

KIC 008678664

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})
008678664-01	OBS	1782.01	15.420408	133.516722	14686.1	2.374	318.2	304.7	0.88	5468	16.11	45.12
008678664-02	OBS	No	368.464502	234.822788	1240.8	9.616	7.4	7.1	0.88	5468	3.06	0.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008678664-01	OBS	FP	0.00	0	1	0	0	DEEP_V_SHAPED
008678664-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—CENT_FEW_DIFFS

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

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

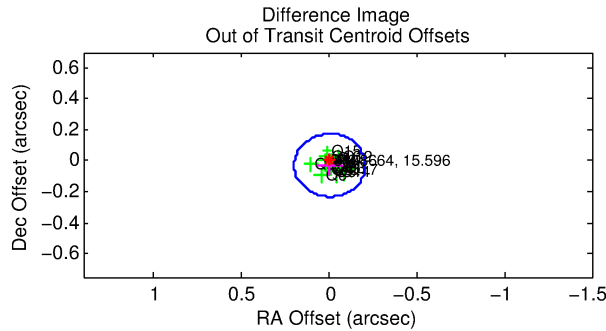
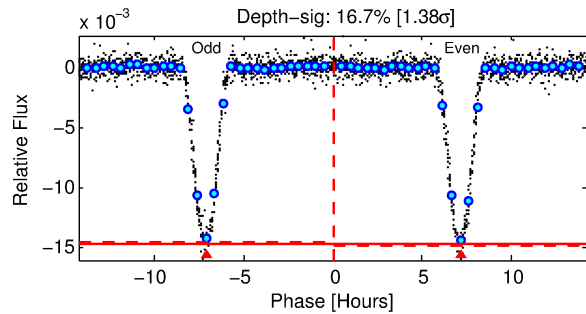
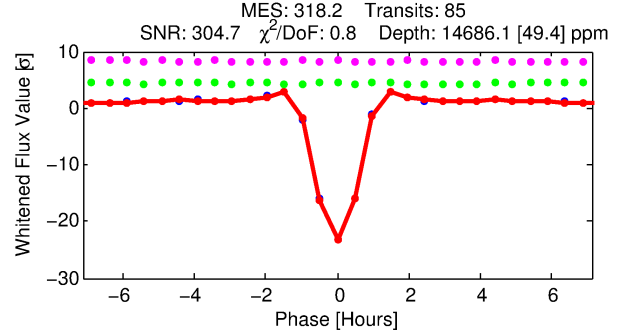
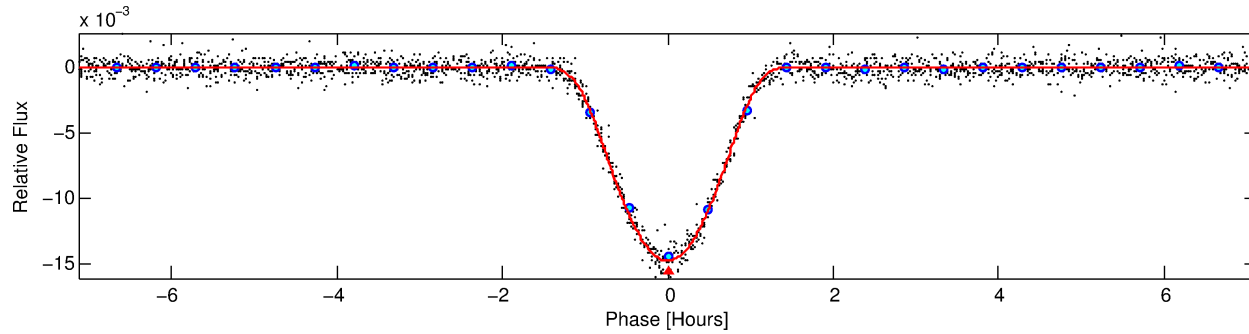
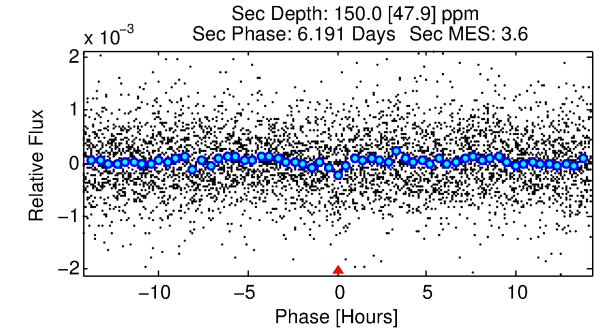
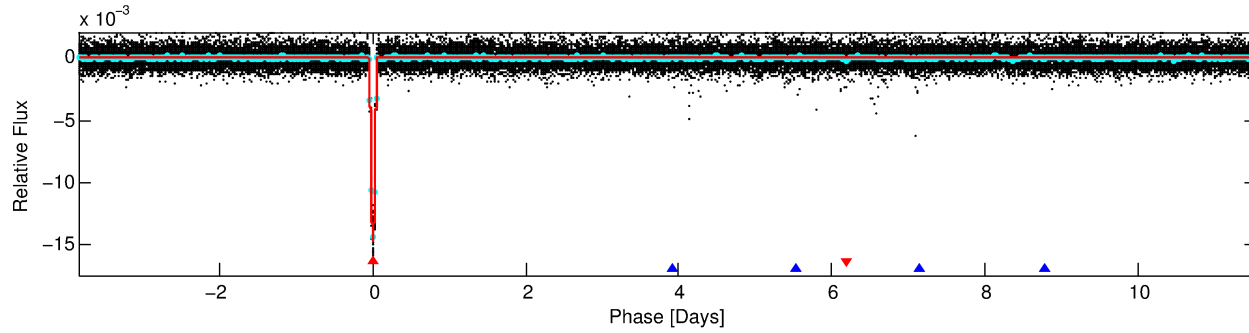
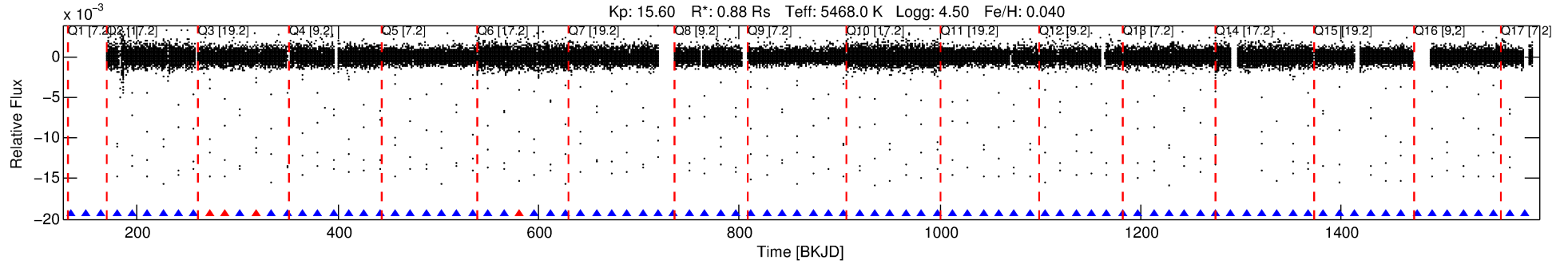
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008678664-01

No Significant Match Found

DV One-Page Summary

KIC: 8678664 Candidate: 1 of 2 Period: 15.420 d
KOI: K01782.01 Corr: 0.998



DV Fit Results:

Period = 15.42041 [0.00000] d
Epoch = 133.5167 [0.0002] BKJD
Rp/R* = 0.1678 [0.0157]
a/R* = 33.85 [0.66]
b = 0.95 [0.03]
Seff = 45.12 [13.96]
Teff = 661 [51] K
Rp = 16.11 [3.93] Re
a = 0.1172 [0.0226] AU
Ag = 4.37 [2.04] [1.65 σ]
Teffp = 1477 [144] K [5.35 σ]

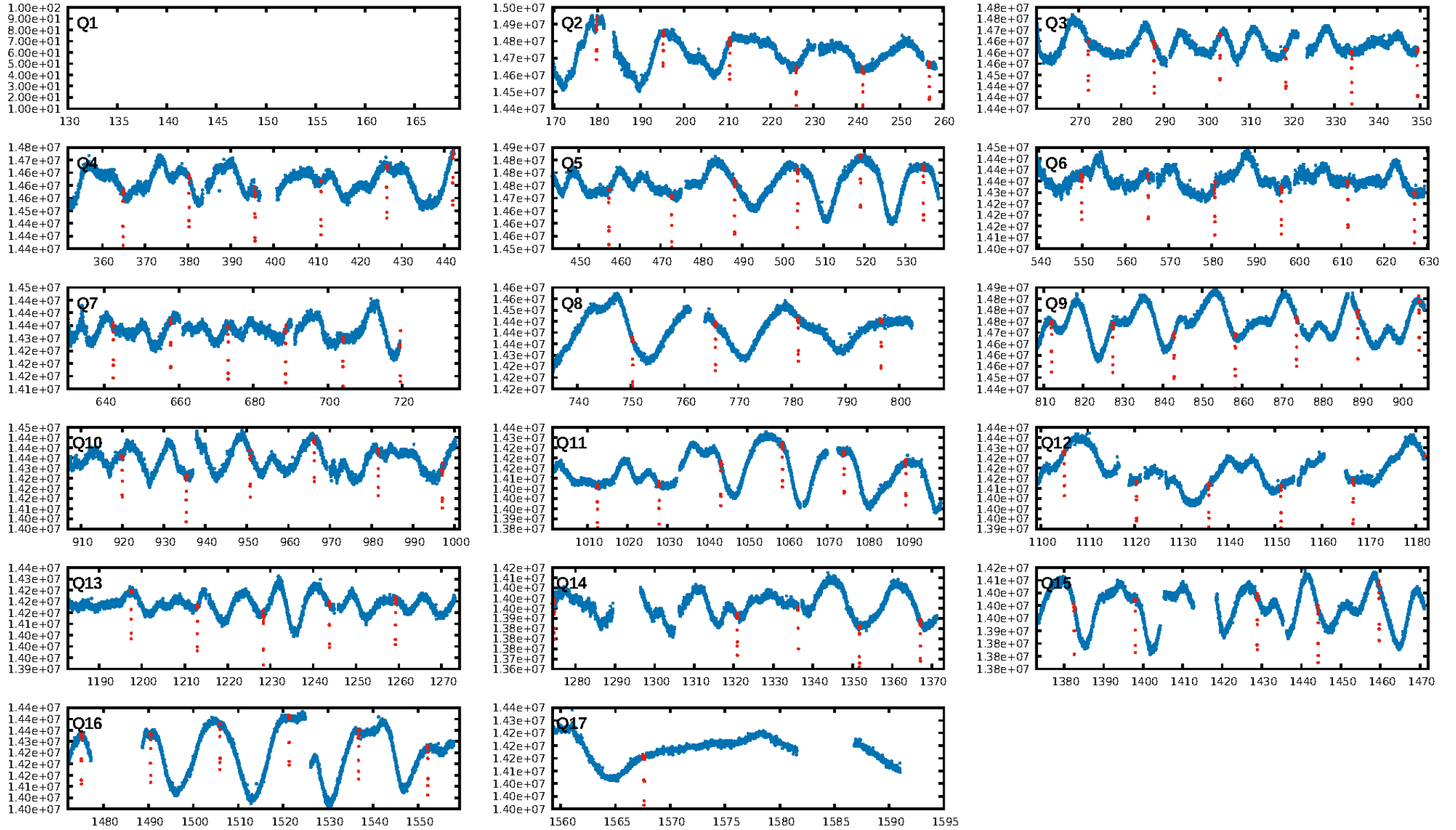
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [855.46 σ]
ModelChiSquare2-sig: 29.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.95 [80/84]
GhostDiagnostic-chr: 4.923
Centroid-sig: 0.0%
Centroid-so: 0.221 arcsec [4.52 σ]
OotOffset-rm: 0.029 arcsec [0.42 σ]
KicOffset-rm: 0.161 arcsec [2.30 σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 1.00 [16/16]

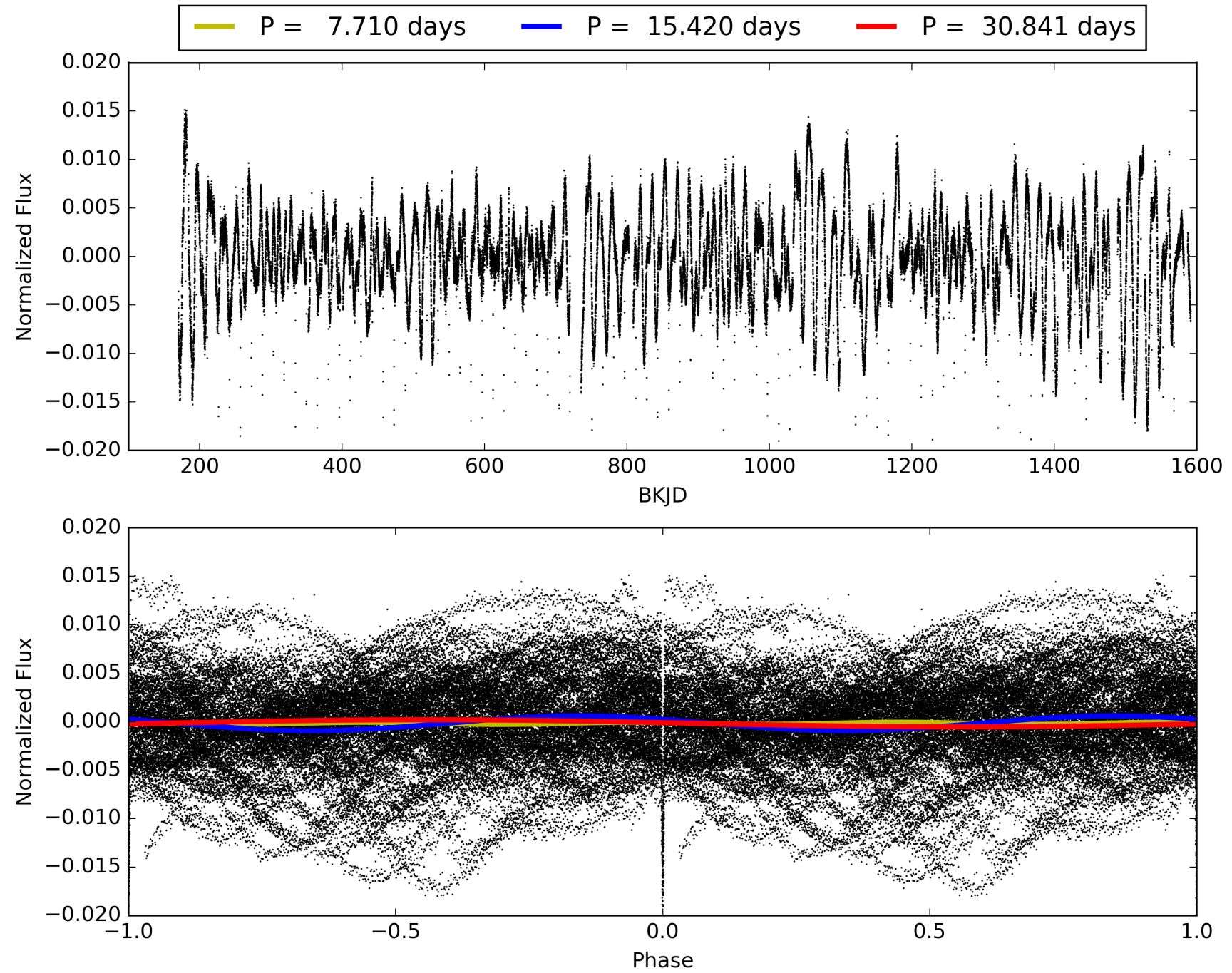
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 008678664-01, PDC Light Curves

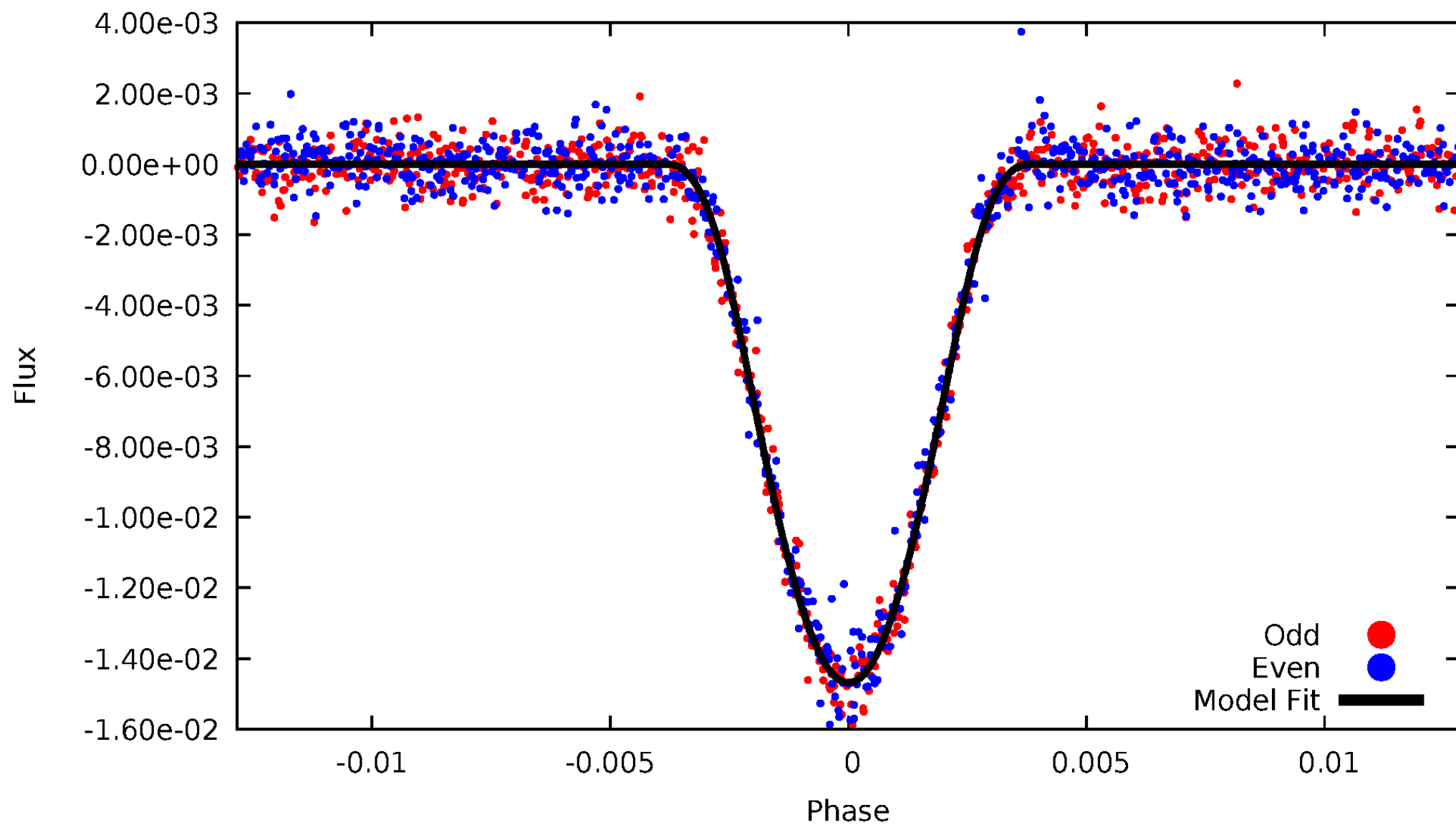


TCE 008678664-01



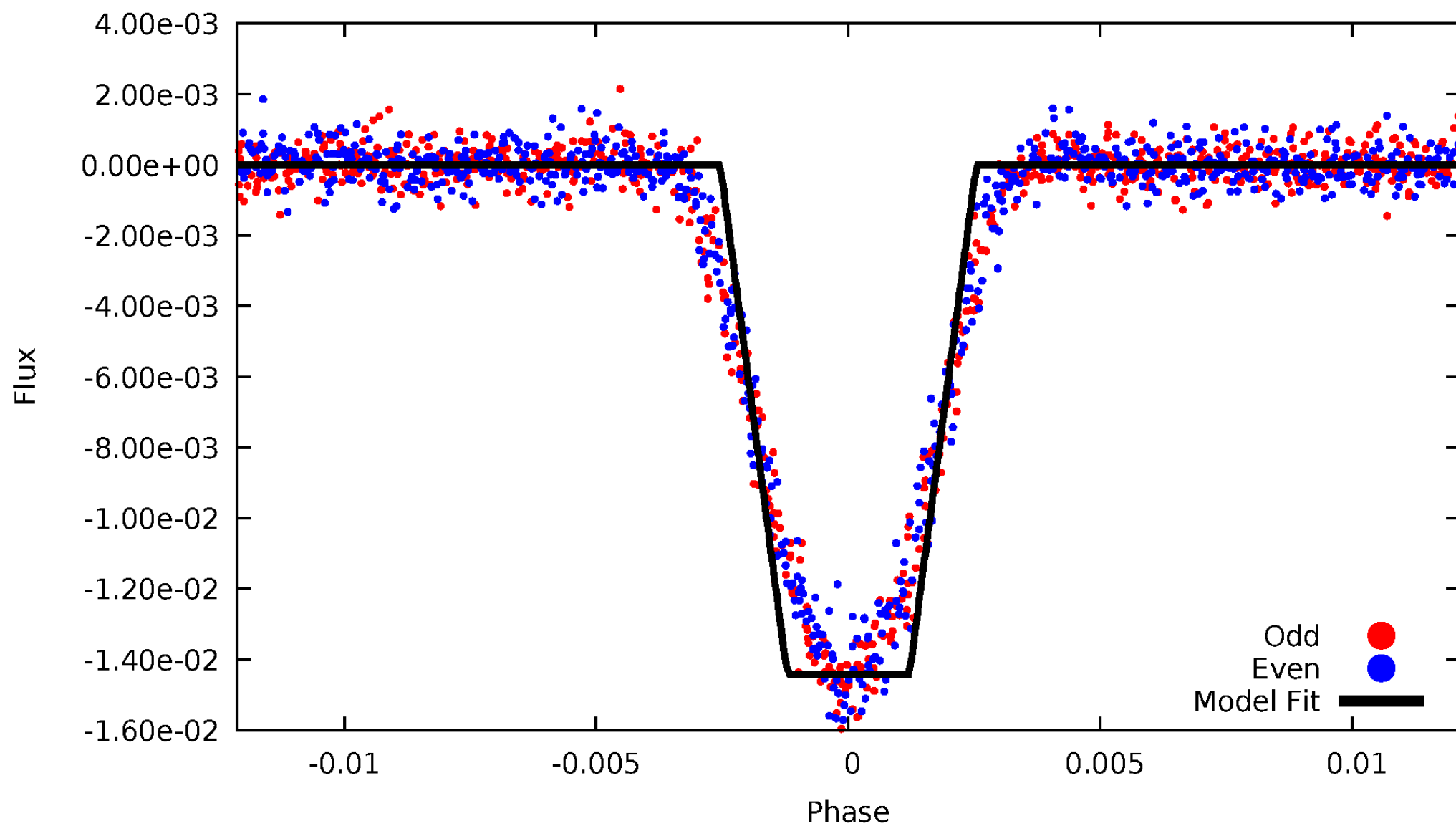
DV Odd/Even

TCE 008678664-01



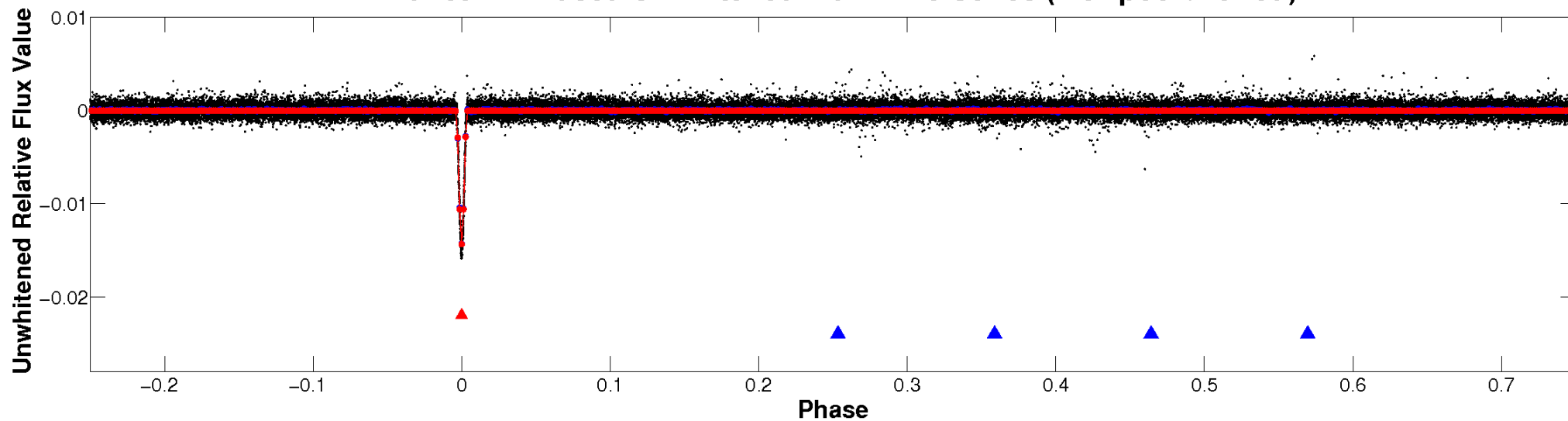
ALT Odd/Even

TCE 008678664-01

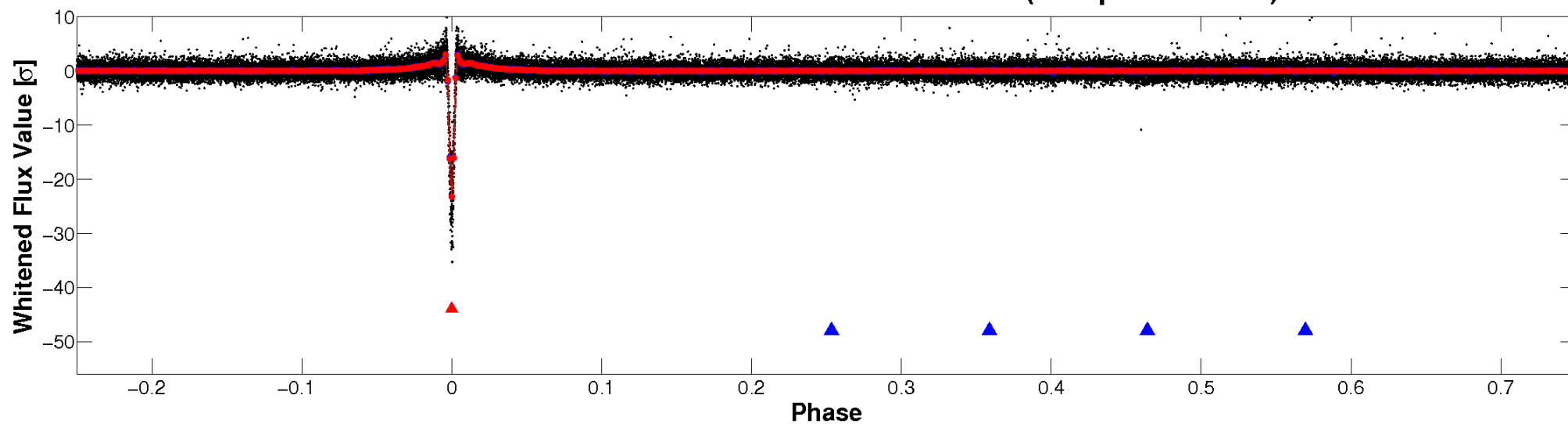


Non-Whitened Vs. Whitened Light Curve

Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

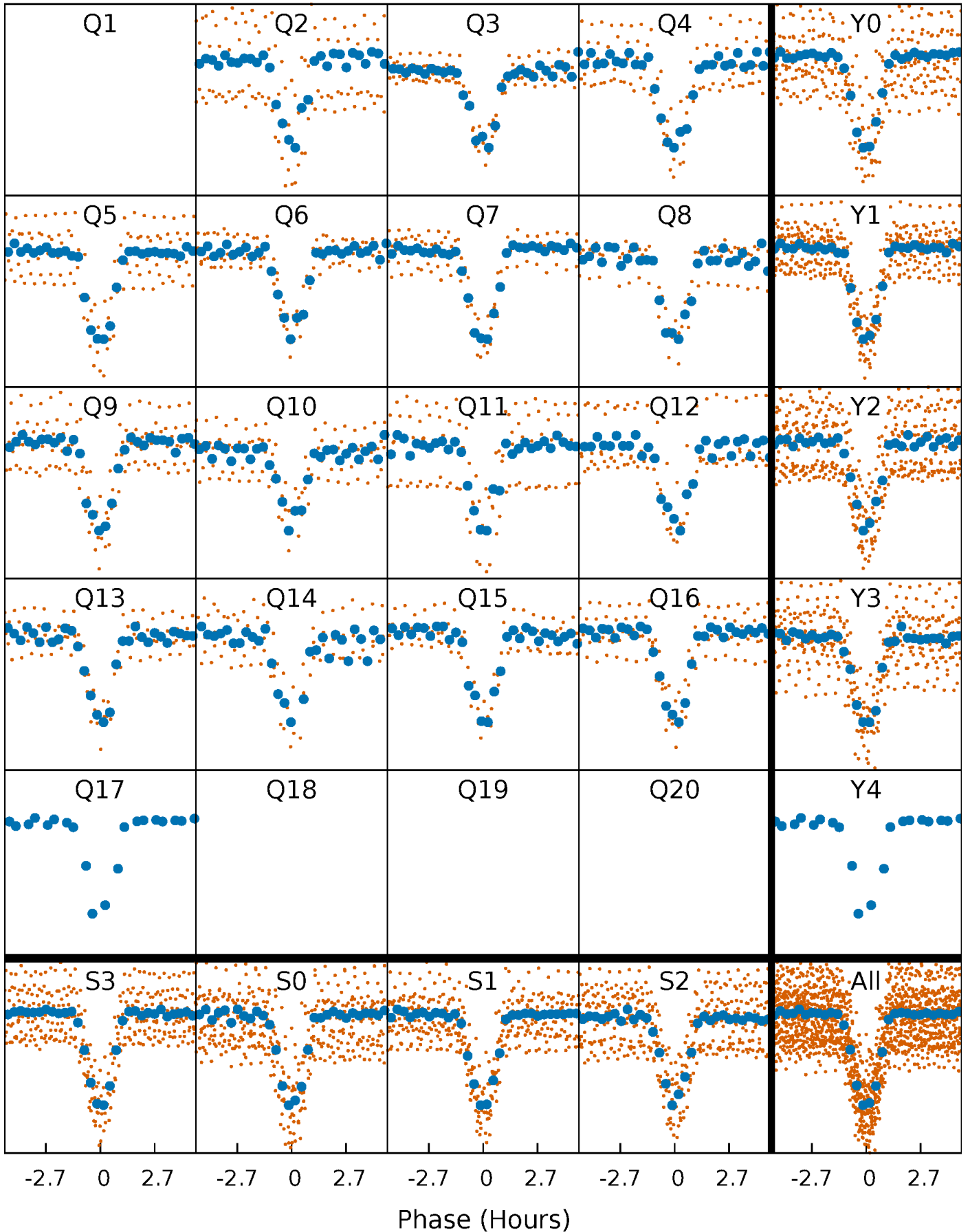


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



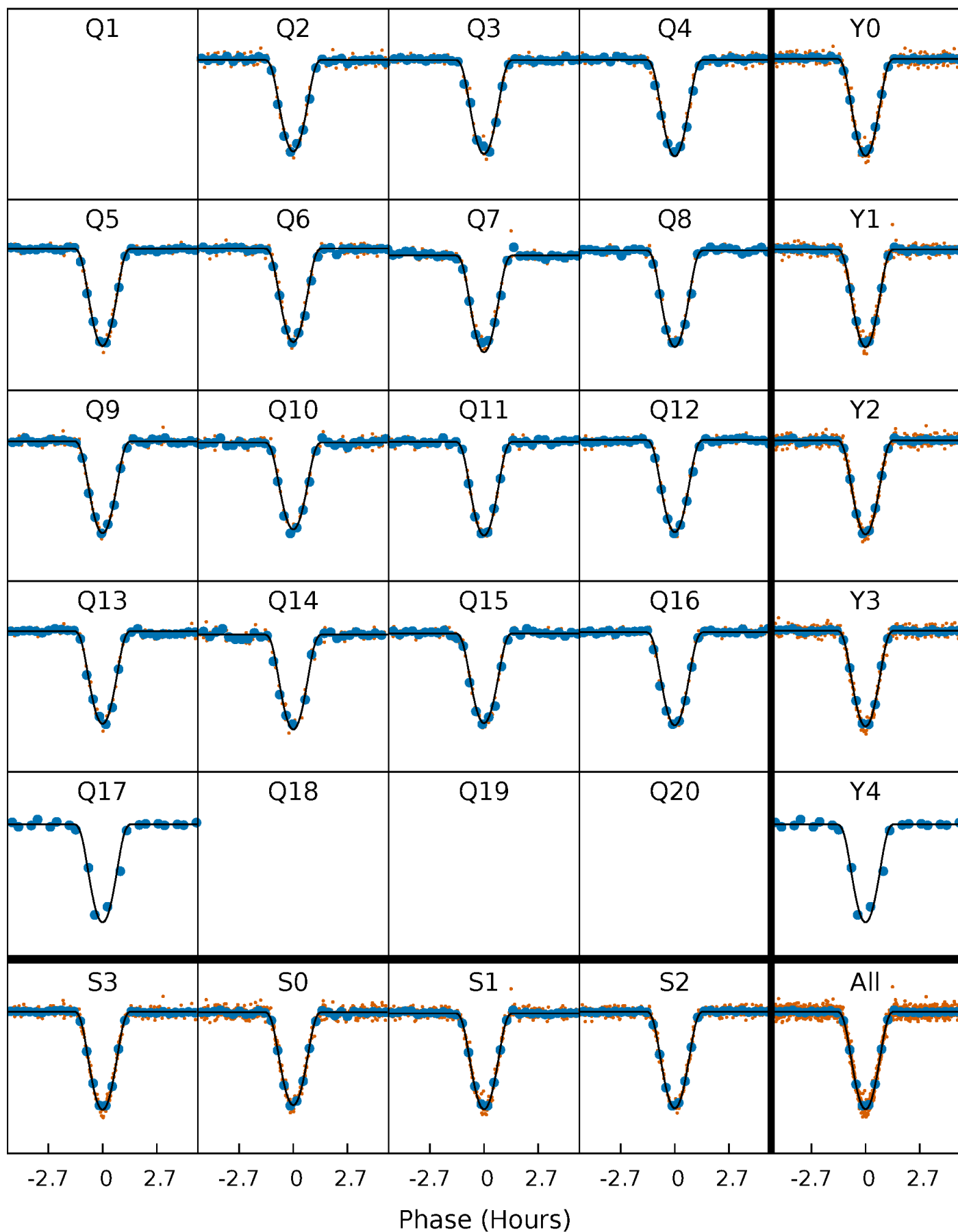
PDC Quarter-Phased Transit Curves

TCE 008678664-01 P= 15.420408 Days $T_0=133.516722$ (BKJD)



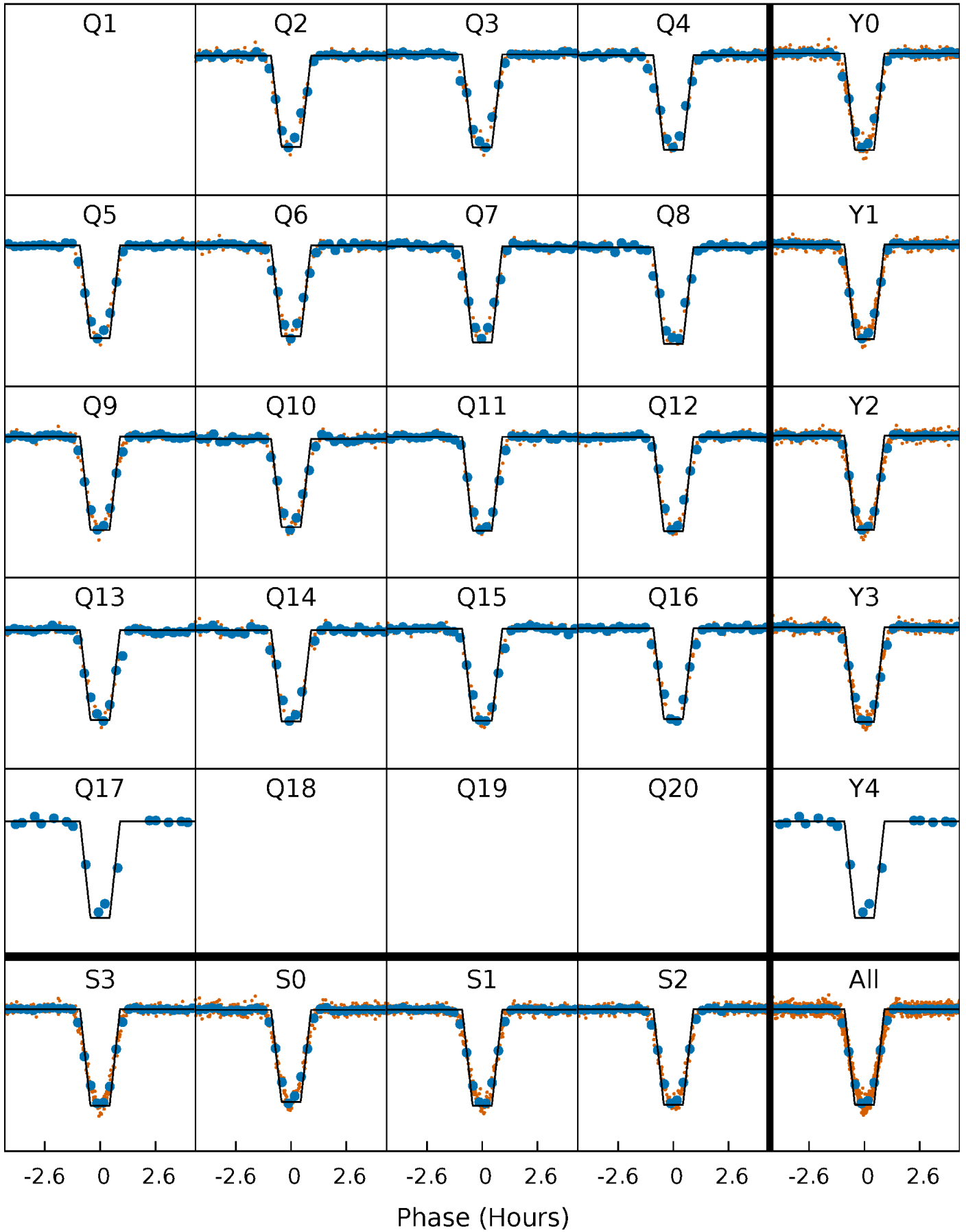
DV Quarter-Phased Transit Curves

TCE 008678664-01 P= 15.420408 Days $T_0=133.516722$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

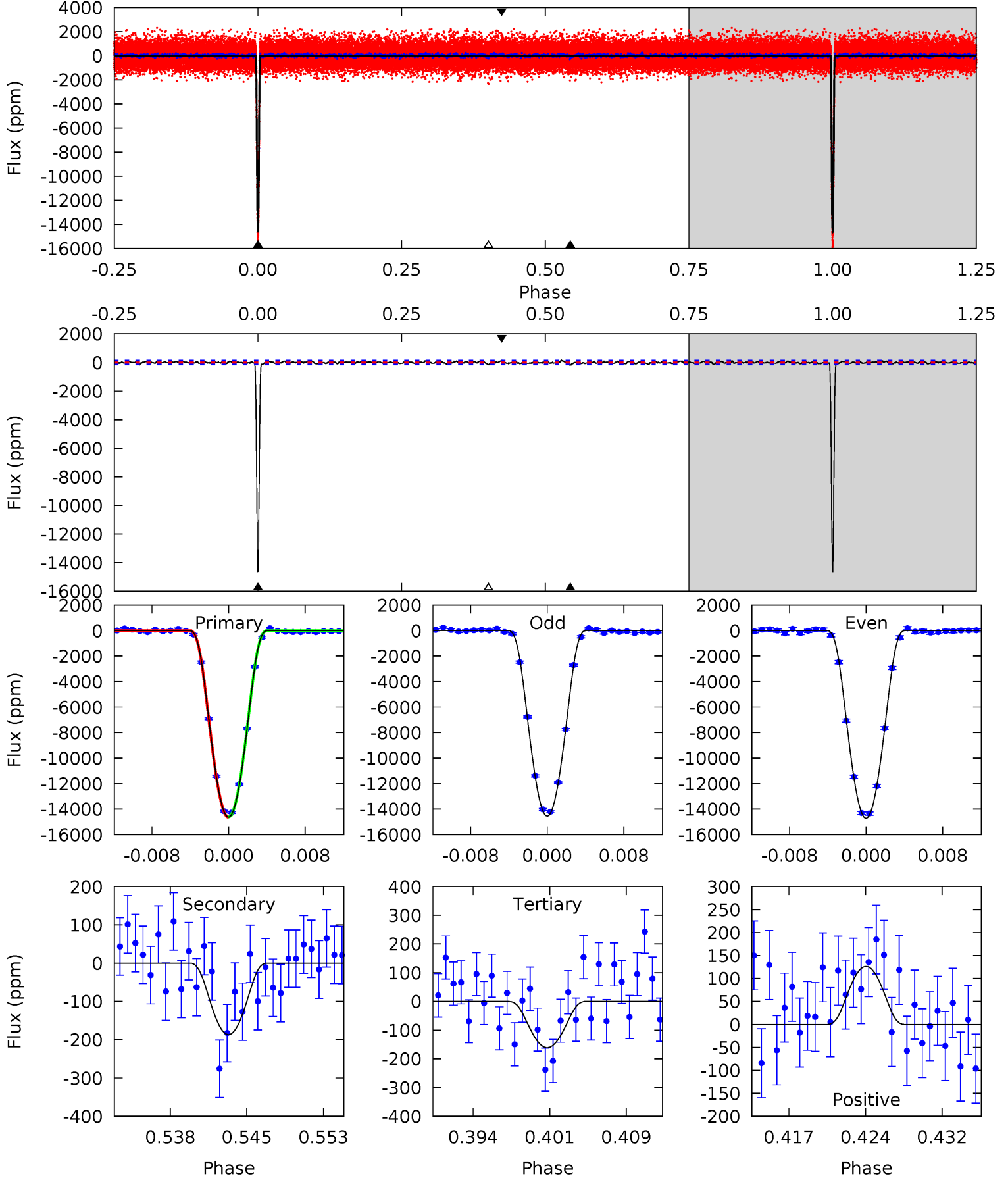
TCE 008678664-01 P= 15.420352 Days $T_0=133.519309$ (BKJD)



DV Model-Shift Uniqueness Test

008678664-01, P = 15.420408 Days, E = 133.516722 Days

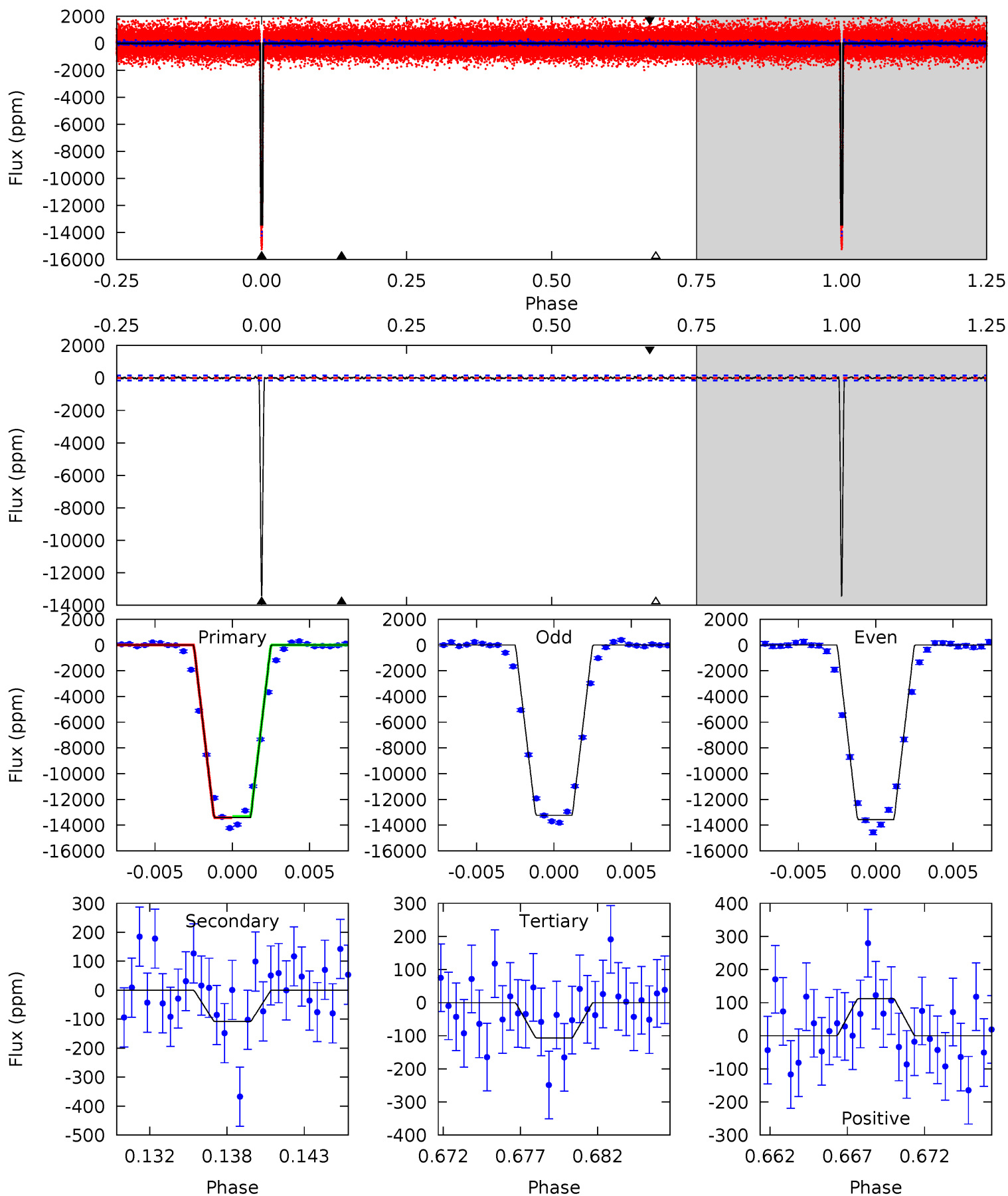
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
567.0	7.23	6.23	4.89	5.08	2.67	1.81	560.7	562.1	1.00	2.34	3.20	0.99	0.01	0.52



Alt Model-Shift Uniqueness Test

008678664-01, P = 15.420352 Days, E = 133.519309 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
442.2	3.57	3.52	3.68	5.15	2.80	1.12	438.7	438.5	0.05	-0.12	5.39	0.99	0.01	1.39



Stellar Parameters For KIC 008678664

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5468^{+164}_{-164}	$4.505^{+0.053}_{-0.158}$	$0.040^{+0.250}_{-0.300}$	$0.880^{+0.198}_{-0.085}$	$0.903^{+0.091}_{-0.082}$	$1.863^{+0.516}_{-0.814}$
	+3%/-3%	+1%/-4%	+625%/-750%	+22%/-10%	+10%/-9%	+28%/-44%
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 008678664-01 / KOI 1782.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-187 ± 26	$16.59^{+2.40}_{-1.86}$	940^{+51}_{-44}	2409^{+90}_{-78}	$4.958^{+1.637}_{-1.227}$
Alt.	-108 ± 30	$11.83^{+2.20}_{-1.74}$	936^{+54}_{-44}	2447^{+143}_{-130}	$5.669^{+2.941}_{-2.030}$

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 $A_{obs} \gg 1.0$

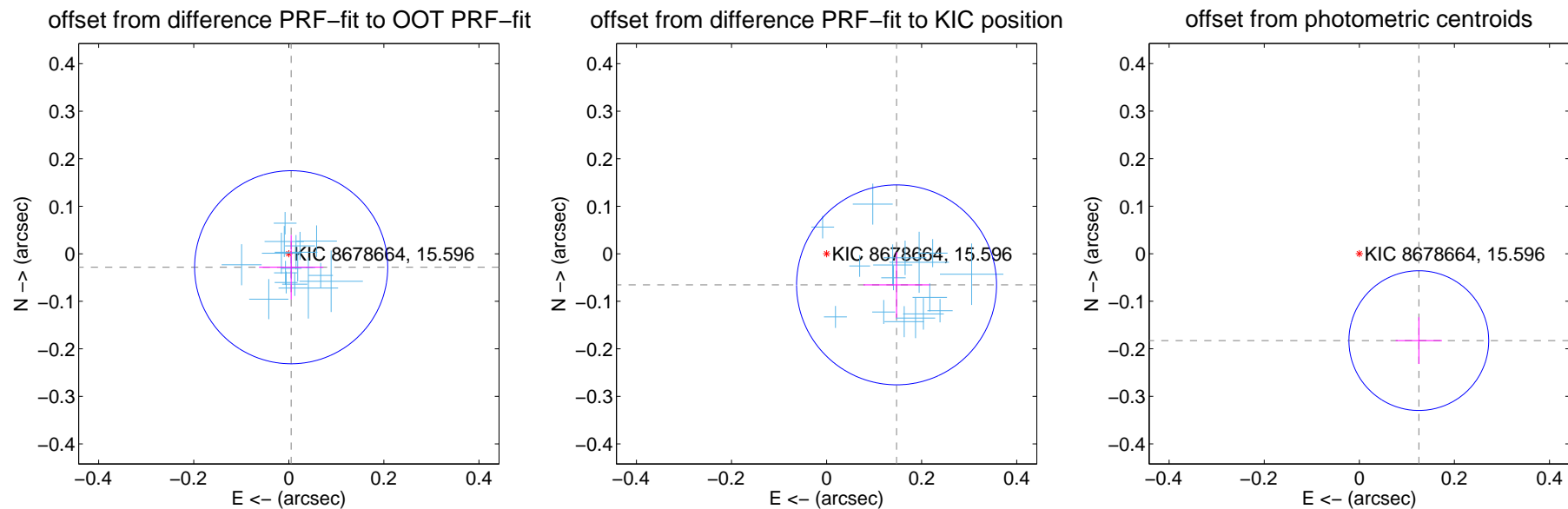
DV Centroid Data

Supplemental centroid analysis for 008678664-01. Kepler magnitude: 15.60. Transit SNR 304.75

There are 16 quarters with good PRF difference image offsets

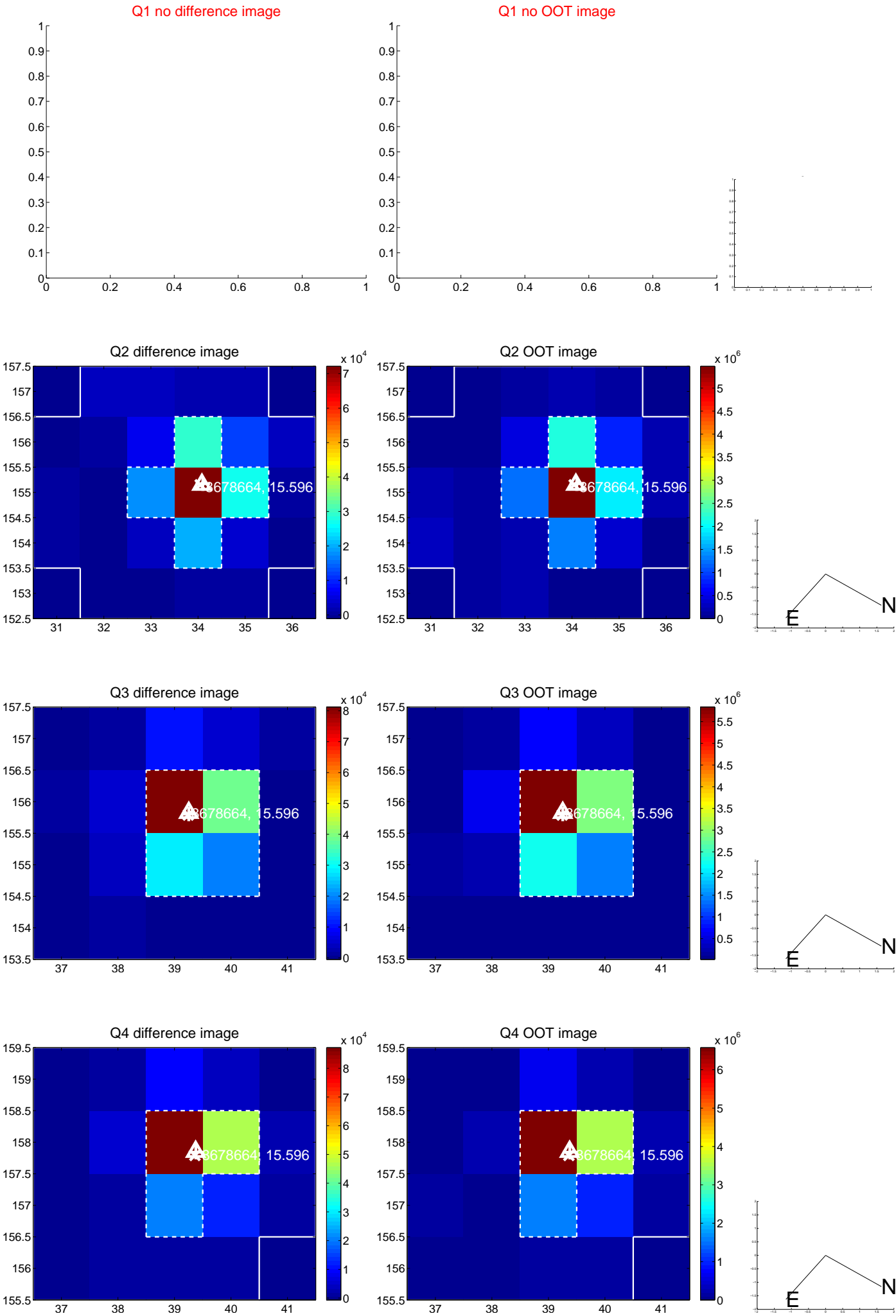
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.029 ± 0.068	0.42	-0.005 ± 0.068	-0.028 ± 0.068
PRF-fit source offset from KIC position	0.161 ± 0.070	2.30	-0.147 ± 0.070	-0.065 ± 0.069
photometric centroid source offset	0.22 ± 0.05	4.52	-0.13 ± 0.05	-0.18 ± 0.05

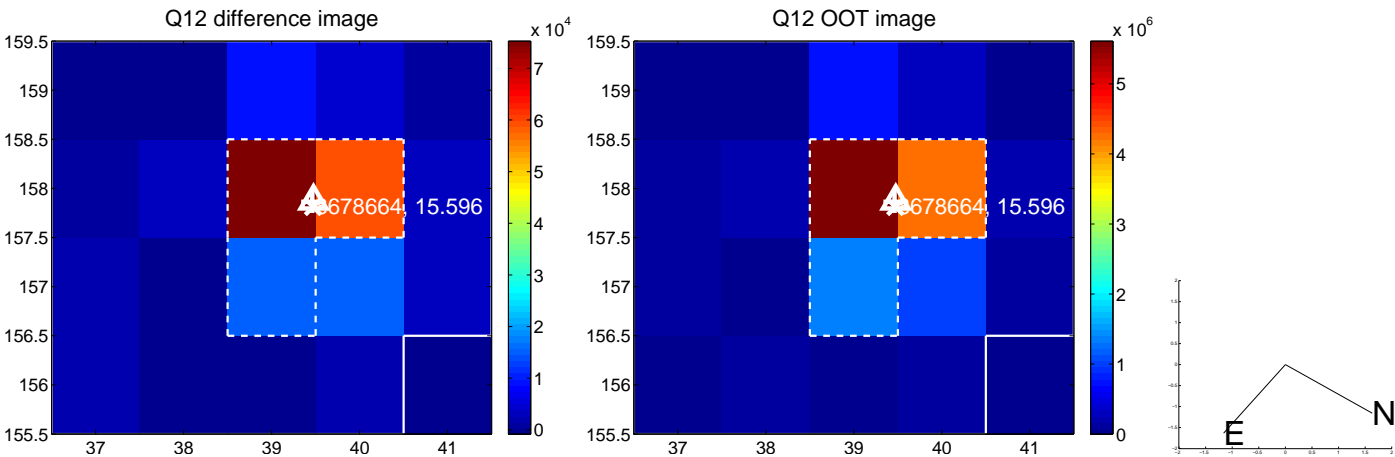
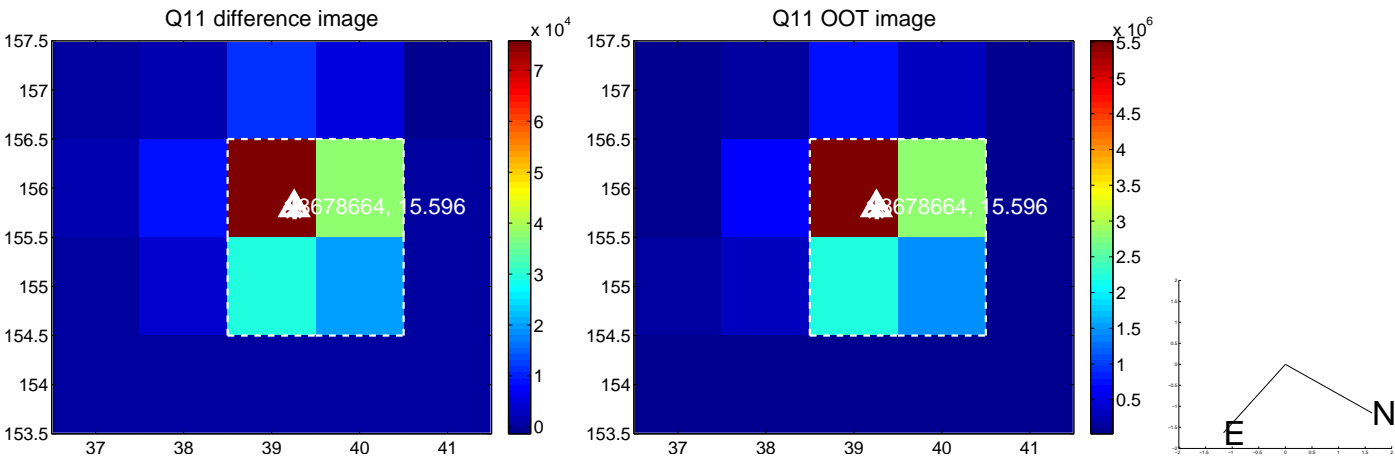
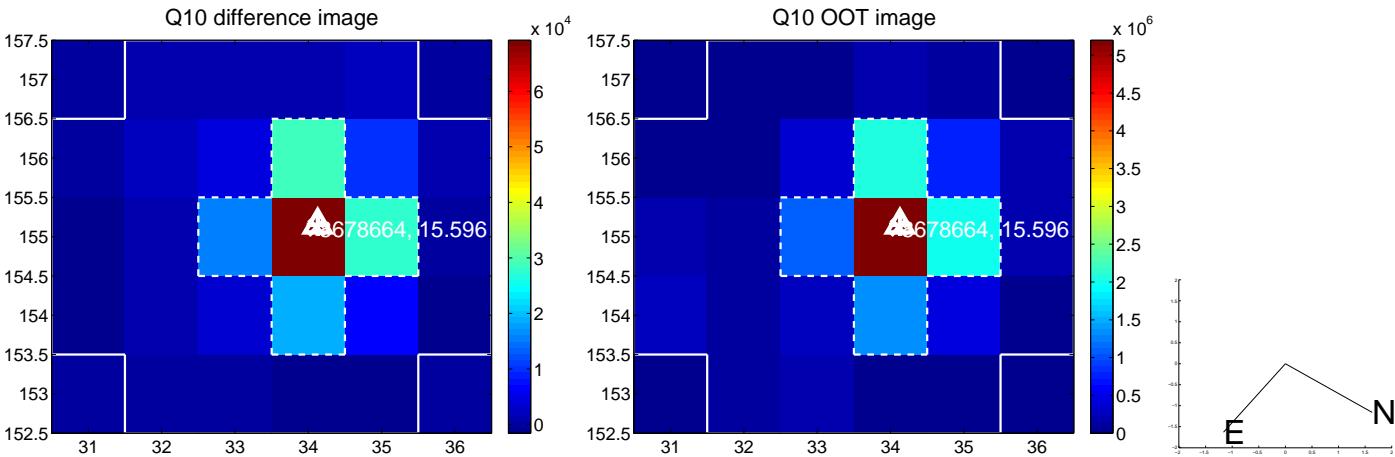
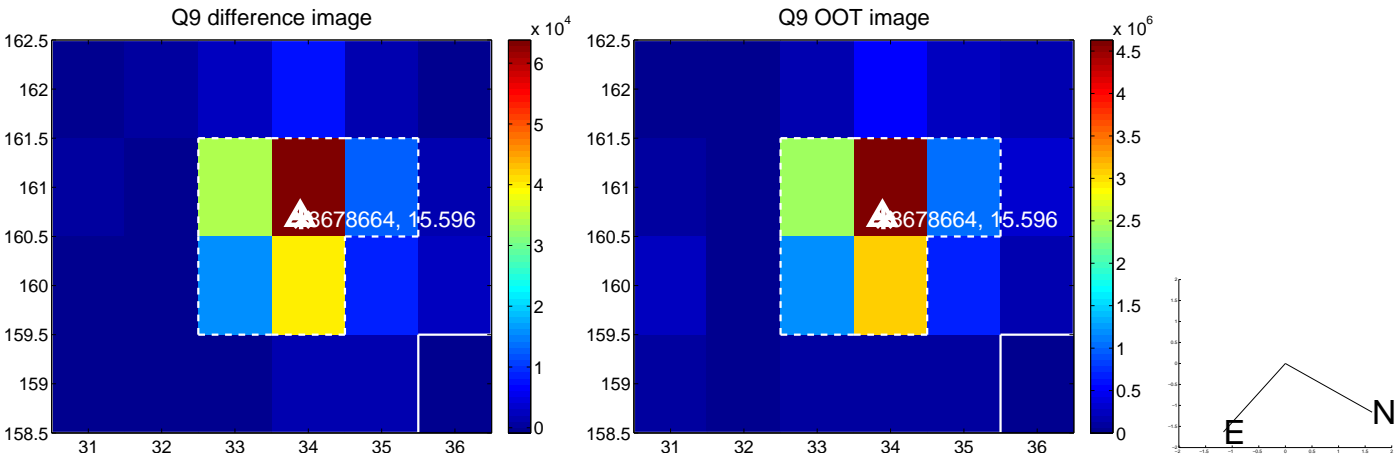


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- 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.

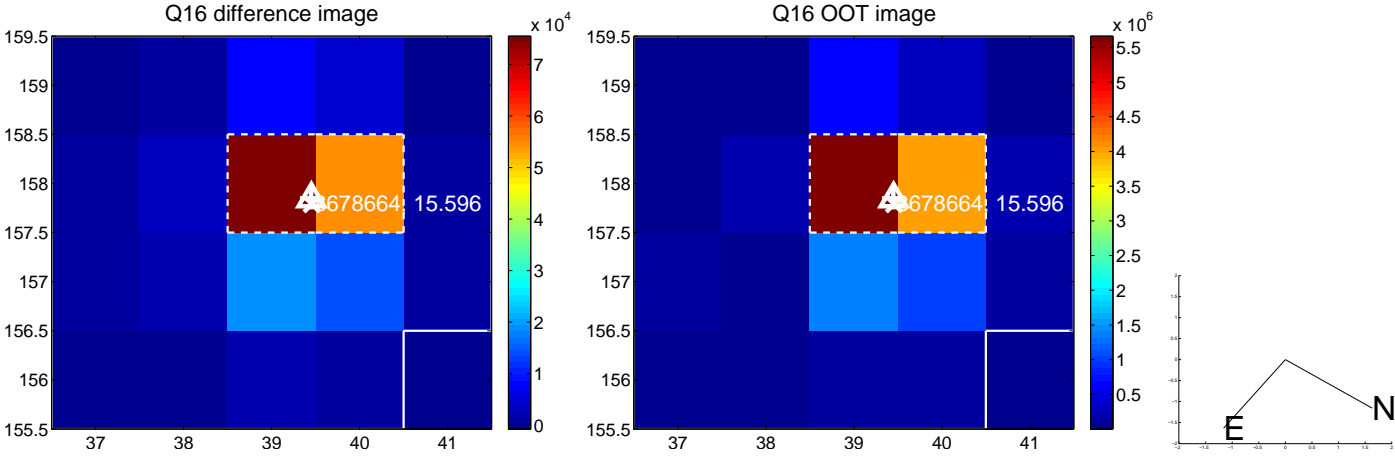
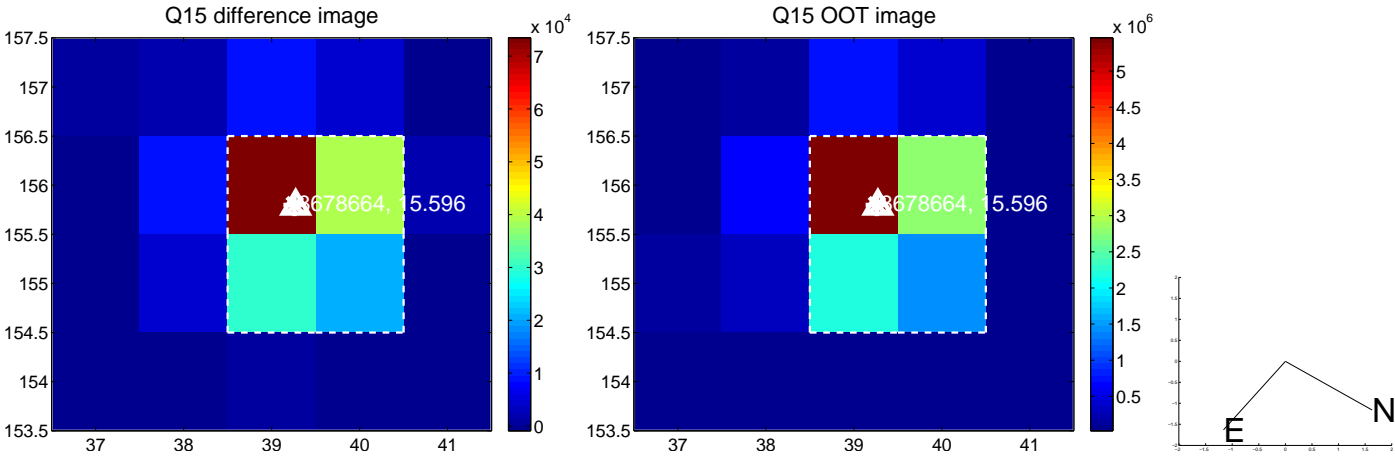
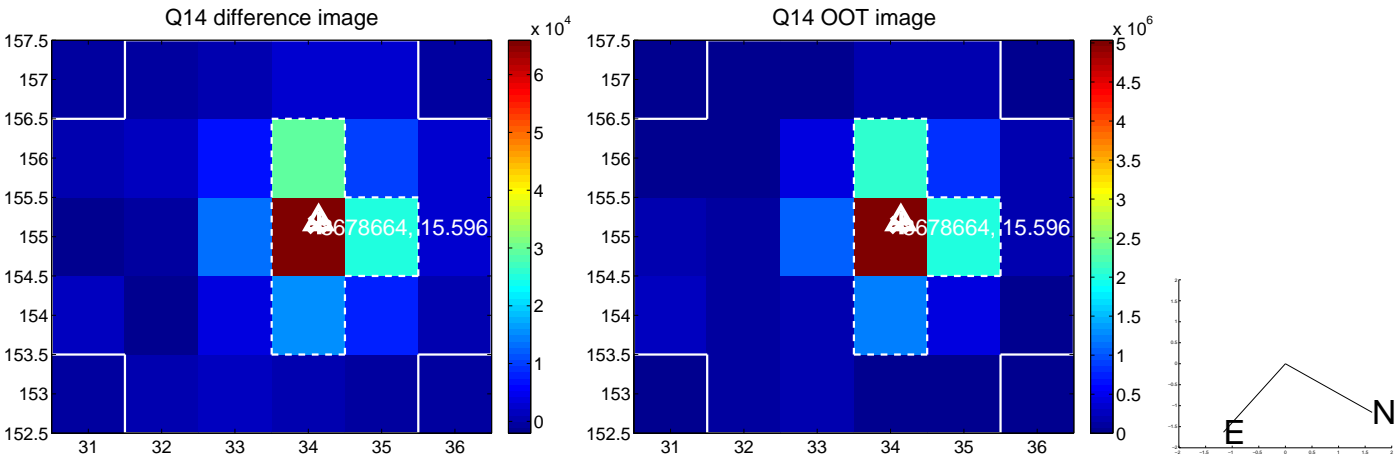
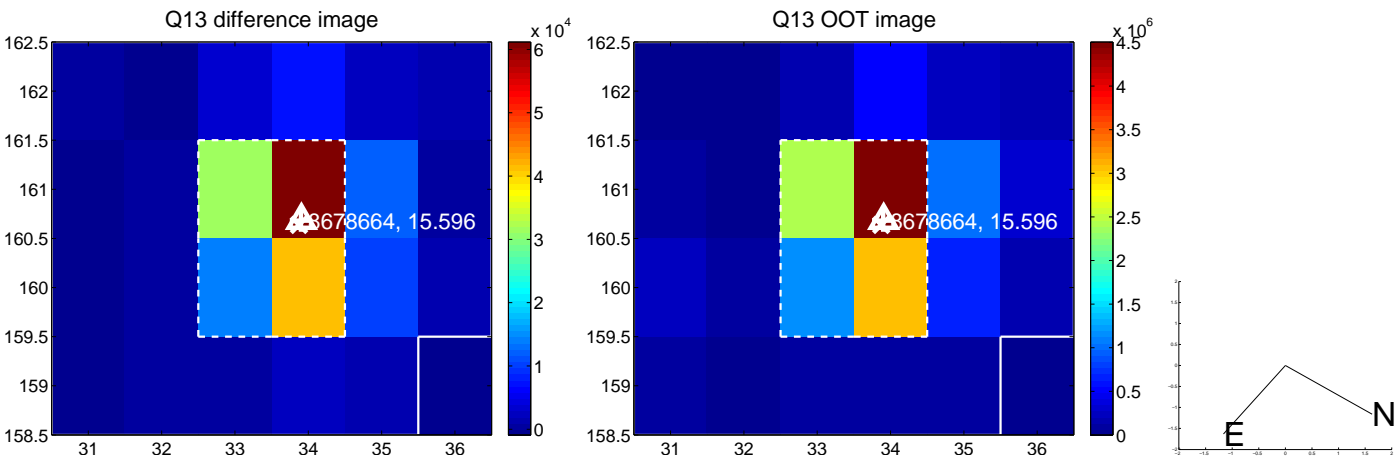
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



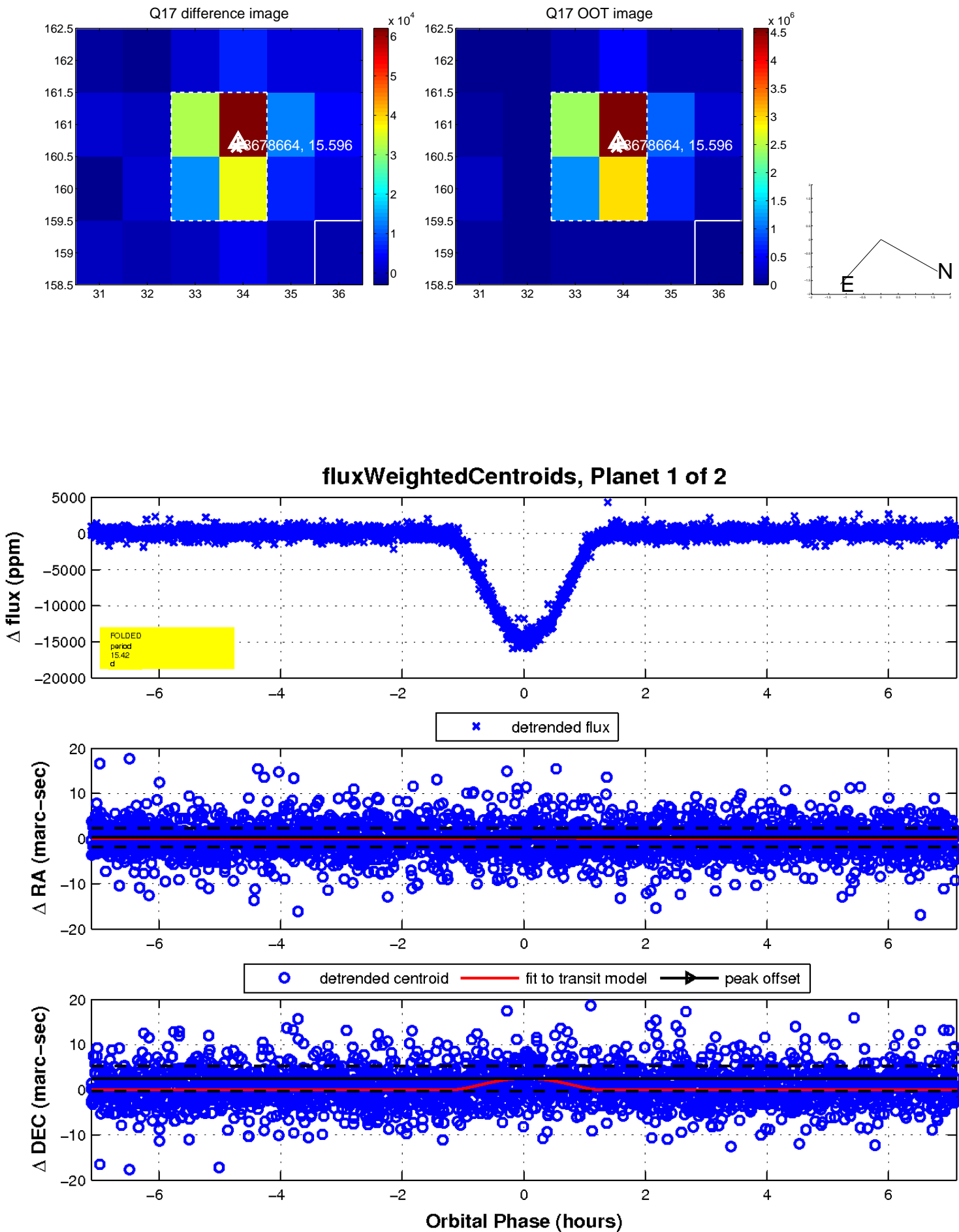
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

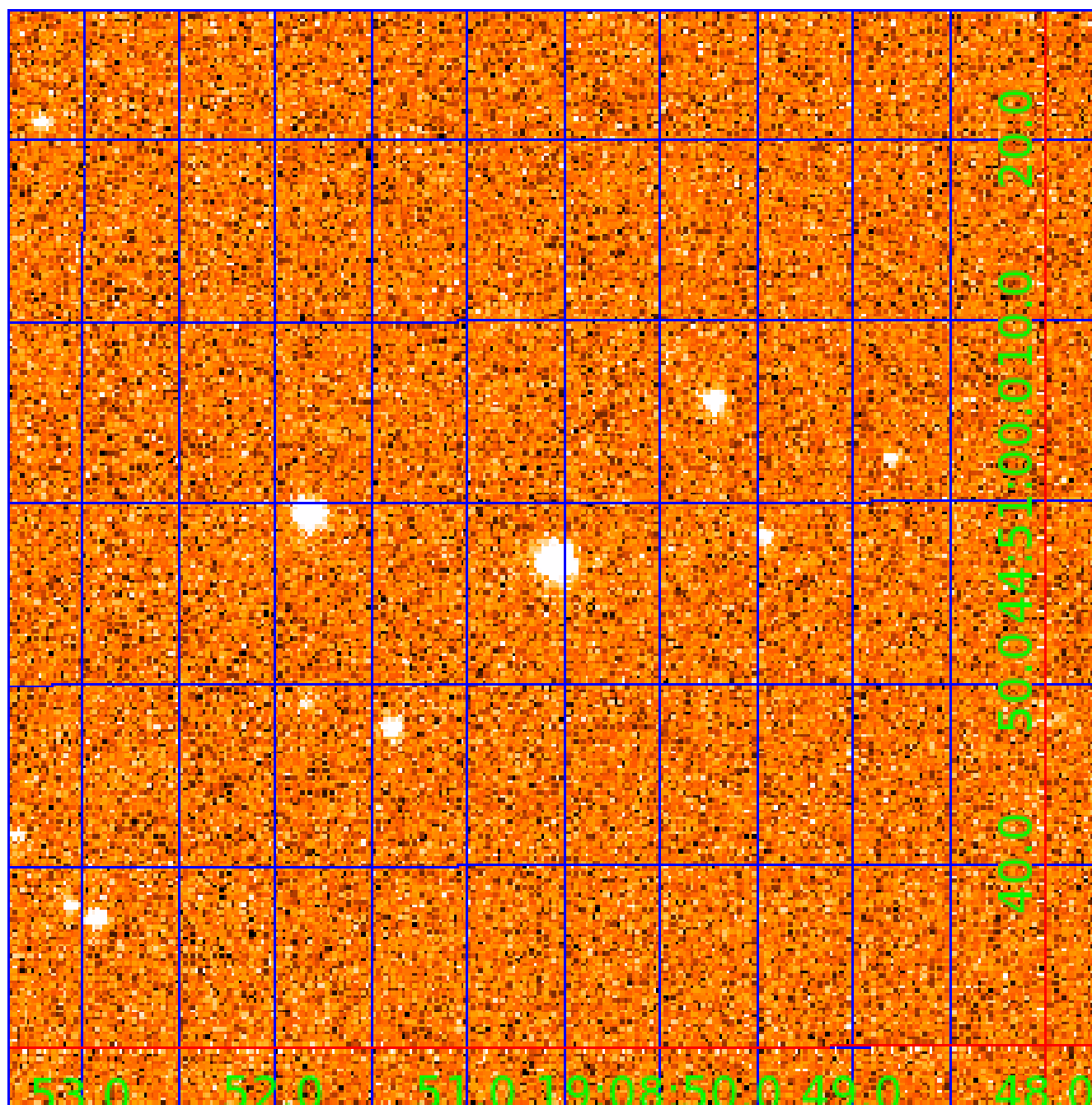


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008678664

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})
008678664-01	OBS	1782.01	15.420408	133.516722	14686.1	2.374	318.2	304.7	0.88	5468	16.11	45.12
008678664-02	OBS	No	368.464502	234.822788	1240.8	9.616	7.4	7.1	0.88	5468	3.06	0.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008678664-01	OBS	FP	0.00	0	1	0	0	DEEP_V_SHAPED
008678664-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—CENT_FEW_DIFFS

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.

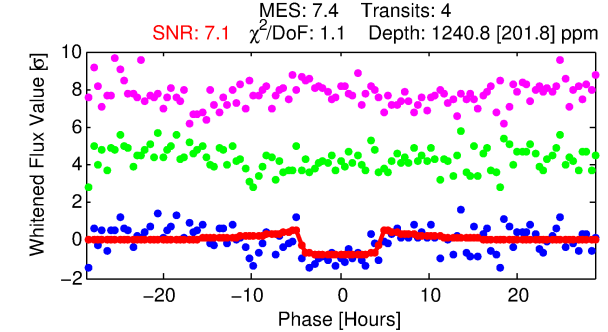
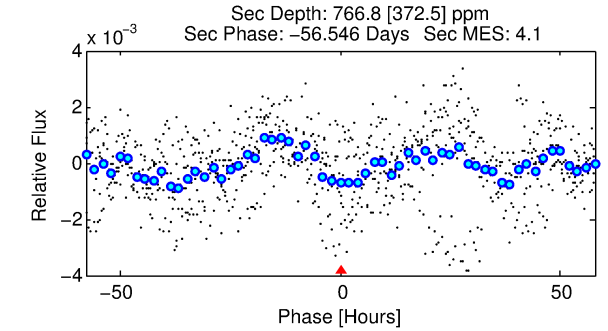
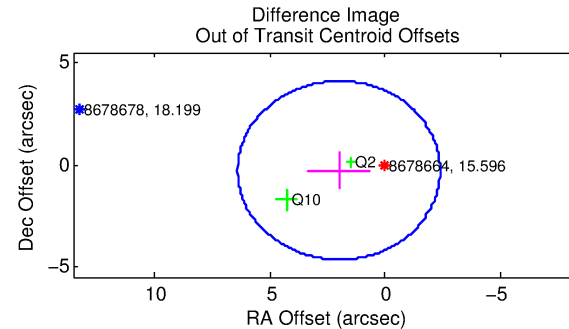
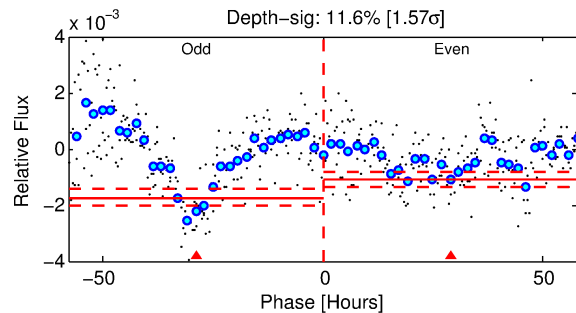
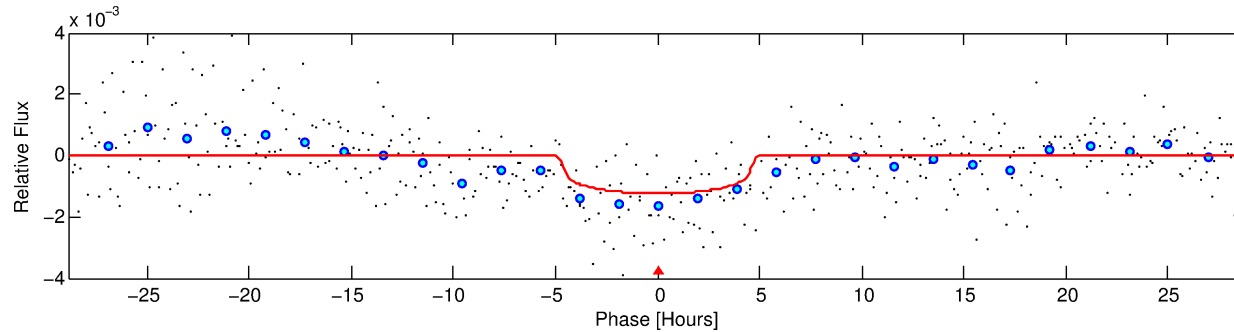
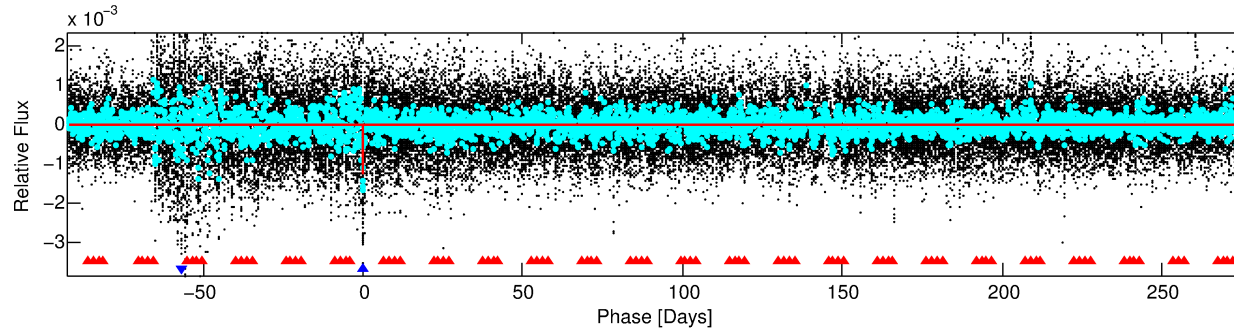
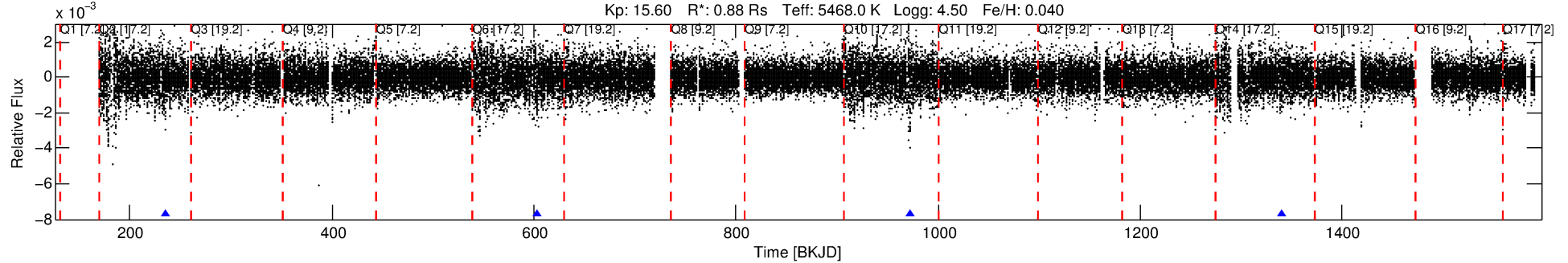
Ephemeris Match Information For 008678664-02

No Significant Match Found

DV One-Page Summary

KIC: 8678664 Candidate: 2 of 2 Period: 368.465 d
KOI: K01782 Corr: No Ephemeris Match

Kp: 15.60 R*: 0.88 Rs Teff: 5468.0 K Logg: 4.50 Fe/H: 0.040



DV Fit Results:

Period = 368.46450 [0.00649] d
Epoch = 234.8228 [0.0134] BKJD
Rp/R* = 0.0318 [0.0378]
a/R* = 295.50 [1371.79]
b = 0.21 [20.92]
Seff = 0.66 [0.20]
Teq = 229 [18] K
Rp = 3.06 [3.69] Re
a = 0.9726 [0.1876] AU
Ag = 42739.13 [104353.21] [0.41σ]
Teffp = 5101 [3096] K [1.57σ]

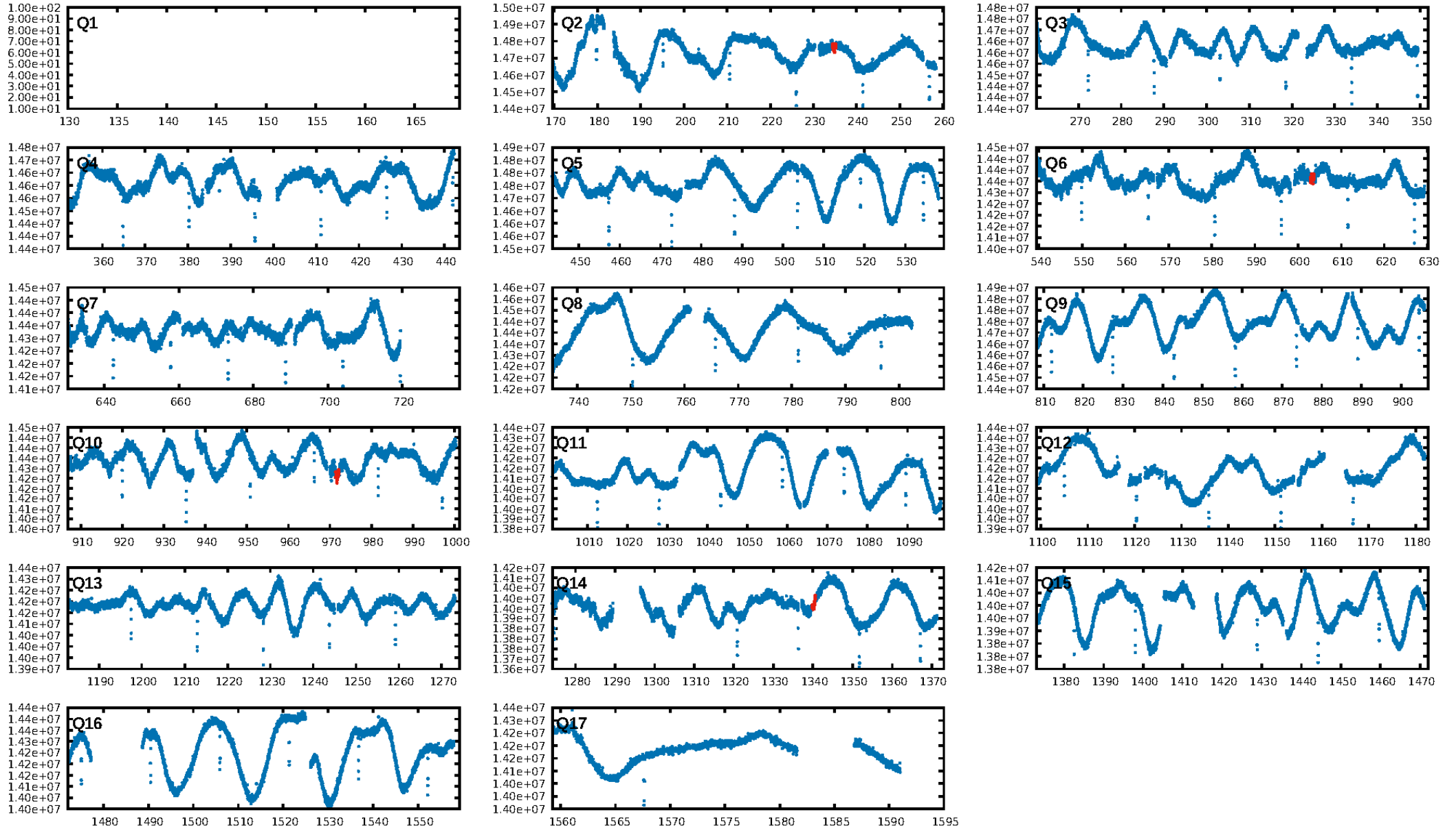
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [855.46σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 3.6%
ModelChiSquareGof-sig: 99.2%
Bootstrap-pfa: 1.62e-08
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 1.684
Centroid-sig: 0.6%
Centroid-so: 4.243 arcsec [2.19σ]
OotOffset-rm: 2.029 arcsec [1.39σ]
KicOffset-rm: 1.806 arcsec [1.35σ]
OotOffset-st: 2/0/0/0 [2]
KicOffset-st: 2/0/0/0 [2]
DiffImageQuality-fgm: 0.00 [0/2]
DiffImageOverlap-fno: 1.00 [4/4]

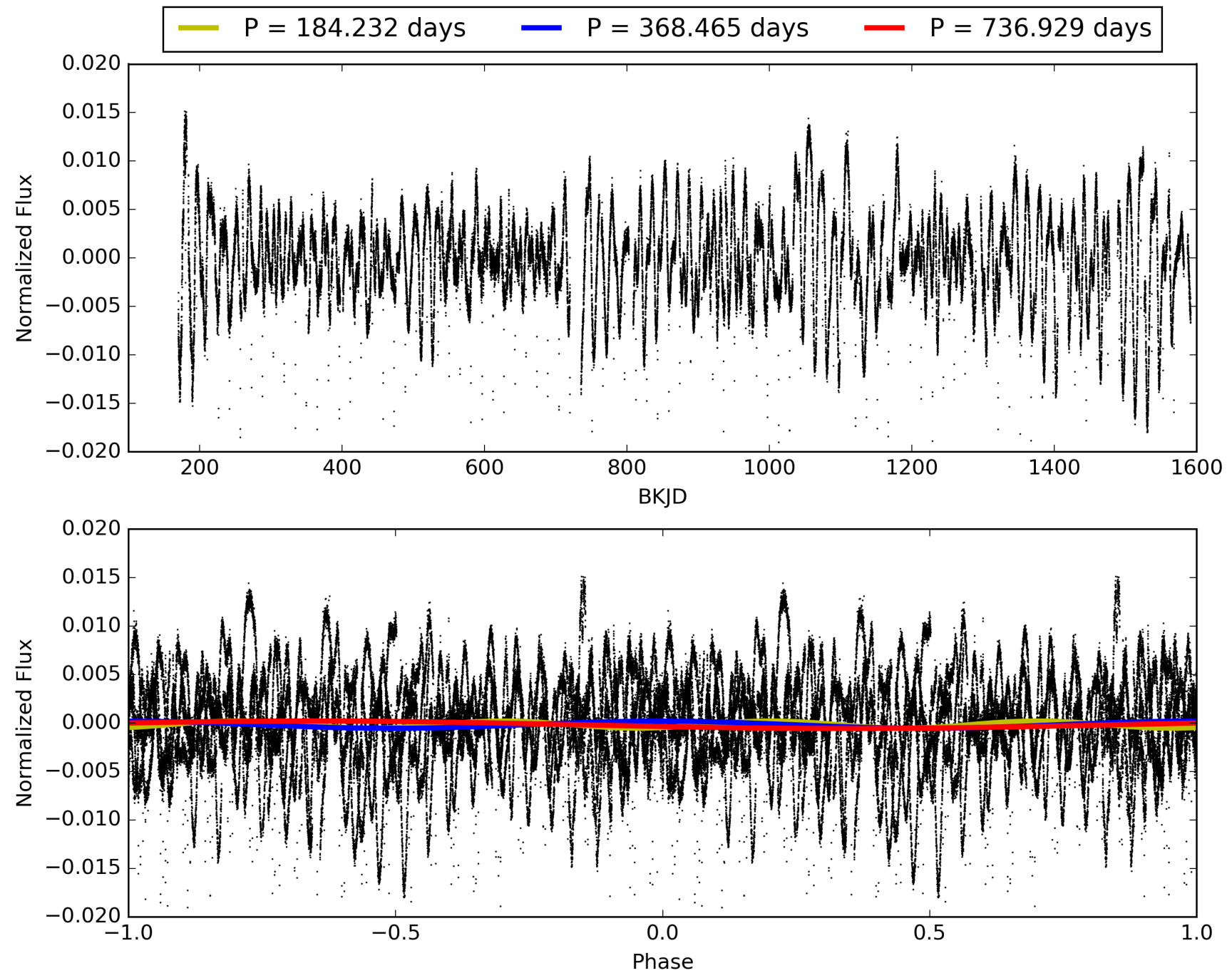
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 02:54:32 Z

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

TCE 008678664-02, PDC Light Curves

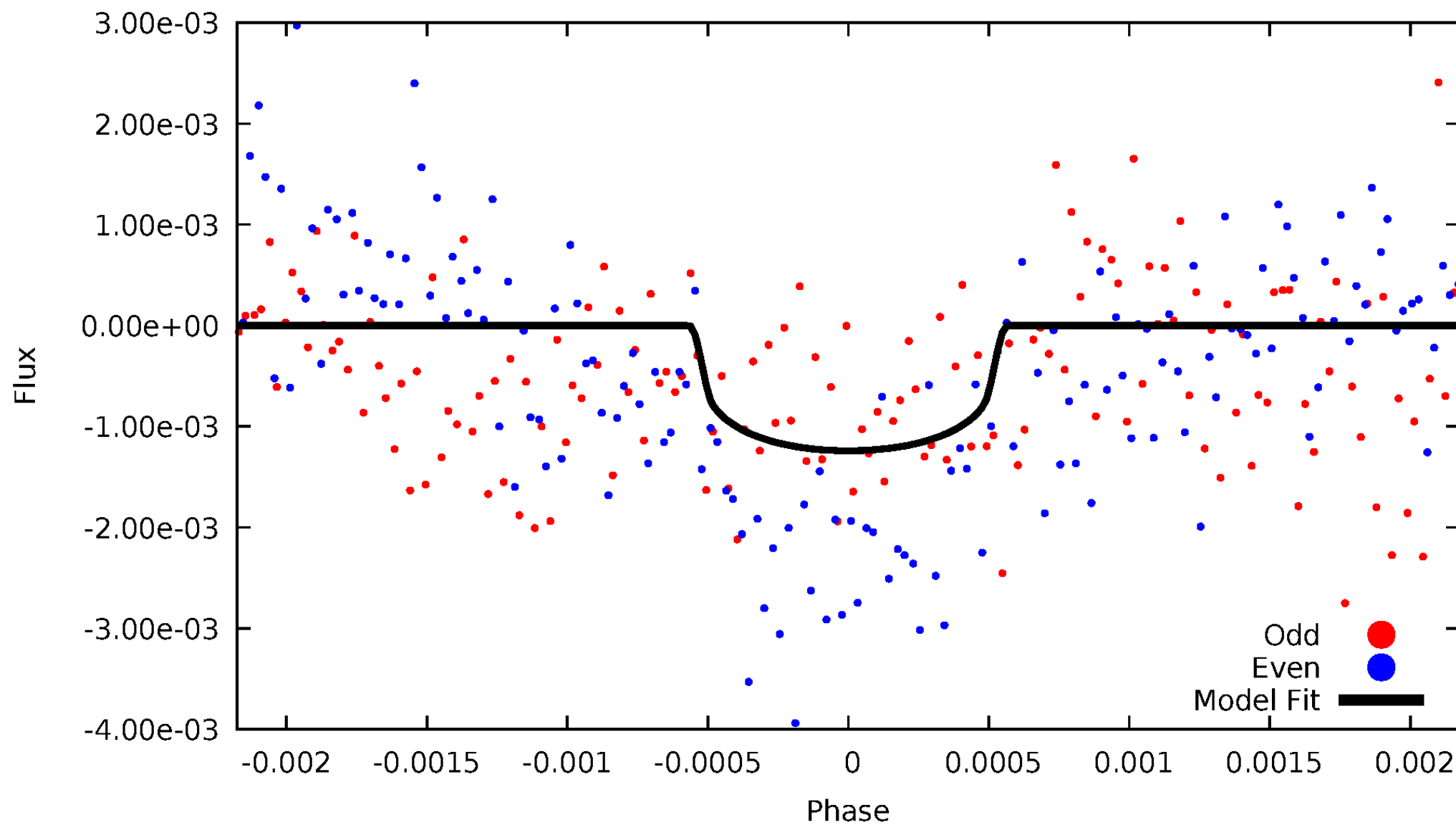


TCE 008678664-02



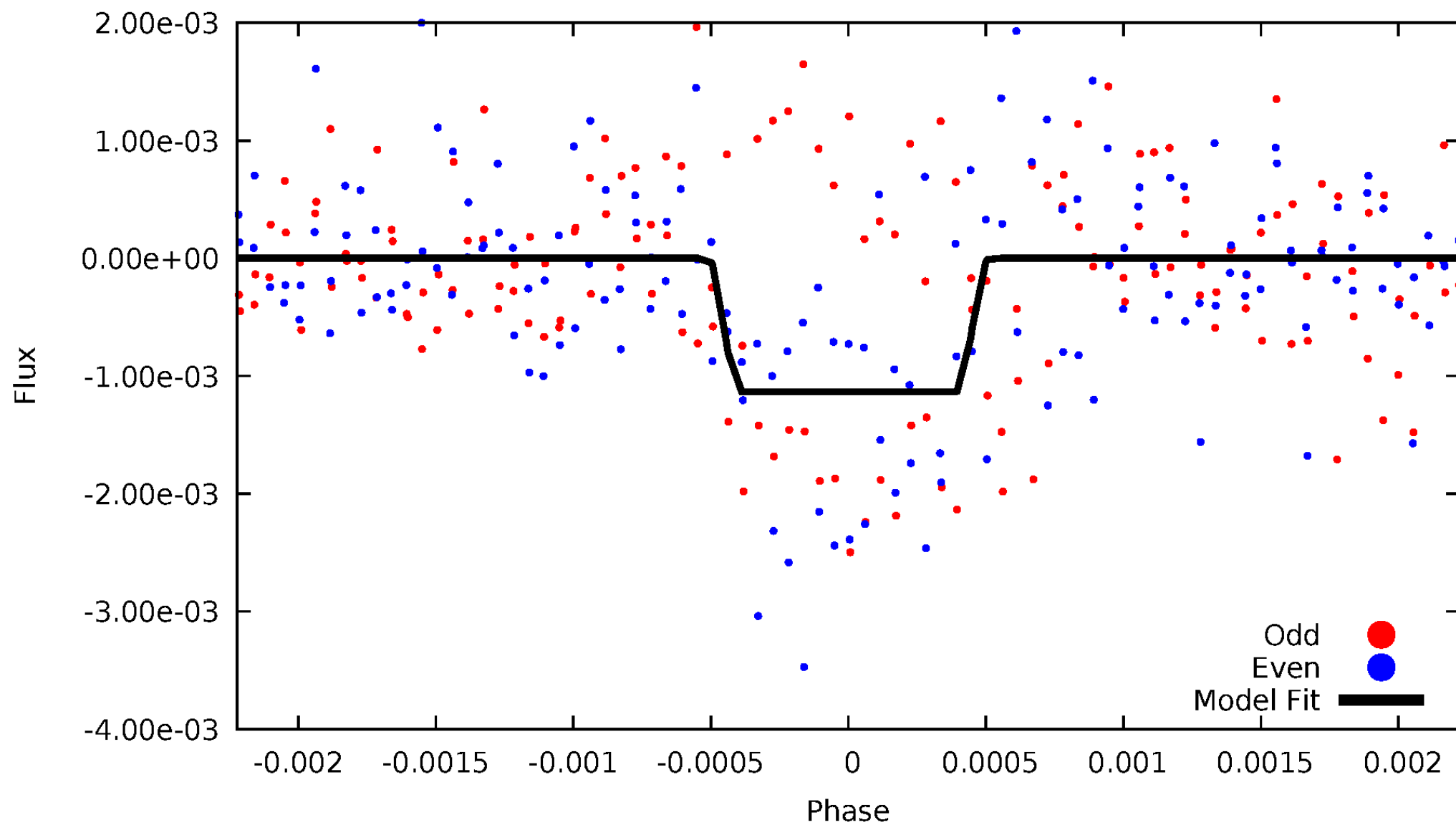
DV Odd/Even

TCE 008678664-02



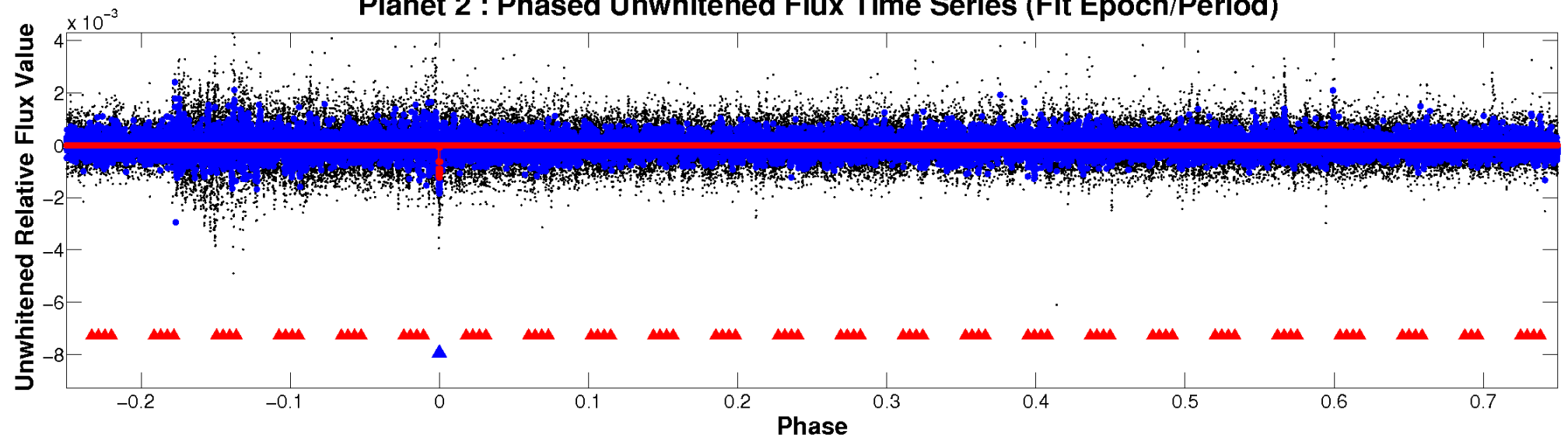
ALT Odd/Even

TCE 008678664-02

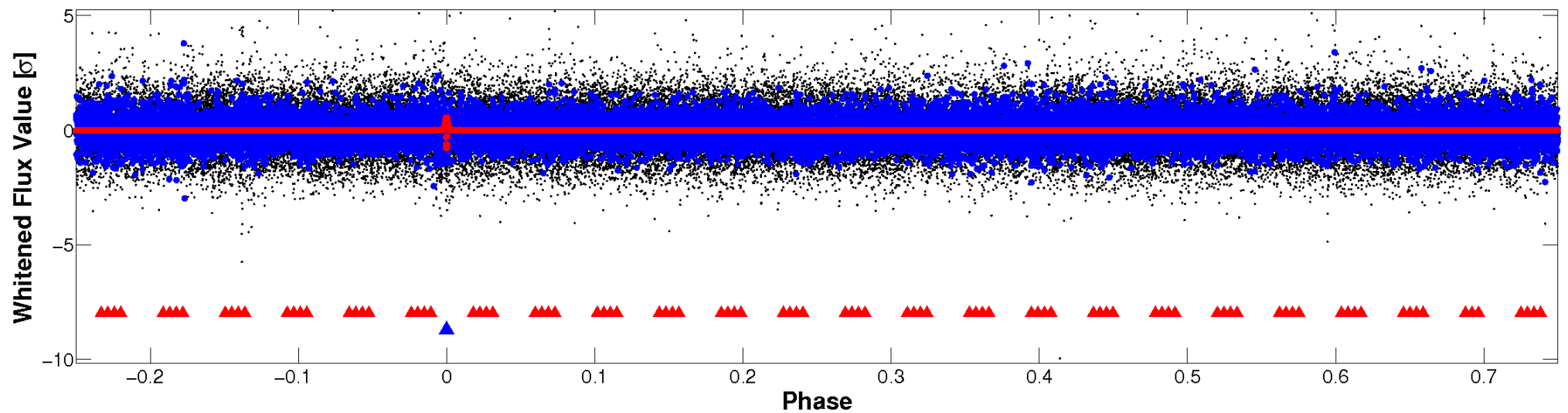


Non-Whitened Vs. Whitened Light Curve

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

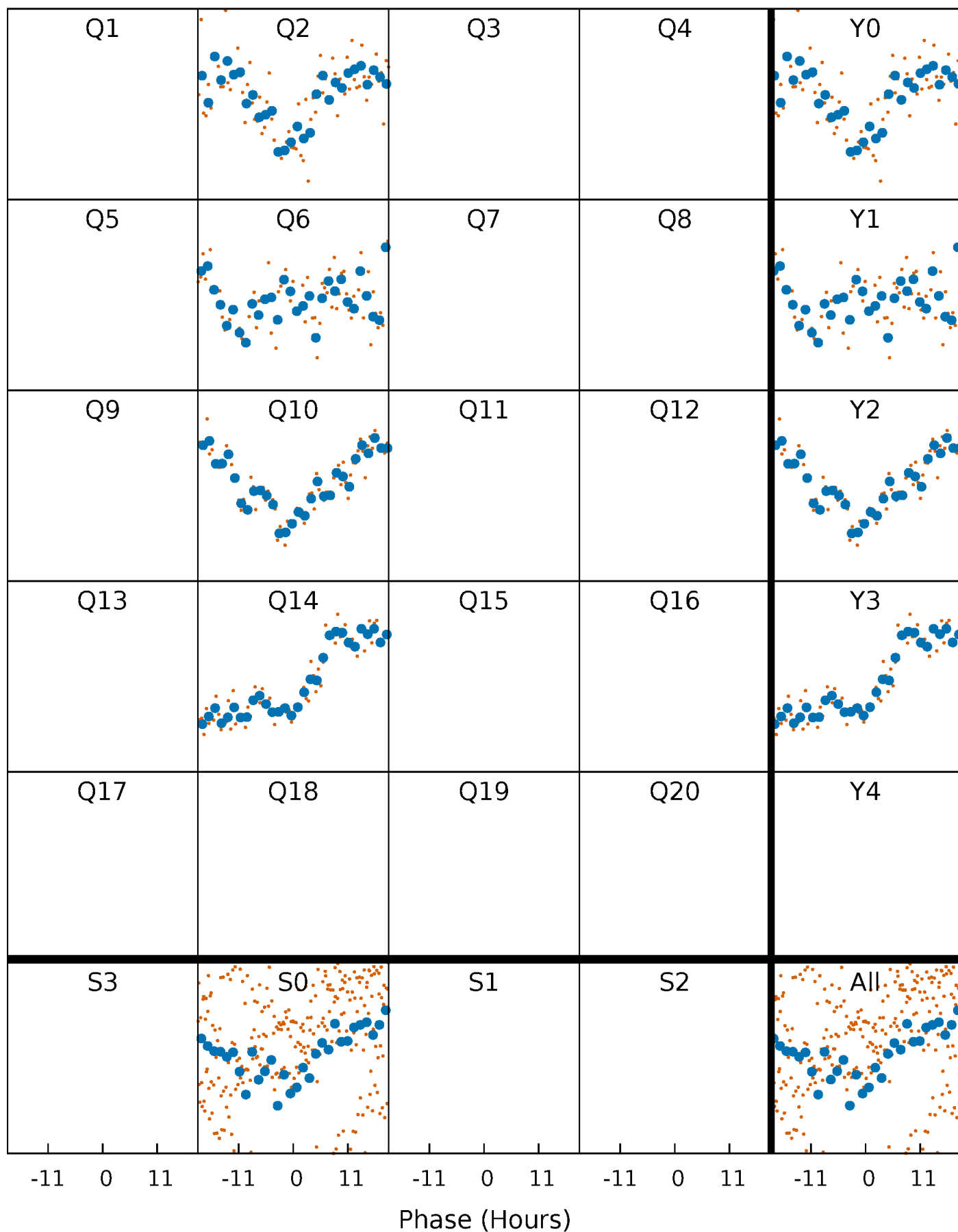


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



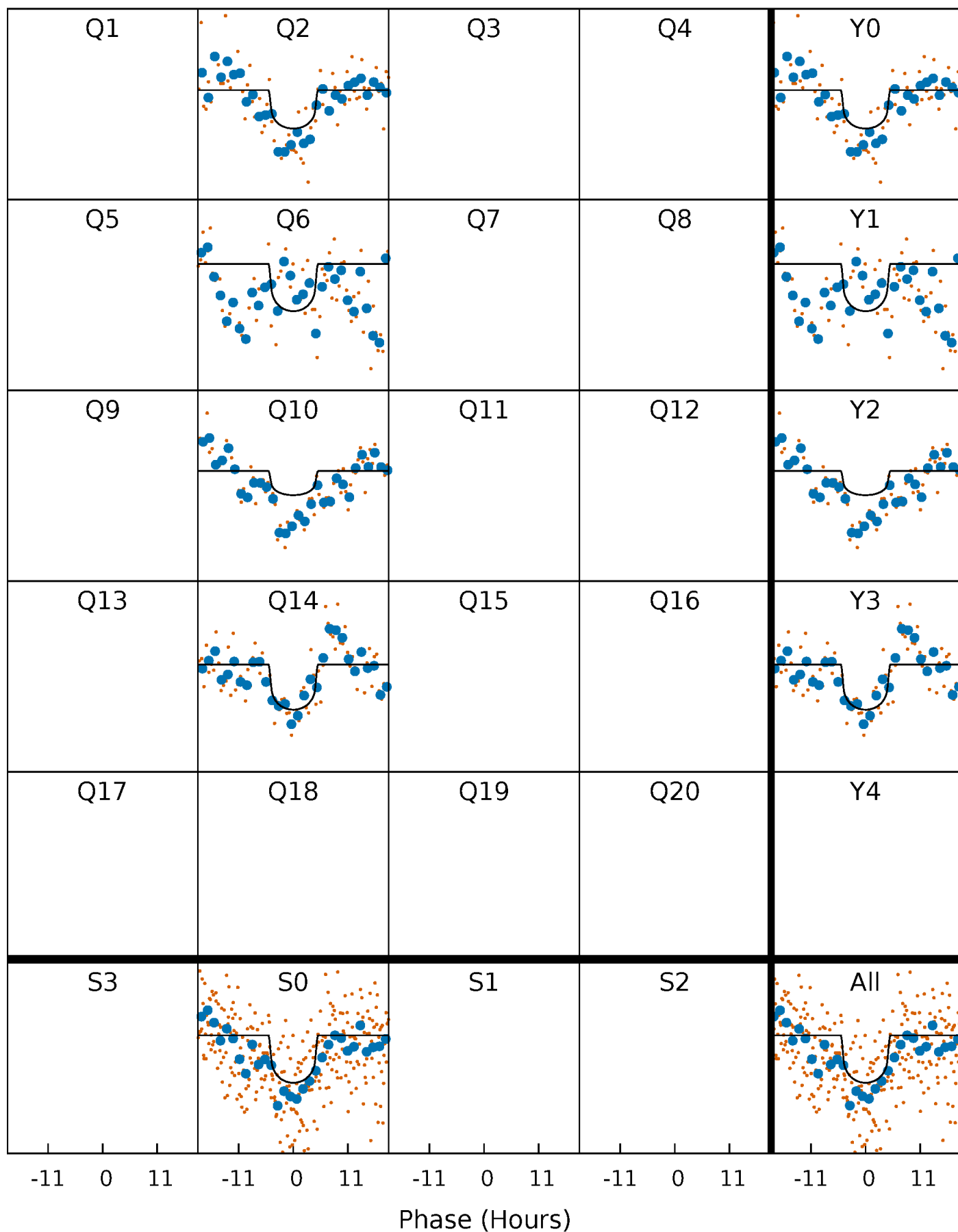
PDC Quarter-Phased Transit Curves

TCE 008678664-02 P=368.464502 Days $T_0=234.822788$ (BKJD)



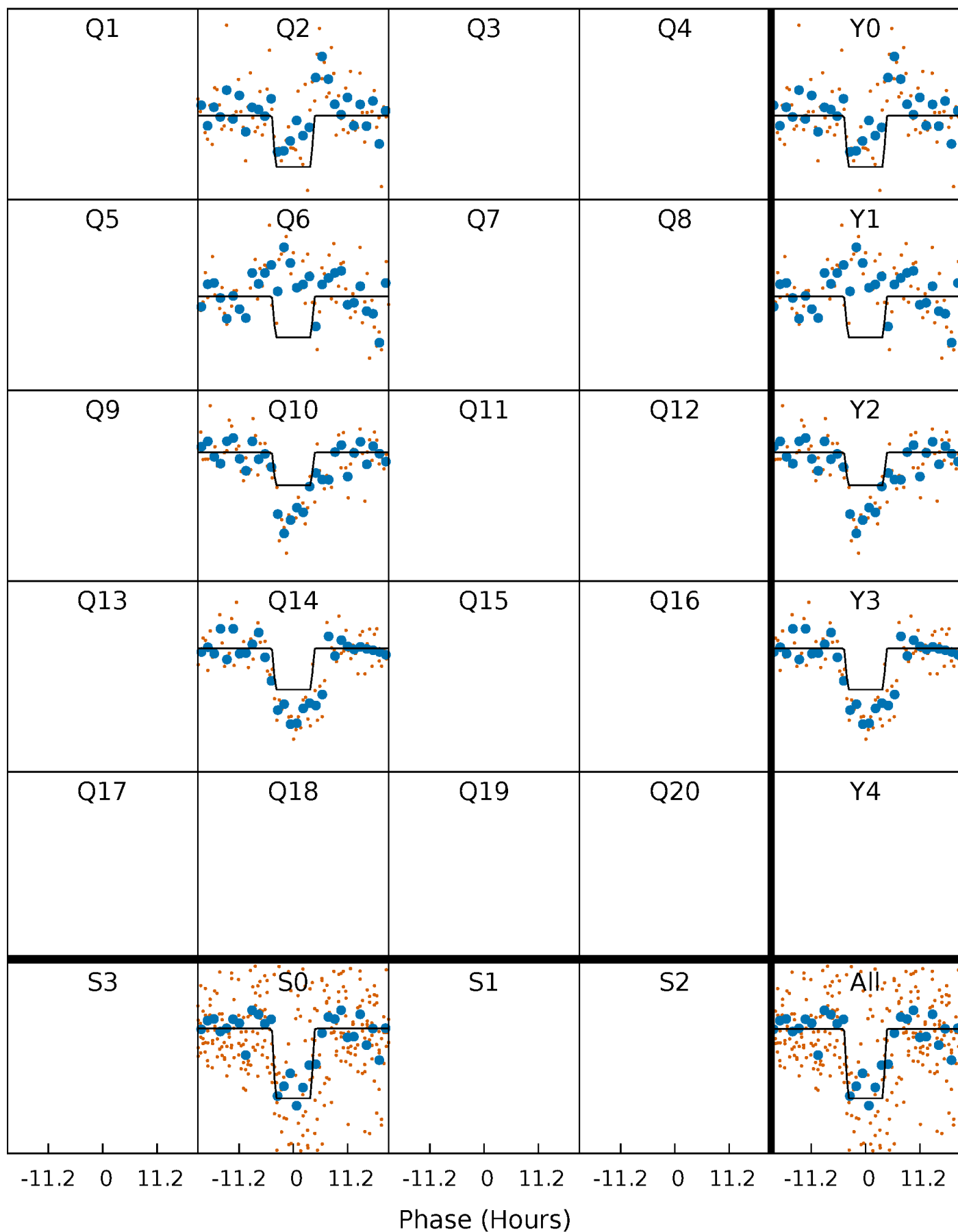
DV Quarter-Phased Transit Curves

TCE 008678664-02 P=368.464502 Days $T_0=234.822788$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

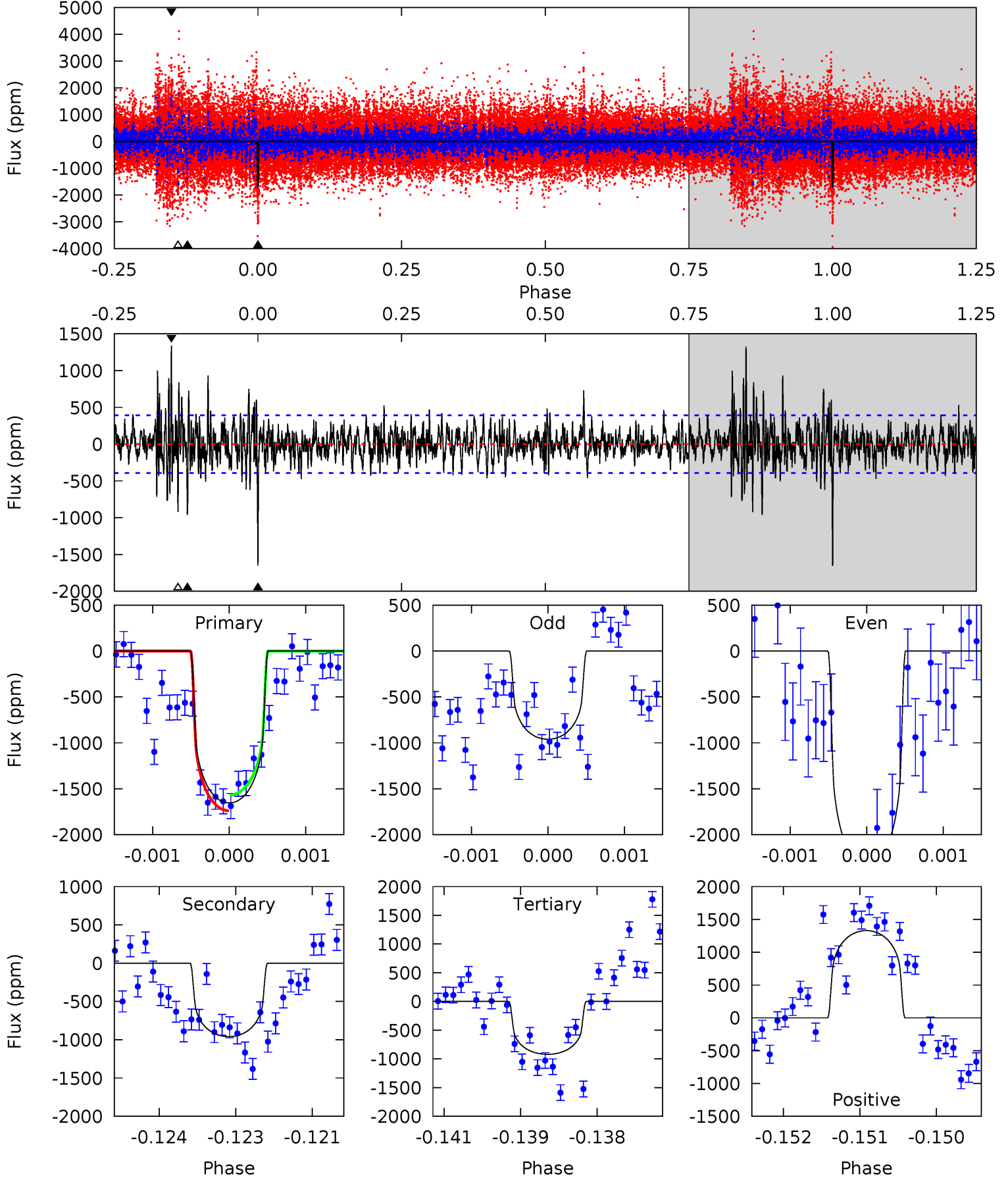
TCE 008678664-02 P=368.457954 Days $T_0=234.825851$ (BKJD)



DV Model-Shift Uniqueness Test

008678664-02, P = 368.464502 Days, E = 234.822788 Days

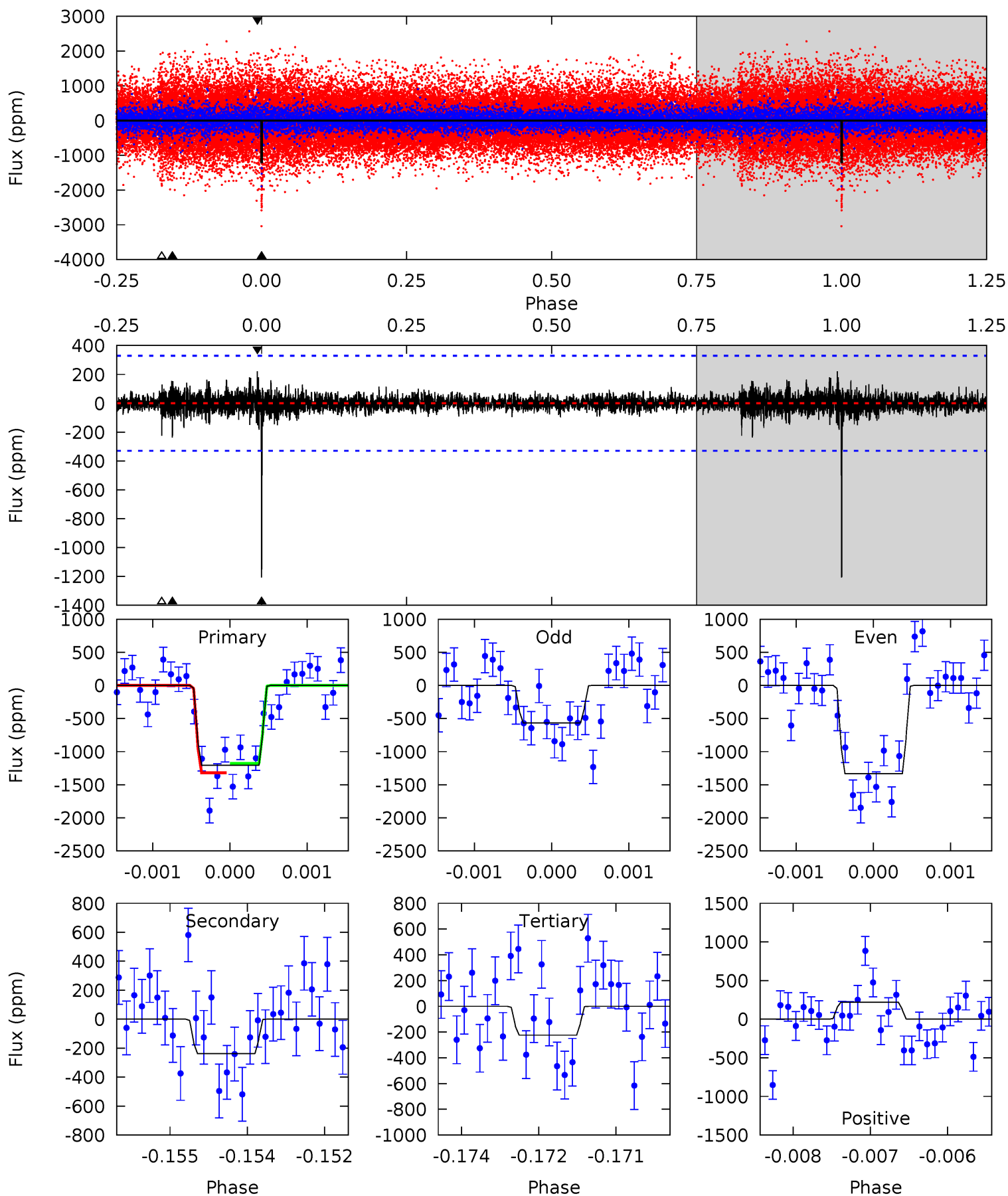
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.9	13.3	12.7	18.4	5.43	3.26	2.60	10.1	4.49	0.54	-5.12	9.56	1.05	0.45	1.19



Alt Model-Shift Uniqueness Test

008678664-02, P = 368.457954 Days, E = 234.825851 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.9	3.92	3.70	3.64	5.44	3.28	0.58	16.2	16.3	0.22	0.28	6.65	0.80	0.15	1.15



Stellar Parameters For KIC 008678664

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5468^{+164}_{-164}	$4.505^{+0.053}_{-0.158}$	$0.040^{+0.250}_{-0.300}$	$0.880^{+0.198}_{-0.085}$	$0.903^{+0.091}_{-0.082}$	$1.863^{+0.516}_{-0.814}$
	+3%/-3%	+1%/-4%	+625%/-750%	+22%/-10%	+10%/-9%	+28%/-44%
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 008678664-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-959 ± 72	$4.03^{+3.34}_{-2.66}$	326^{+19}_{-15}	4905^{+3720}_{-1045}	$30590^{+240649}_{-21669}$
Alt.	-237 ± 61	$4.39^{+3.47}_{-2.79}$	324^{+19}_{-13}	3635^{+1761}_{-628}	6424^{+42685}_{-4627}

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 $A_{obs} \gg 1.0$

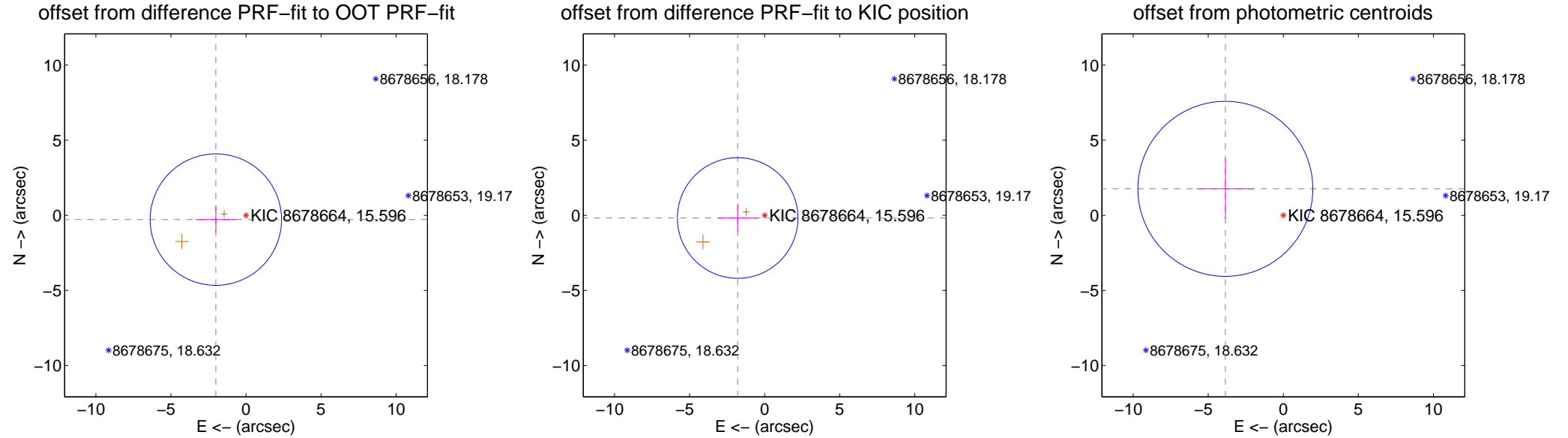
DV Centroid Data

Supplemental centroid analysis for 008678664-02. Kepler magnitude: 15.60. Transit SNR 7.07

There are 0 quarters with good PRF difference image offsets

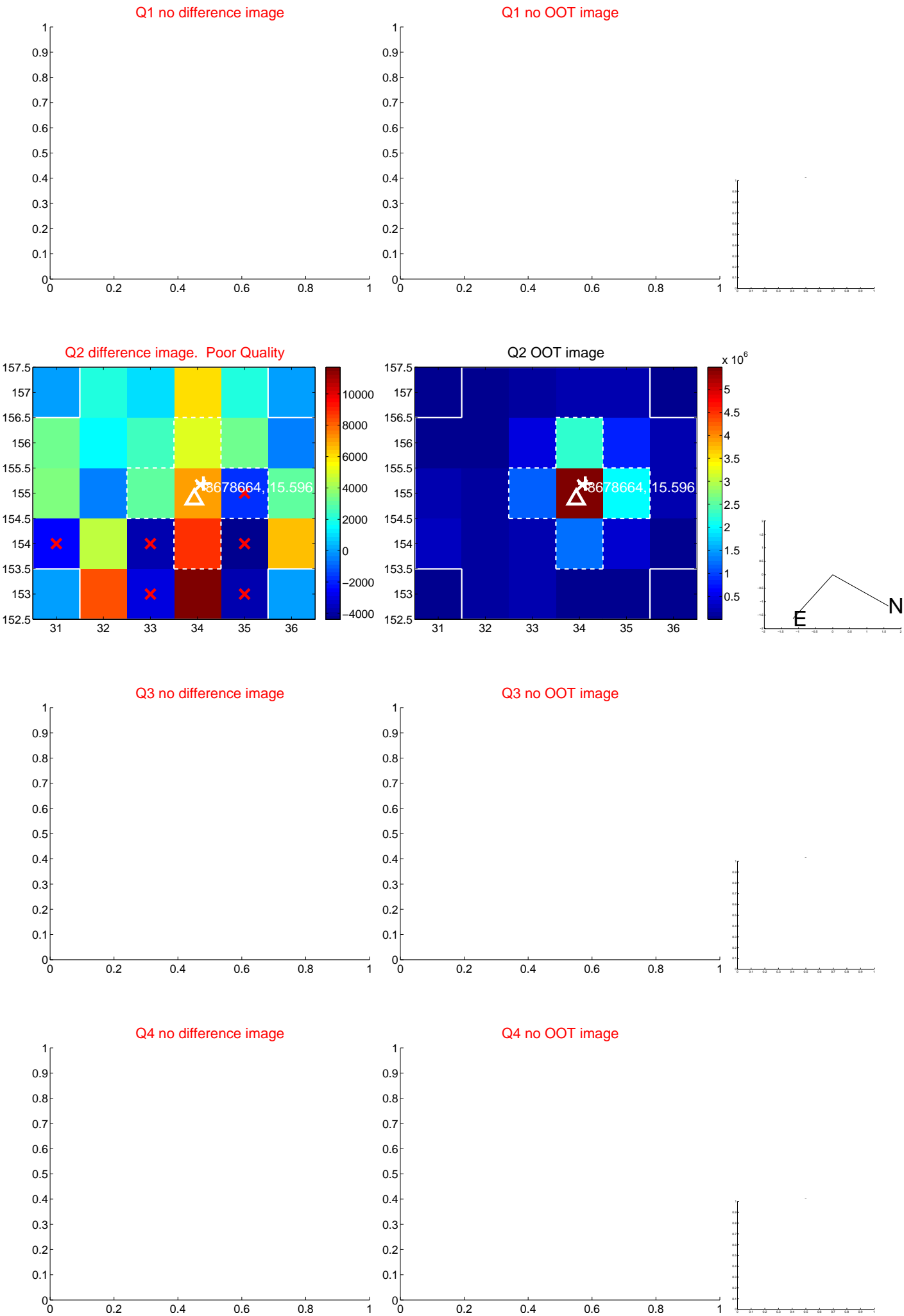
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.029 ± 1.458	1.39	2.009 ± 1.349	-0.284 ± 0.881
PRF-fit source offset from KIC position	1.806 ± 1.338	1.35	1.797 ± 1.342	-0.178 ± 0.946
photometric centroid source offset	4.24 ± 1.94	2.19	3.86 ± 1.93	1.76 ± 2.02

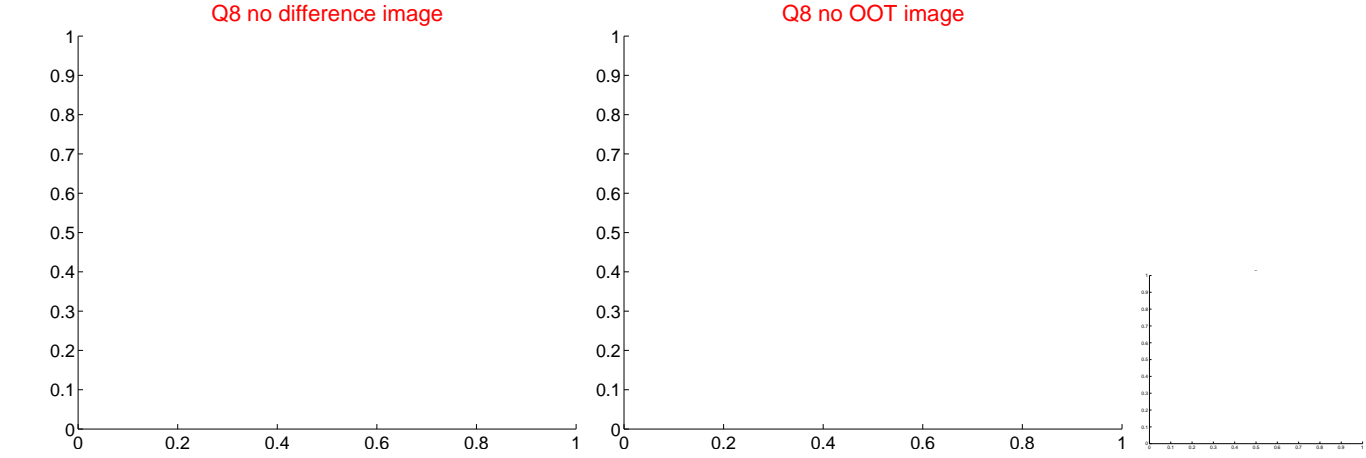
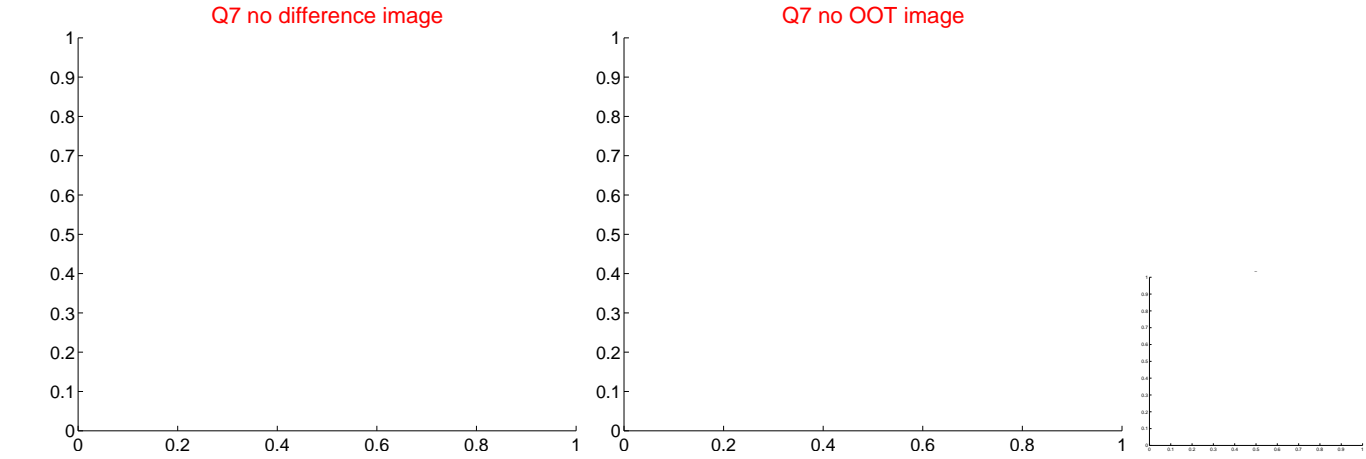
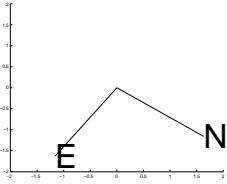
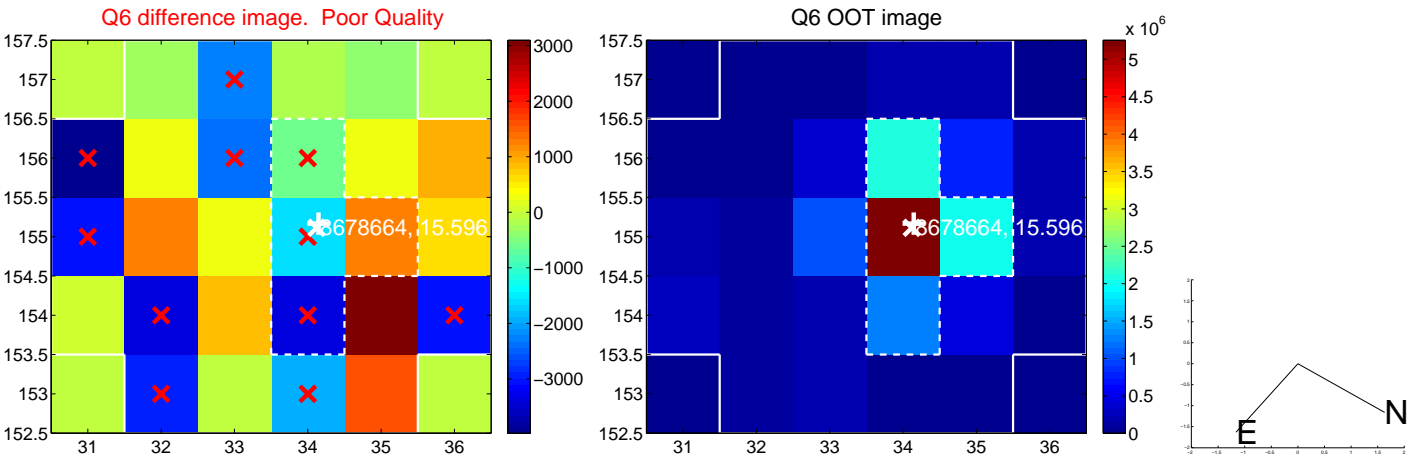
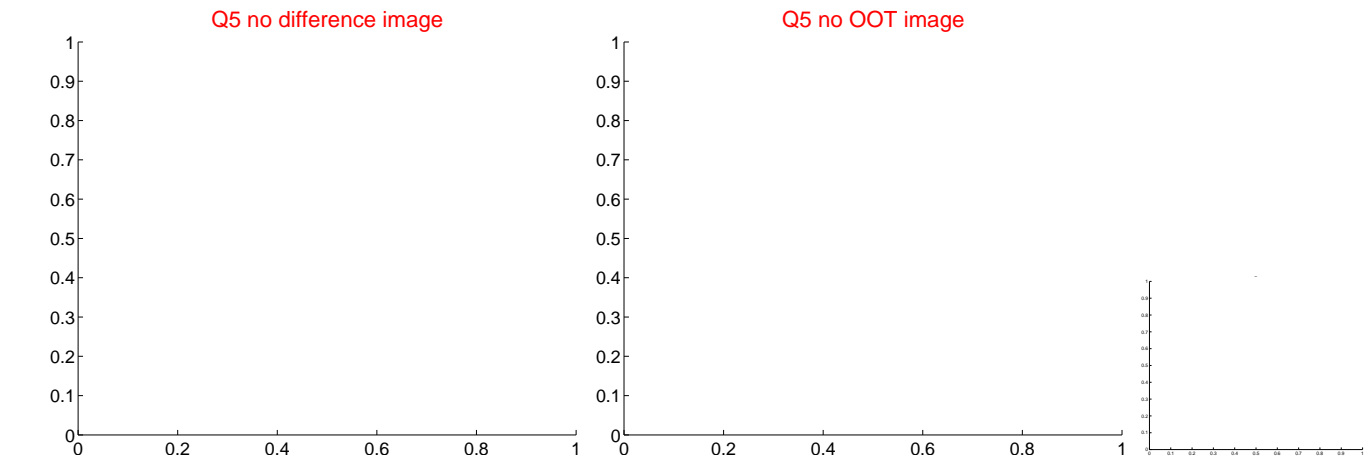


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . 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.

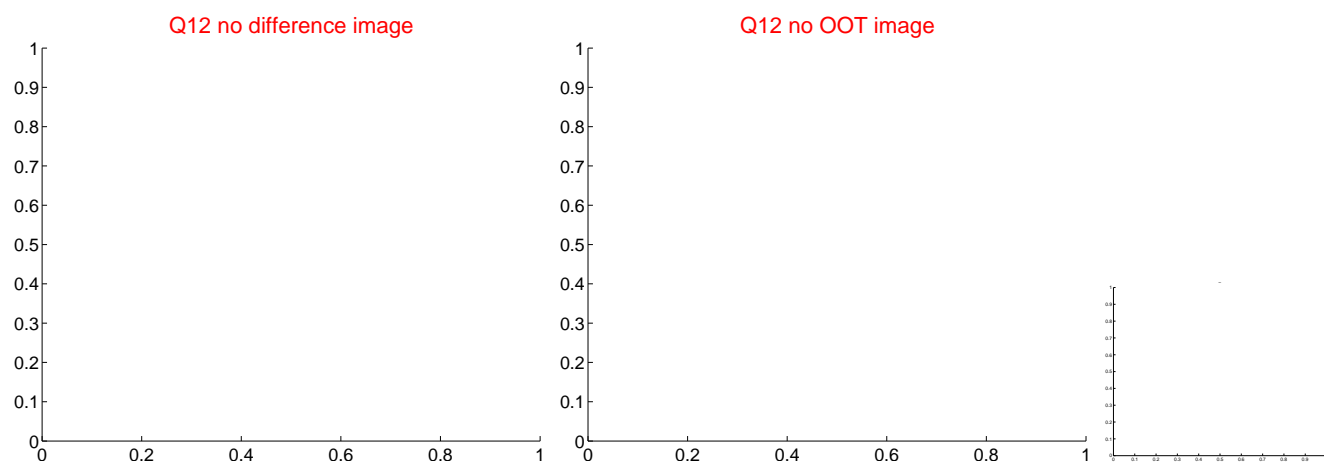
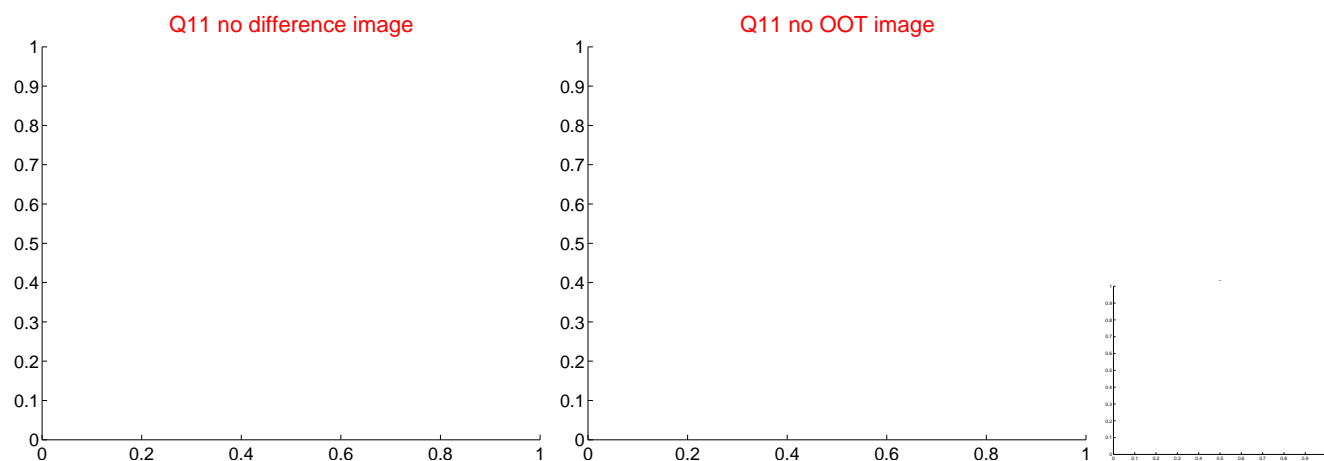
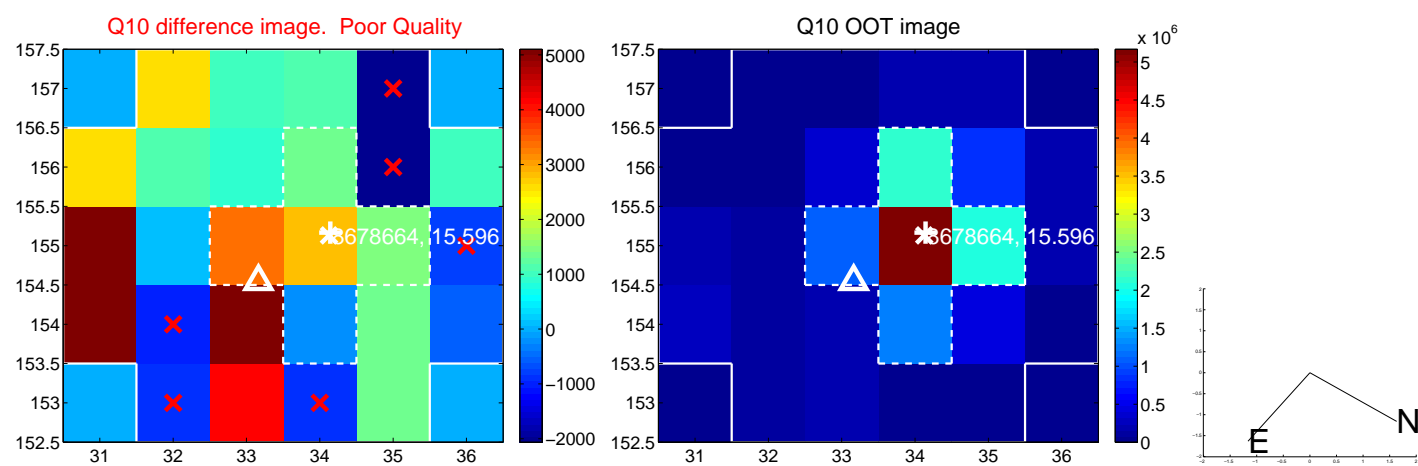
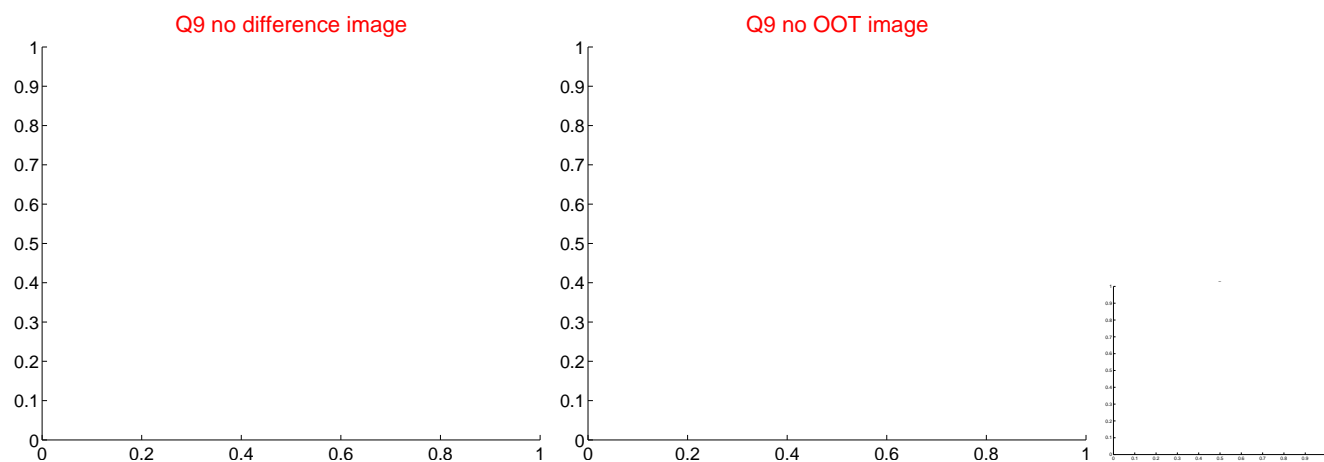
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



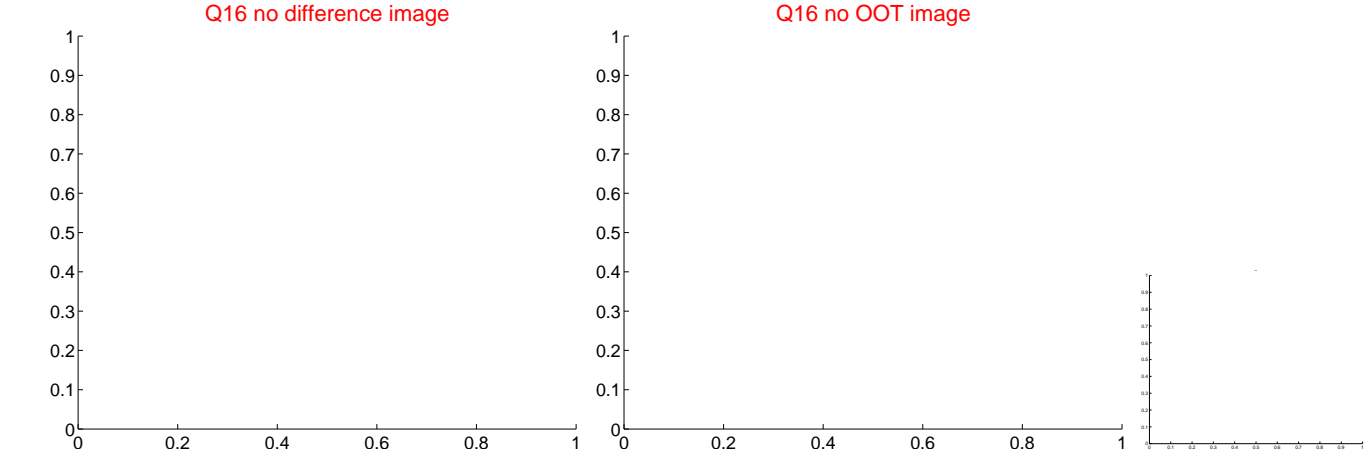
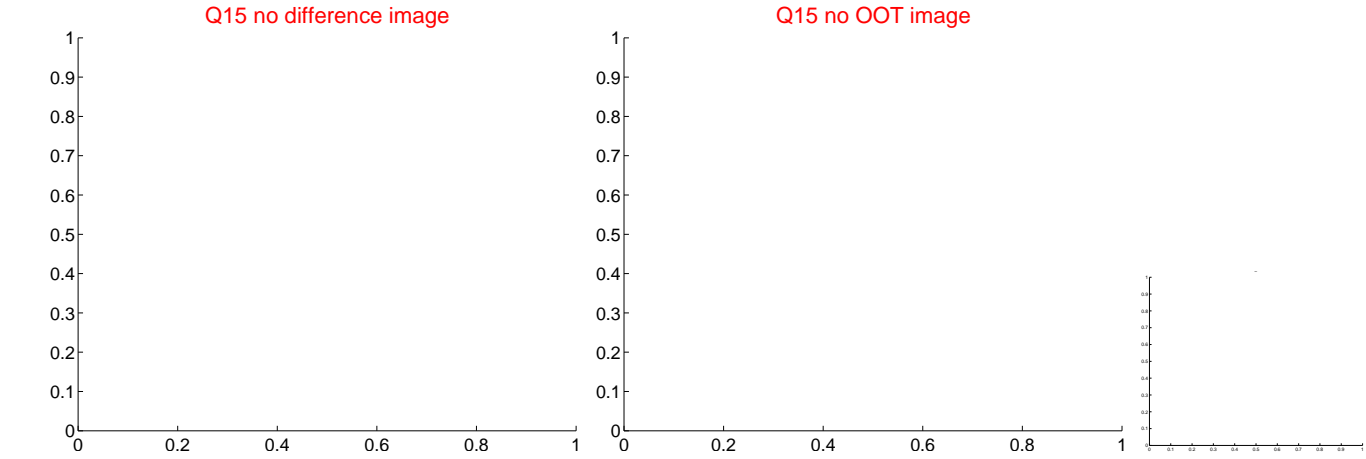
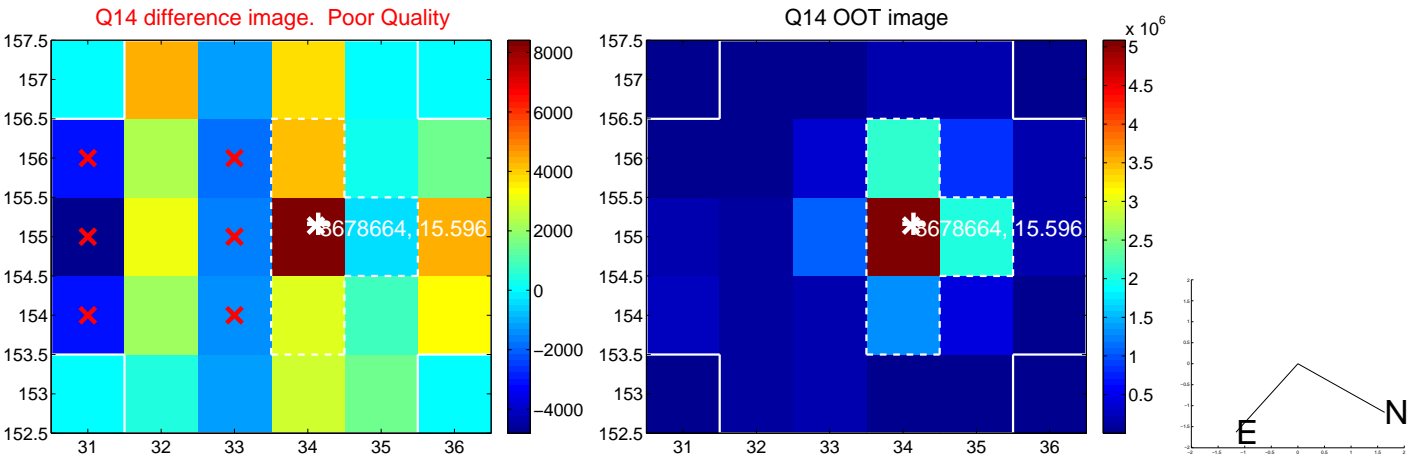
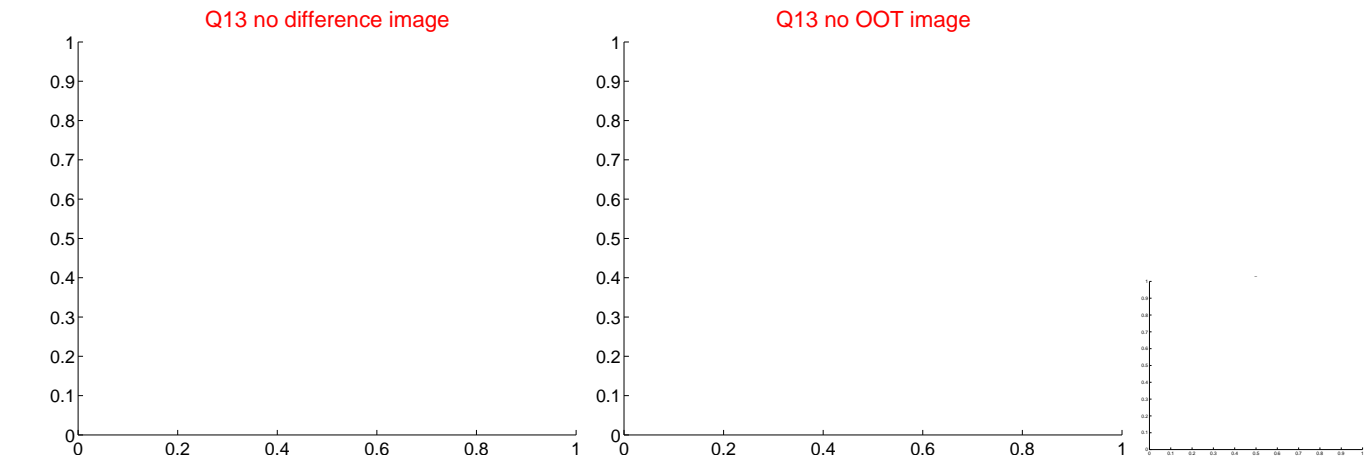
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



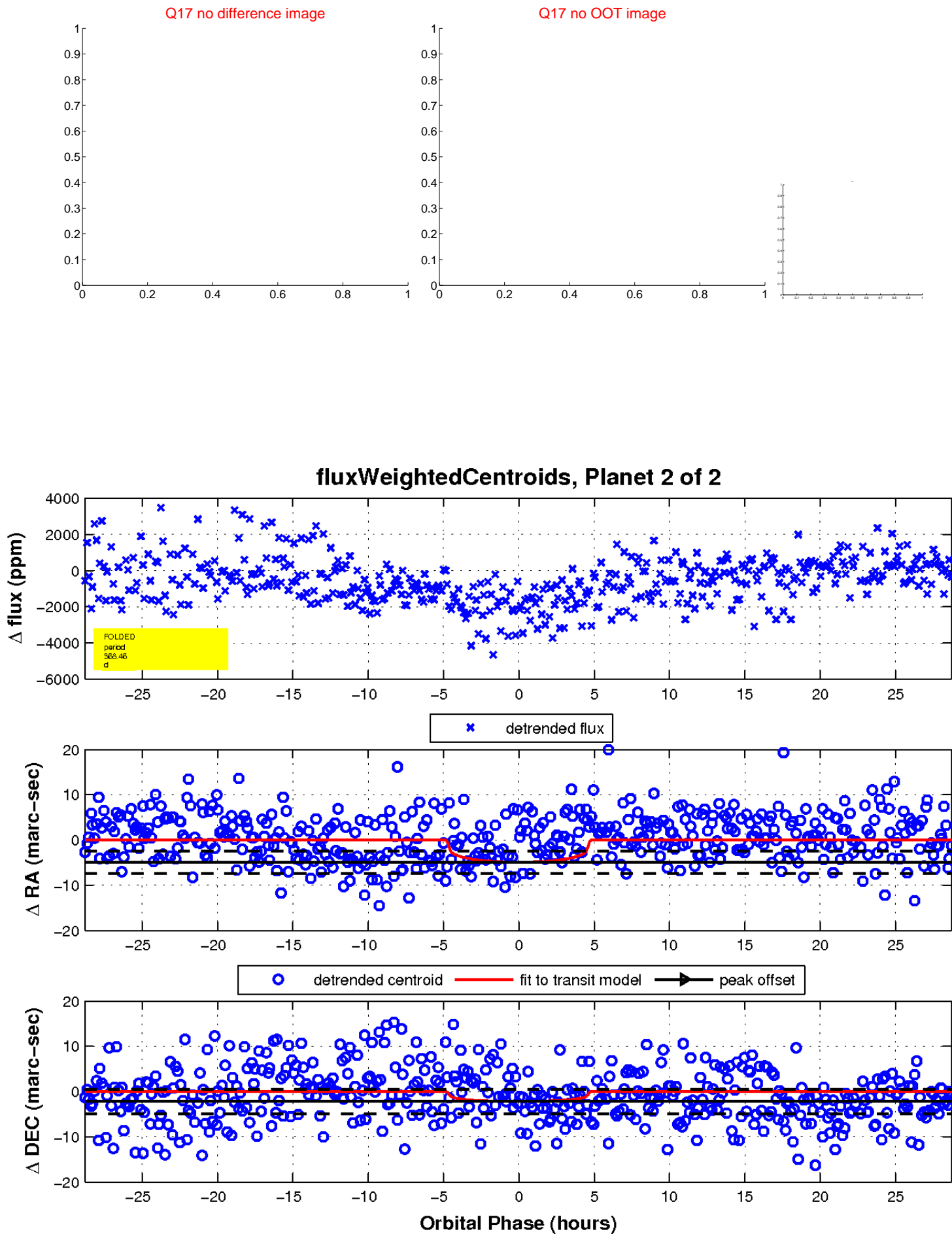
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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

Declination

