

KIC 003644071

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
003644071-01	OBS	1192.02	359.047040	295.776897	5675.4	32.209	144.1	111.7	1.05	5609	12.57	1.08
003644071-02	OBS	No	359.039273	274.226742	4407.8	15.578	113.9	92.0	1.05	5609	8.72	1.08

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003644071-01	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_MARSHALL_SKYE—INCONSISTENT_TRANS—CENT_FEW_DIFFS—EPHEM_MATCH
003644071-02	OBS	FP	0.00	1	0	1	1	INDIV_TRANS_SKYE—SAME_NTL_PERIOD—CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

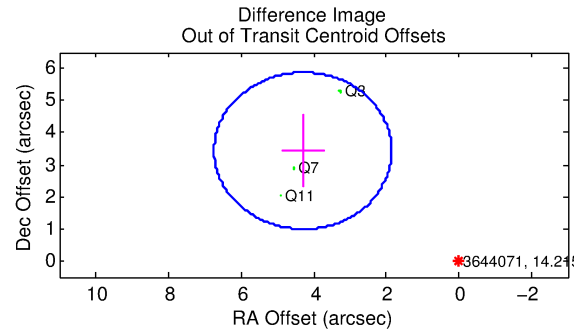
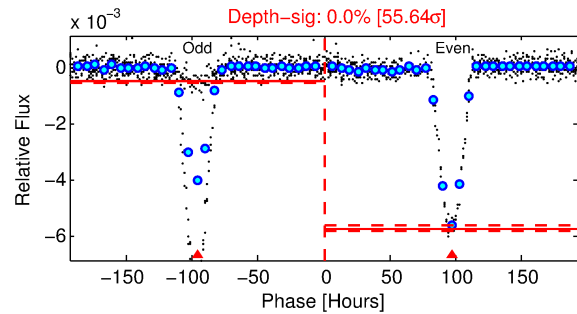
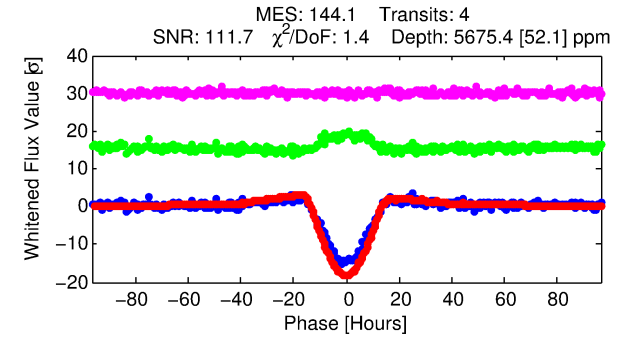
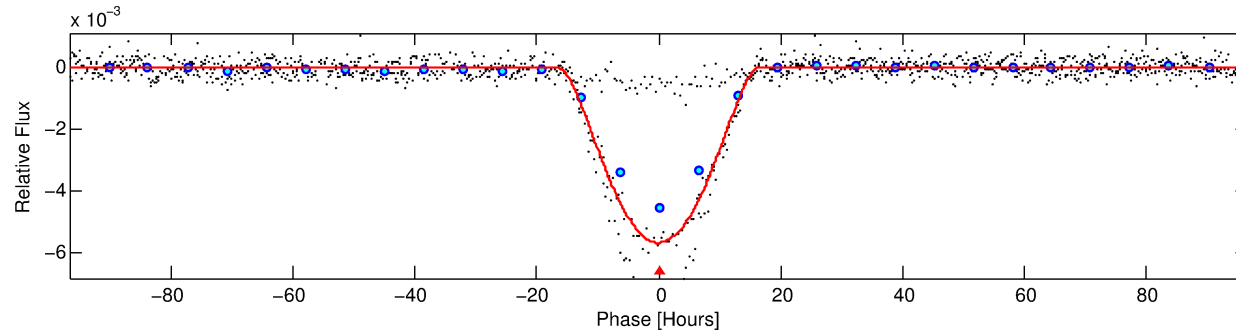
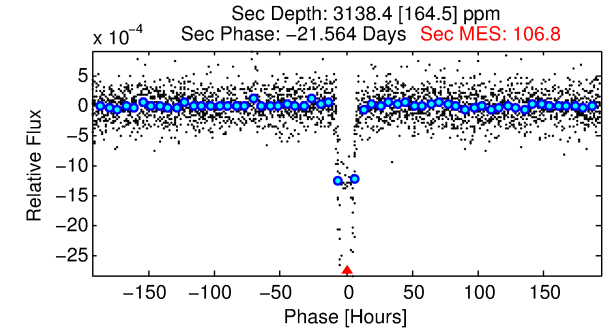
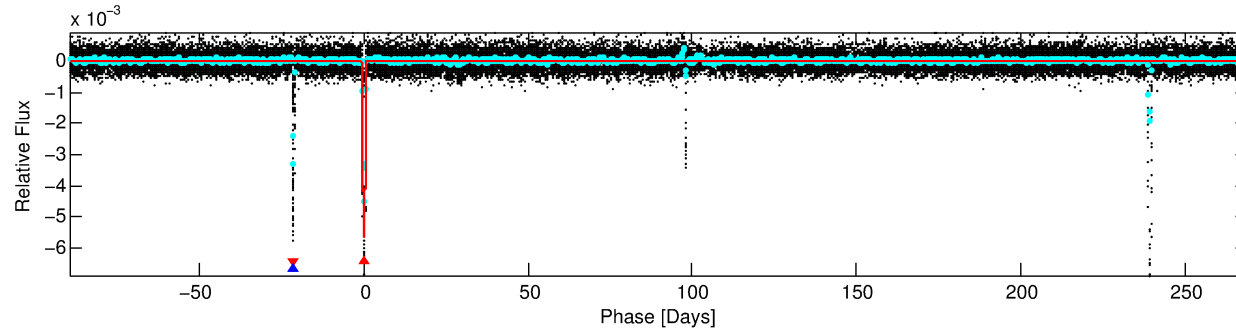
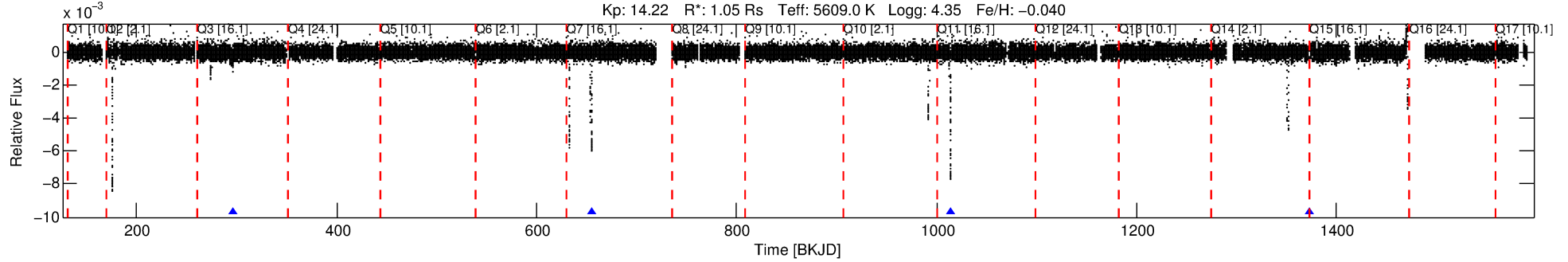
Ephemeris Match Information For 003644071-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
003644071-01	3644071	3511.01	3644542	3:1	447.0	-6	-1	8.35	14.21	52.69	Direct-PRF	0	1.01	0.12

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 3644071 Candidate: 1 of 2 Period: 359.047 d
KOI: K01192.02 Corr: 0.948



DV Fit Results:

Period = 359.04704 [0.00346] d
Epoch = 295.7769 [0.0044] BKJD
Rp/R* = 0.1099 [0.0212]
a/R* = 45.51 [2.09]
b = 0.97 [0.03]
Seff = 1.08 [0.40]
Teq = 260 [24] K
Rp = 12.57 [4.24] Re
a = 0.9507 [0.2272] AU
Ag = 9873.81 [5203.80] [1.90 σ]
Teffp = 4004 [408] K [9.17 σ]

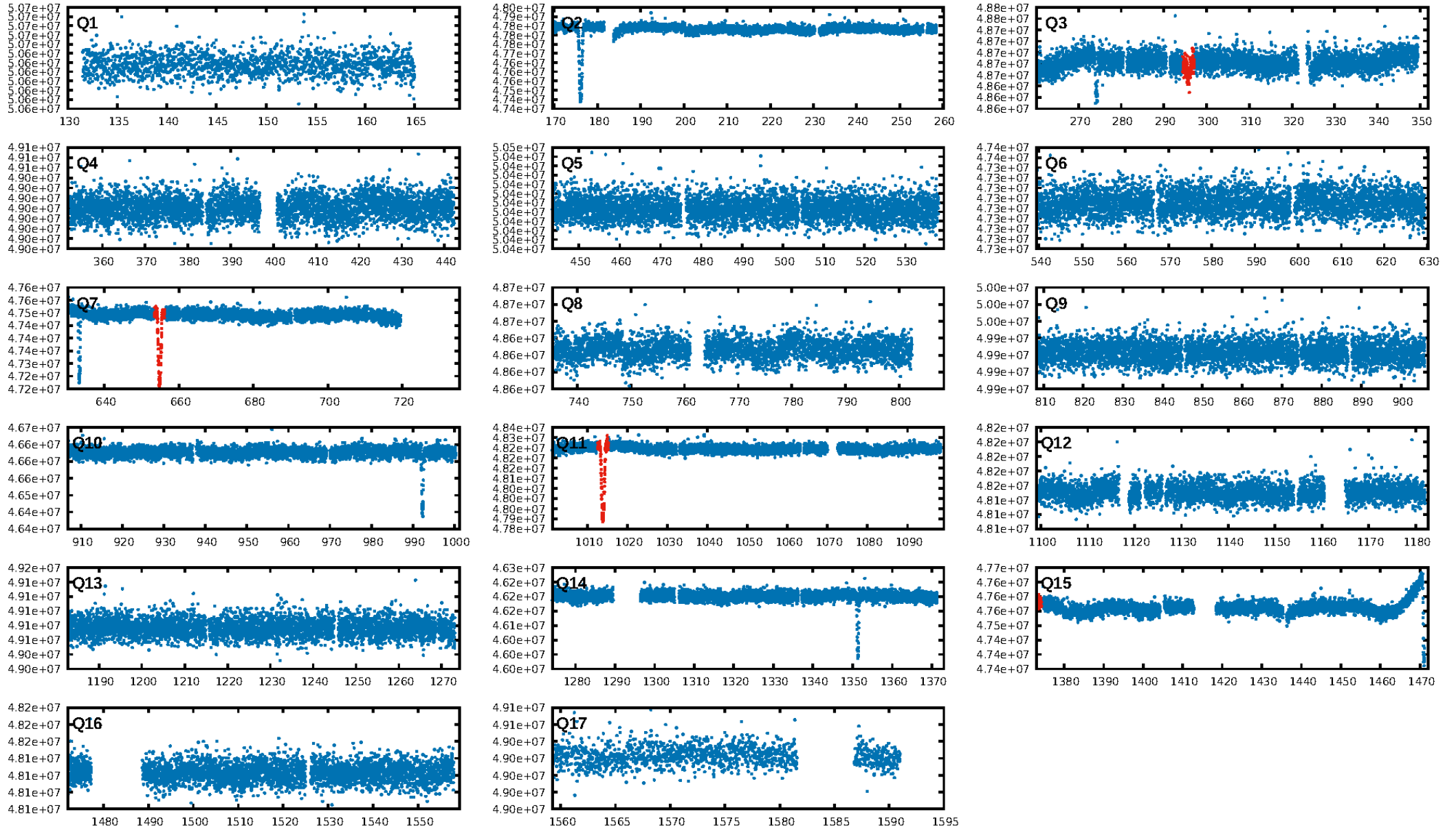
DV Diagnostic Results:

ShortPeriod-sig: 0.4% [0.01 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -0.5573
Centroid-sig: 0.0%
Centroid-so: 4.473 arcsec [14.41 σ]
OotOffset-rm: 5.497 arcsec [6.75 σ]
KicOffset-rm: 5.602 arcsec [6.84 σ]
OotOffset-st: 0/3/0/0 [3]
KicOffset-st: 0/3/0/0 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

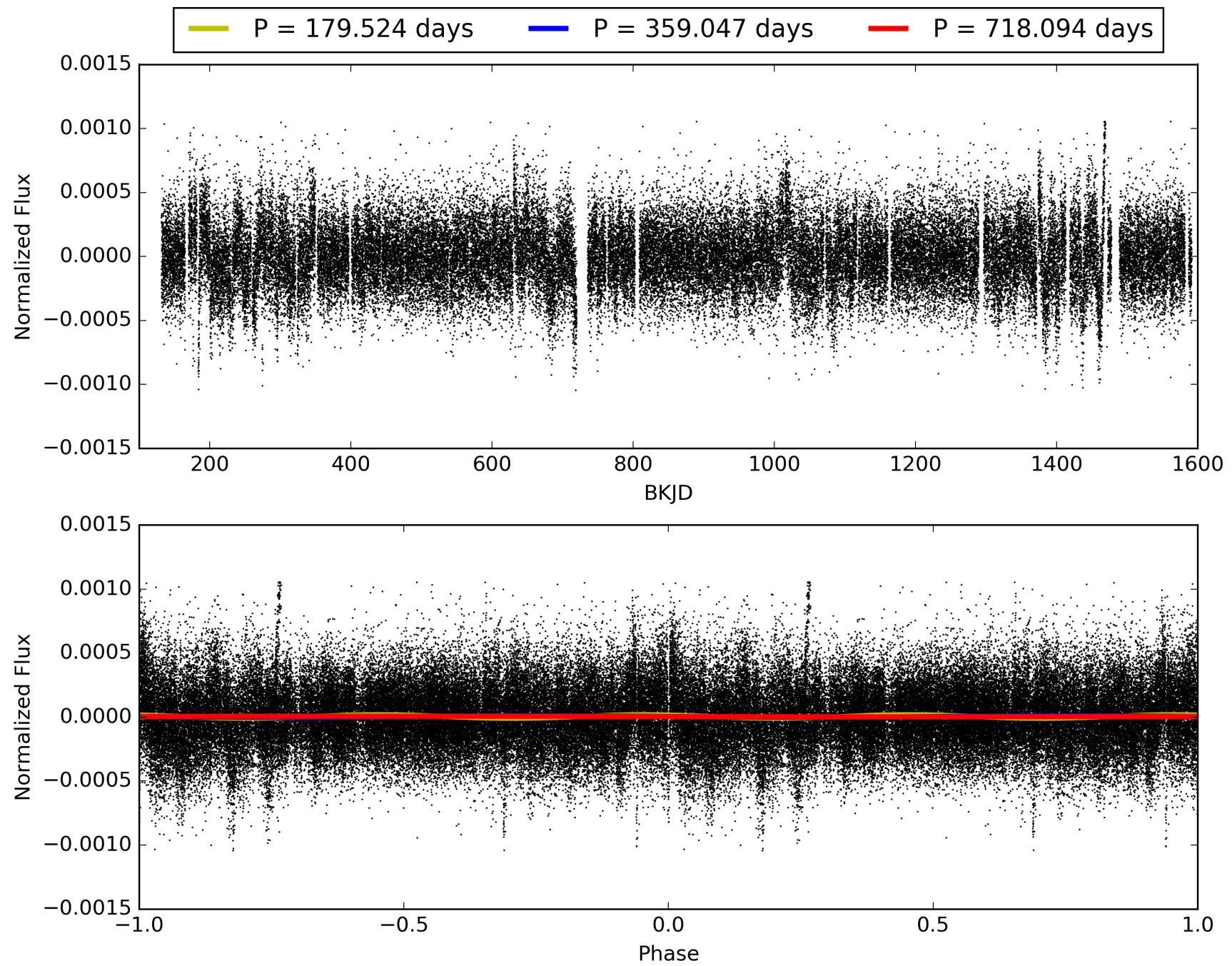
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 003644071-01, PDC Light Curves

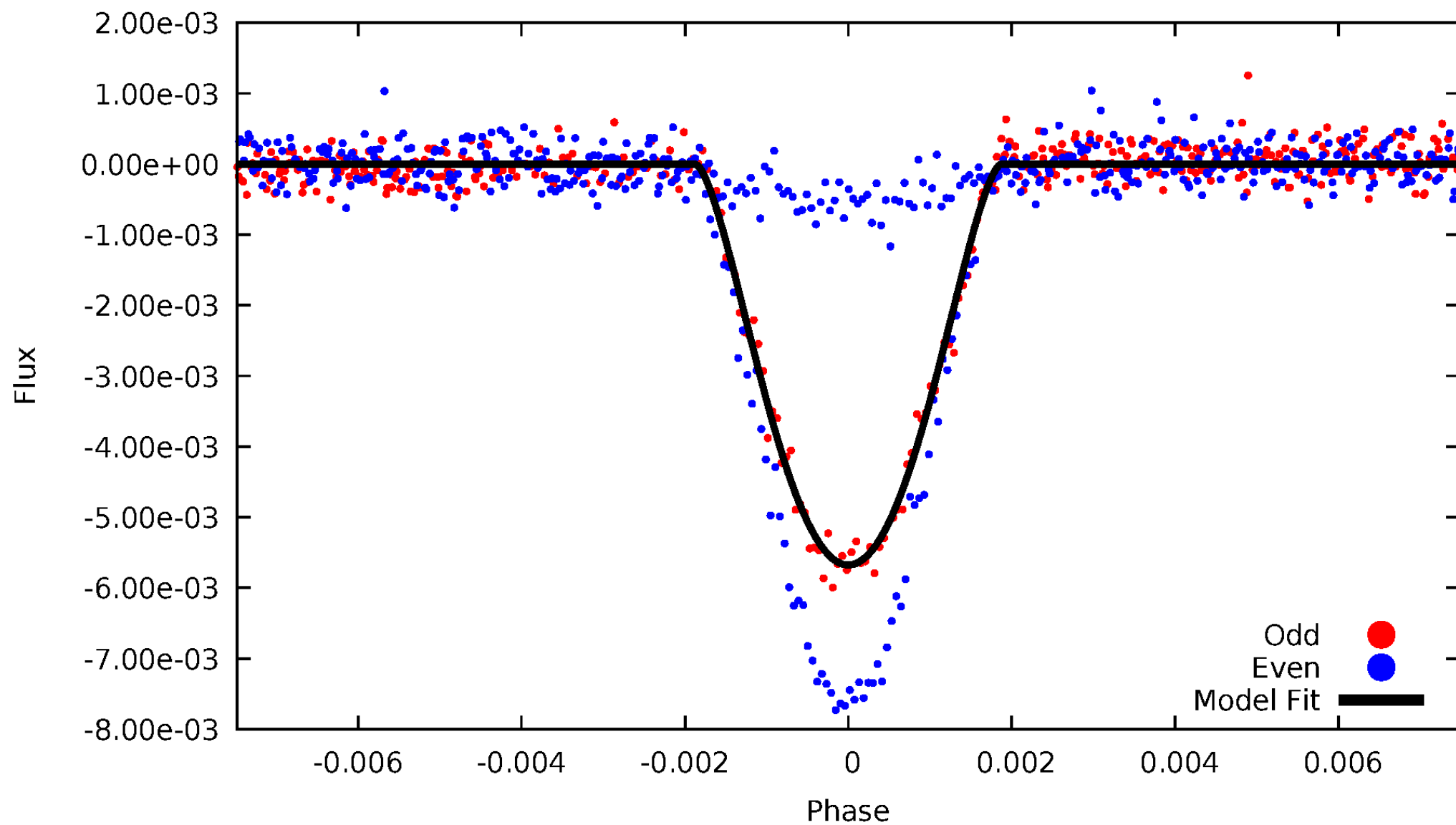


TCE 003644071-01



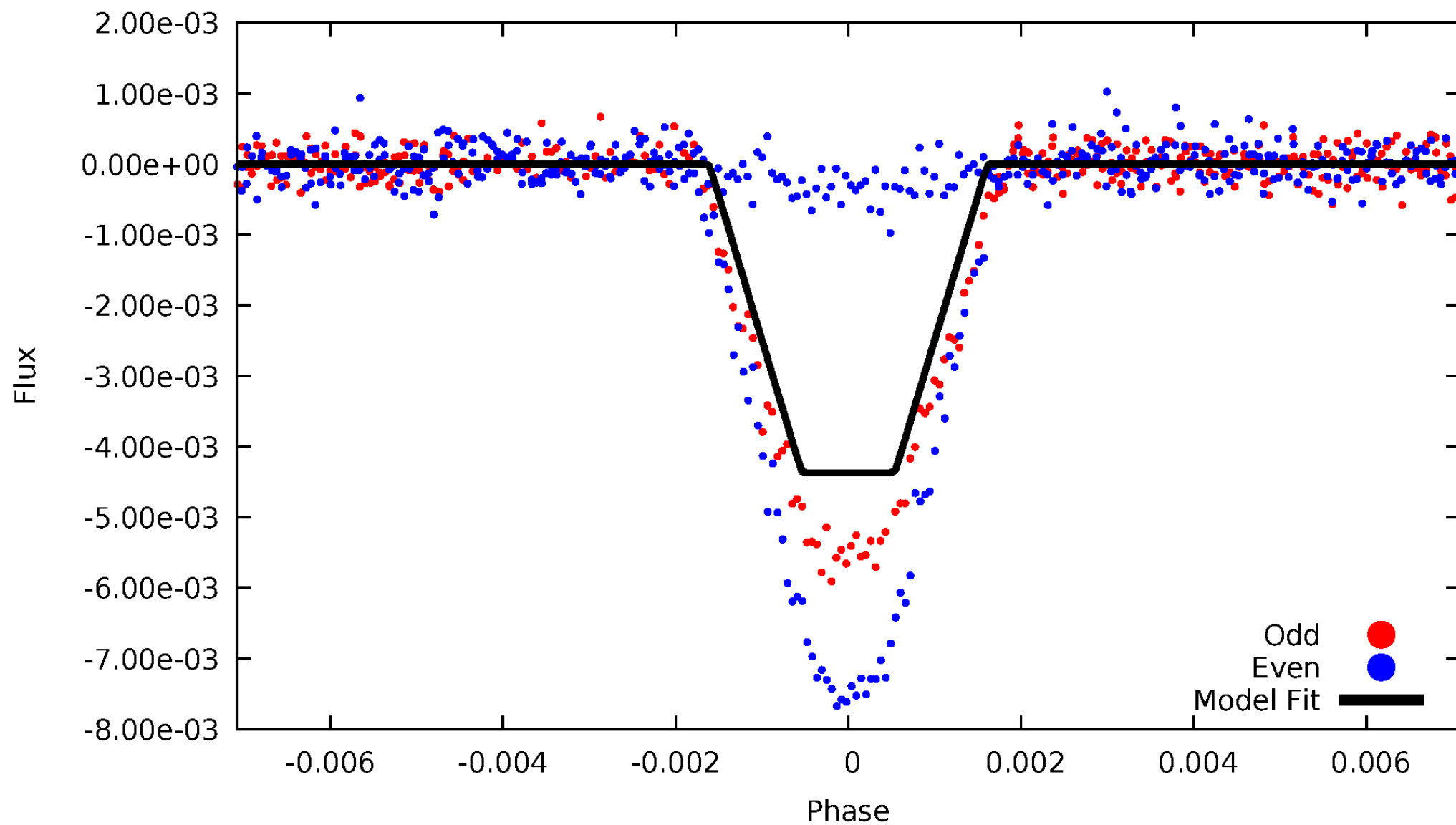
DV Odd/Even

TCE 003644071-01

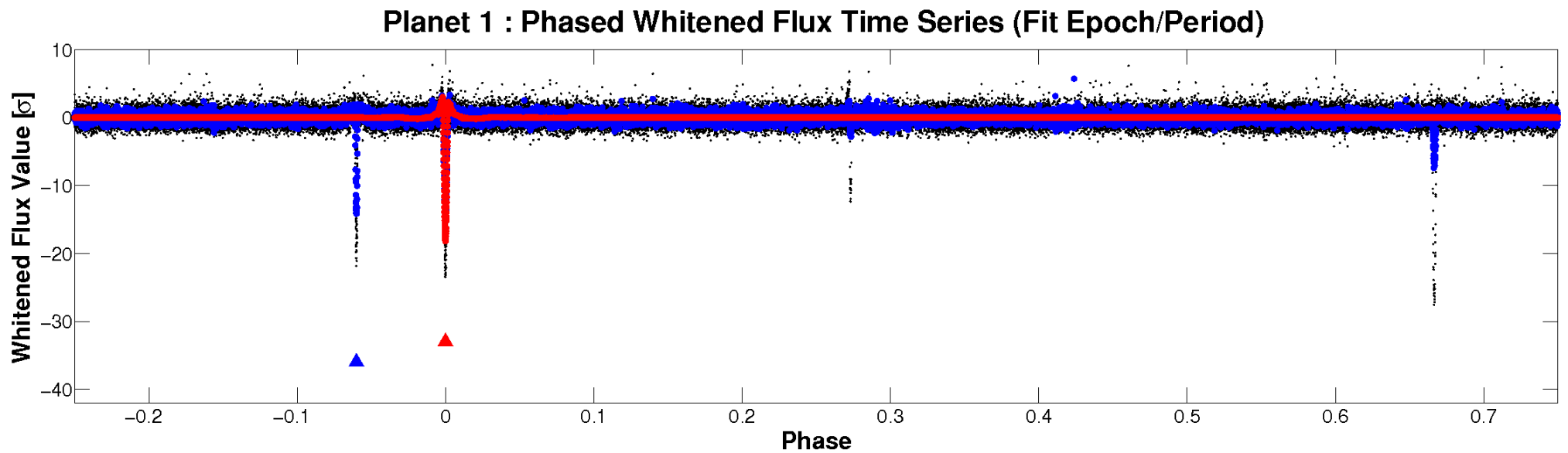
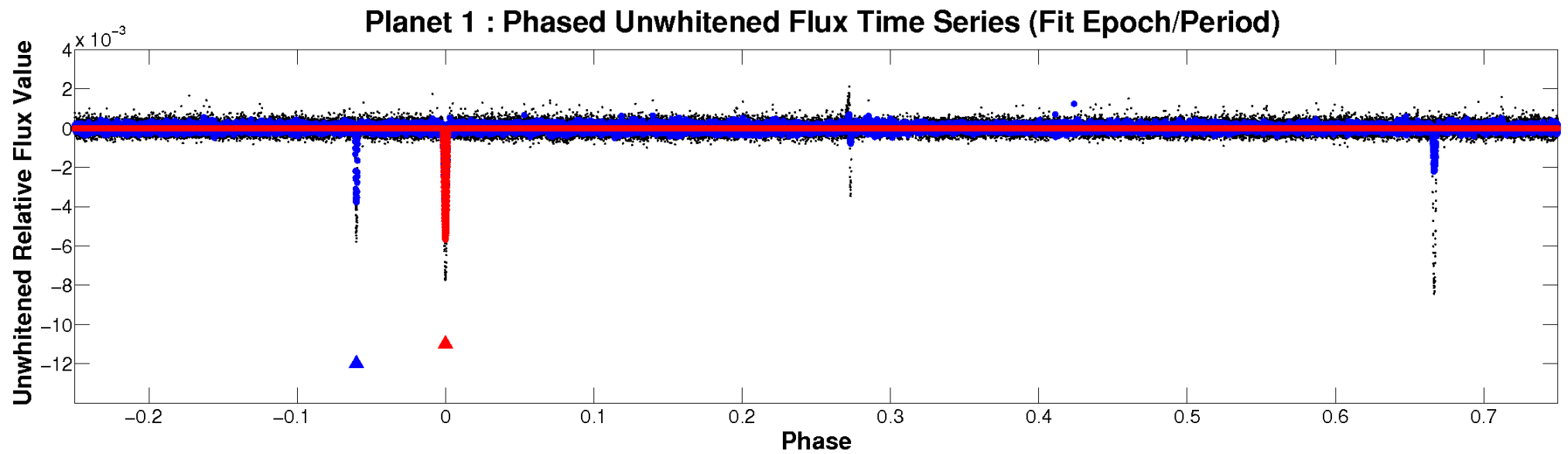


ALT Odd/Even

TCE 003644071-01

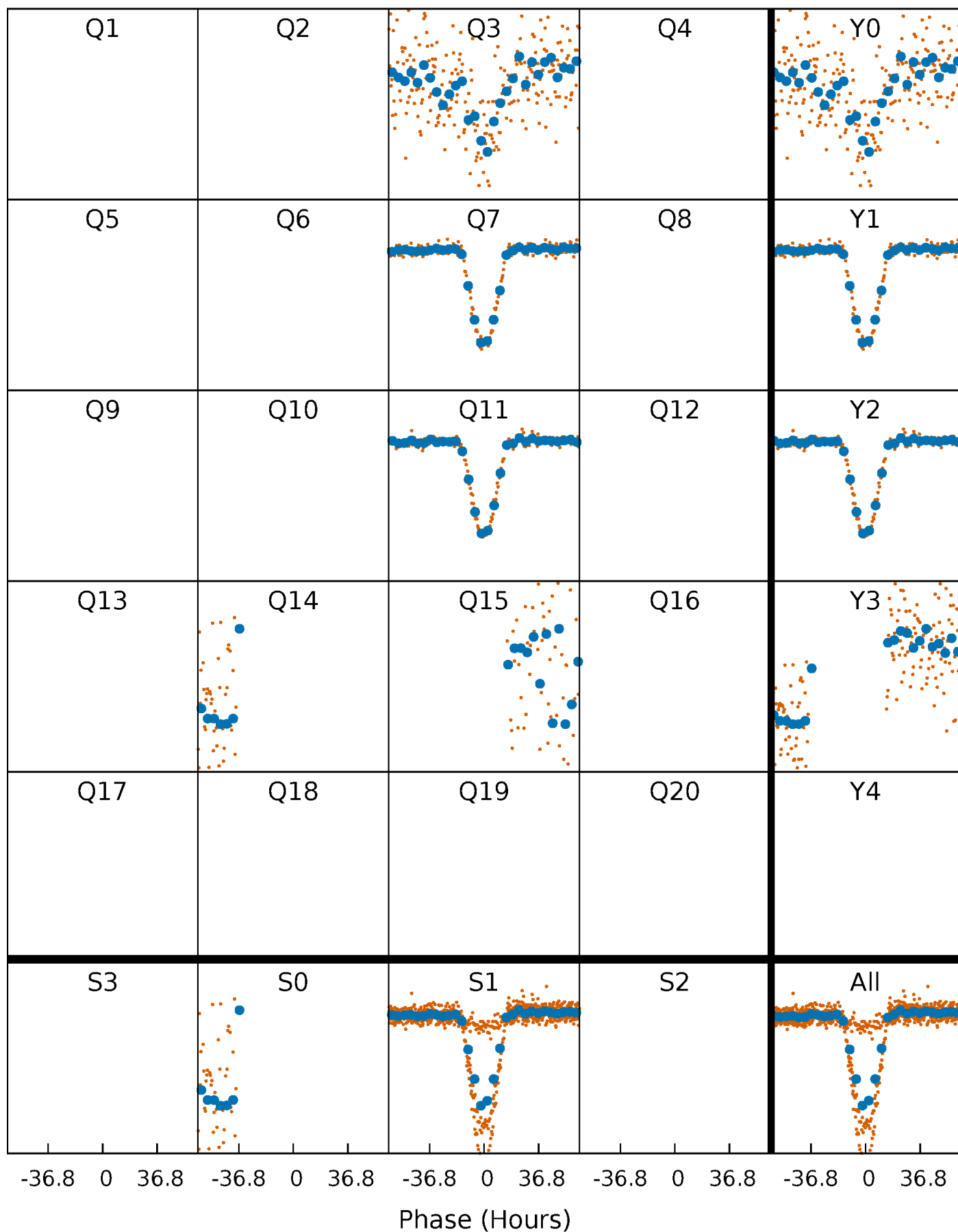


Non-Whitened Vs. Whitened Light Curve



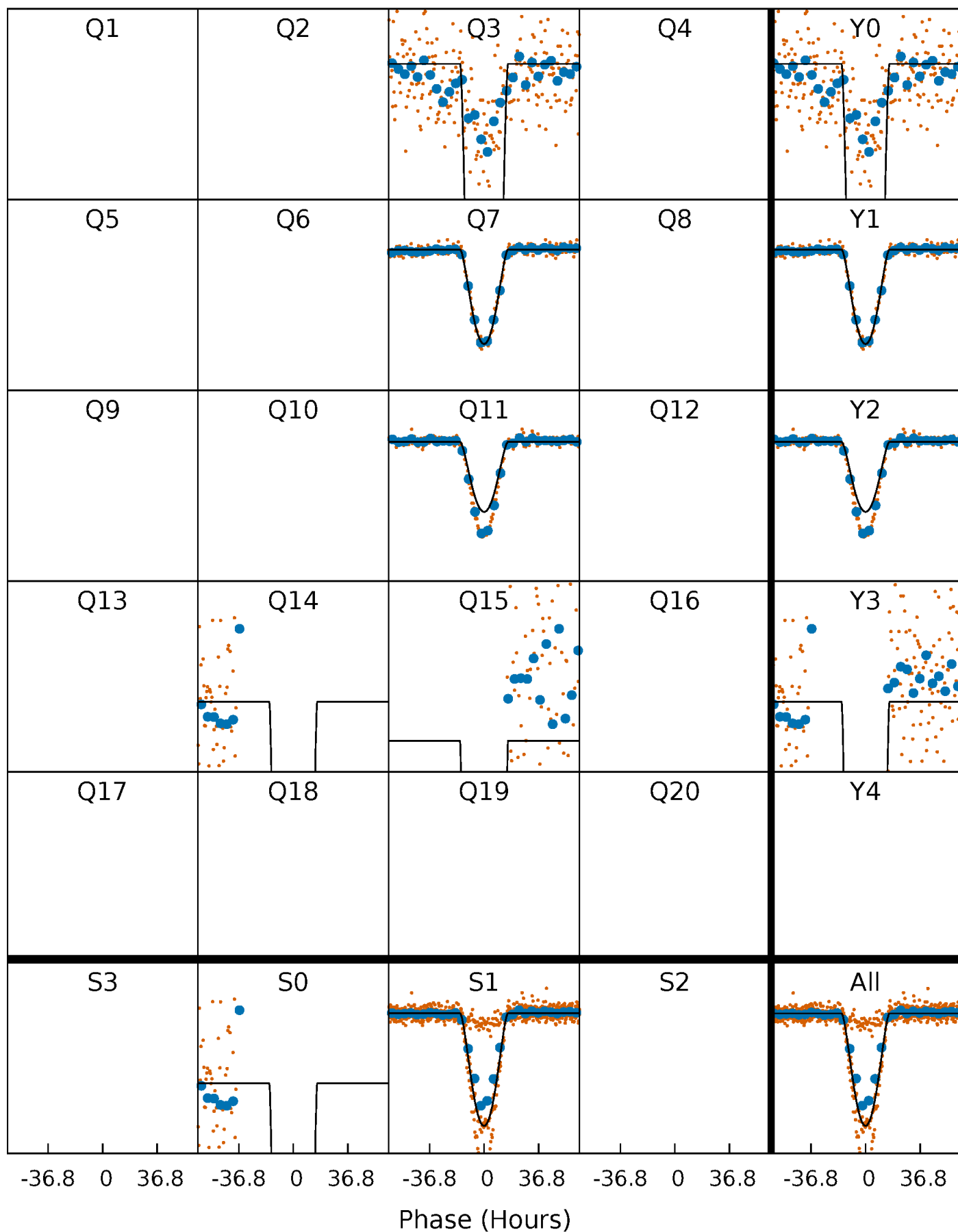
PDC Quarter-Phased Transit Curves

TCE 003644071-01 P=359.047040 Days $T_0=295.776897$ (BKJD)



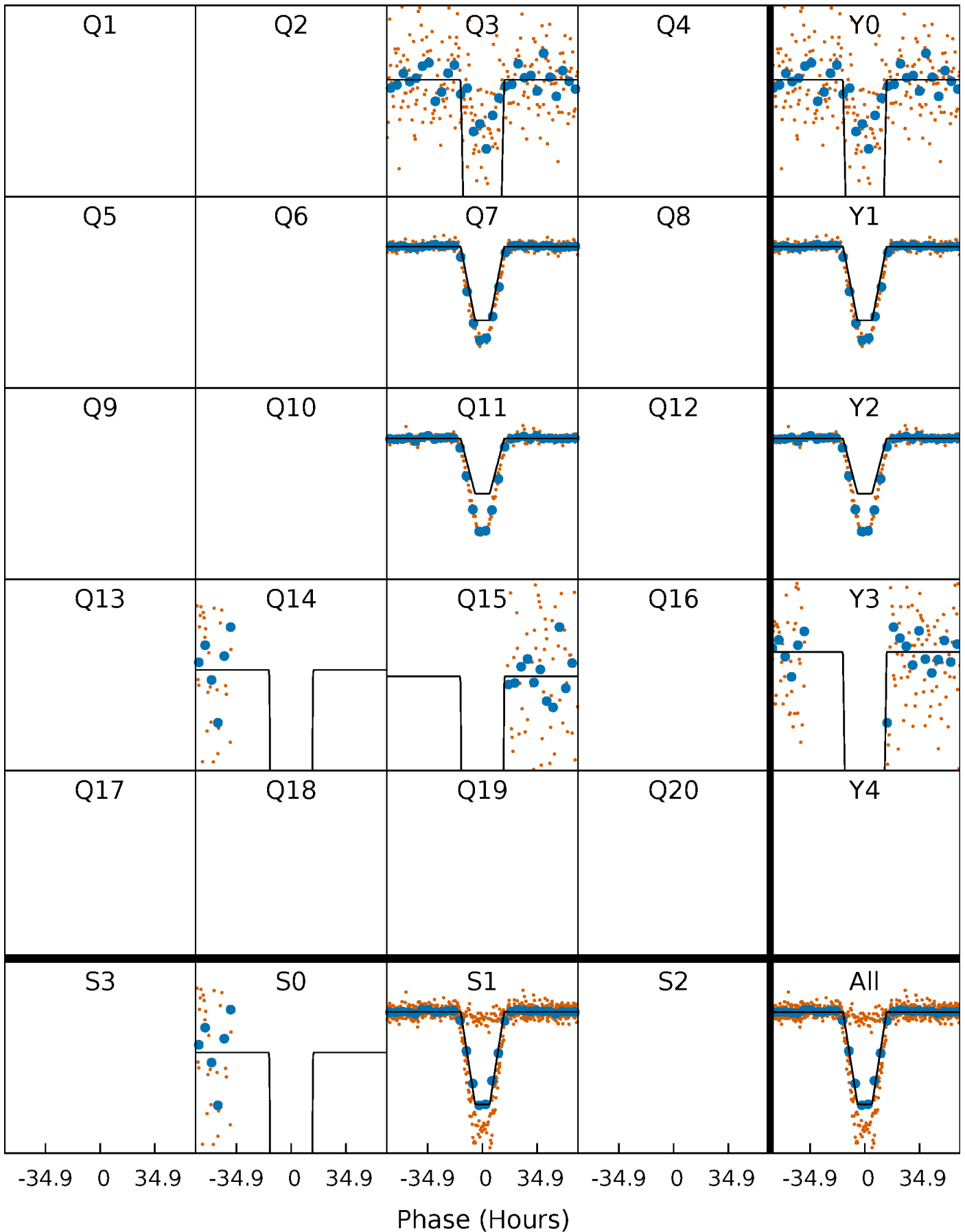
DV Quarter-Phased Transit Curves

TCE 003644071-01 P=359.047040 Days $T_0=295.776897$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

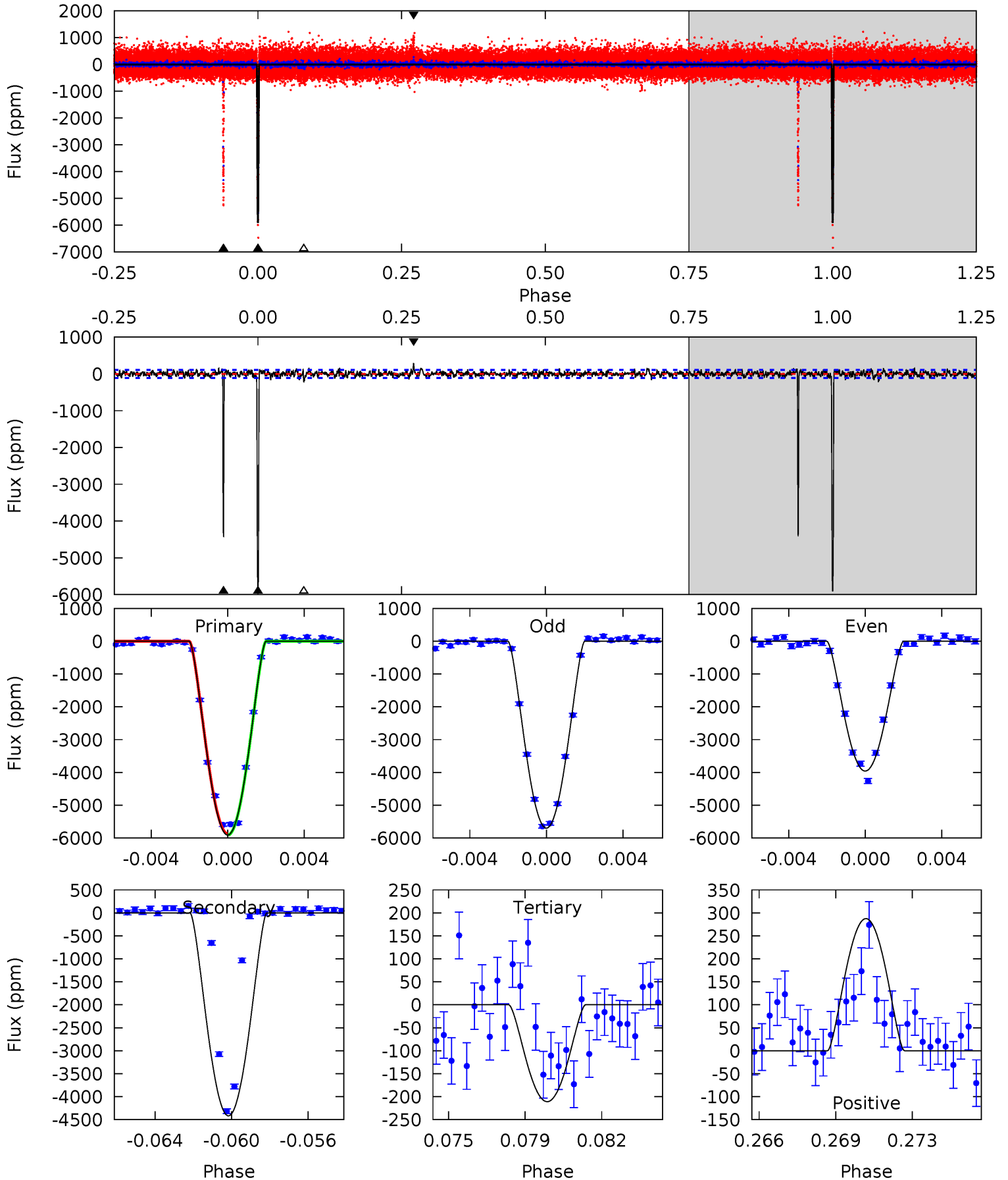
TCE 003644071-01 P=359.038083 Days $T_0=295.788071$ (BKJD)



DV Model-Shift Uniqueness Test

003644071-01, P = 359.047040 Days, E = 295.776897 Days

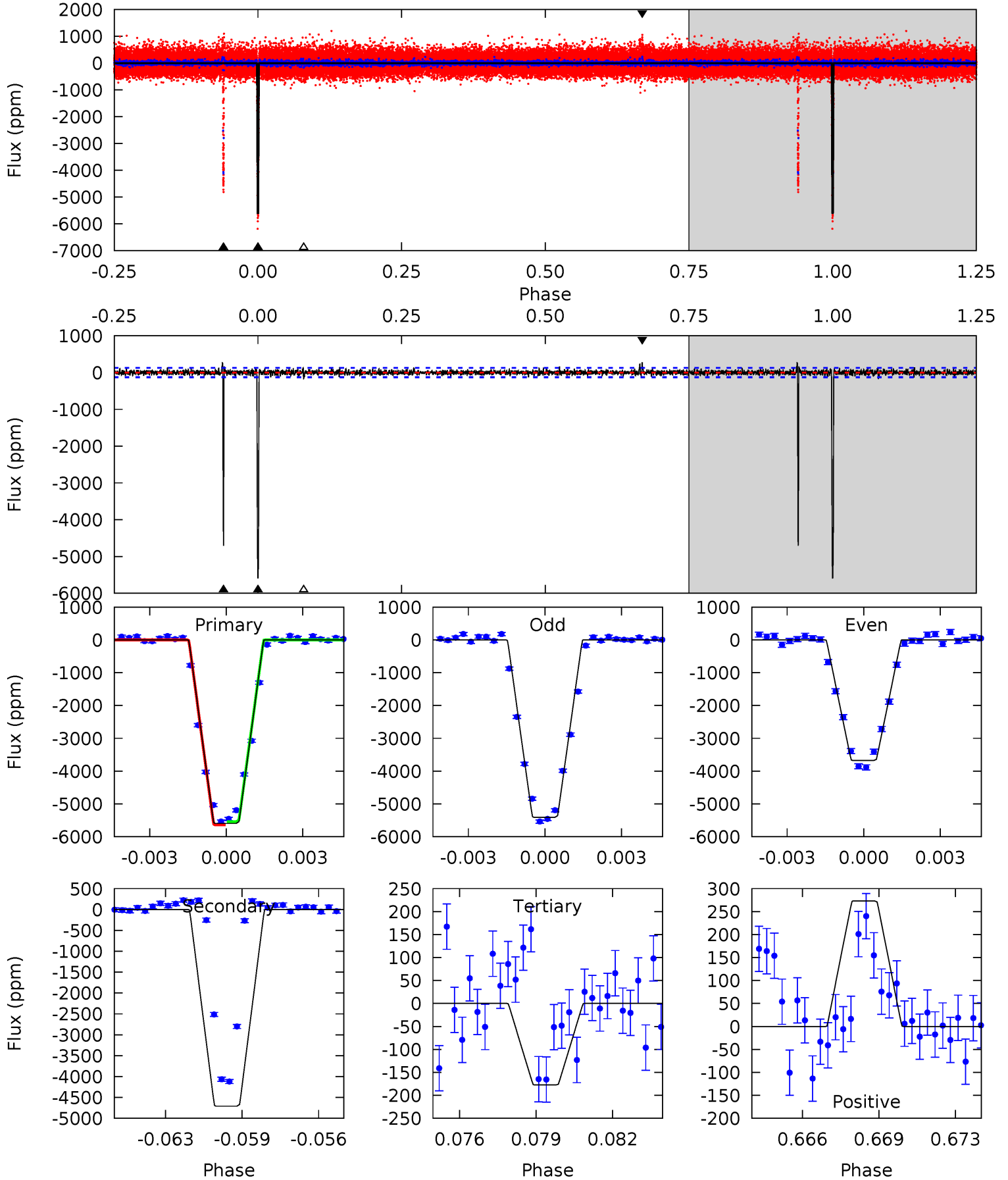
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
279.3	208.8	9.97	13.6	5.21	2.90	2.23	269.4	265.7	198.8	195.2	47.3	0.88	0.05	0.98



Alt Model-Shift Uniqueness Test

003644071-01, P = 359.038083 Days, E = 295.788071 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
230.0	193.6	7.30	11.2	5.24	2.94	1.50	222.7	218.8	186.3	182.4	43.3	0.79	0.05	0



Stellar Parameters For KIC 003644071

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5609^{+169}_{-152}	$4.346^{+0.162}_{-0.198}$	$-0.040^{+0.300}_{-0.300}$	$1.048^{+0.290}_{-0.193}$	$0.889^{+0.114}_{-0.076}$	$1.088^{+0.872}_{-0.563}$
	+3%/-3%	+4%/-5%	+750%/-750%	+28%/-18%	+13%/-9%	+80%/-52%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 003644071-01 / KOI 1192.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-4416 ± 21	$12.55^{+3.58}_{-2.57}$	364^{+28}_{-22}	4532^{+429}_{-304}	14051^{+8147}_{-5380}
Alt.	-4709 ± 24	$7.54^{+2.63}_{-2.48}$	365^{+29}_{-23}	5742^{+1366}_{-664}	41482^{+51189}_{-18820}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

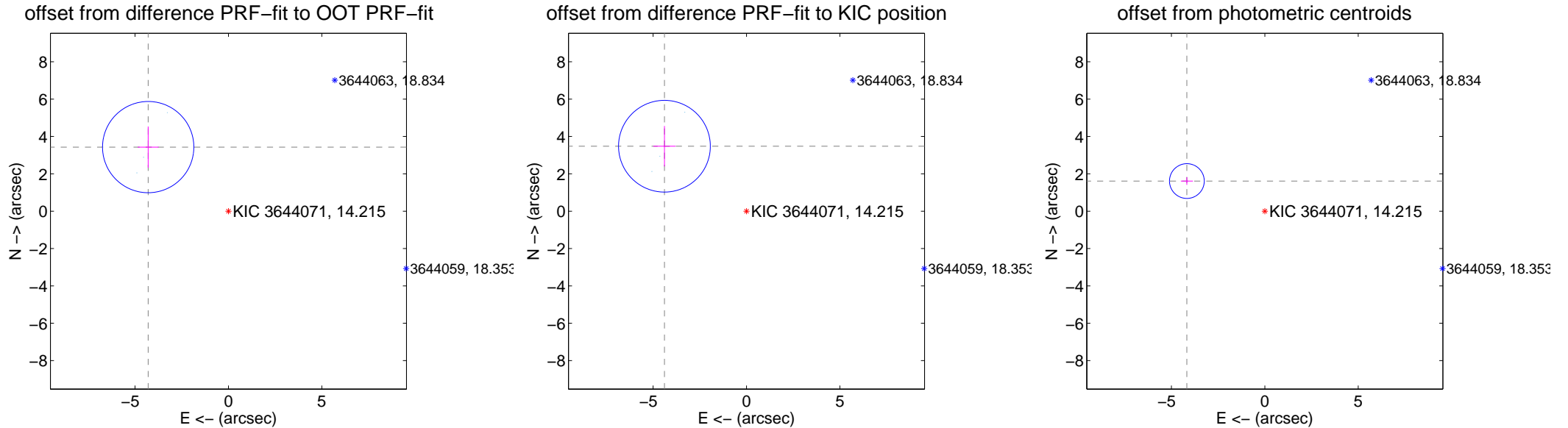
DV Centroid Data

Supplemental centroid analysis for 003644071-01. Kepler magnitude: 14.21. Transit SNR 111.70

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.497 ± 0.814	6.75	4.295 ± 0.559	3.431 ± 1.101
PRF-fit source offset from KIC position	5.602 ± 0.819	6.84	4.391 ± 0.596	3.479 ± 1.082
photometric centroid source offset	4.47 ± 0.31	14.41	4.17 ± 0.32	1.61 ± 0.20



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

Q1 no difference image



Q1 no OOT image



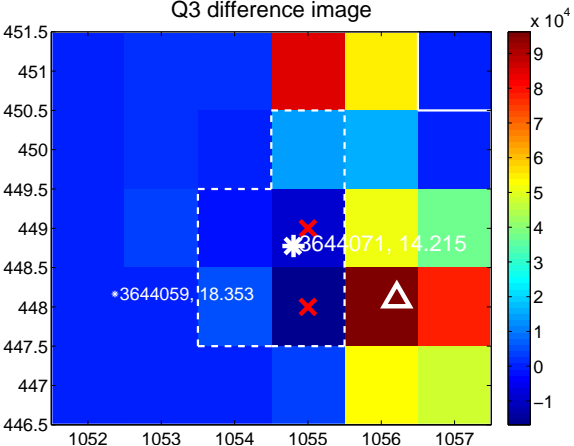
Q2 no difference image



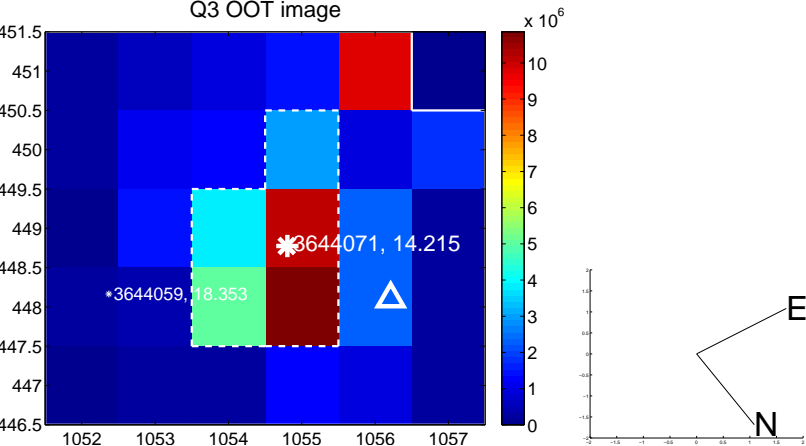
Q2 no OOT image



Q3 difference image



Q3 OOT image



Q4 no difference image



Q4 no OOT image



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

Q5 no difference image



Q5 no OOT image



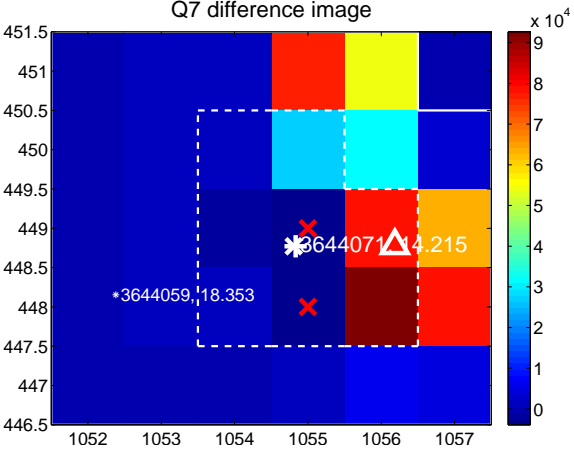
Q6 no difference image



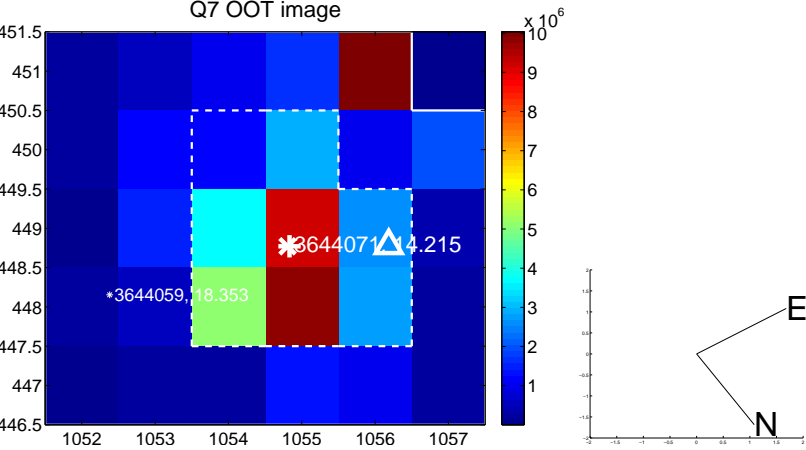
Q6 no OOT image



Q7 difference image



Q7 OOT image



Q8 no difference image



Q8 no OOT image



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

Q9 no difference image



Q9 no OOT image



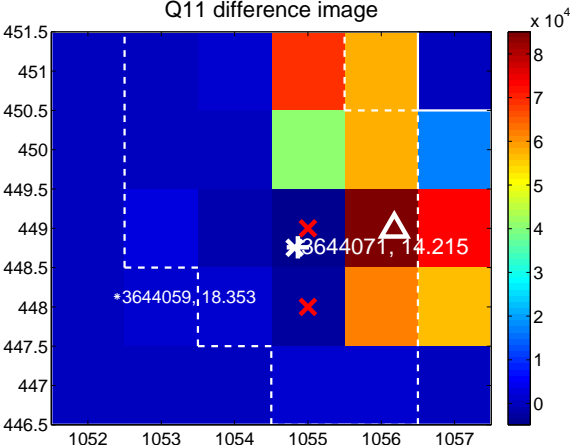
Q10 no difference image



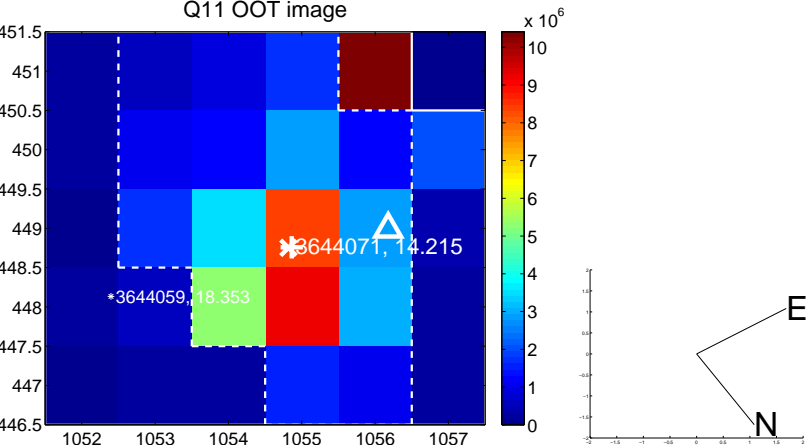
Q10 no OOT image



Q11 difference image



Q11 OOT image



Q12 no difference image



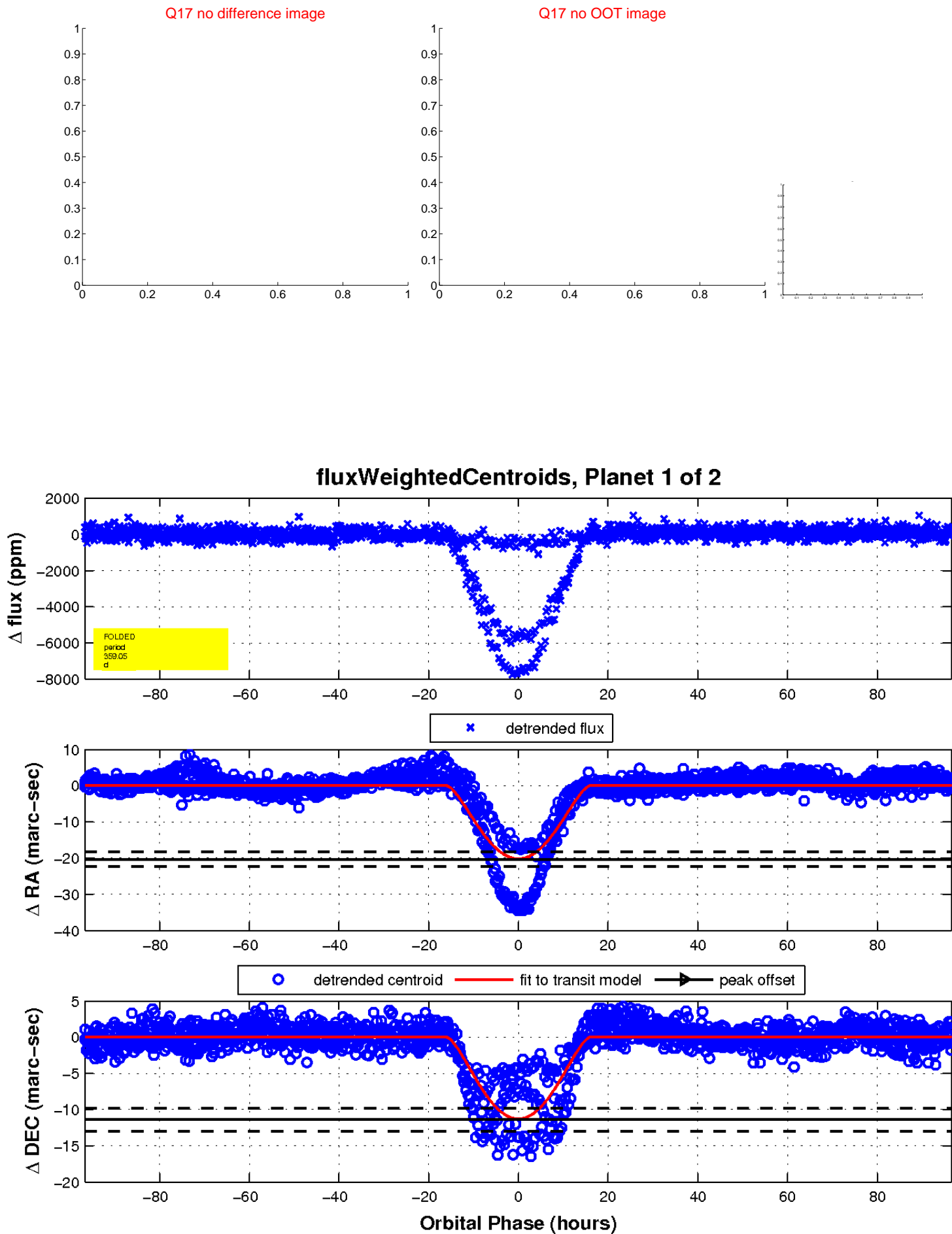
Q12 no OOT image



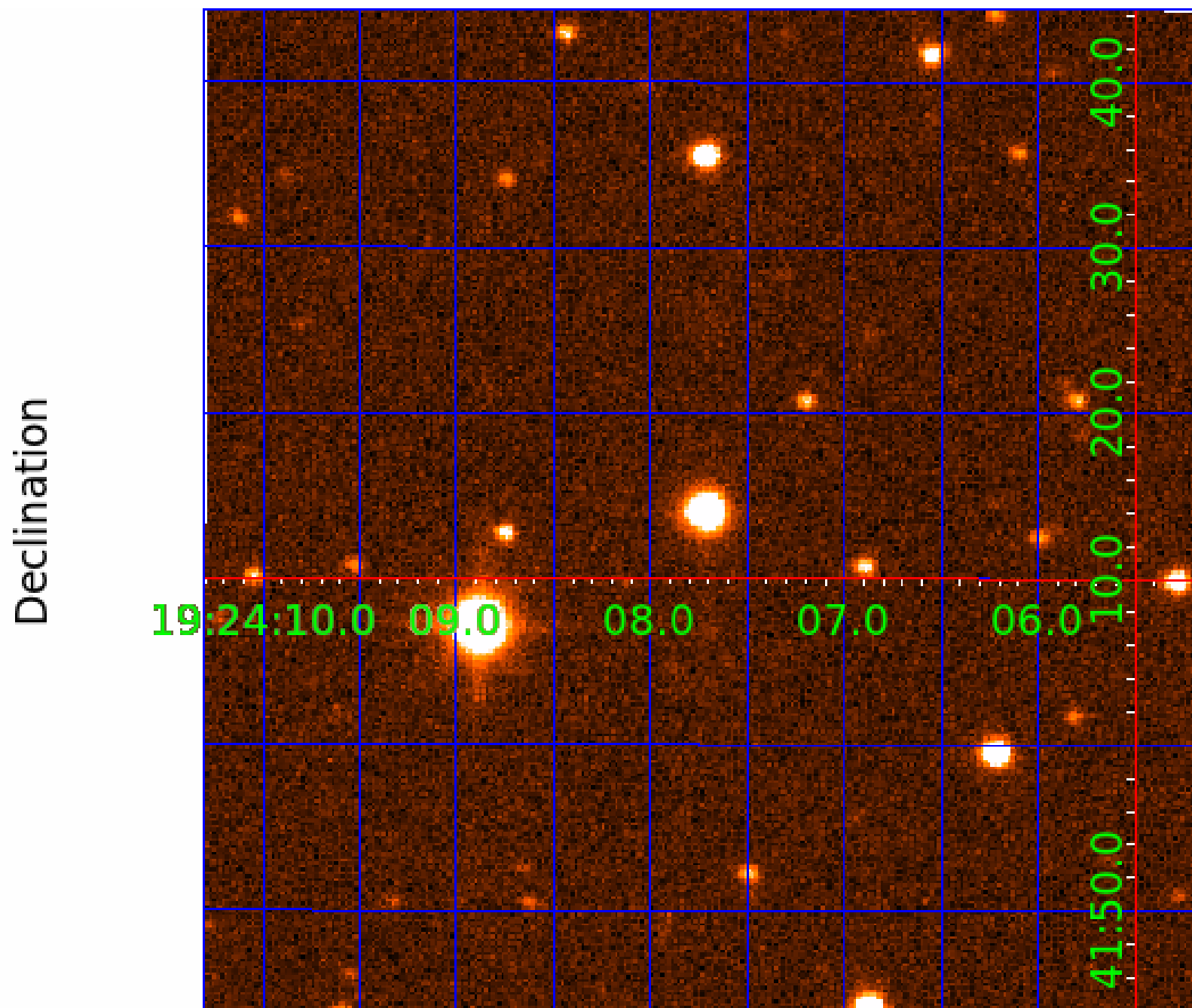
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image



KIC 003644071

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
003644071-01	OBS	1192.02	359.047040	295.776897	5675.4	32.209	144.1	111.7	1.05	5609	12.57	1.08
003644071-02	OBS	No	359.039273	274.226742	4407.8	15.578	113.9	92.0	1.05	5609	8.72	1.08

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003644071-01	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_MARSHALL_SKYE—INCONSISTENT_TRANS—CENT_FEW_DIFFS—EPHEM_MATCH
003644071-02	OBS	FP	0.00	1	0	1	1	INDIV_TRANS_SKYE—SAME_NTL_PERIOD—CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003644071-02

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
003644071-02	3644071	003644542-sec	3644542	3:1	447.0	-6	-1	8.35	14.21	58.30	Direct-PRF	0	0.01	0.10

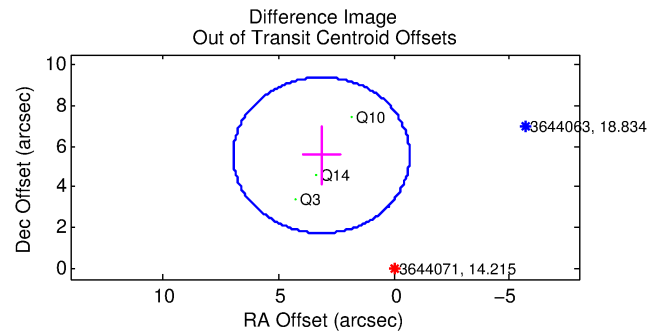
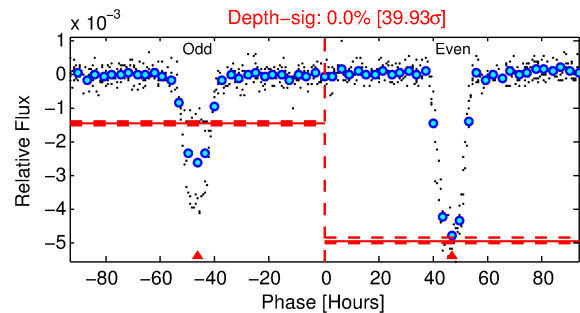
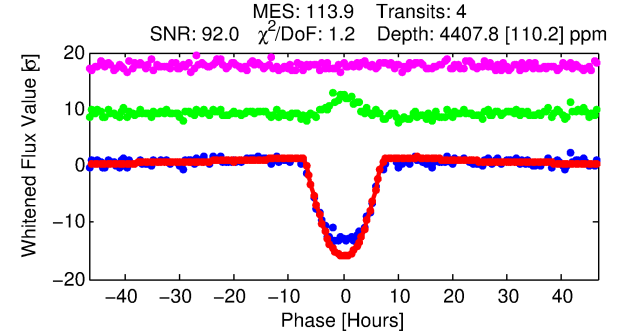
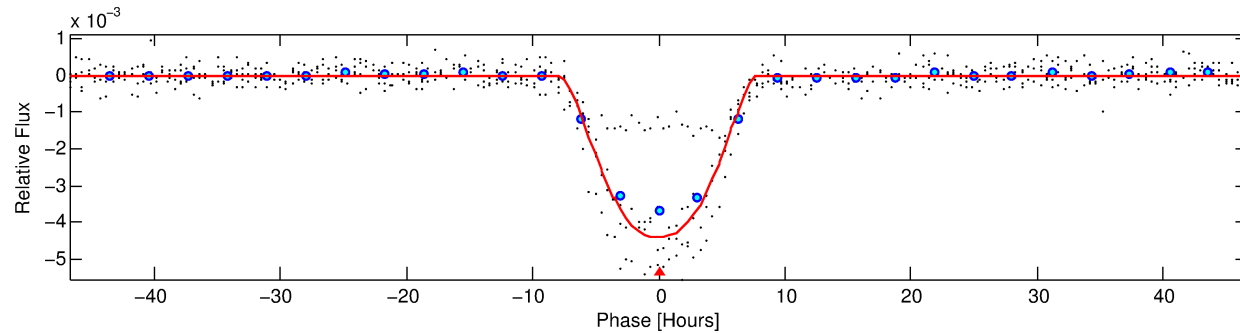
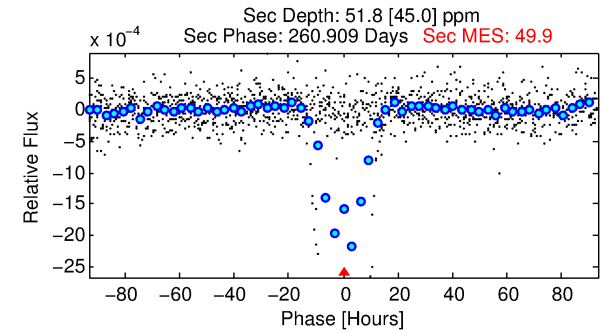
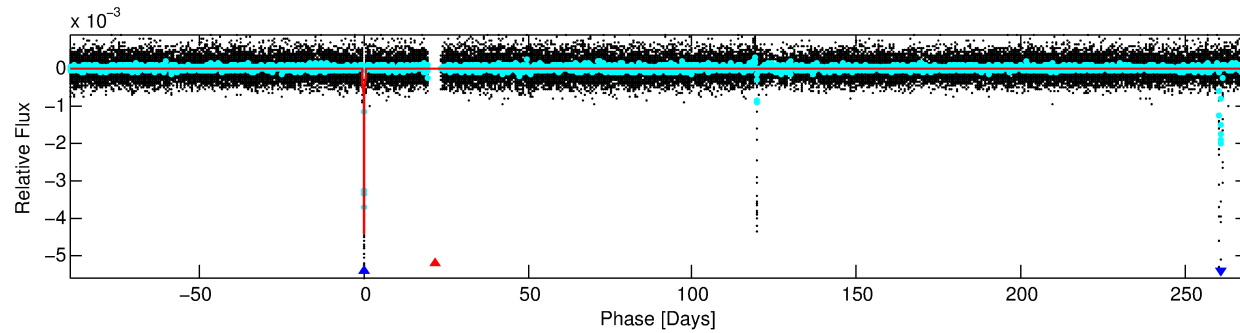
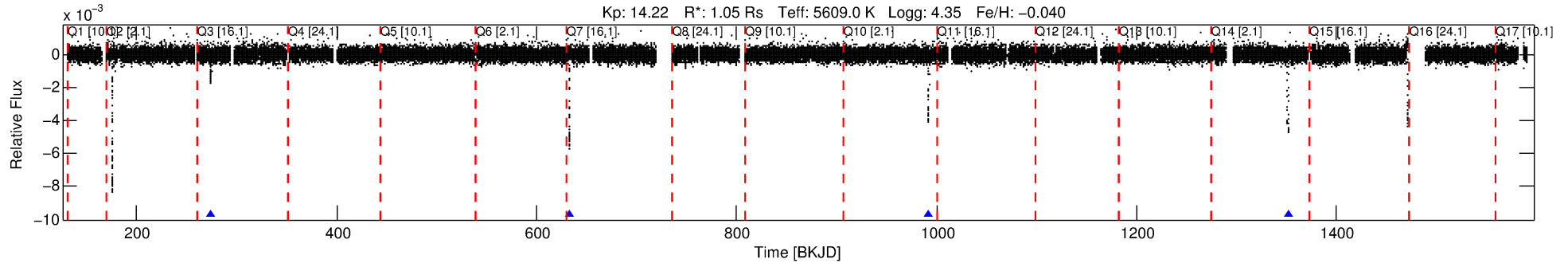
Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 3644071 Candidate: 2 of 2 Period: 359.039 d

KOI: K01192 Corr: No Ephemeris Match

Kp: 14.22 R*: 1.05 Rs Teff: 5609.0 K Logg: 4.35 Fe/H: -0.040



DV Fit Results:

Period = 359.03927 [0.00164] d
Epoch = 274.2267 [0.0031] BKJD
Rp/R* = 0.0762 [0.0022]
a/R* = 96.05 [2.56]
b = 0.93 [0.01]
Seff = 1.08 [0.40]
Teq = 260 [24] K
Rp = 8.72 [2.43] Re
a = 0.9507 [0.2272] AU
Ag = 339.23 [318.80] [1.06σ]
Teffp = 1724 [378] K [3.86σ]

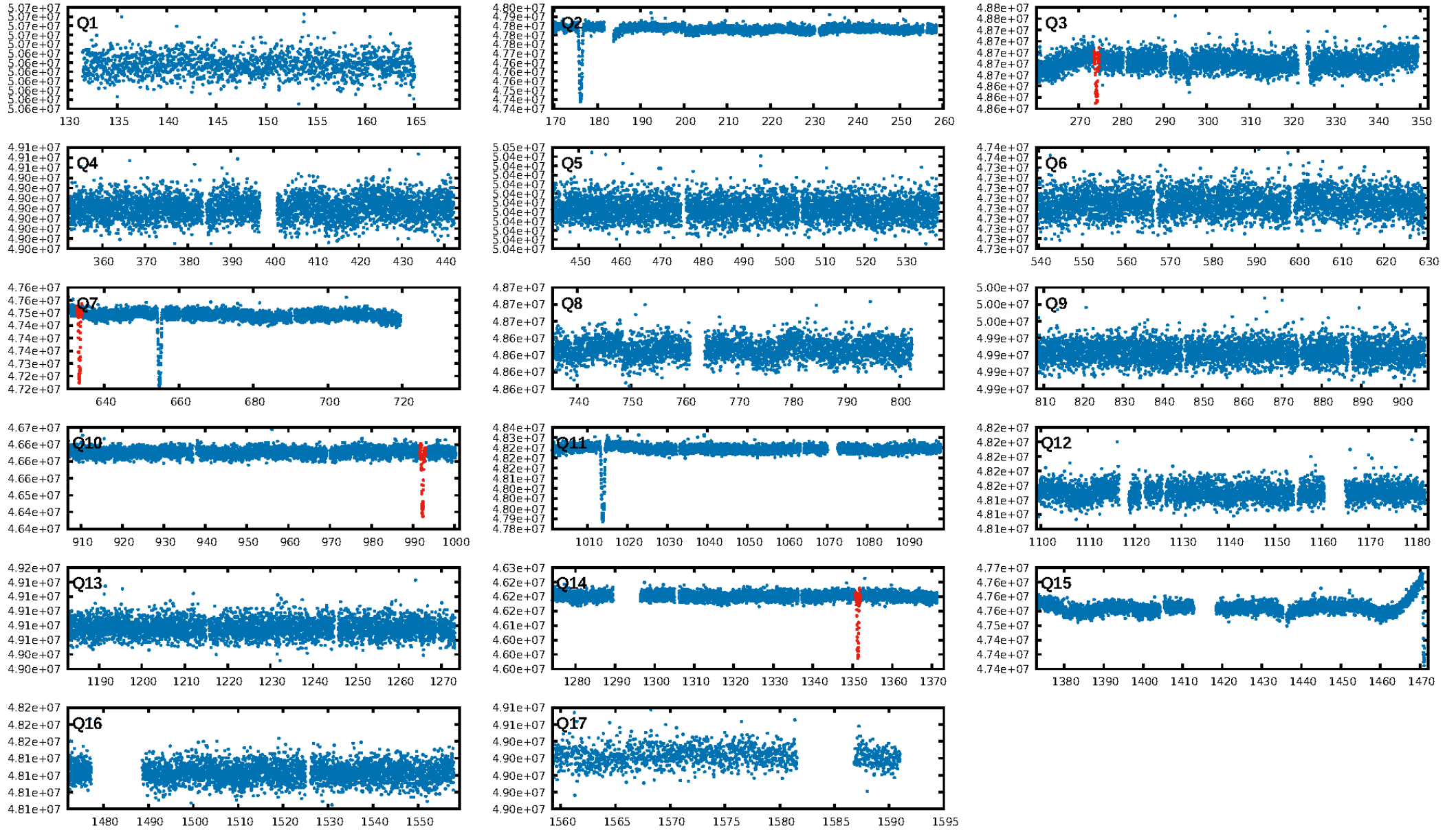
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.4% [0.01σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 34.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 0.1897
Centroid-sig: 0.0%
Centroid-so: 8.258 arcsec [36.78σ]
OotOffset-rm: 6.384 arcsec [5.02σ]
KicOffset-rm: 6.442 arcsec [5.11σ]
OotOffset-st: 2/1/0/0 [3]
KicOffset-st: 2/1/0/0 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

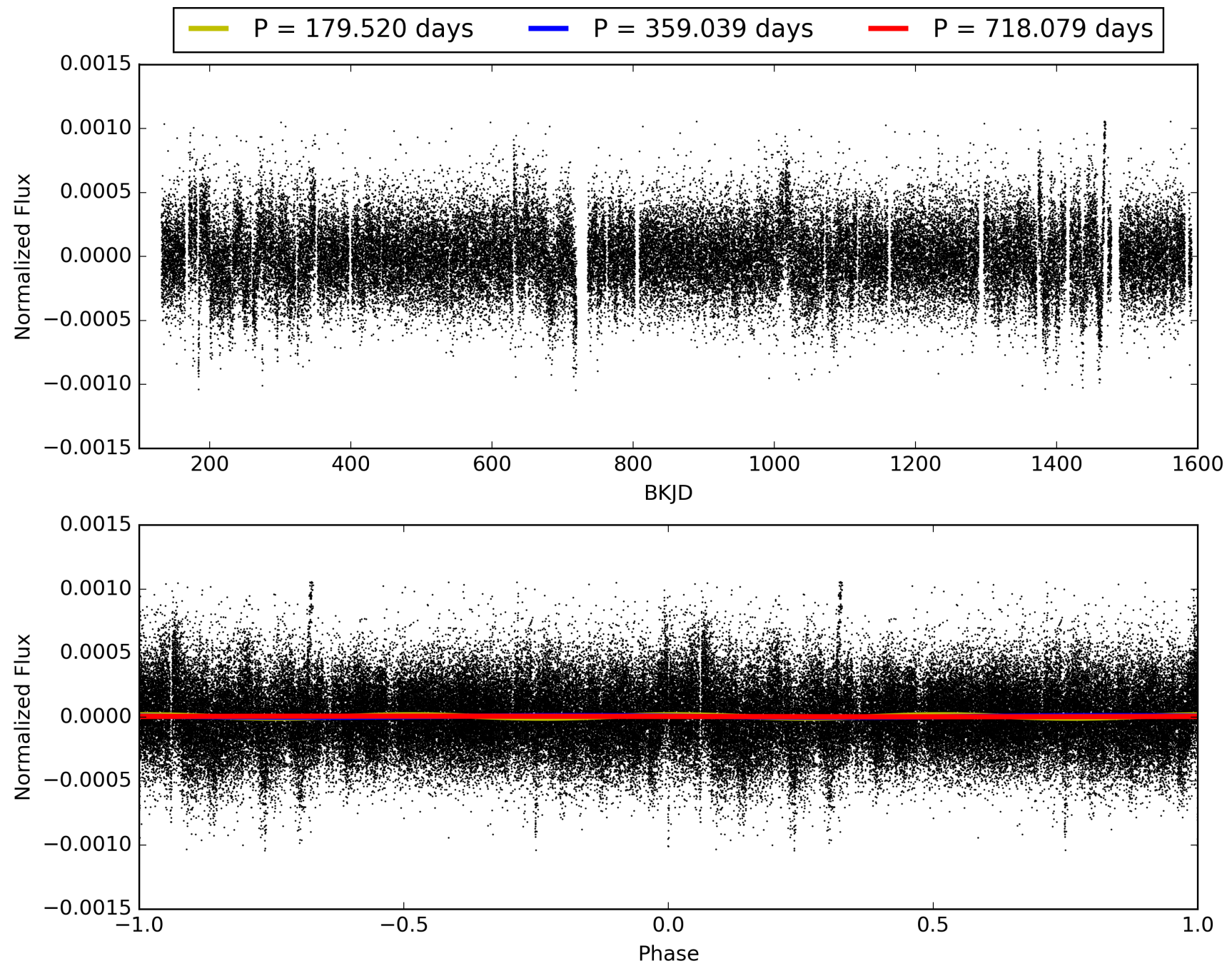
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 003644071-02, PDC Light Curves

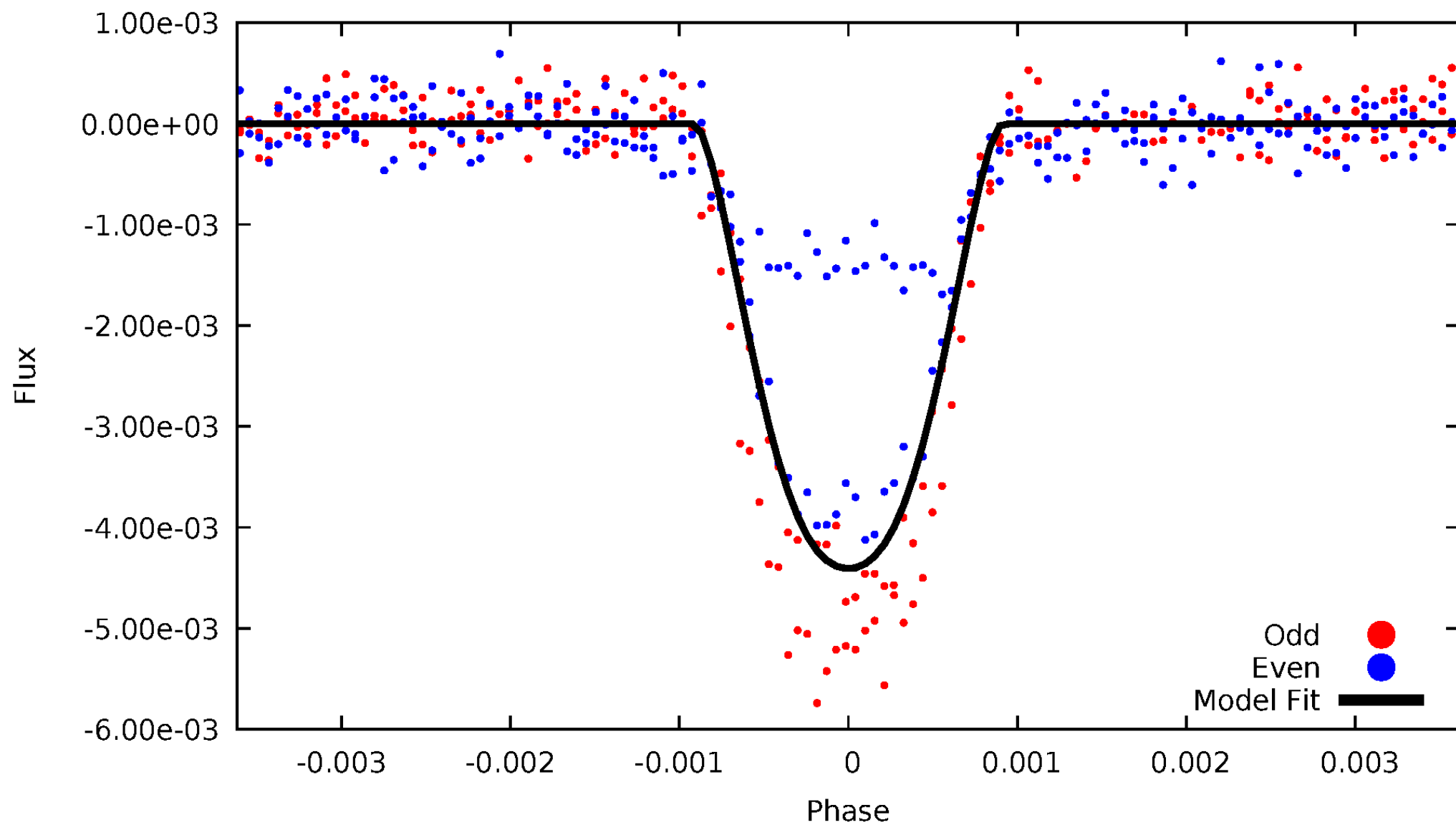


TCE 003644071-02



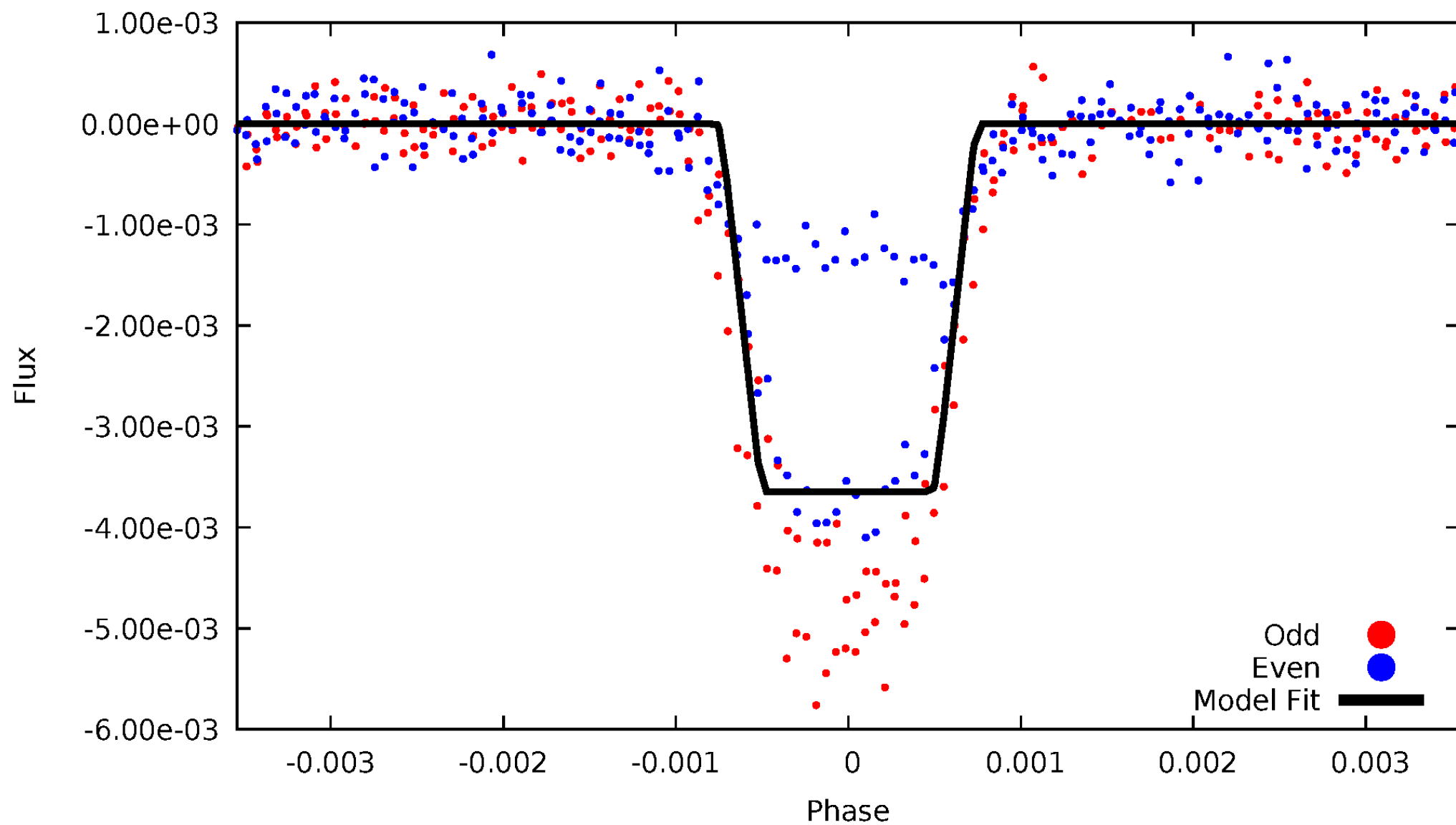
DV Odd/Even

TCE 003644071-02



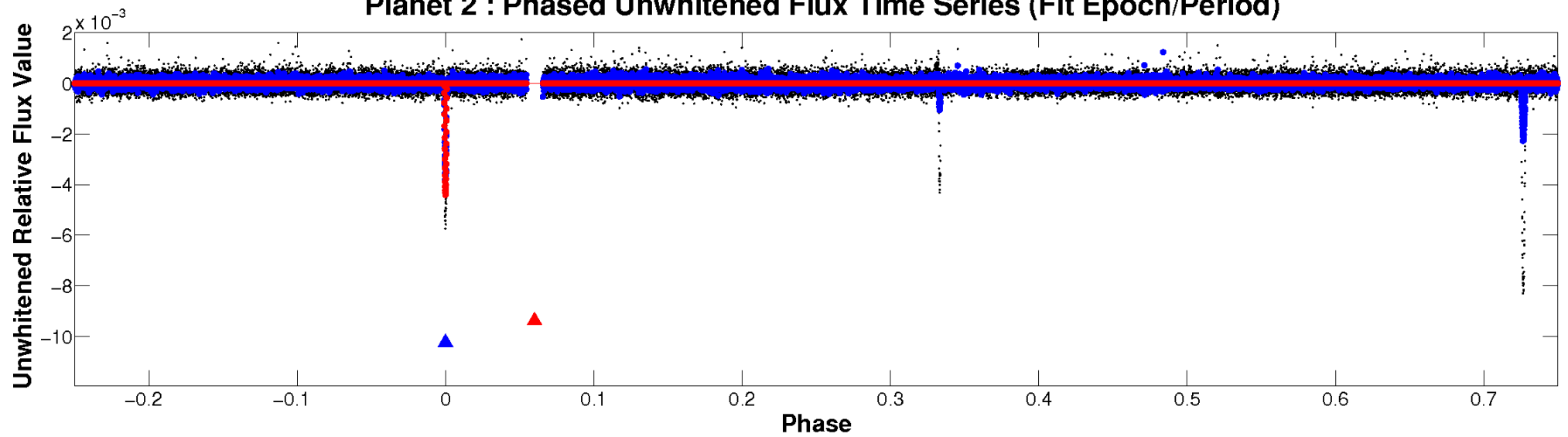
ALT Odd/Even

TCE 003644071-02

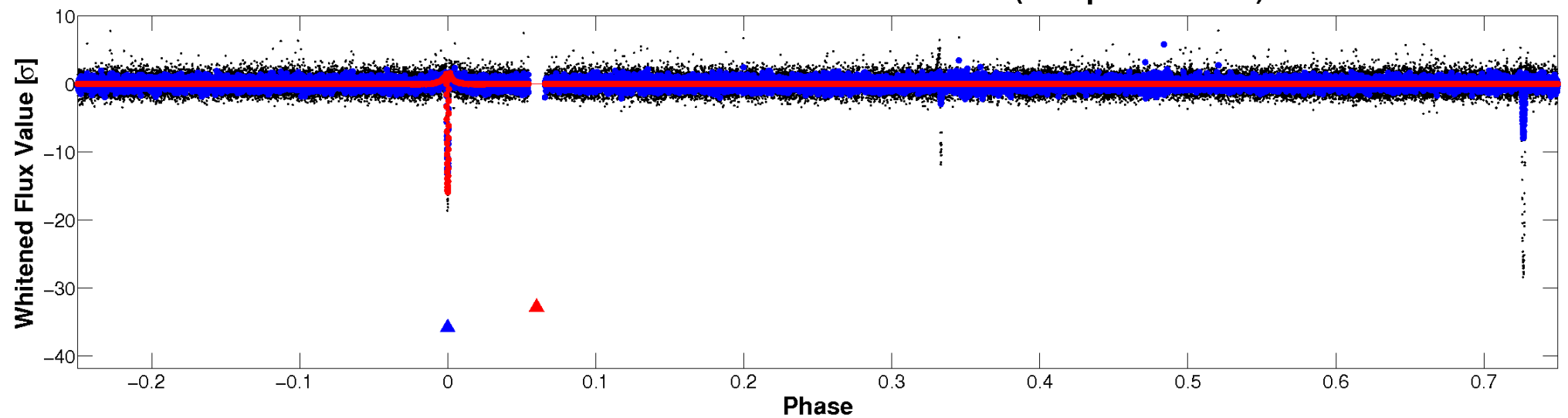


Non-Whitened Vs. Whitened Light Curve

Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

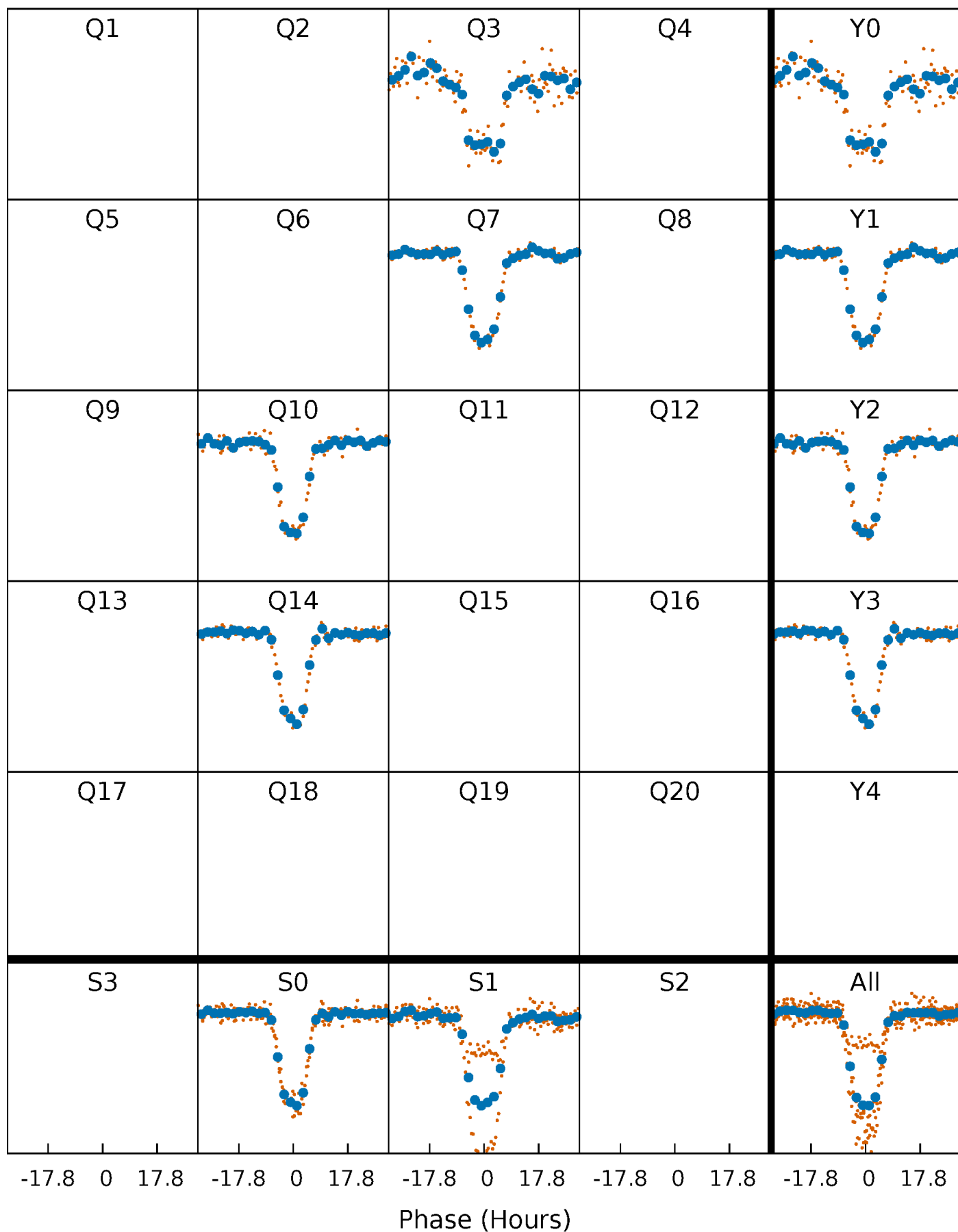


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



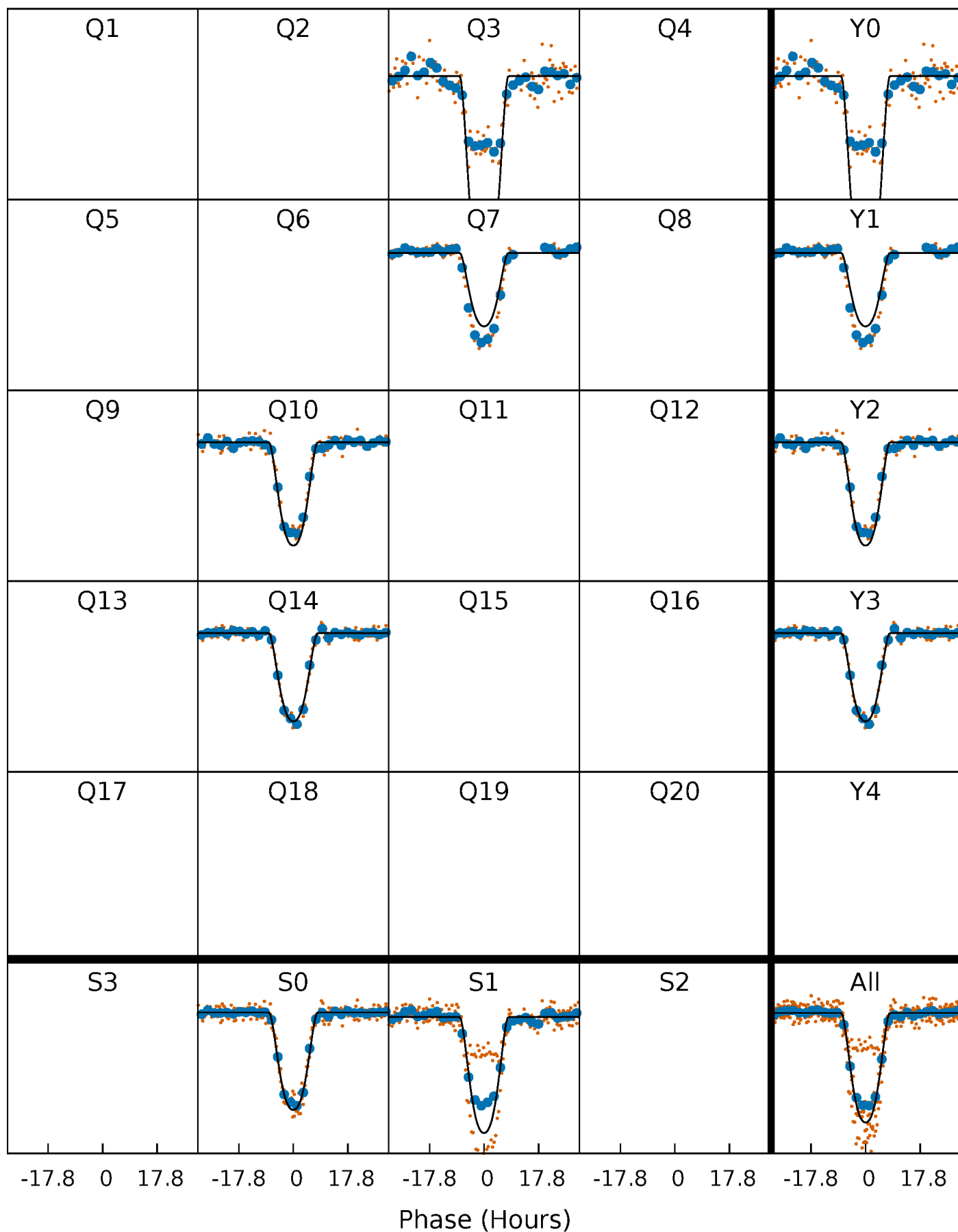
PDC Quarter-Phased Transit Curves

TCE 003644071-02 P=359.039273 Days $T_0=274.226742$ (BKJD)



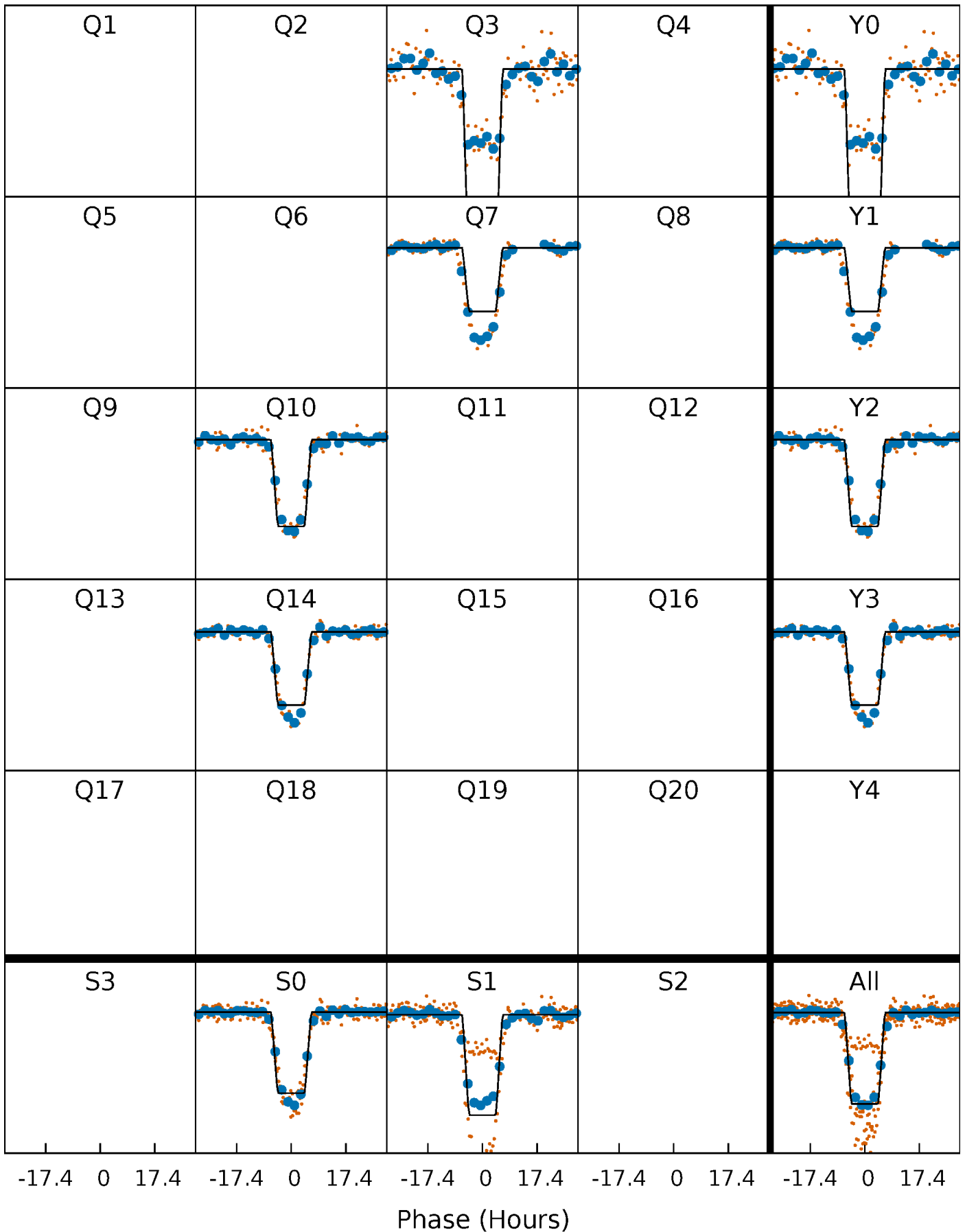
DV Quarter-Phased Transit Curves

TCE 003644071-02 P=359.039273 Days $T_0=274.226742$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

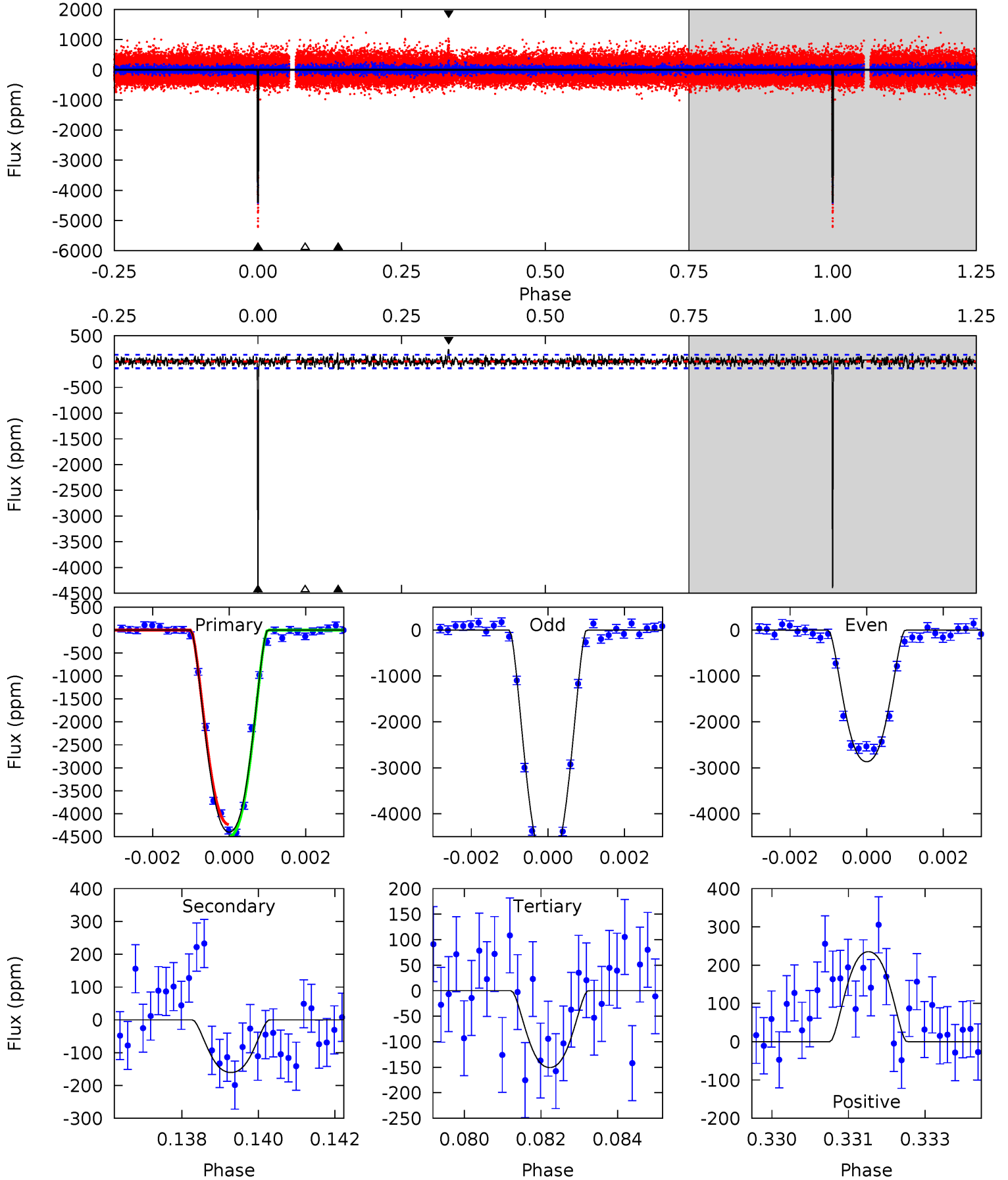
TCE 003644071-02 P=359.038083 Days $T_0=274.228365$ (BKJD)



DV Model-Shift Uniqueness Test

003644071-02, $P = 359.039273$ Days, $E = 274.226742$ Days

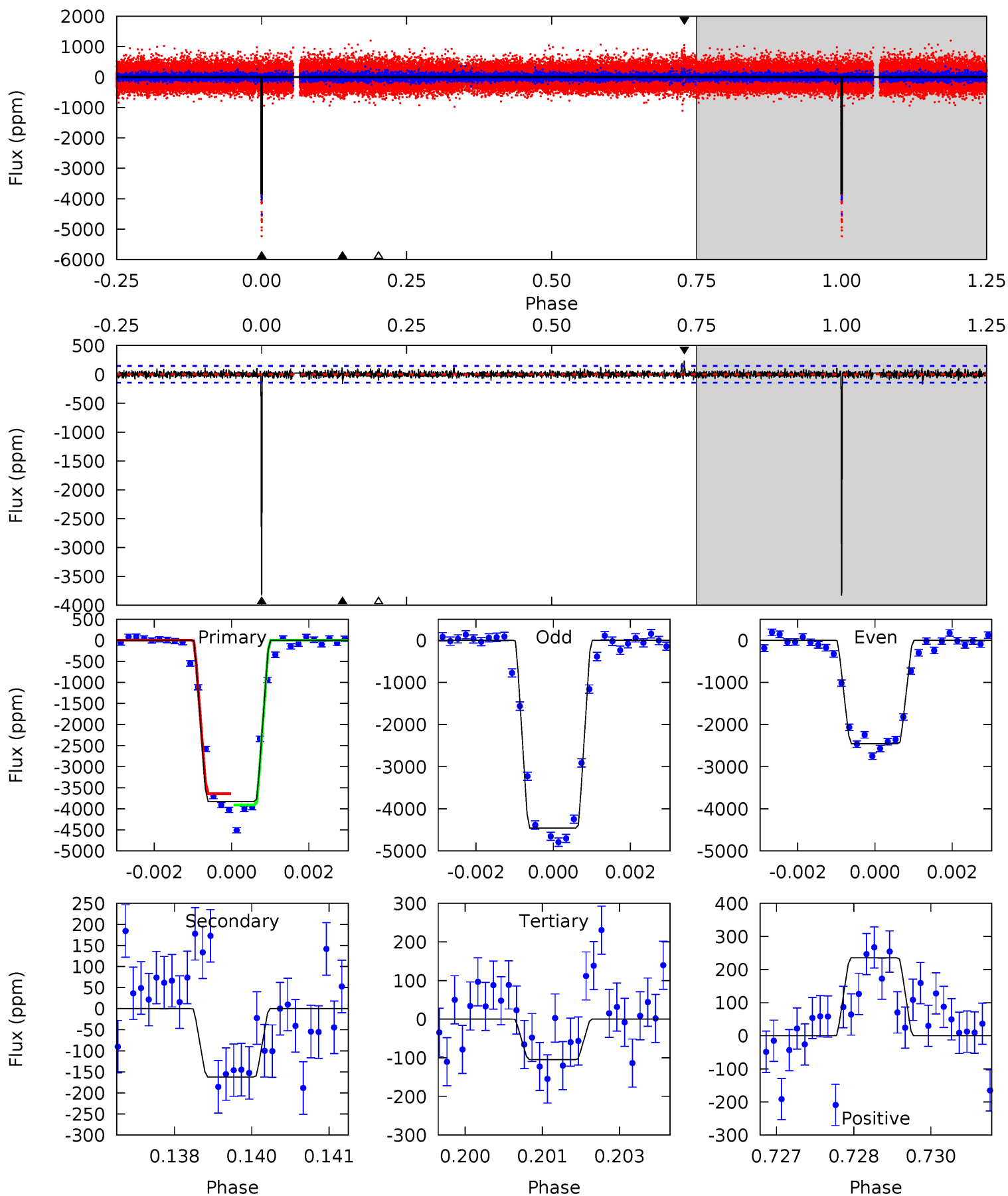
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
180.7	6.59	6.18	9.66	5.34	3.12	1.71	174.5	171.0	0.40	-3.07	55.8	0.93	0.05	0



Alt Model-Shift Uniqueness Test

003644071-02, $P = 359.038083$ Days, $E = 274.228365$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
141.8	6.00	3.88	8.71	5.37	3.17	1.12	137.9	133.1	2.13	-2.70	44.9	0.93	0.06	4.90



Stellar Parameters For KIC 003644071

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	5609^{+169}_{-152}	$4.346^{+0.162}_{-0.198}$	$-0.040^{+0.300}_{-0.300}$	$1.048^{+0.290}_{-0.193}$	$0.889^{+0.114}_{-0.076}$	$1.088^{+0.872}_{-0.563}$
	+3%/-3%	+4%/-5%	+750%/-750%	+28%/-18%	+13%/-9%	+80%/-52%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 003644071-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-160 ± 24	$8.82^{+1.47}_{-0.93}$	366^{+26}_{-23}	2963^{+94}_{-91}	1022^{+320}_{-284}
Alt.	-162 ± 27	$6.97^{+1.13}_{-0.82}$	365^{+29}_{-23}	3173^{+101}_{-101}	1641^{+620}_{-454}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

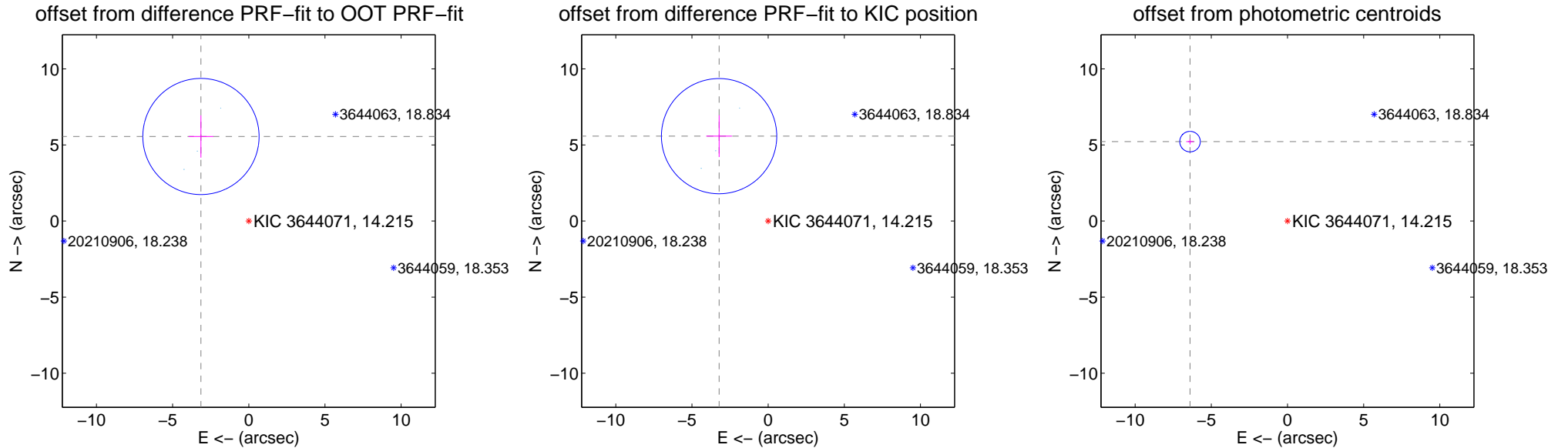
DV Centroid Data

Supplemental centroid analysis for 003644071-02. Kepler magnitude: 14.21. Transit SNR 92.02

There are 3 quarters with good PRF difference image offsets

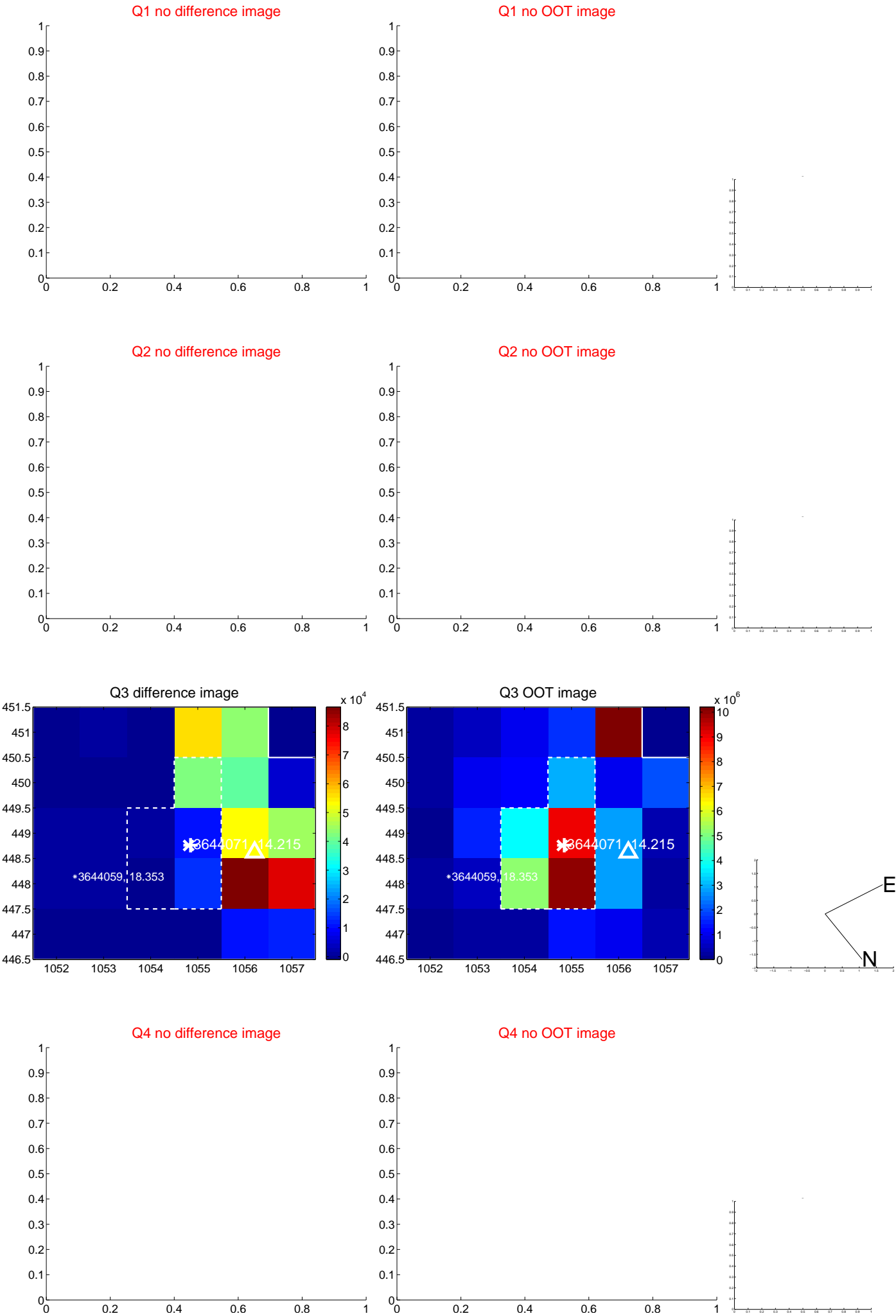
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	6.384 ± 1.272	5.02	3.141 ± 0.807	5.557 ± 1.388
PRF-fit source offset from KIC position	6.442 ± 1.262	5.11	3.220 ± 0.842	5.579 ± 1.374
photometric centroid source offset	8.26 ± 0.22	36.78	6.40 ± 0.25	5.22 ± 0.18



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

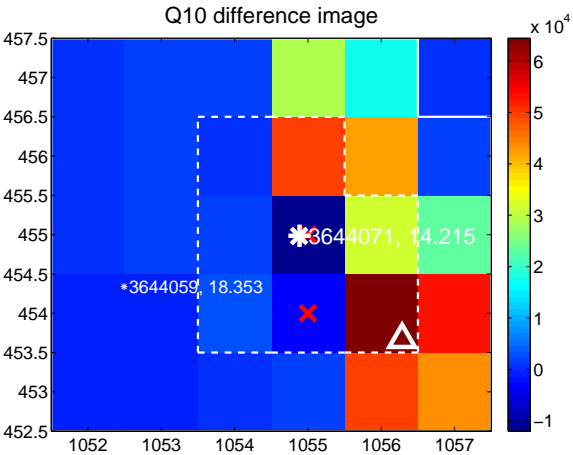
Q9 no difference image



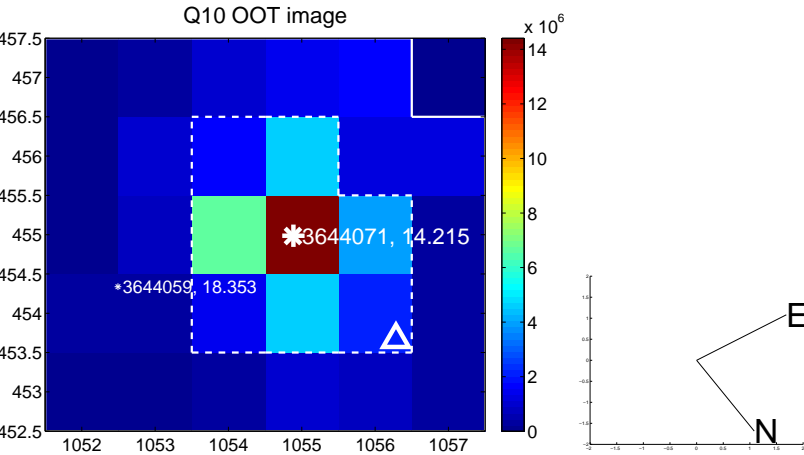
Q9 no OOT image



Q10 difference image



Q10 OOT image



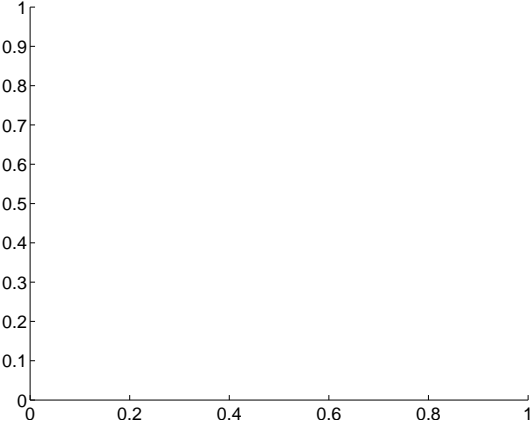
Q11 no difference image



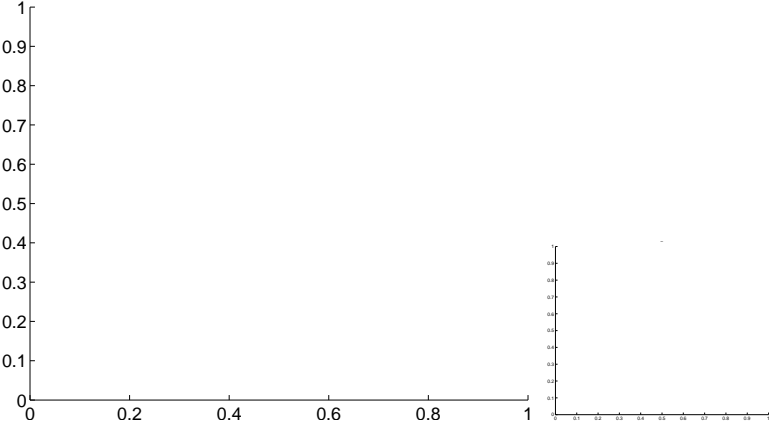
Q11 no OOT image



Q12 no difference image



Q12 no OOT image



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

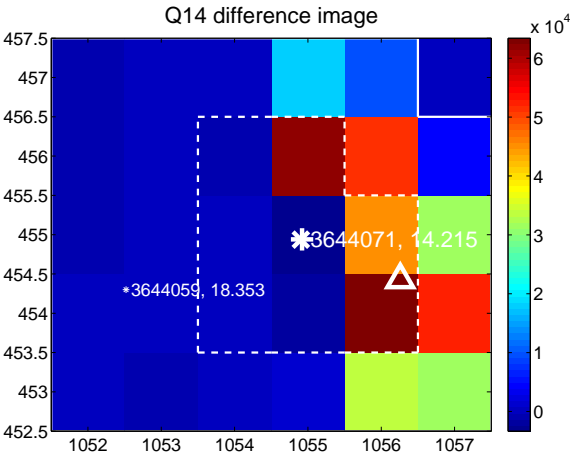
Q13 no difference image



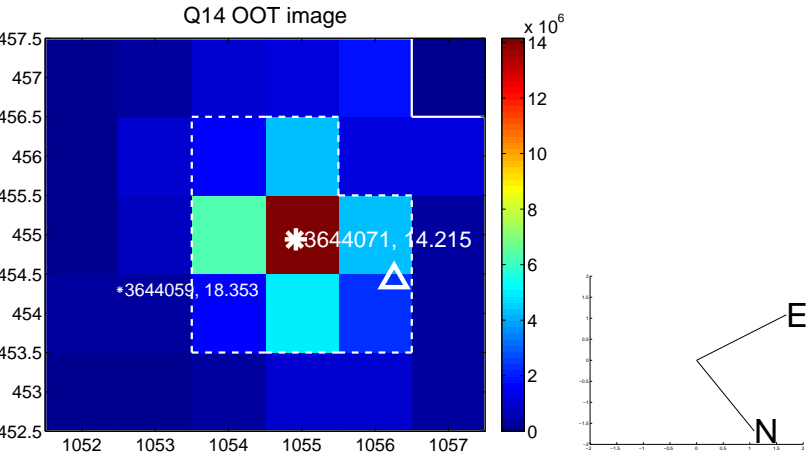
Q13 no OOT image



Q14 difference image



Q14 OOT image



Q15 no difference image



Q15 no OOT image



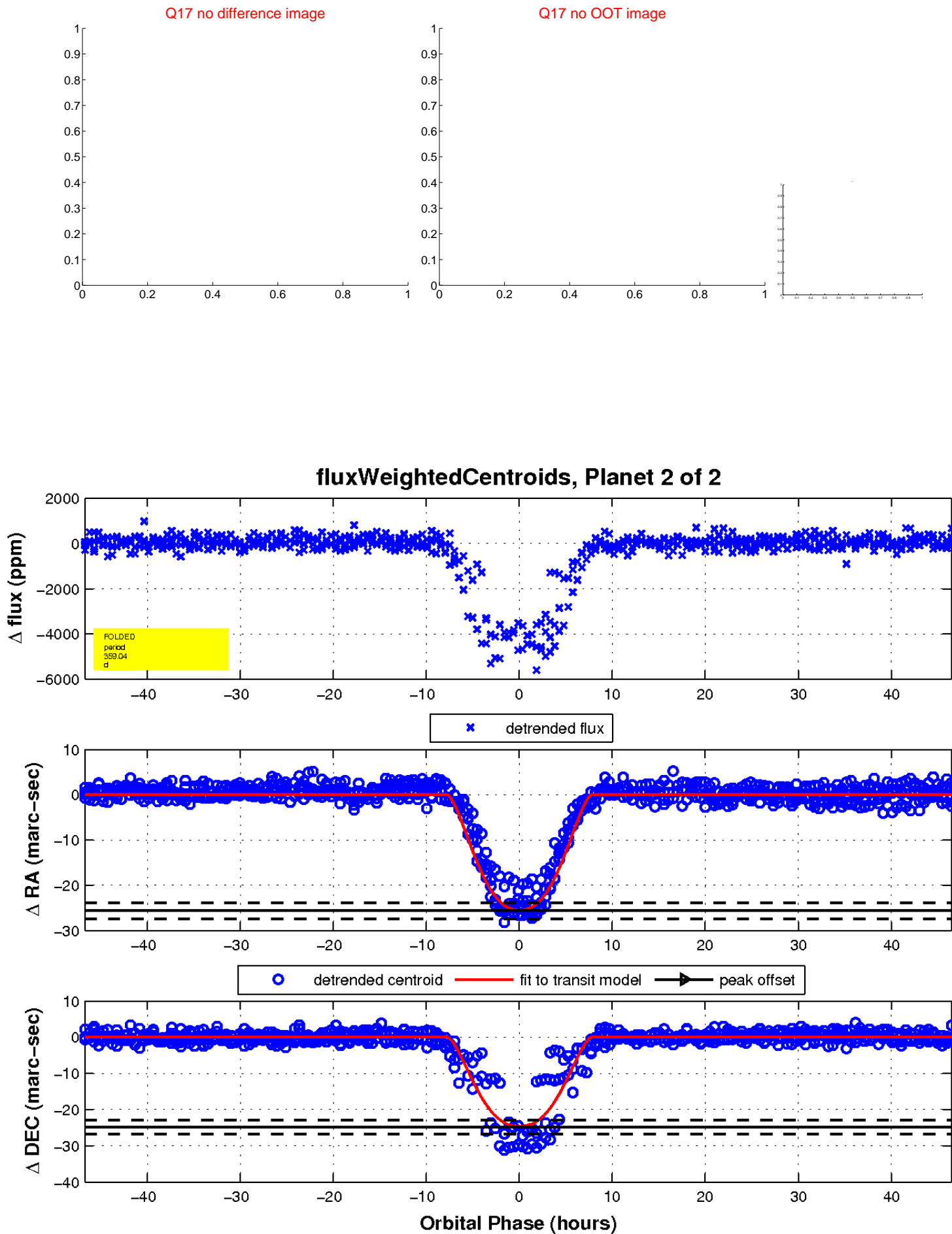
Q16 no difference image



Q16 no OOT image



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

