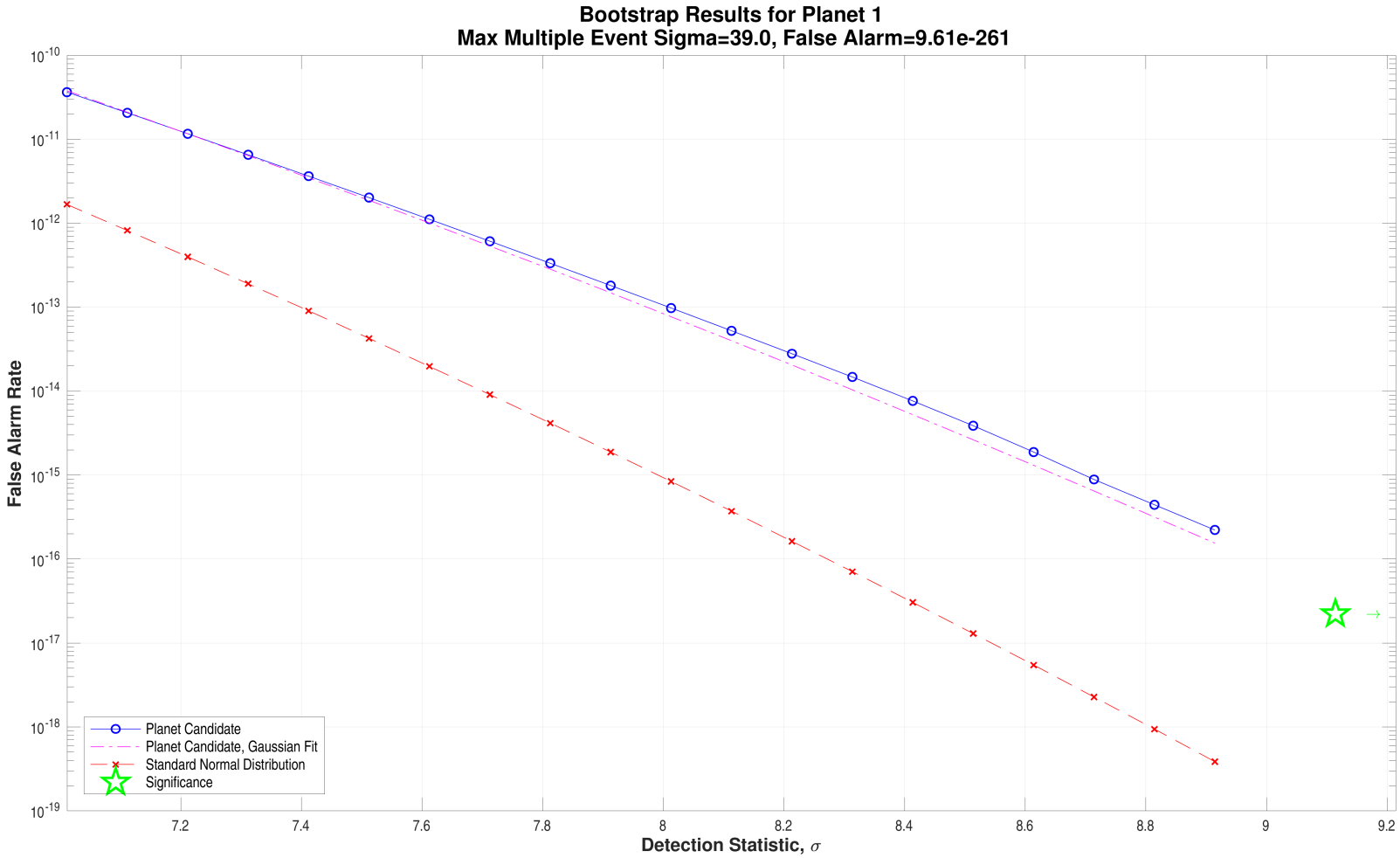
7.4.4 Ghost Diagnostic Test

Result	Value	Significance (%)
Maximum MES	39.0	
SNR	55.4	
Core Aperture Statistic	3.5818e+01	100.00
Halo Aperture Statistic	8.4392e+00	100.00
Ratio of Core/Halo Aperture Statistics	4.2443e+00	

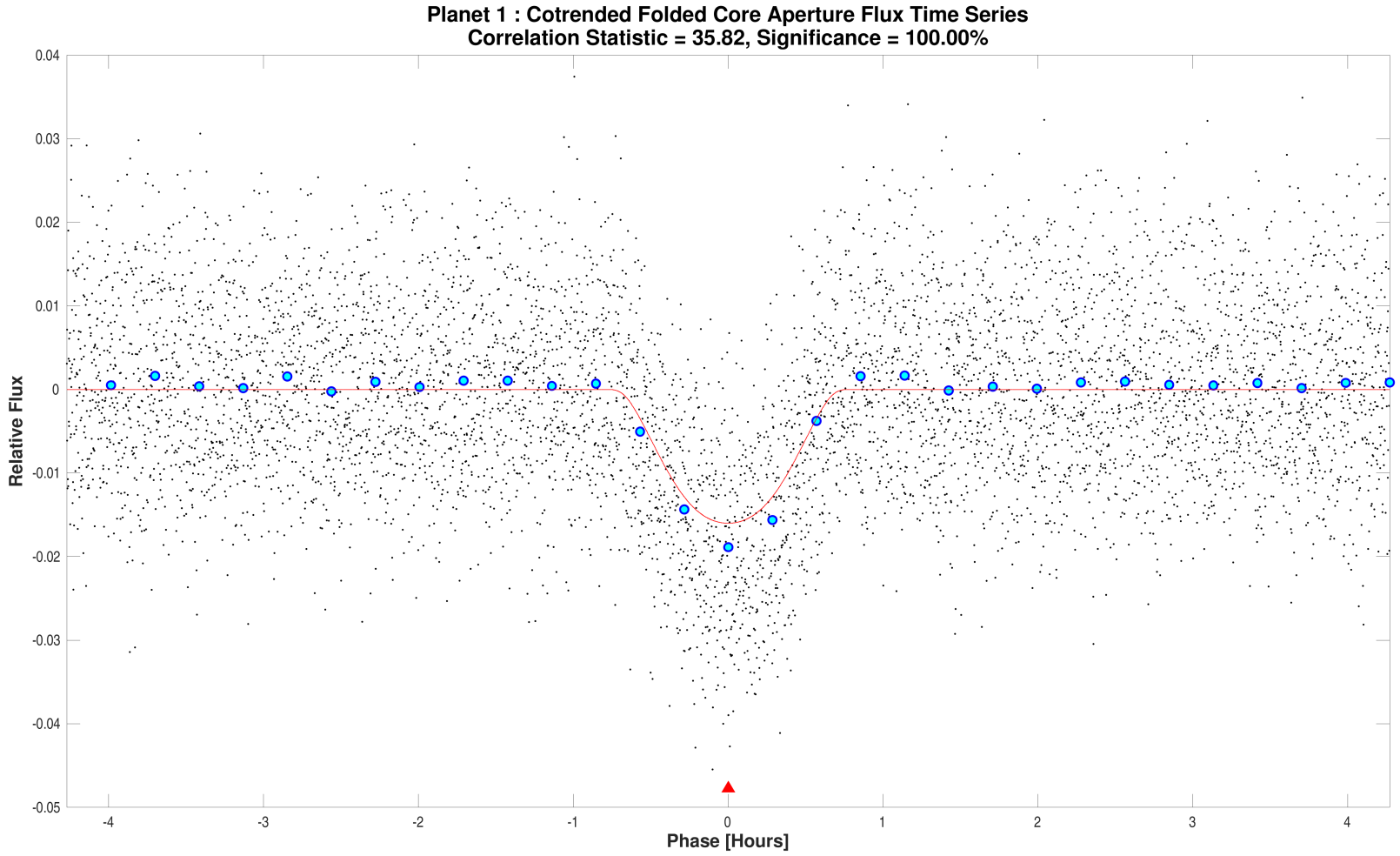
7.4.5 Validation Test Figures



The primary event has been set to zero and both the max and min of the resulting MES vs. Phase are marked with a red star. The best matched pulse duration in hours is 1. The maximum secondary MES and corresponding phase are 2.7664 and 0.475 days respectively. The minimum secondary MES and corresponding phase are -2.2553 and 0.5125 days respectively.
Open `./planet-01/report-summary/0000000268301217-01-weak-secondary-diagnostic.fig`

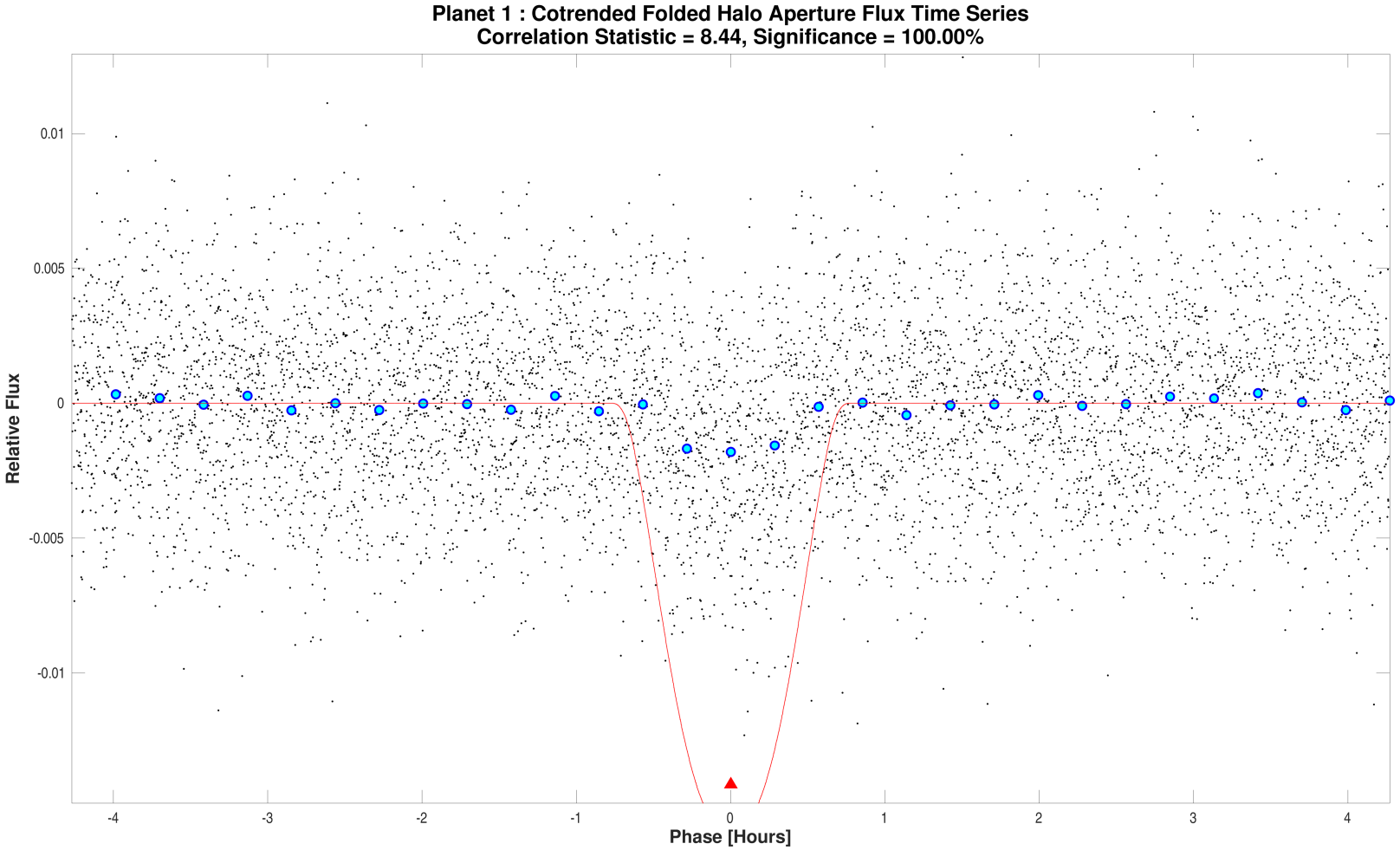


Bootstrap results for target 268301217, planet 1. Cumulative sum of the probabilities (derived from the histogram of counts) from upper tail to the search transit threshold; false alarm probability is indicated by the star. The Gaussian equivalent threshold for this false alarm probability is 34.4747. The threshold on this distribution that achieves the same false alarm rate as a 7.1 sigma threshold on a Gaussian distribution is 7.7103.
Open `./planet-01/bootstrap-results/00000000268301217-01-bootstrap-false-alarm.fig`



Optical ghost diagnostic core aperture flux time series for target 268301217, 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/0000000268301217-01-core-unwhitened-cotrended-zoomed-model.fig`

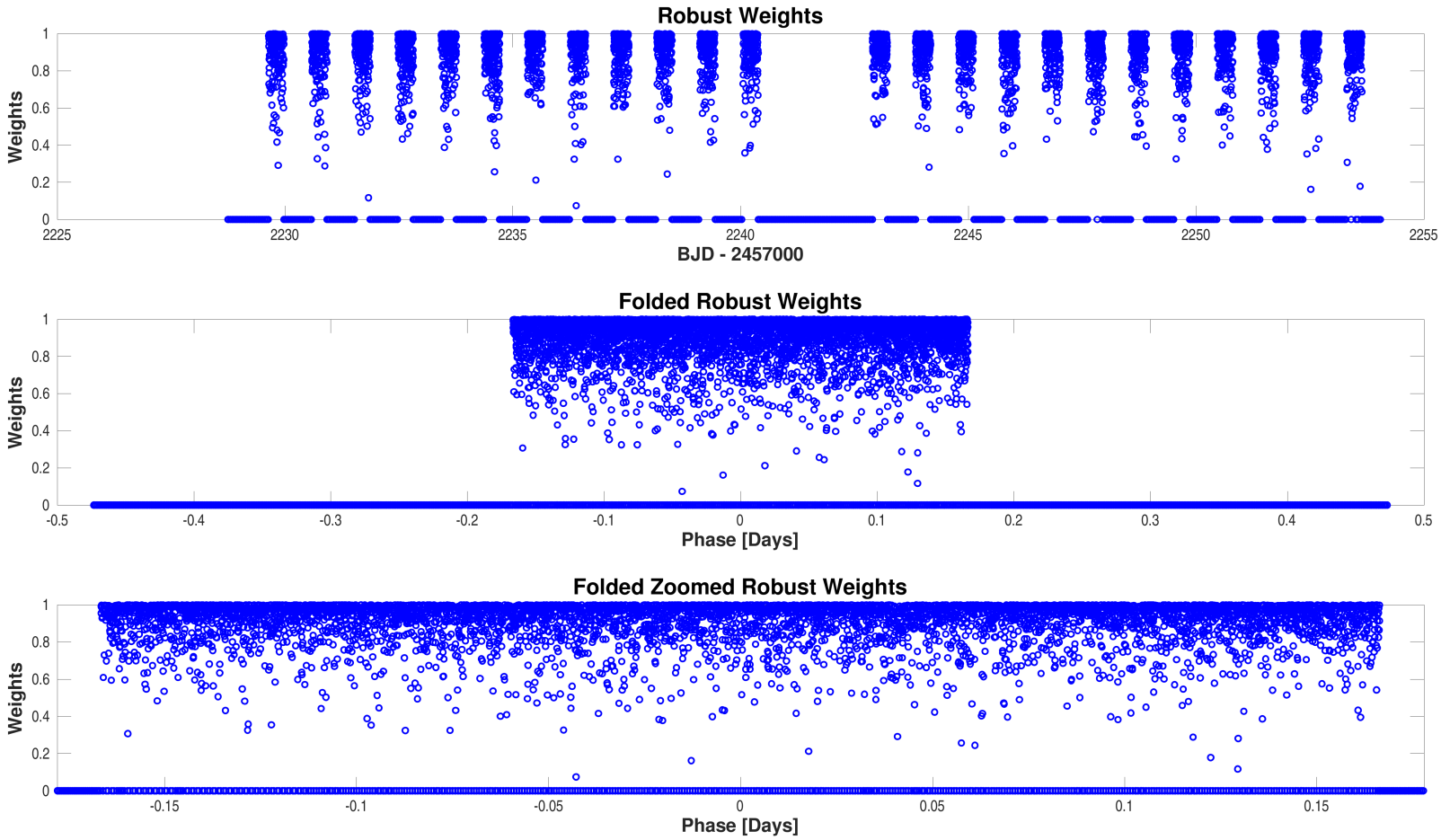


Optical ghost diagnostic halo aperture flux time series for target 268301217, planet candidate 1. The unwhitened time series is phase folded at the orbital period associated with the planet candidate and centered on the epoch of the first transit. The time series was first cotrended against spacecraft 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.

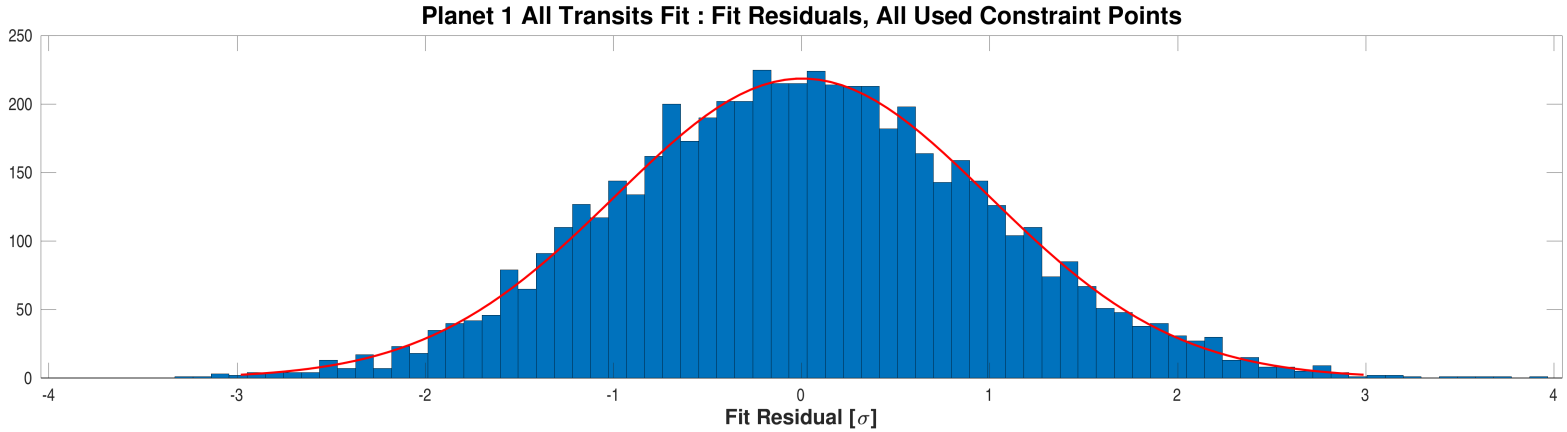
Open `./planet-01/ghost-diagnostic-results/0000000268301217-01-halo-unwhitened-cotrended-zoomed-model.fig`

Appendix A Planet Candidate 1

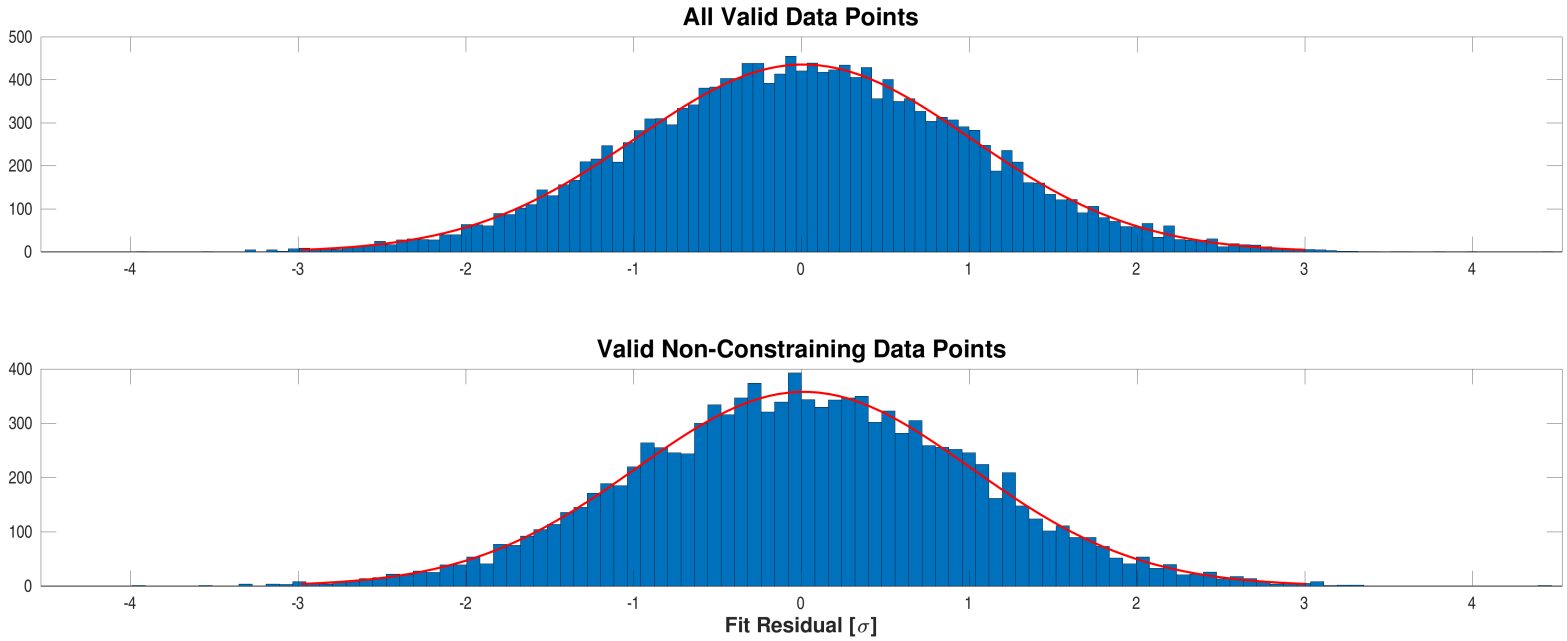
A.1 Model Fitter: All Transits



Robust weights distribution for CatId 268301217, 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/0000000268301217-01-all-robust-weights.fig`



Fit residuals distribution for CatId 268301217, 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/0000000268301217-01-all-histo-used.fig`

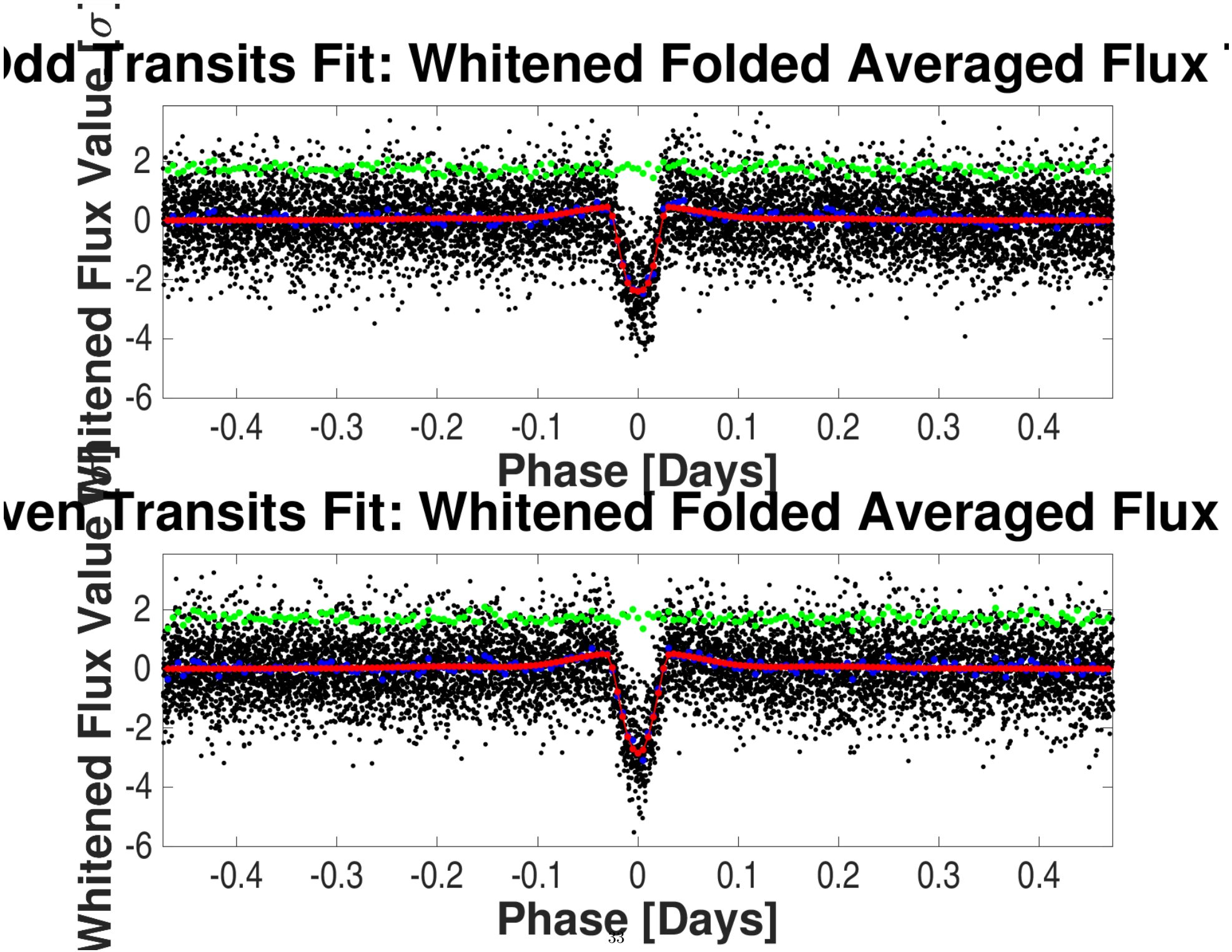


Fit residuals distribution for CatId 268301217, Planet candidate 1. Top plot: all valid data. Bottom plot: valid data not used to constrain fit (due to distance from a transit). Gaussian fits to the histograms are shown in red.
Open `./planet-01/planet-search-and-model-fitting-results/all-transits-fit/0000000268301217-01-all-histo-all-and-unused.fig`

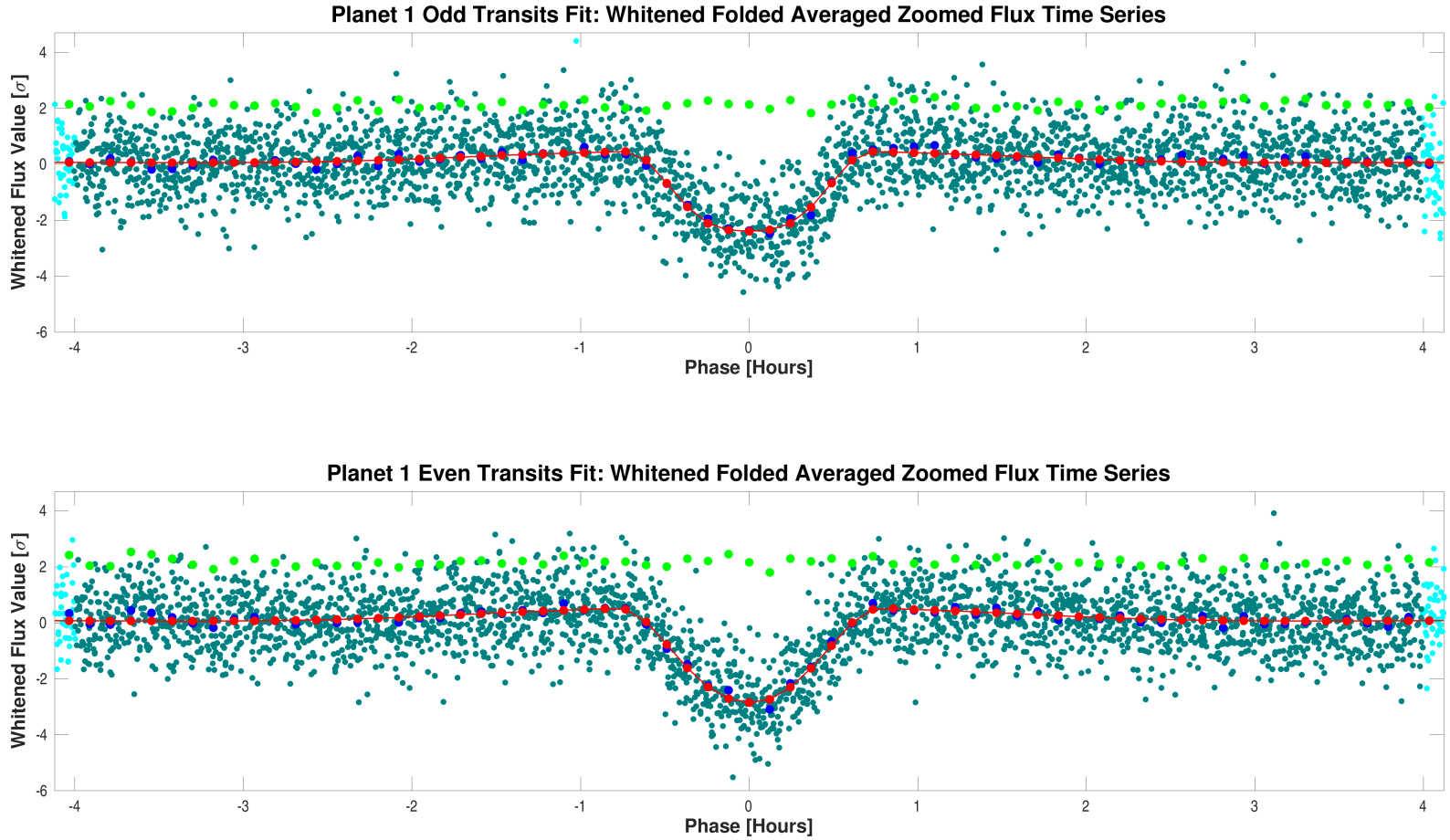
A.2 Model Fitter: Odd & Even Transits

Parameter	Odd Transits Value	Odd Transits Uncertainty	Even Transits Value	Even Transits Uncertainty	Units	Difference / Uncertainty
SNR	37.3		42.2			
Orbital Period	0.9467142	5.0138e-05	0.9466610	4.7195e-05	days	7.7178e-01
Transit Epoch	2228.8591729	7.8353e-04	2229.8065619	6.5674e-04	BTJD	6.8177e-01
Impact Parameter	0.8548	1.9031e-02	0.9255	1.0285e-01		6.7630e-01
Planet Radius to Star Radius Ratio	0.1266138	3.4213e-03	0.1625716	5.5186e-02		6.5033e-01
Semi-major Axis to Star Radius Ratio	3.9818	1.9112e-01	3.6240	2.9746e-01		1.0120e+00
Planet Radius	14.7920	8.5491e-01	18.9929	6.5198e+00	Earth radii	6.3886e-01
Semi-major Axis	0.0190	1.3354e-03	0.0190	1.3353e-03	AU	3.7660e-04
Effective Stellar Flux	3013.6590	4.7973e+02	3013.8845	4.7976e+02	Goldilocks	3.3247e-04
Equilibrium Temperature	1890	7.5202e+01	1890	7.5204e+01	Kelvin	3.3247e-04
Stellar Density	0.9463	1.3625e-01	0.7135	1.7569e-01	Solar density	1.0470e+00
Transit Depth	14595	5.1318e+02	17254	6.2400e+02	ppm	3.2912e+00
Transit Duration	1.3731	4.2992e-02	1.4621	5.4450e-02	hours	1.2830e+00
Transit Ingress Duration	0.5197	1.0558e-01	0.7311	2.7225e-02	hours	1.9384e+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)	4282.8 (5246.3)		4282.8 (5246.3)			

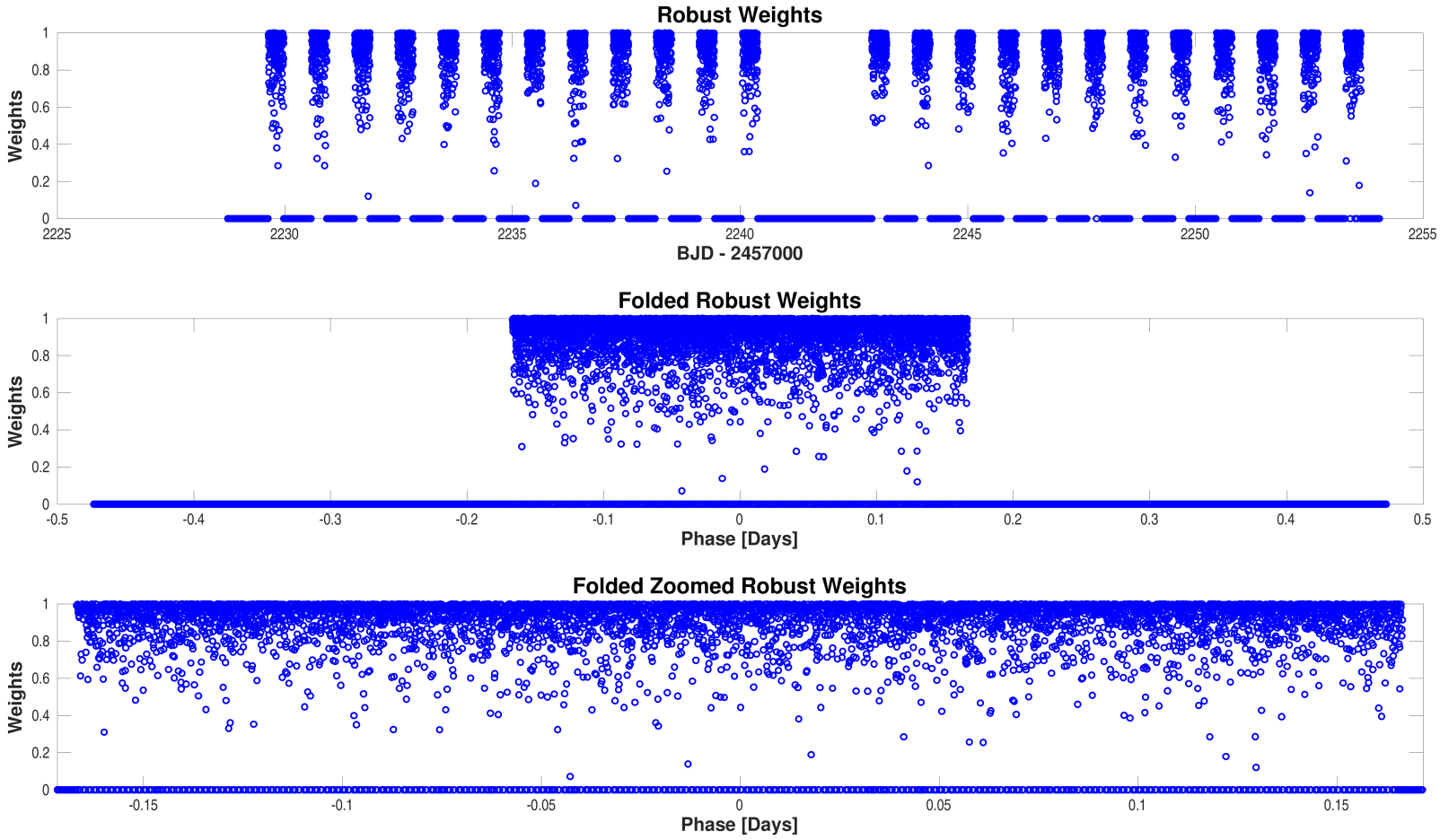
DoF: Degrees of Freedom


dd Transits Fit: Whitened Folded Averaged Flux
Whitened Flux Value [σ]
2
0
-2
-4
-6
-0.4
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
0.4
Phase [Days]
ven Transits Fit: Whitened Folded Averaged Flux
Whitened Flux Value [σ]
2
0
-2
-4
-6
-0.4
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
0.4
Phase [Days]

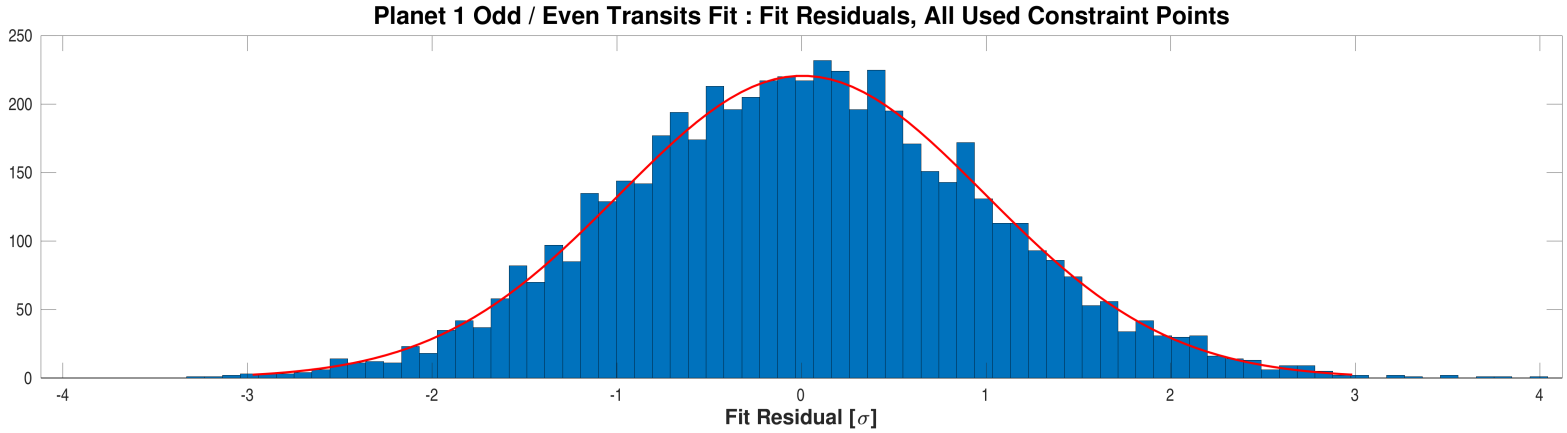
Folded flux time series for CatId 268301217, Planet candidate 1 in the whitened domain is plotted in black dots. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged values of the folded flux time series; the red dots represent the averaged values of the folded model light 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/0000000268301217-01-odd-even-whitened.fig`



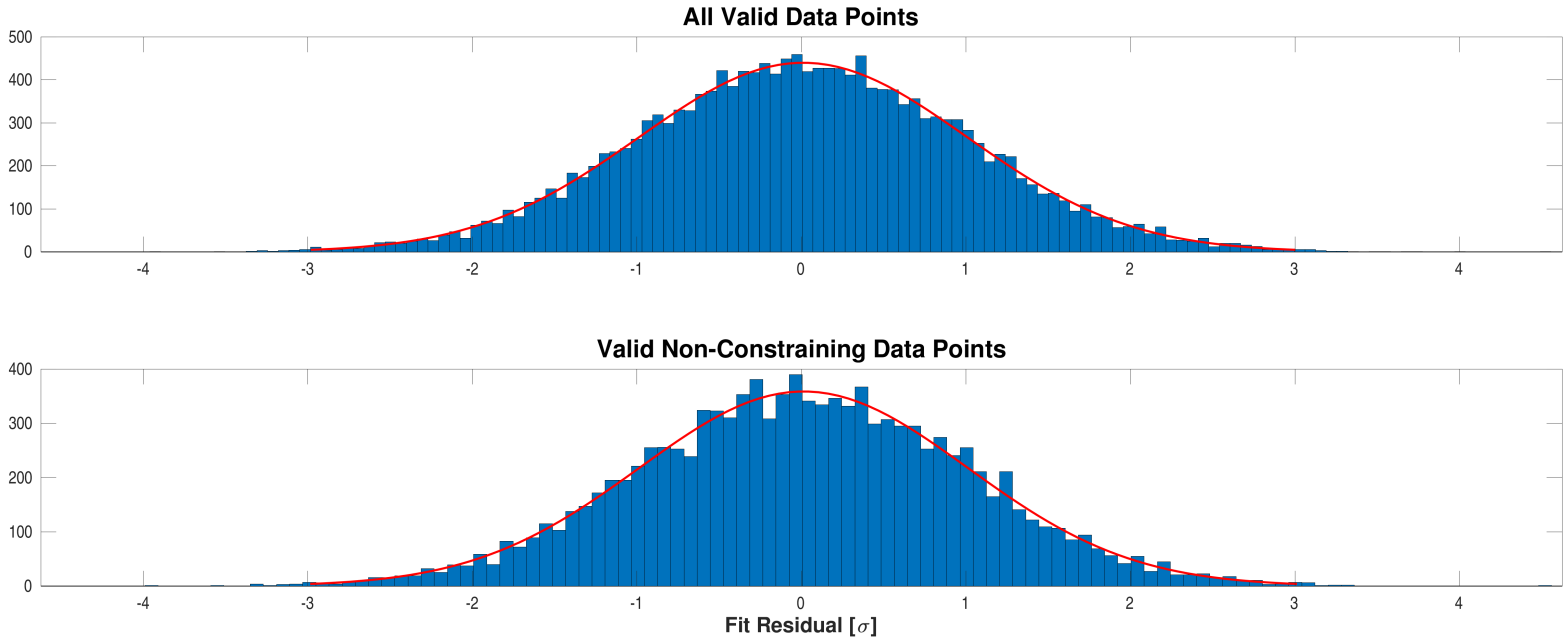
Folded flux time series for CatId 268301217, Planet candidate 1 in the whitened domain, zoomed on the transit. The flux data whose robust weights are larger/smaller than 0.1 are plotted in dark green/cyan dots, respectively. Values are averaged into 1 cadence wide bins. The blue dots represent the averaged 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/0000000268301217-01-odd-even-whitened-zoomed.fig`



Robust weights distribution for CatId 268301217, 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/0000000268301217-01-odd-even-robust-weights.fig`

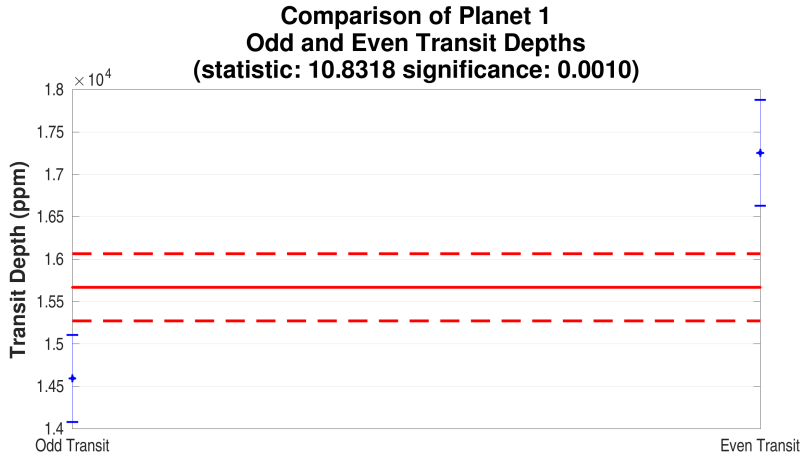


Fit residuals distribution for CatId 268301217, Planet candidate 1. Only the valid data points used to constrain the fit are shown here. A Gaussian fit to the histogram is shown in red.
Open `./planet-01/planet-search-and-model-fitting-results/odd-even-transits-fit/0000000268301217-01-odd-even-histo-used.fig`



Fit residuals distribution for CatId 268301217, 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/0000000268301217-01-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 268301217, planet 1. A significance level close to 1/0 favors a transiting planet/an eclipsing binary. Open `./planet-01/binary-discrimination-test-results/0000000268301217-01-eclipsing-binary-discrimination-tests.fig`

Appendix B Alerts

This target did not trigger any alerts.