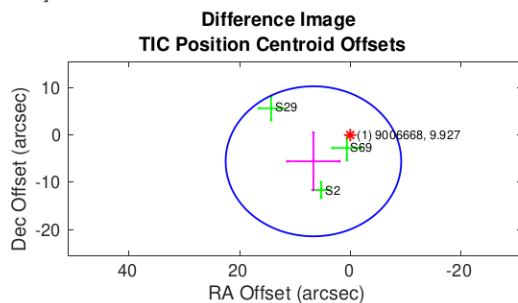
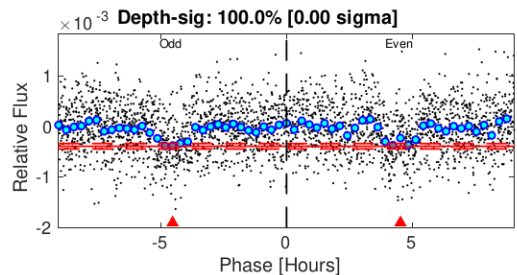
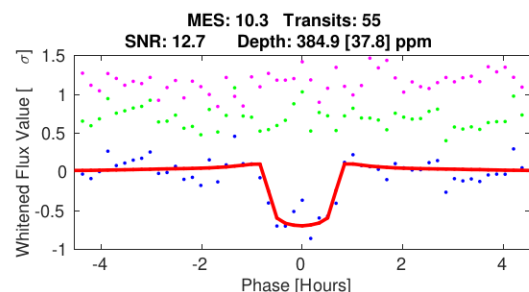
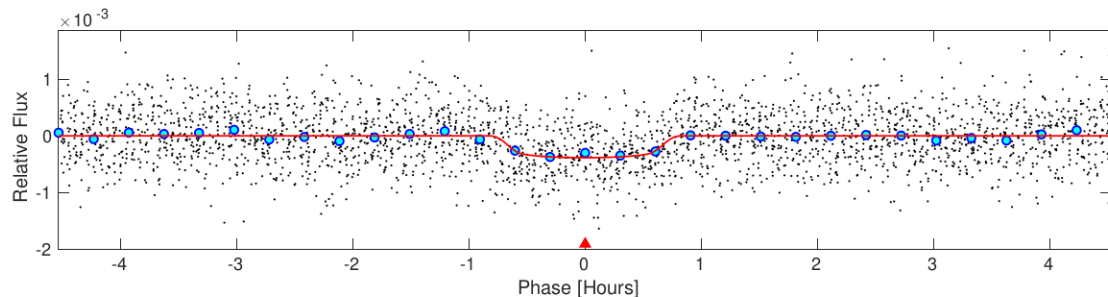
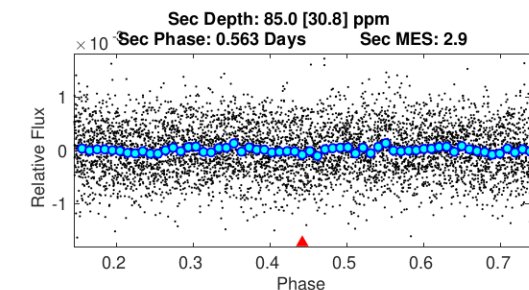
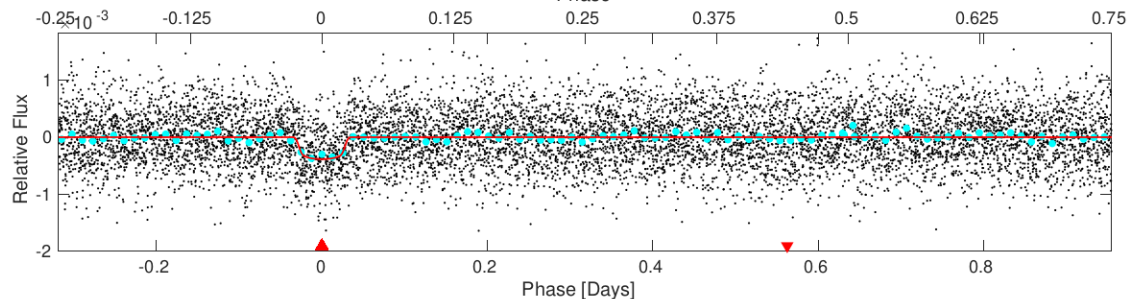
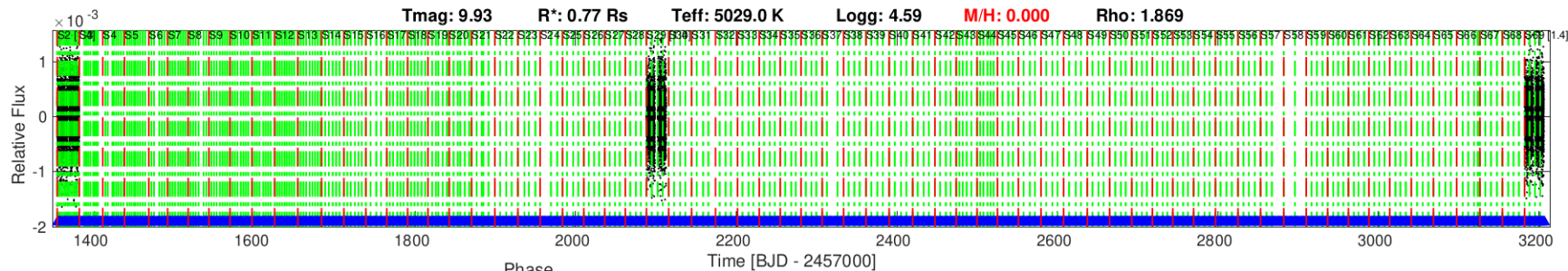


TIC: 9006668 Candidate: 1 of 1 Period: 1.273 d
 TOI: 238.01 Corr: 0.962

Tmag: 9.93 R*: 0.77 Rs Teff: 5029.0 K Logg: 4.59 M/H: 0.000 Rho: 1.869



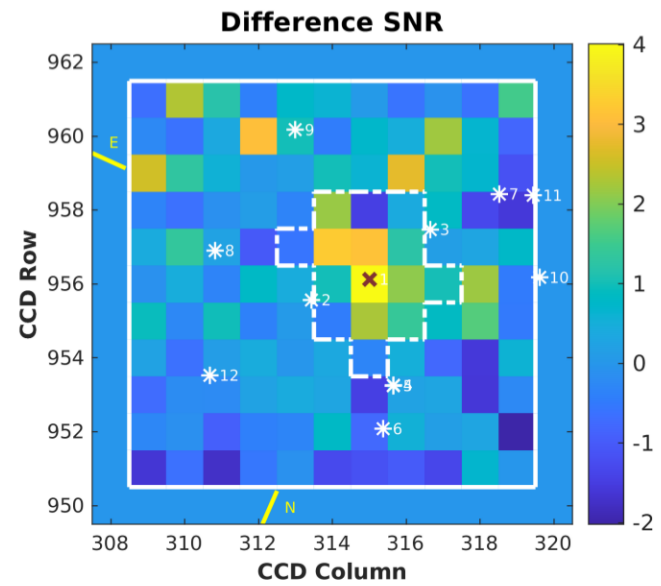
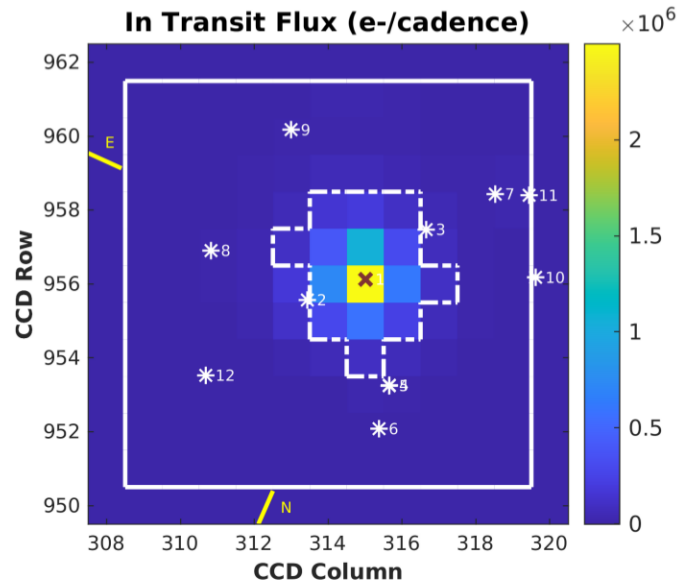
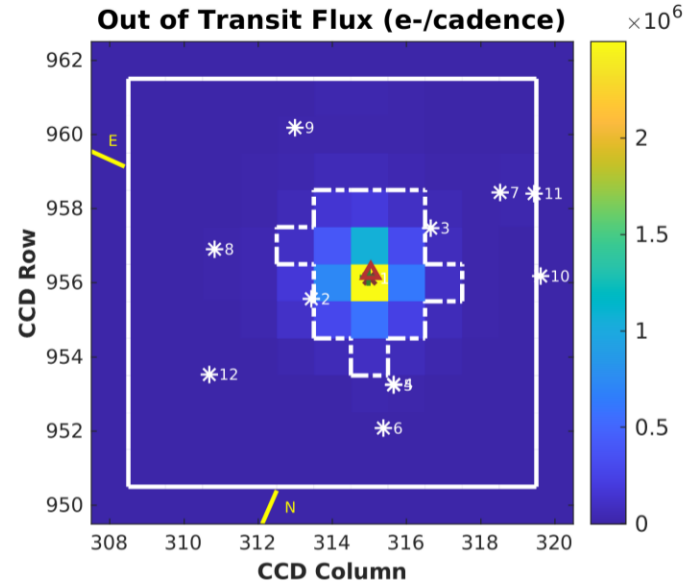
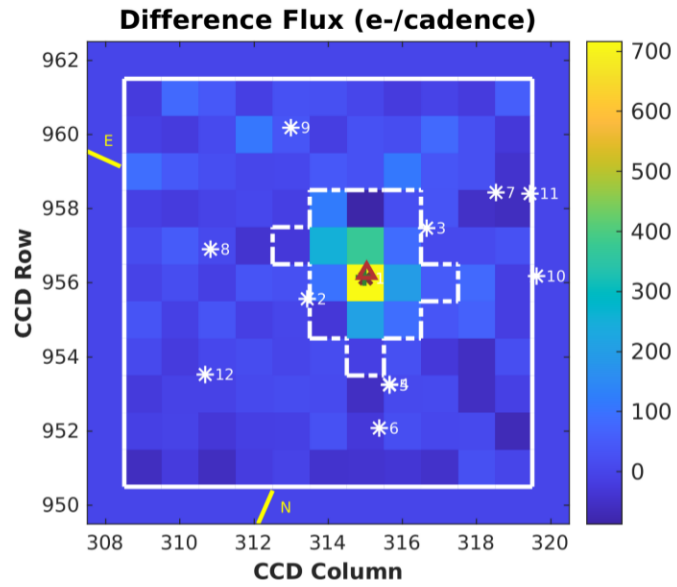
DV Fit Results:
 Period = 1.27310 [0.00001] d
 Epoch = 1354.6624 [0.0011] BTJD
 Rp/R* = 0.0213 [0.0037]
 a/R* = 3.25 [2.50]
 b = 0.90 [0.18]
 Seff = 713.96 [123.71]
 Teq = 1318 [57] K
 Rp = 1.78 [0.33] Re
 a = 0.0217 [0.0017] AU
 Rho = 0.284 [0.657]
 Ag = 6.94 [3.63] [1.63 sigma]
 Tp = 3308 [424] K [4.65 sigma]

DV Diagnostic Results:
 ShortPeriod-sig: N/A
 LongPeriod-sig: N/A
 ModelChiSquare2-sig: 100.0%
 ModelChiSquareGof-sig: 100.0%
 Bootstrap-pfa: 1.43e-23
 GhostDiagnostic-chr: 2.028
 OotOffset-rm: 8.321 arcsec [1.53 sigma]
 TicOffset-rm: 8.668 arcsec [1.64 sigma]
 OotOffset-tot: 3
 TicOffset-tot: 3
 DiffImageQuality-fgm: 1.00 [3/3]
 DiffImageOverlap-fno: 1.00 [3/3]

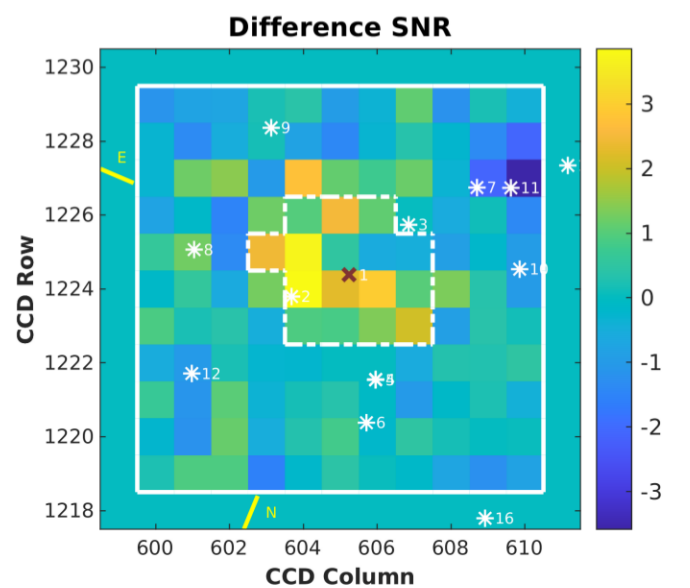
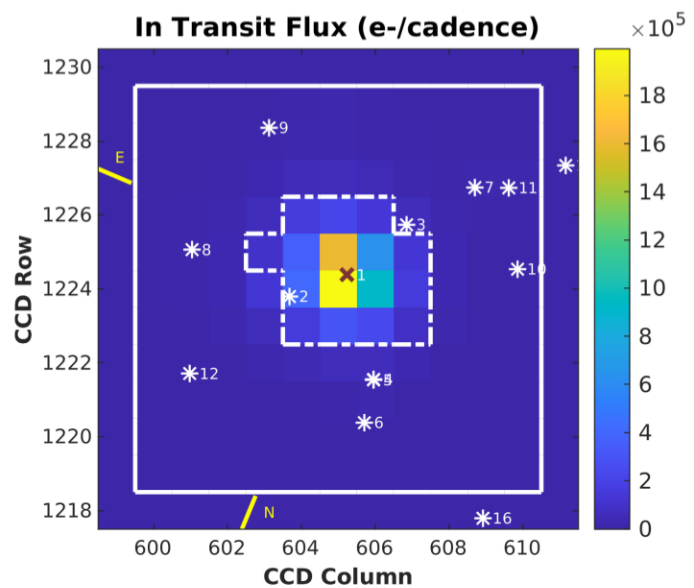
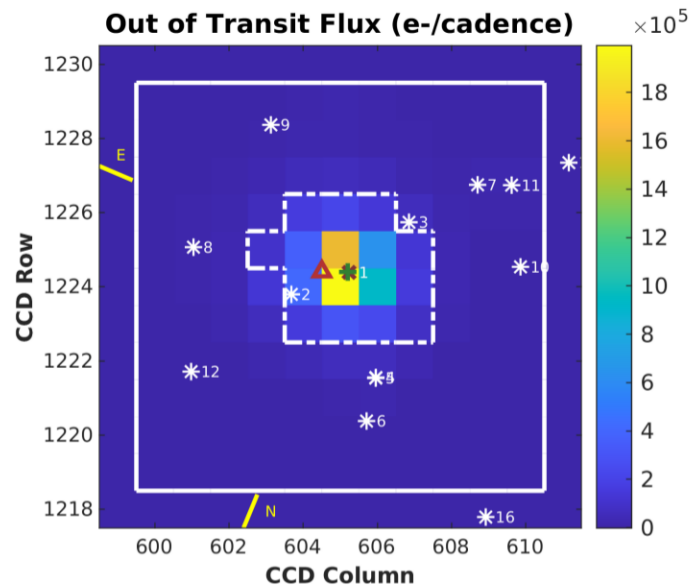
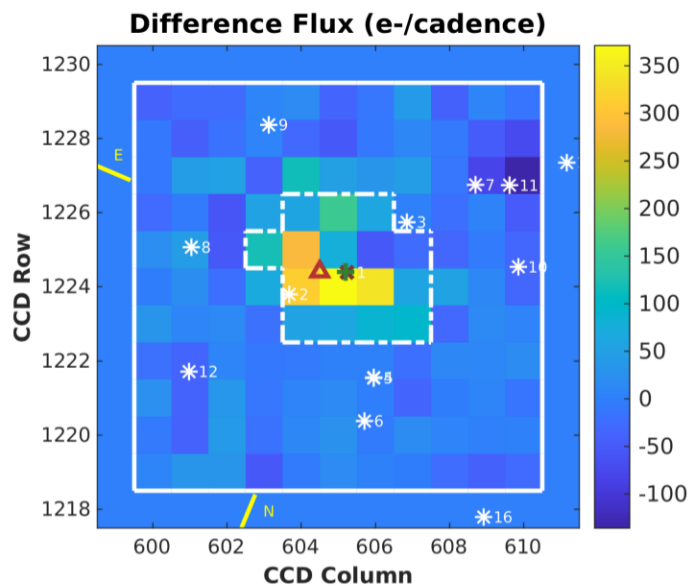
Software Revision: spoc-5.0.101-20231004 -- Cadence Type: TARGET (10.0-min) -- Date Generated: 31-Oct-2023 05:50:38 Z

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

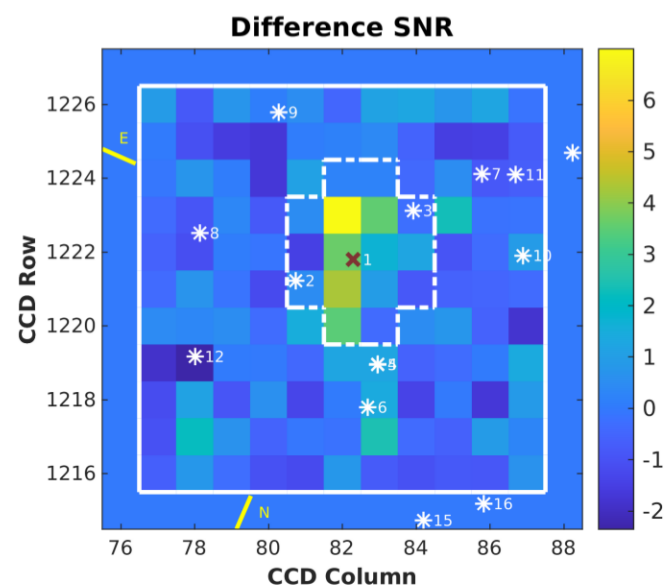
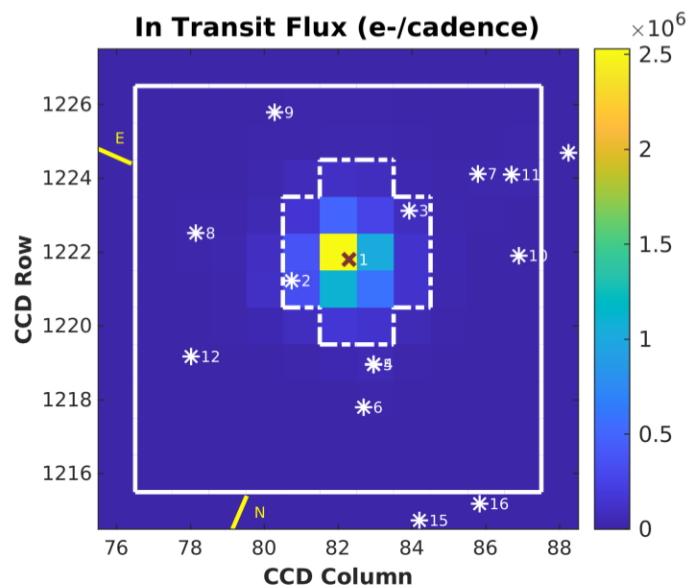
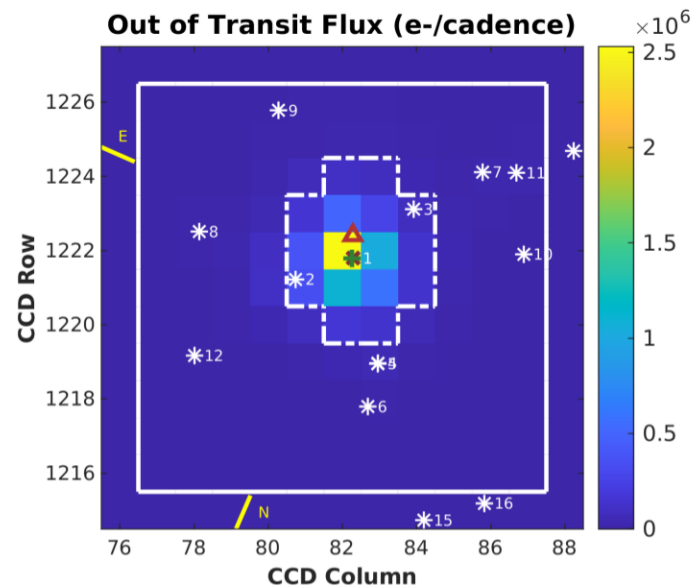
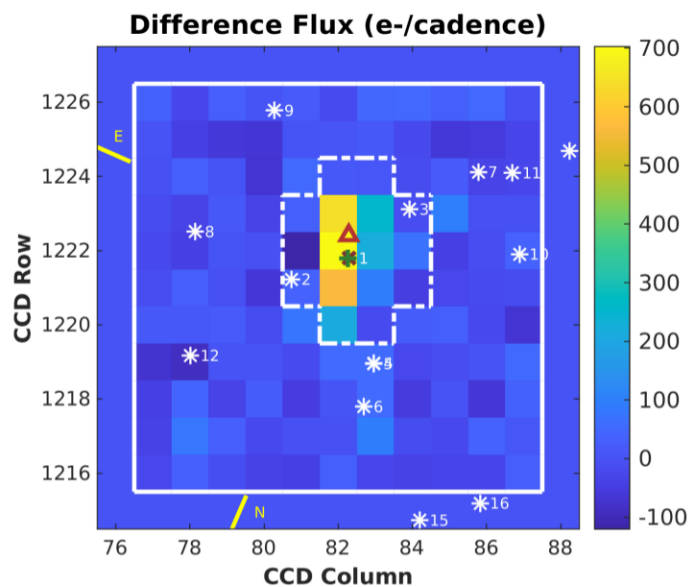
Planet Candidate 1 / Sector 69 / Target Pixel Table 411

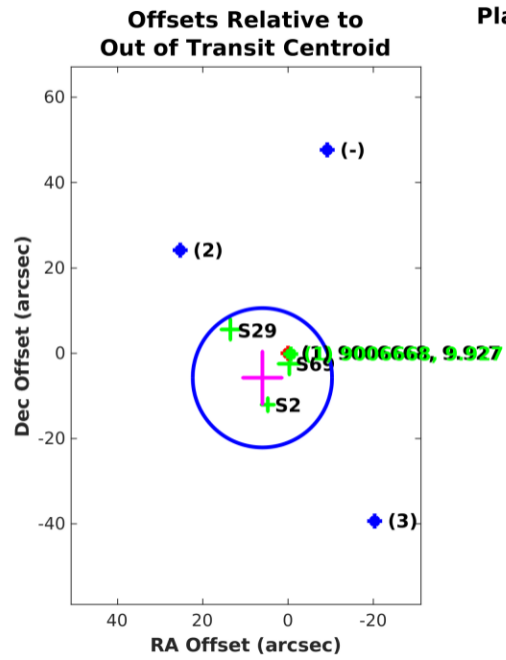


Planet Candidate 1 / Sector 29 / Target Pixel Table 268

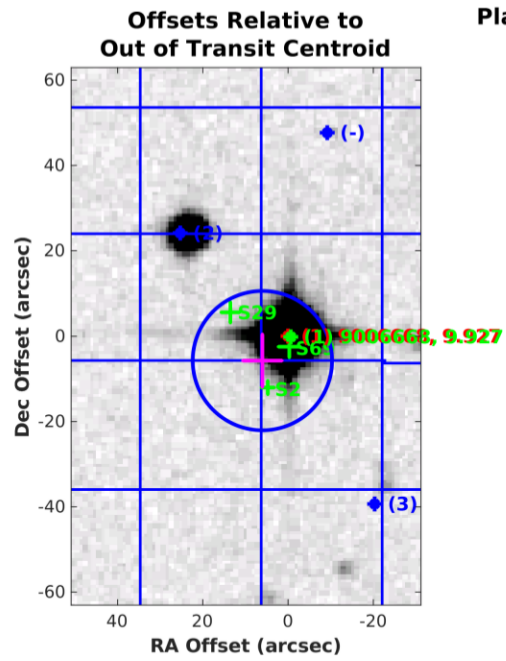
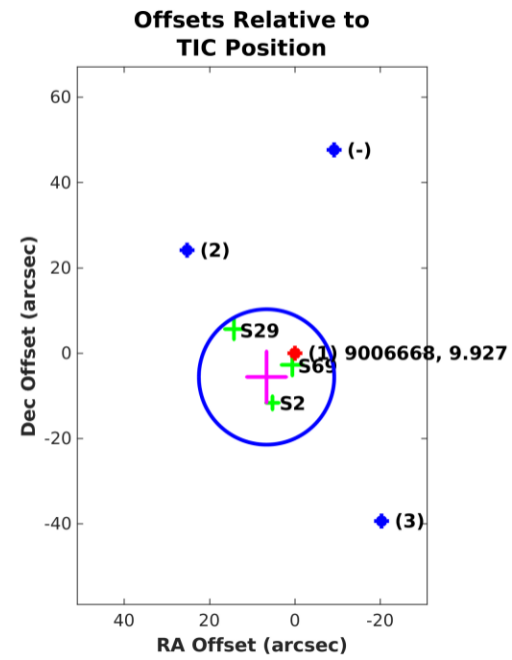


Planet Candidate 1 / Sector 2 / Target Pixel Table 129

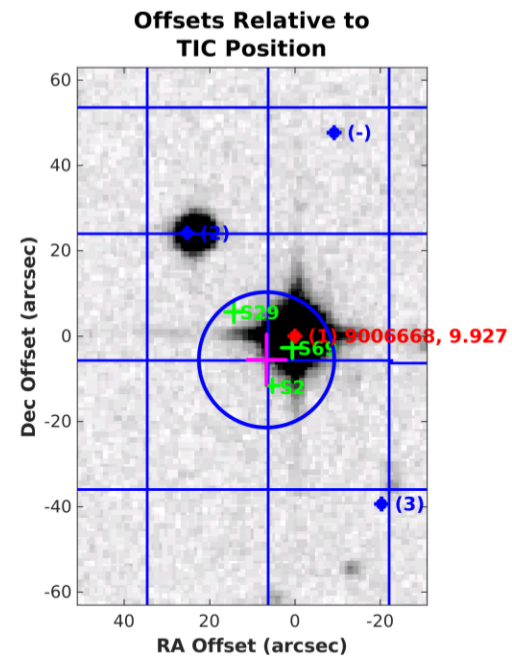


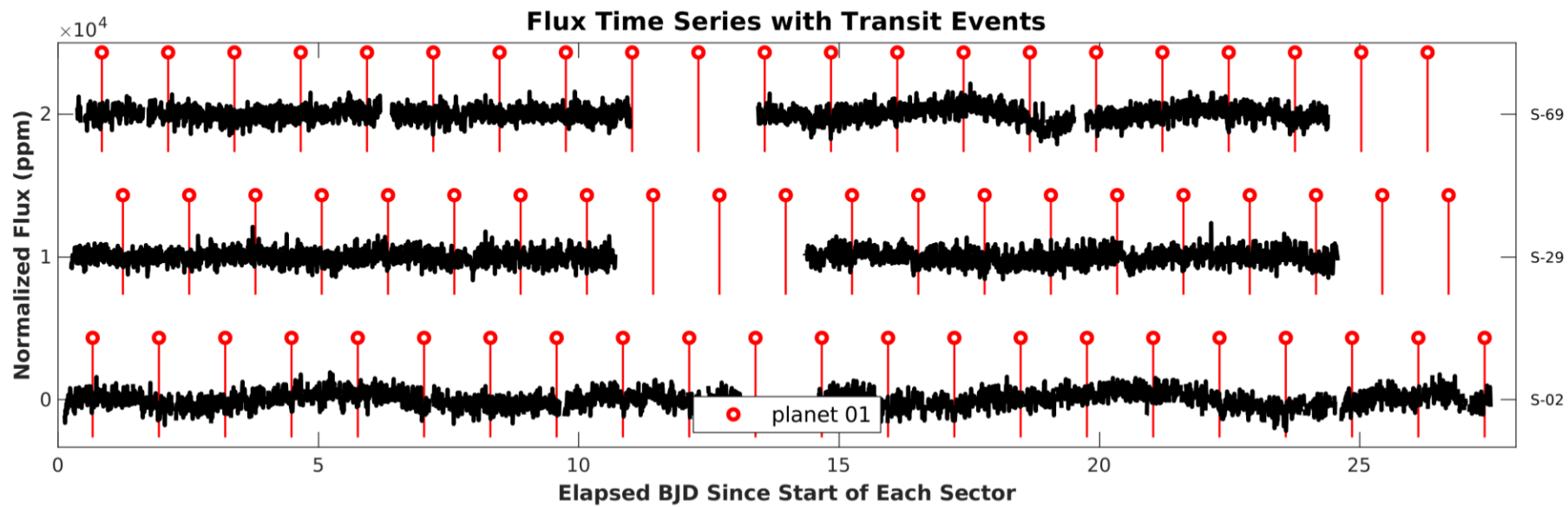
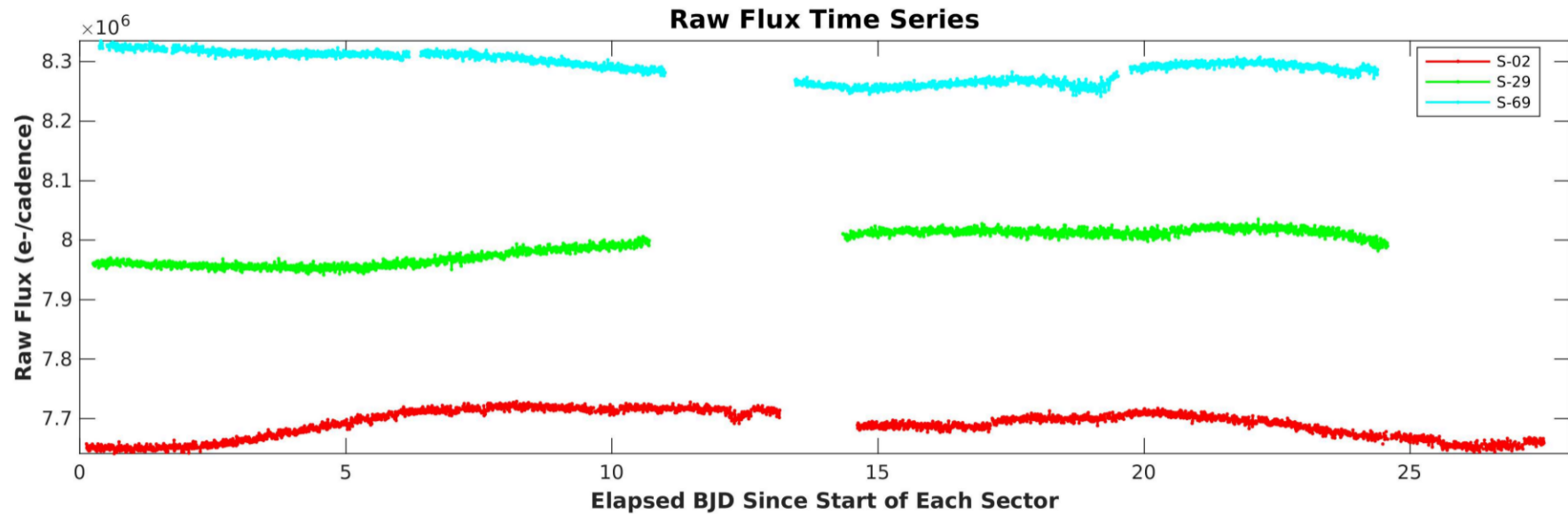


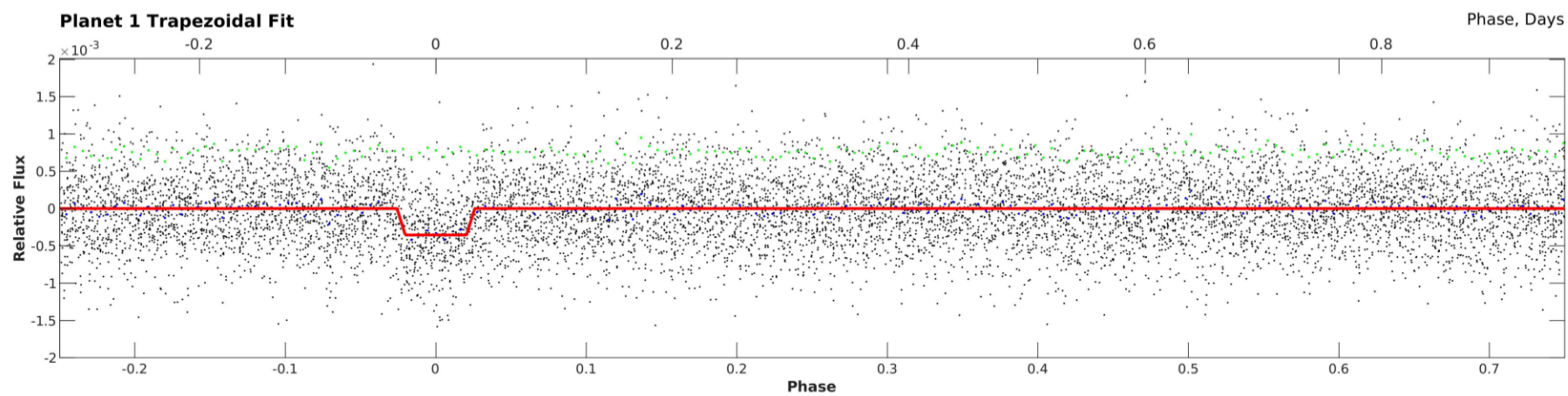
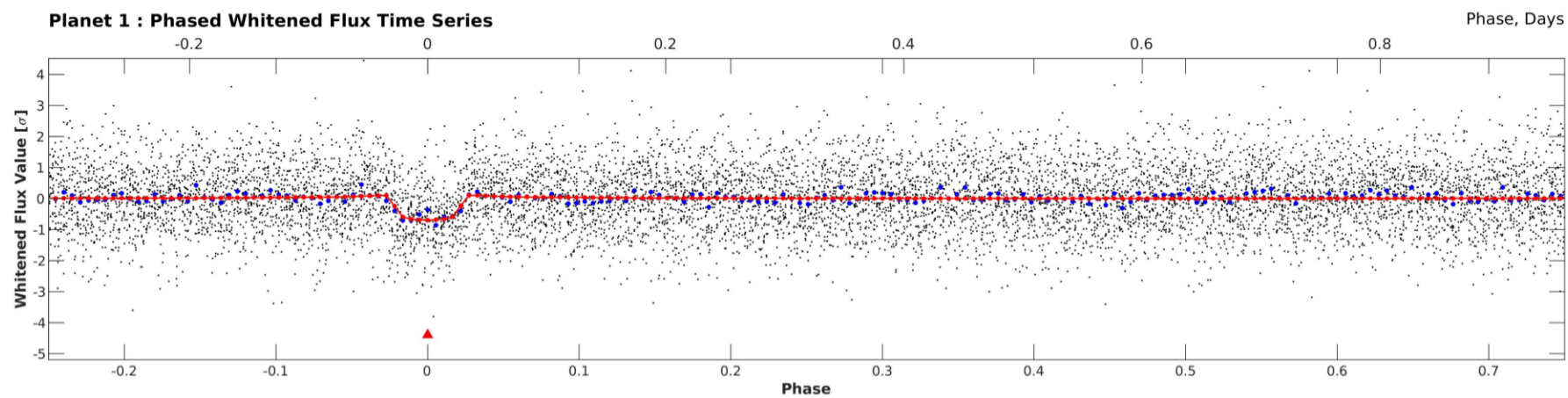
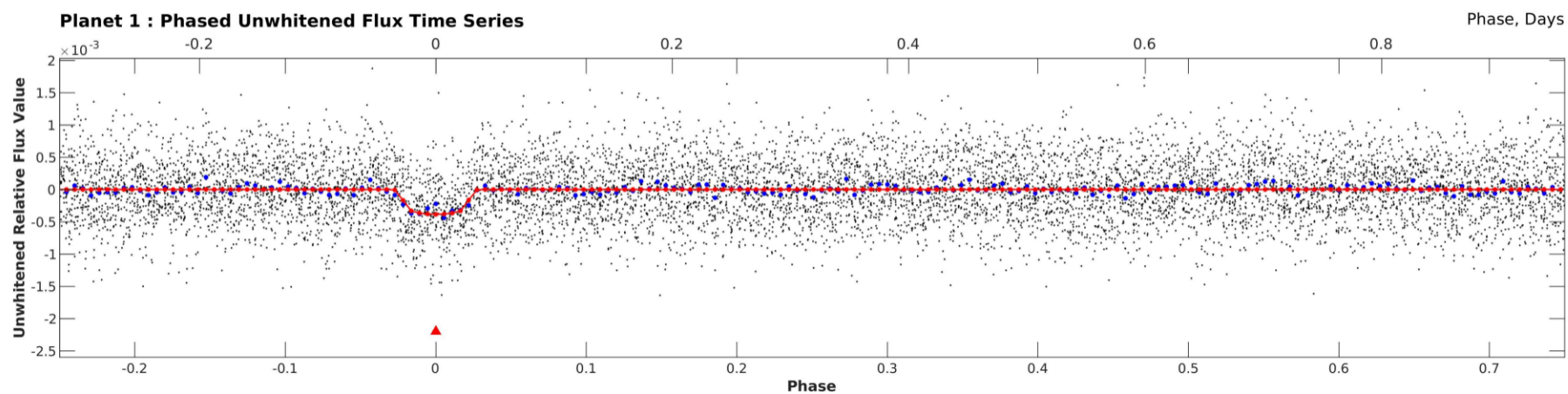
Planet Candidate 1



Planet Candidate 1

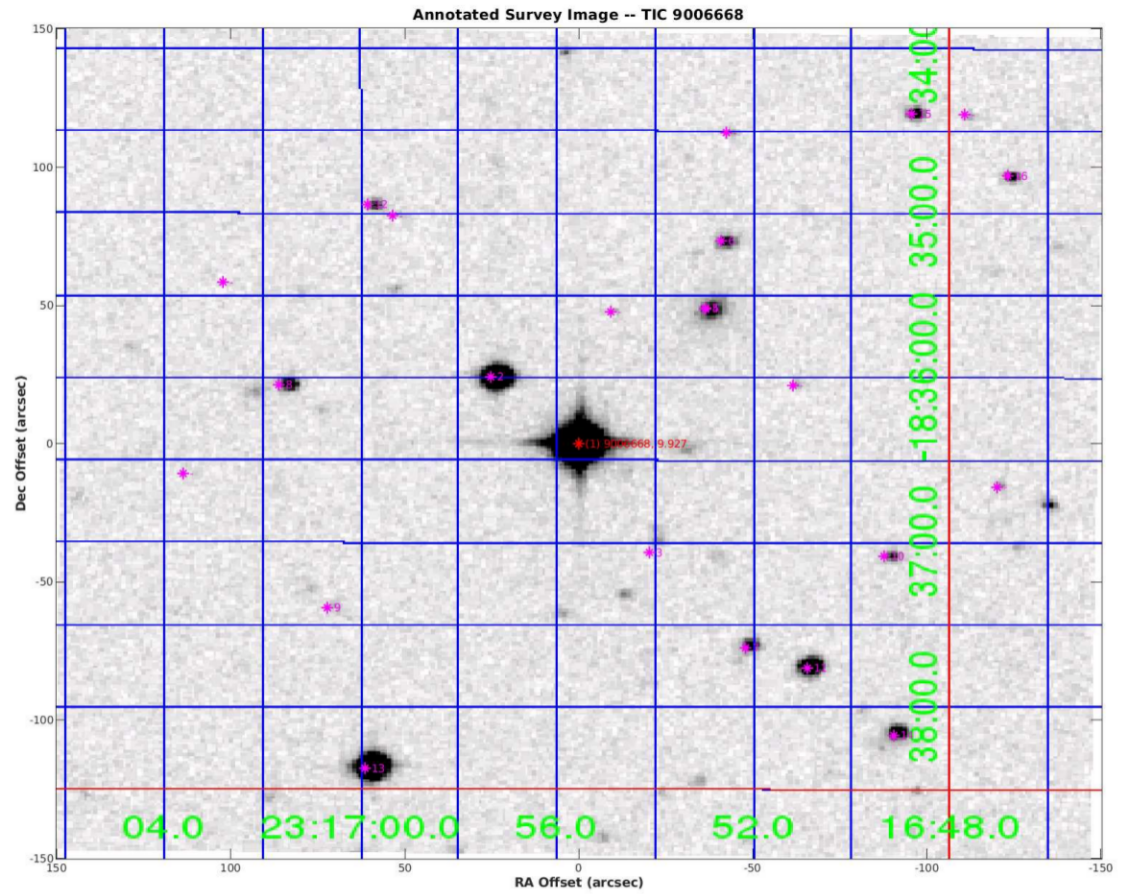




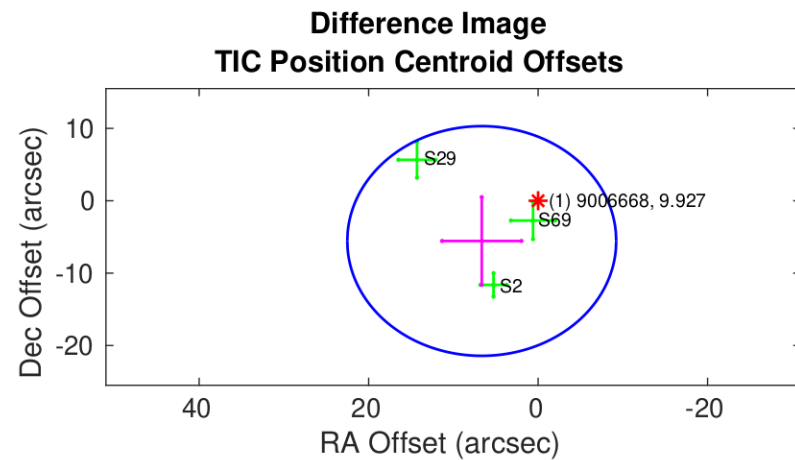
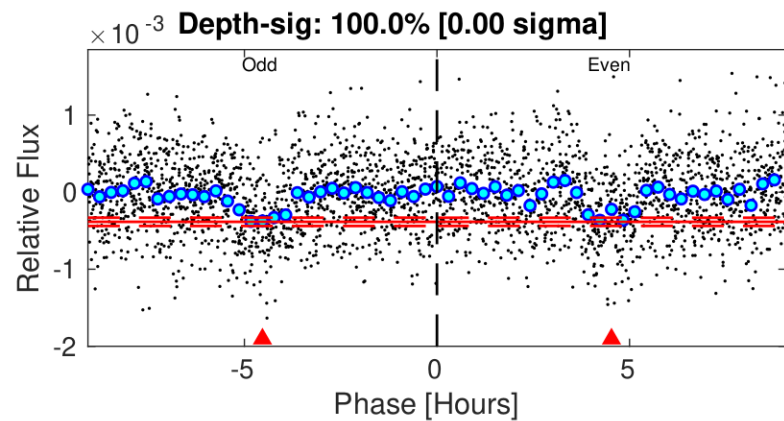
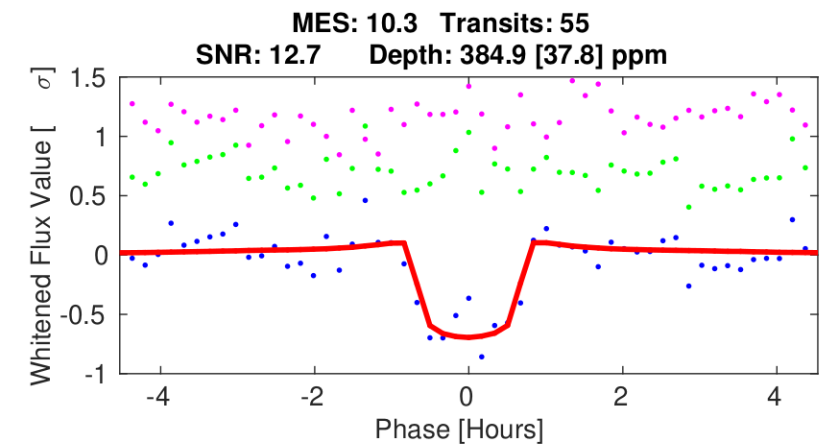
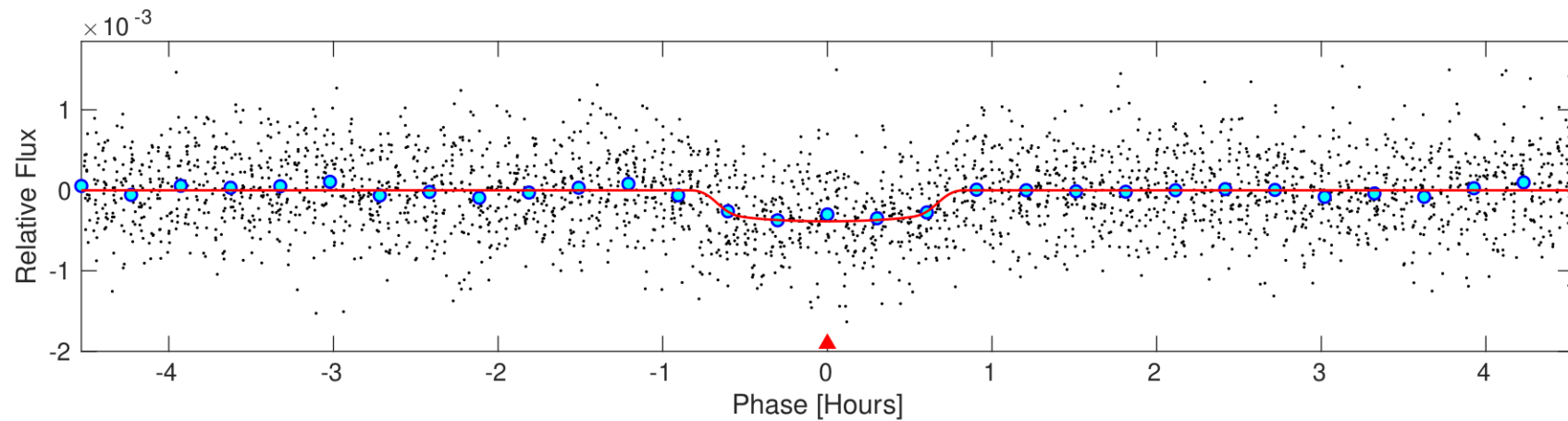
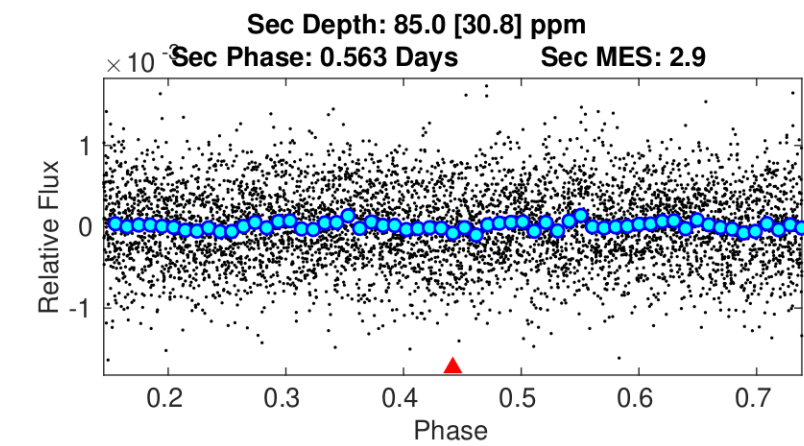
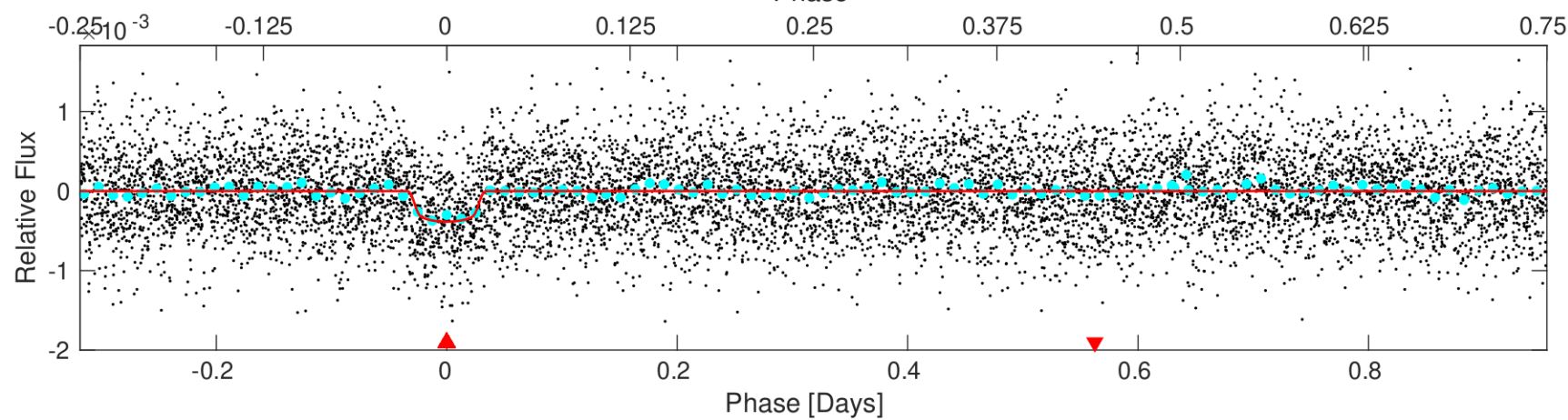
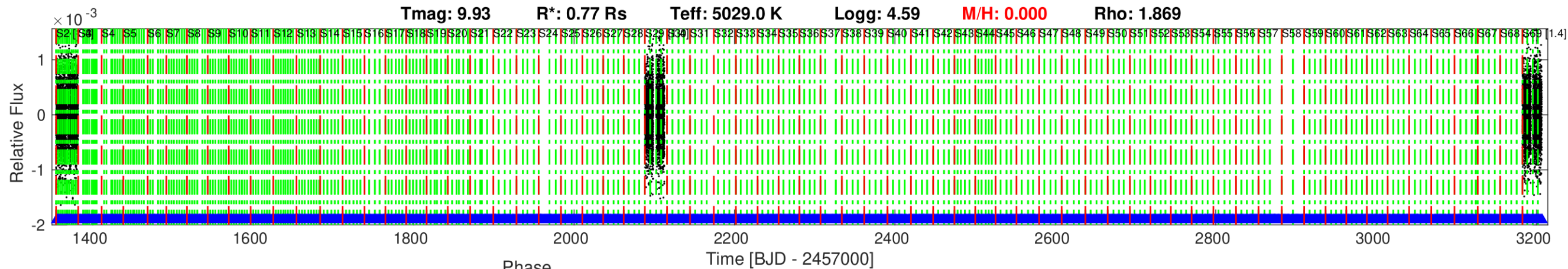


Stellar Distance Table

Index	TIC ID	TESS Mag	Distance (arcsec)
1	000000009006668	9.93	0.00
2	000000009006666	13.26	34.97
3	0000002052212922	18.92	44.28
4	000000009006665	18.24	60.78
5	0000010000007152	15.61	61.09
6	000000009006663	18.49	83.99
7	000000009006671	16.87	88.08
8	000000009006667	16.65	88.81
9	0000002052212921	18.77	93.51
10	000000009006670	16.72	96.75
11	000000009006672	14.86	104.47
12	000000009006662	17.51	105.66
13	000000009006675	12.55	132.52
14	000000009006673	16.08	139.09
15	000000009006658	16.80	152.84
16	000000009006661	17.49	156.81



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



DV Fit Results:

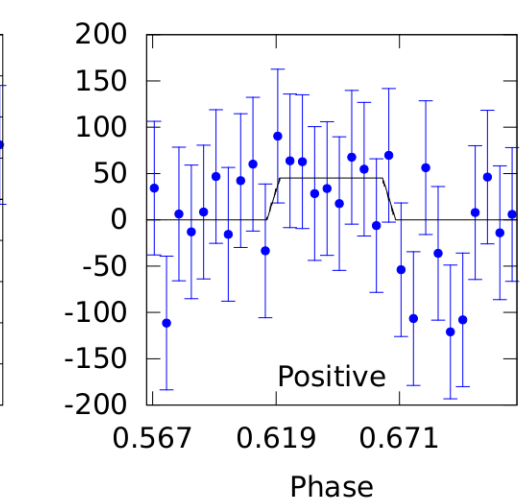
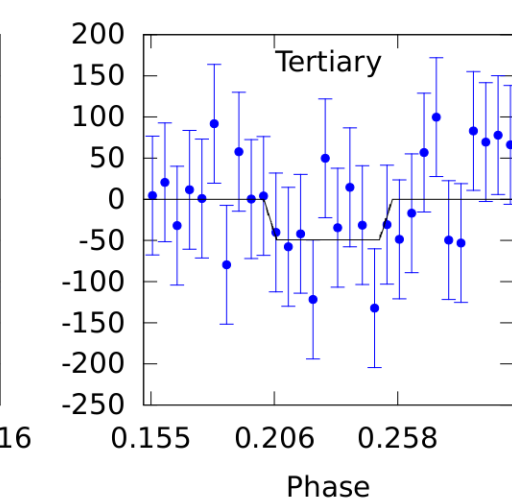
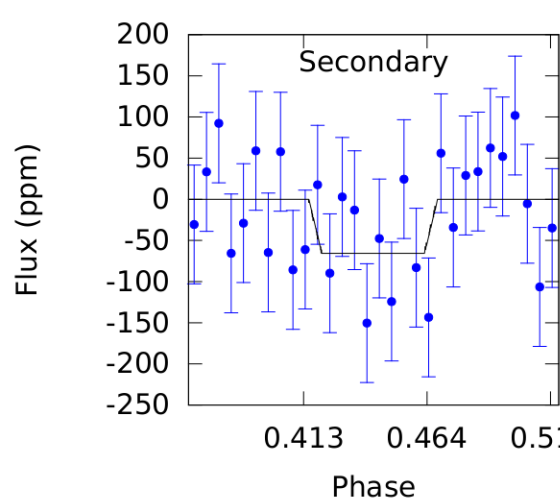
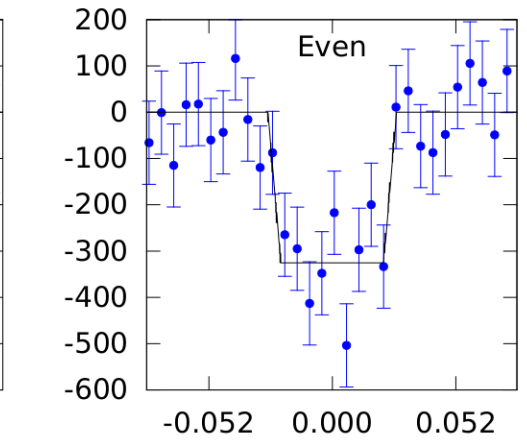
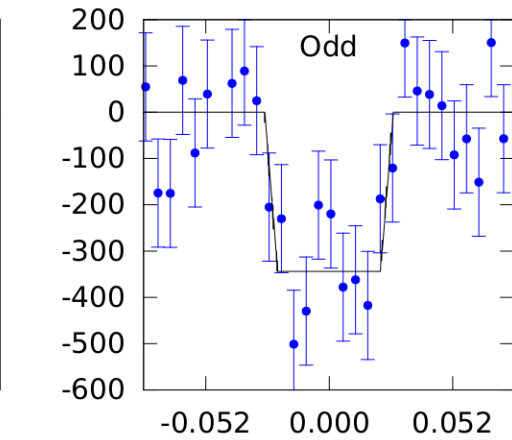
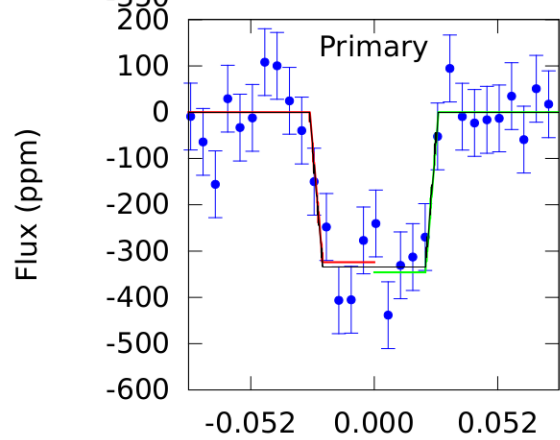
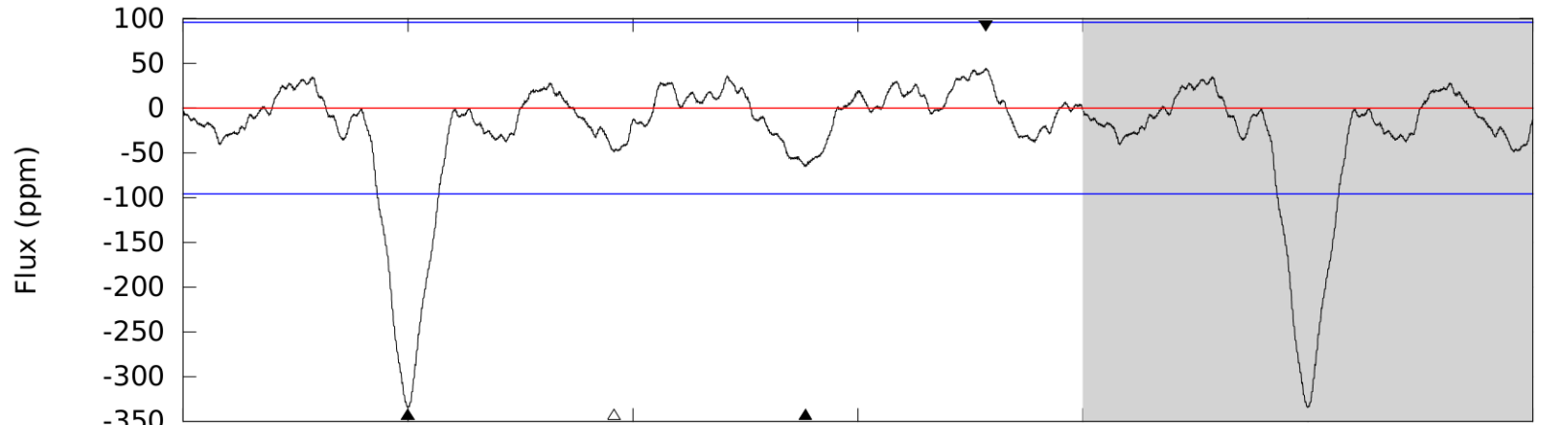
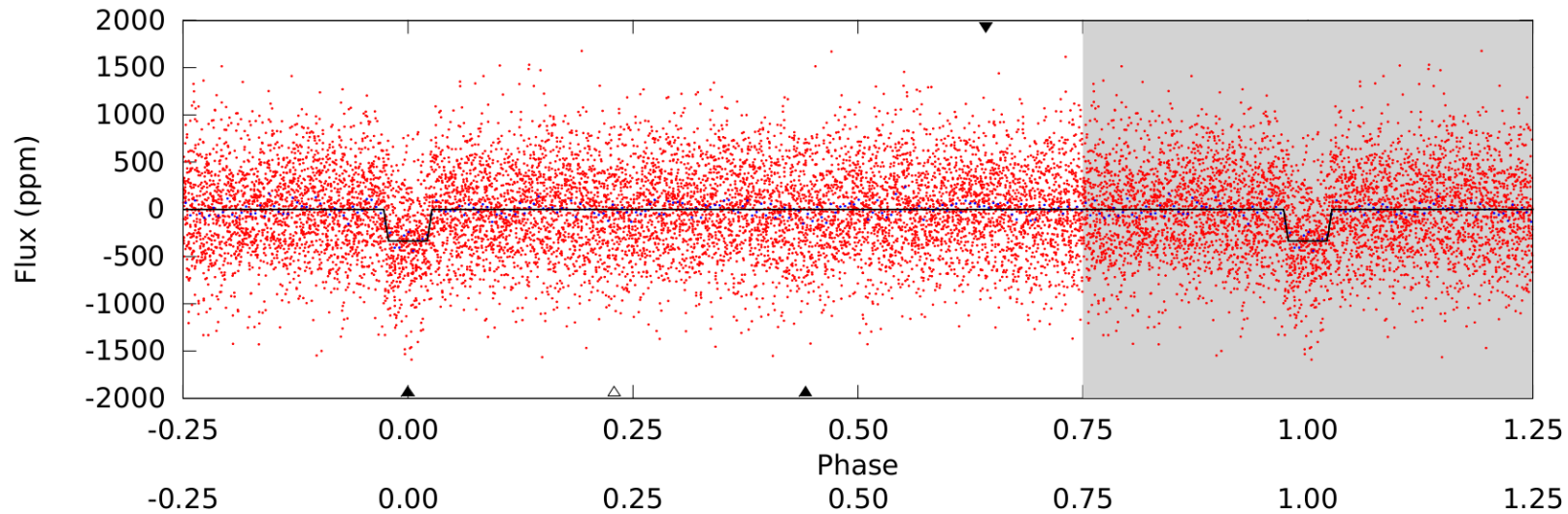
Period = 1.27310 [0.00001] d
 Epoch = 1354.6624 [0.0011] BTJD
 Rp/R* = 0.0213 [0.0037]
 a/R* = 3.25 [2.50]
 b = 0.90 [0.18]
 Seff = 713.96 [123.71]
 Teq = 1318 [57] K
 Rp = 1.78 [0.33] Re
 a = 0.0217 [0.0017] AU
 Rho = 0.284 [0.657]
 Ag = 6.94 [3.63] [1.63 sigma]
 Tp = 3308 [424] K [4.65 sigma]

DV Diagnostic Results:

ShortPeriod-sig: N/A
 LongPeriod-sig: N/A
 ModelChiSquare2-sig: 100.0%
 ModelChiSquareGof-sig: 100.0%
 Bootstrap-pfa: 1.43e-23
 GhostDiagnostic-chr: 2.028
 OotOffset-rm: 8.321 arcsec [1.53 sigma]
 TicOffset-rm: 8.668 arcsec [1.64 sigma]
 OotOffset-tot: 3
 TicOffset-tot: 3
 DiffImageQuality-fgm: 1.00 [3/3]
 DiffImageOverlap-fno: 1.00 [3/3]

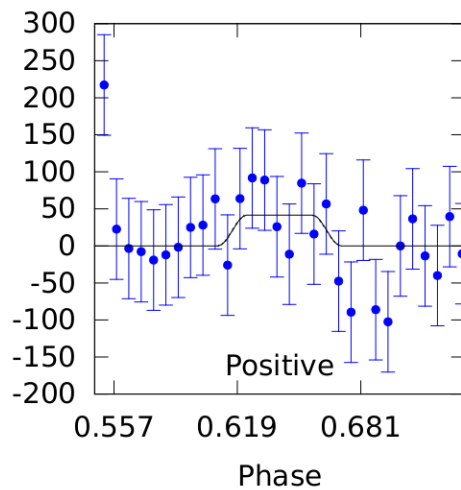
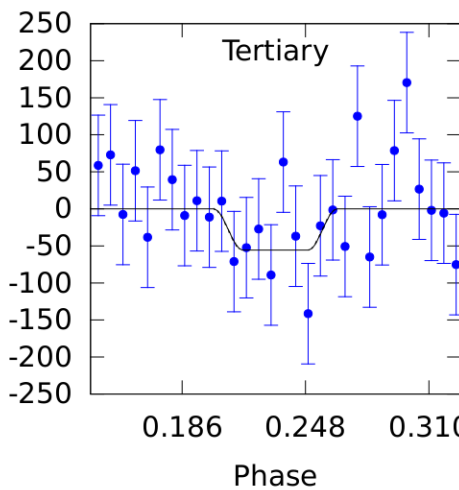
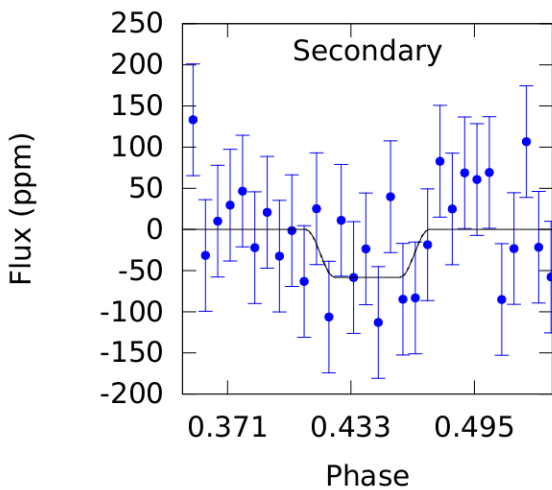
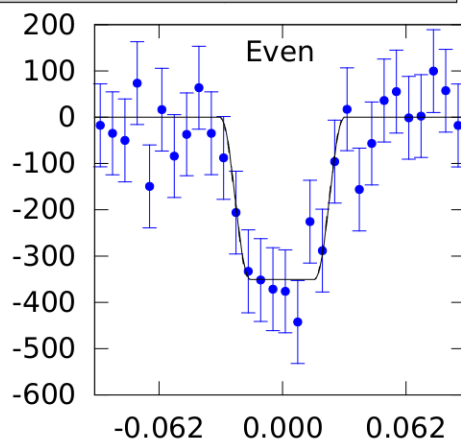
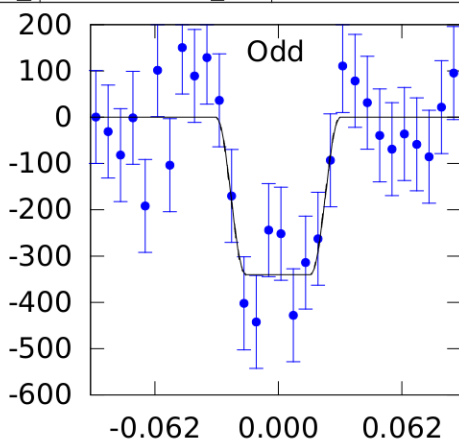
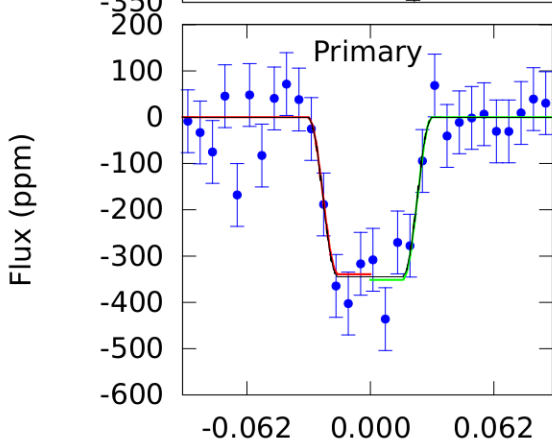
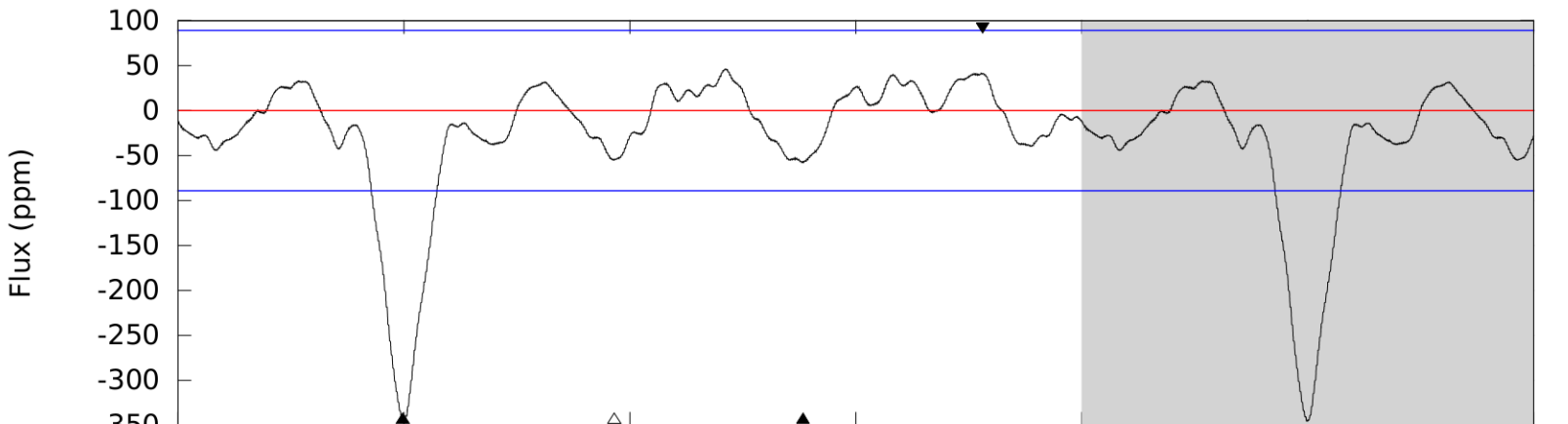
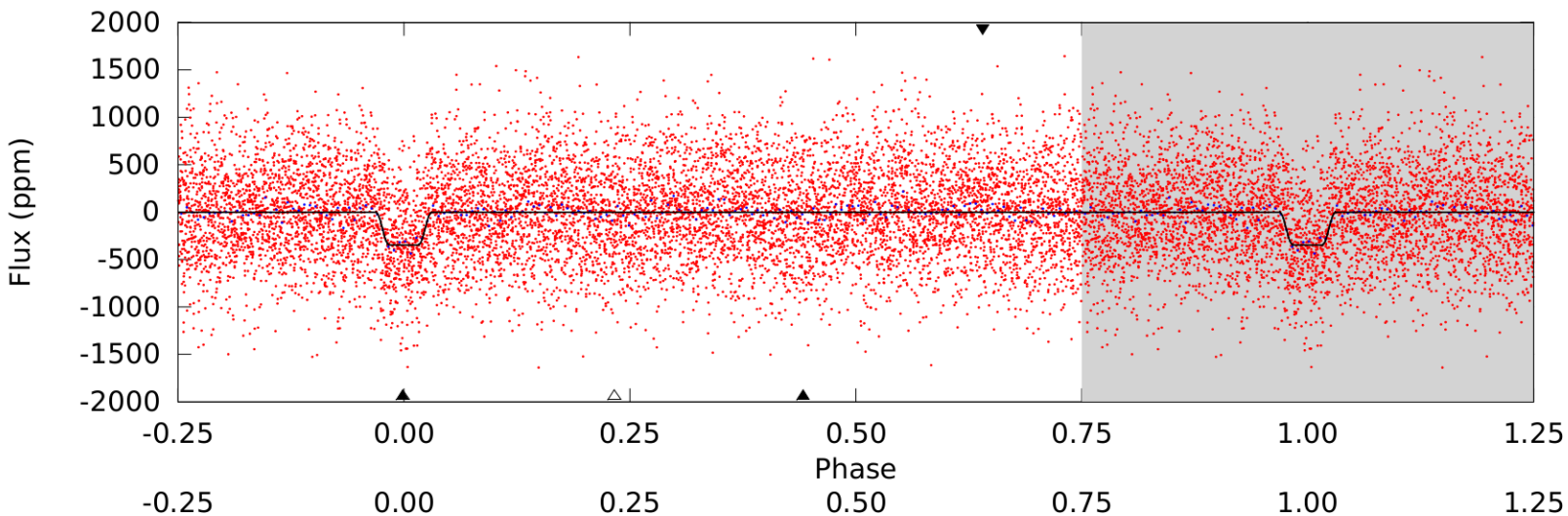
Tier 1 0000000009006668₀1, P = 1.273104 Days, E = 1353.389167 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.4	3.22	2.42	2.21	4.70	1.95	1.07	14.0	14.2	0.80	1.01	0.46	1.09	0.12	0.53

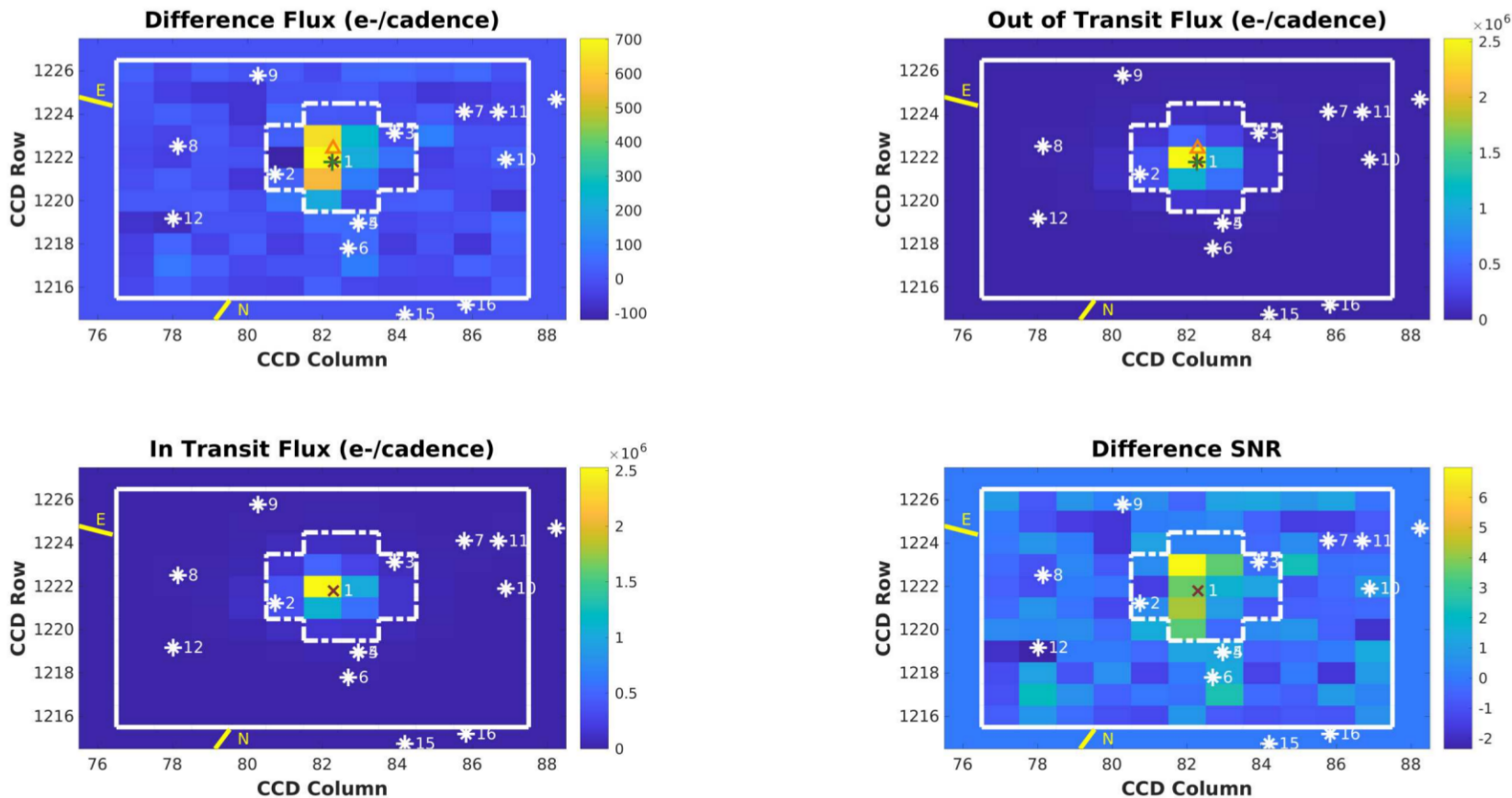


Tier 1 0000000009006668₀1, P = 1.273104 Days, E = 1353.389084 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.1	3.05	2.92	2.18	4.66	1.87	1.41	15.2	15.9	0.13	0.87	0.27	1.05	0.12	0.32



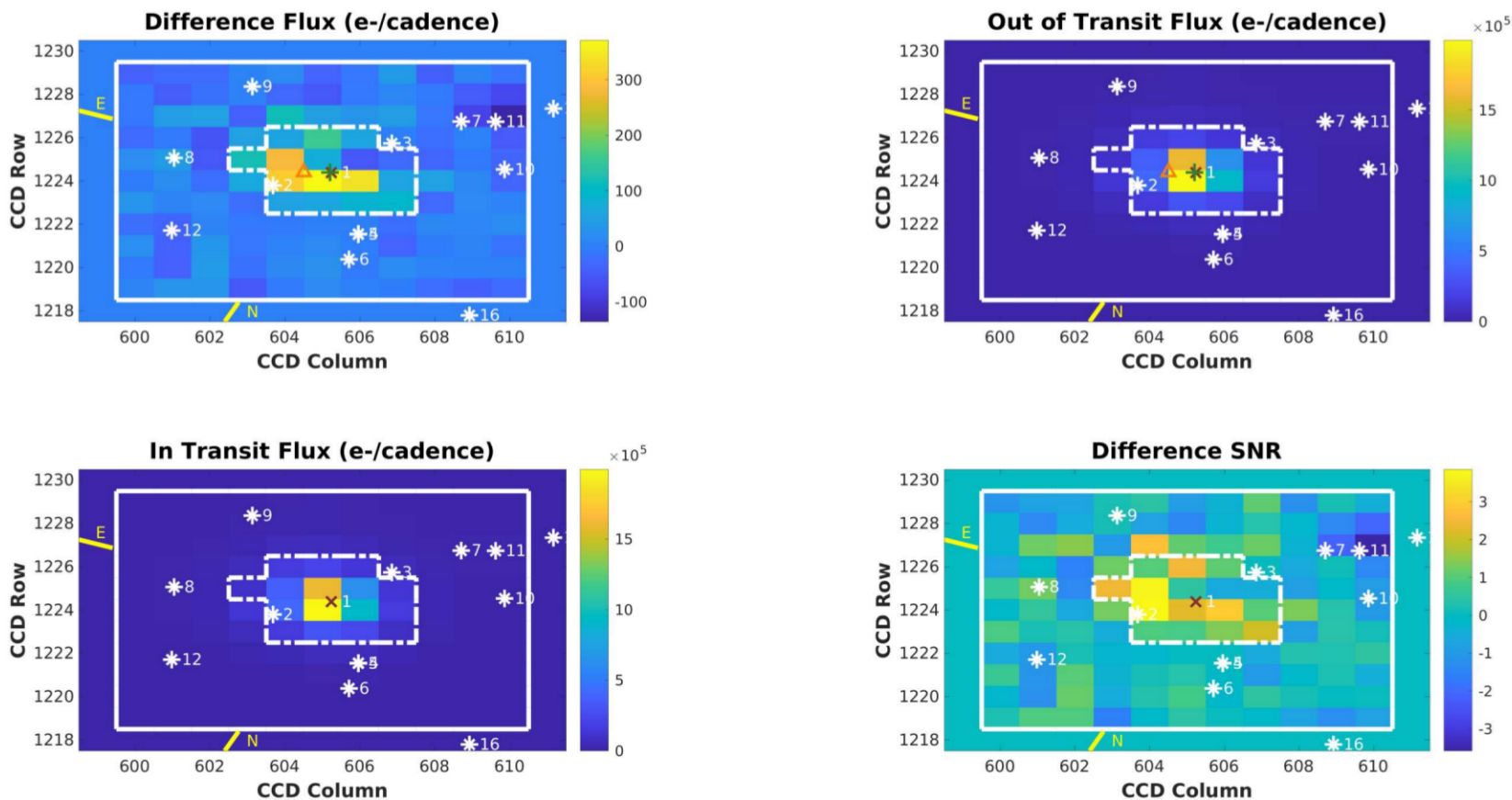
Difference Image
Planet Candidate 1 / Sector 2 / Target Pixel Table 129



Difference image for target 9006668, planet candidate 1, sector 2, target pixel table 129. Upper left: difference between mean flux out-of-transit and in-transit; upper right: mean out-of-transit flux; lower left: mean in-transit flux; lower right: difference between mean flux out-of-transit and in-transit after normalizing by the uncertainty in the difference for each pixel. The optimal aperture is outlined with a white dash-dotted line in each panel and the target mask is outlined with a solid white line. Symbol key: x: target position from TIC RA and Dec converted to CCD coordinates via motion polynomials; *: position of nearby TIC objects converted to CCD coordinates via motion polynomials; +: PRF-fit location of target from out-of-transit image; triangle: PRF-fit location of transit source from the difference image. Number of transits = 15; number of valid in-transit cadences = 102; number of in-transit cadence gaps = 3; number of valid out-of-transit cadences = 287; number of out-of-transit cadence gaps = 6. Difference image quality metric = 0.82 (good).

Open `./planet-01/difference-image/000000009006668-01-difference-image-02-129.fig`

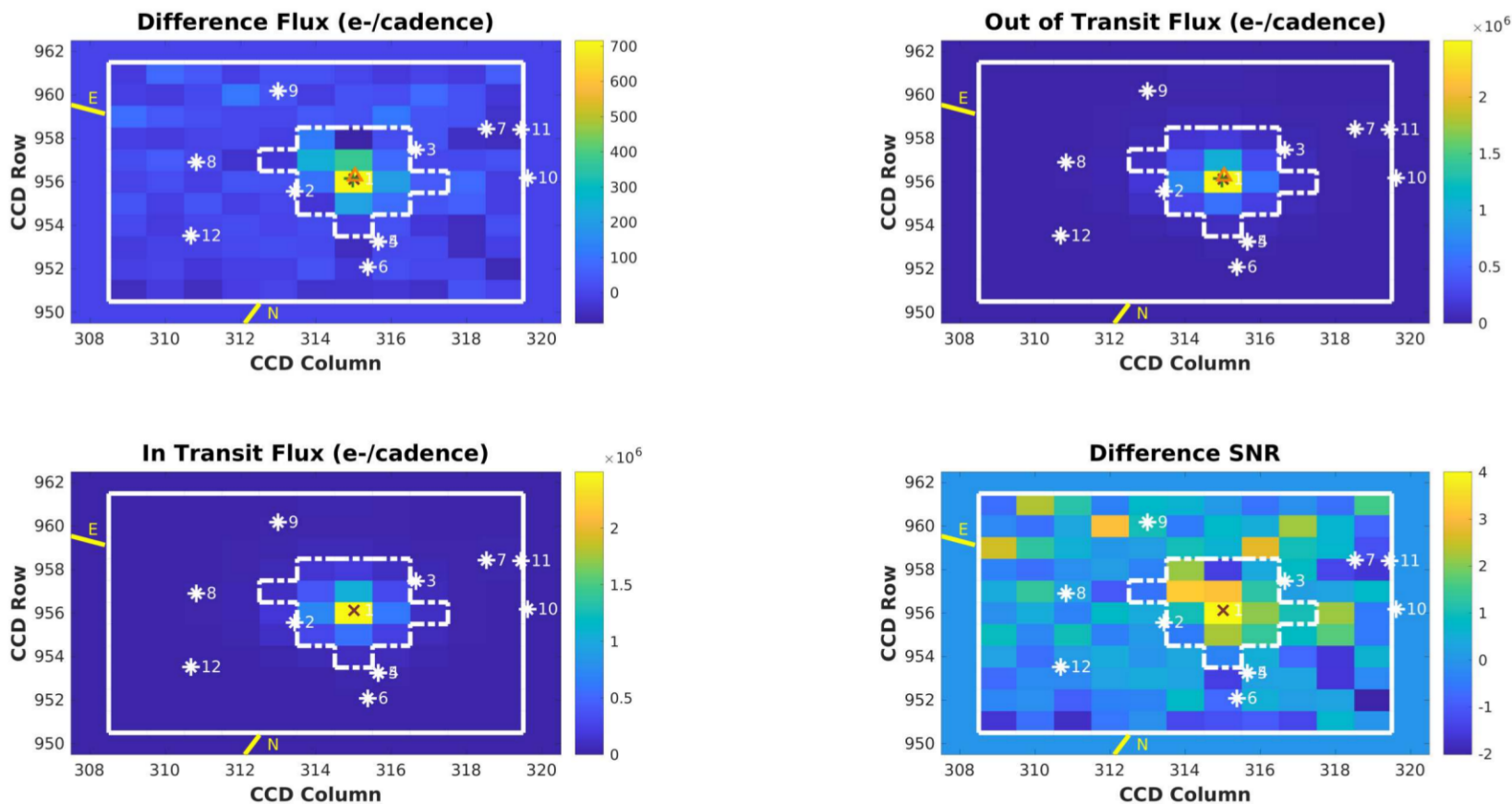
Difference Image
Planet Candidate 1 / Sector 29 / Target Pixel Table 268



Difference image for target 9006668, planet candidate 1, sector 29, target pixel table 268. 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. Number of transits = 16; number of valid in-transit cadences = 111; number of in-transit cadence gaps = 1; number of valid out-of-transit cadences = 311; number of out-of-transit cadence gaps = 1. Difference image quality metric = 0.75 (good).

Open `./planet-01/difference-image/000000009006668-01-difference-image-29-268.fig`

Difference Image
Planet Candidate 1 / Sector 69 / Target Pixel Table 411



Difference image for target 9006668, planet candidate 1, sector 69, target pixel table 411. 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 = 17; number of valid in-transit cadences = 117; number of in-transit cadence gaps = 2; number of valid out-of-transit cadences = 336; number of out-of-transit cadence gaps = 0. Difference image quality metric = 0.89 (good).

Open `./planet-01/difference-image/000000009006668-01-difference-image-69-411.fig`

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

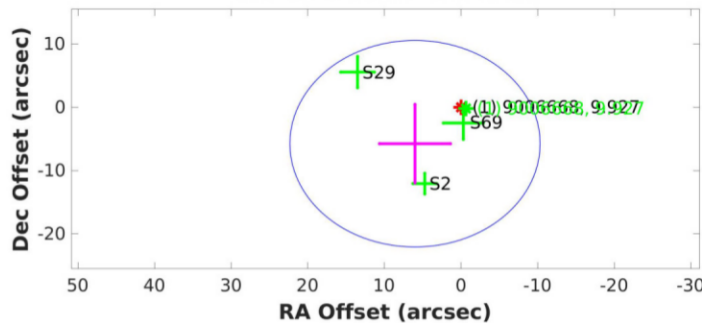
	RA	Dec	Units
Offset	$6.0152 \pm 4.63e + 00$	$-5.7491 \pm 6.21e + 00$	arcseconds
Offset/ σ	1.30	-0.93	
Offset Distance	$8.3208 \pm 5.44e + 00$		arcseconds
Offset Distance/ σ	1.53		
3σ Radius	16.3332		arcseconds

Mean offset from the TIC RA and Dec

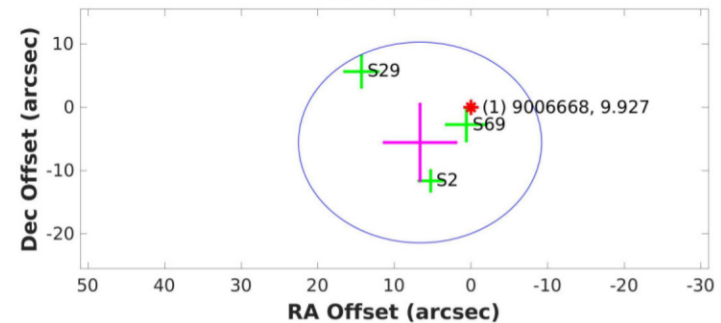
	RA	Dec	Units
Offset	$6.6508 \pm 4.68e + 00$	$-5.5588 \pm 6.06e + 00$	arcseconds
Offset/ σ	1.42	-0.92	
Offset Distance	$8.6679 \pm 5.29e + 00$		arcseconds
Offset Distance/ σ	1.64		
3σ Radius	15.8689		arcseconds

Planet Candidate 1

Offsets Relative to Out of Transit Centroid



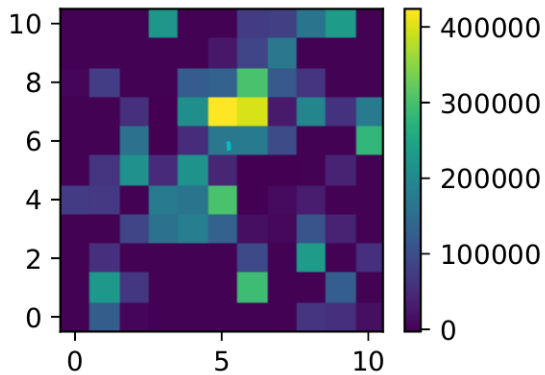
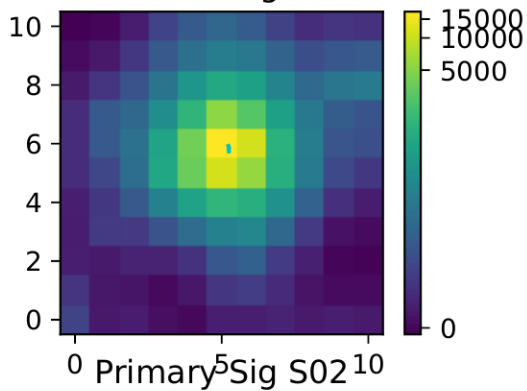
Offsets Relative to TIC Position



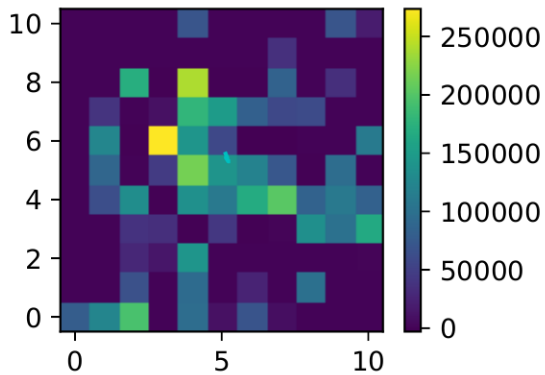
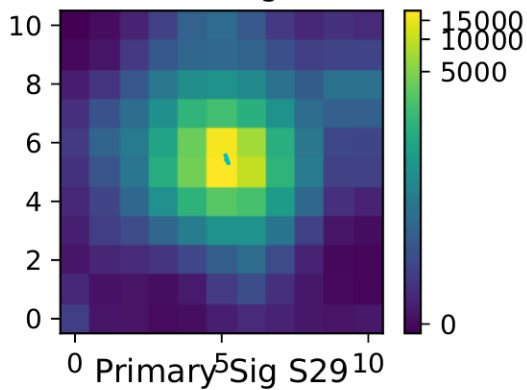
Difference image centroid offsets for target 9006668, planet candidate 1. Left: difference image PRF centroid offsets in RA and Dec with respect to the per sector out-of-transit centroids for the given target. Right: difference image PRF centroid offsets in RA and Dec with respect to the TC coordinates 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/000000009006668-01-difference-image-centroid-offsets.fig`

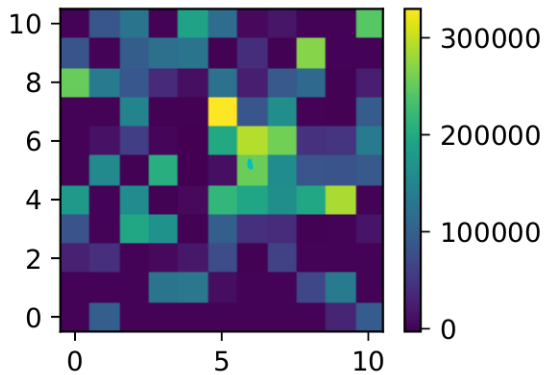
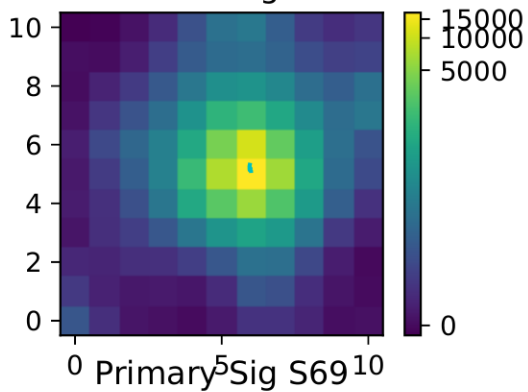
Median Image S02



Median Image S29



Median Image S69



Using TIC: 9006668

Tier 1

Using TIC catalog position 349.231323 -18.606645 [J2000.0; epoch 2000.0]

Predicted GAIA position 349.231081 -18.606646 [J2000.0; epoch 2015.5]

2MASS J23165553-1836238 From TIC

2 TIC entries within 60.0 arcsec of target 9006668

9006666 Sep [arcsec]: 34.228 Tmag: 13.26 Teff: 6316.0 Logg: 3.88 Rs[Rsun]: 2.11
2052212922 Sep [arcsec]: 42.860 Tmag: 18.92 Teff: 3990.0 Logg: 0.00 Rs[Rsun]: 0.00

TIC Hosts TOIs

238.01

Target Parameters

Catalog	Tmag/Rpmag	Teff	Logg	Rstar	Mstar
TIC	9.9266	5029.0±123.5	4.59±0.09	0.77± 0.0	0.84± 0.10
GAIA DR2	9.877	5047.0± 63.2	...	0.76± 0.0	...

Other GAIA G: 10.49 Bp: 10.97 AbsG: 5.82 (Bp-Rp)o: 1.023 AstroGOF: 4.35 AstroExNoiSig: 0.00

Target Links

- [ExoFOP](#)
- [Simbad](#)
- [Vizier](#)
- [MAST TESS Data Holdings](#)
- [IRSA FINDERCHART](#)
- [ESO Data Archive Holdings](#)
- [TESScut TPF Download](#)
- [GAIA DR2 60" Cone Search @MAST](#)

NASA Ames SPOC DV Results Available at MAST

- https://mast.stsci.edu/api/v0/download/file?uri=mast:TESS/product/tess2018206190142-s0001-s0036-000000009006668-00471_dvr.pdf
- https://mast.stsci.edu/api/v0/download/file?uri=mast:TESS/product/tess2018206190142-s0001-s0036-000000009006668-00471_dvm.pdf
- https://mast.stsci.edu/api/v0/download/file?uri=mast:TESS/product/tess2018206190142-s0001-s0036-000000009006668-01-00471_dvs.pdf
- https://mast.stsci.edu/api/v0/download/file?uri=mast:TESS/product/tess2018206190142-s0001-s0069-000000009006668-00810_dvr.pdf
- https://mast.stsci.edu/api/v0/download/file?uri=mast:TESS/product/tess2018206190142-s0001-s0069-000000009006668-00810_dvm.pdf
- https://mast.stsci.edu/api/v0/download/file?uri=mast:TESS/product/tess2018206190142-s0001-s0069-000000009006668-01-00810_dvs.pdf
- https://mast.stsci.edu/api/v0/download/file?uri=mast:TESS/product/tess2018235142541-s0002-s0002-000000009006668-00109_dvr.pdf
- https://mast.stsci.edu/api/v0/download/file?uri=mast:TESS/product/tess2018235142541-s0002-s0002-000000009006668-00372_dvr.pdf
- https://mast.stsci.edu/api/v0/download/file?uri=mast:TESS/product/tess2018235142541-s0002-s0002-000000009006668-00109_dvm.pdf
- https://mast.stsci.edu/api/v0/download/file?uri=mast:TESS/product/tess2018235142541-s0002-s0002-000000009006668-00372_dvm.pdf
- https://mast.stsci.edu/api/v0/download/file?uri=mast:TESS/product/tess2018235142541-s0002-s0002-000000009006668-01-00109_dvs.pdf
- https://mast.stsci.edu/api/v0/download/file?uri=mast:TESS/product/tess2018235142541-s0002-s0002-000000009006668-01-00372_dvs.pdf

9006668 2 1 4 83.18 1221.82
9006668 29 1 4 606.14 1224.37
9006668 69 1 4 315.92 956.16

Tier 1