

KIC 002438490

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})
002438490-01	OBS	3699.01	3.315727	131.547262	96990.3	4.301	356.5	284.4	0.85	5528	38.30	351.29
002438490-02	OBS	No	3.315685	133.212379	6462.6	3.631	25.6	28.4	0.85	5528	7.94	351.30

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002438490-01	OBS	FP	0.01	0	1	0	0	SWEET_EB—MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_KIC_POS
002438490-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

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.

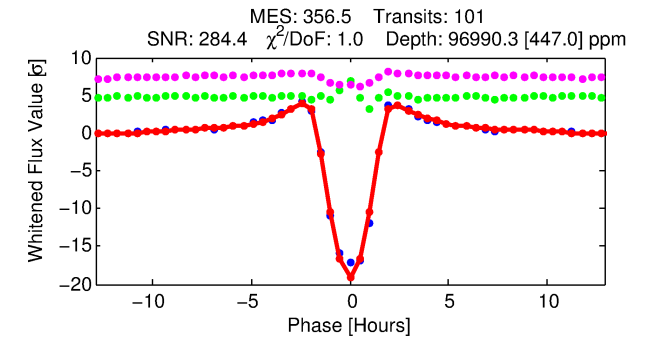
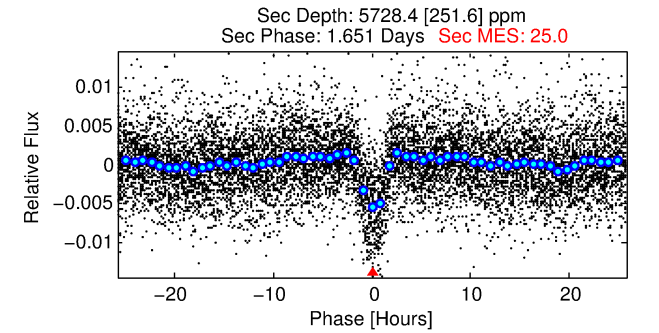
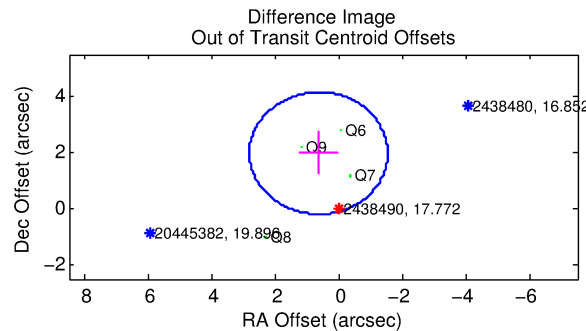
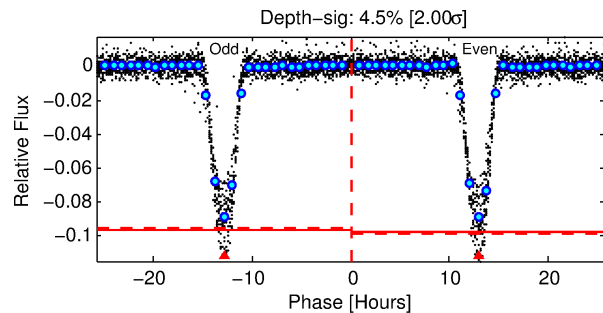
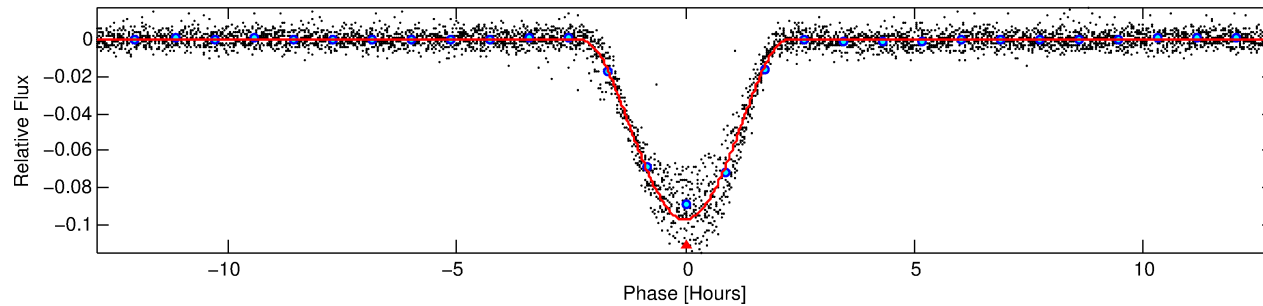
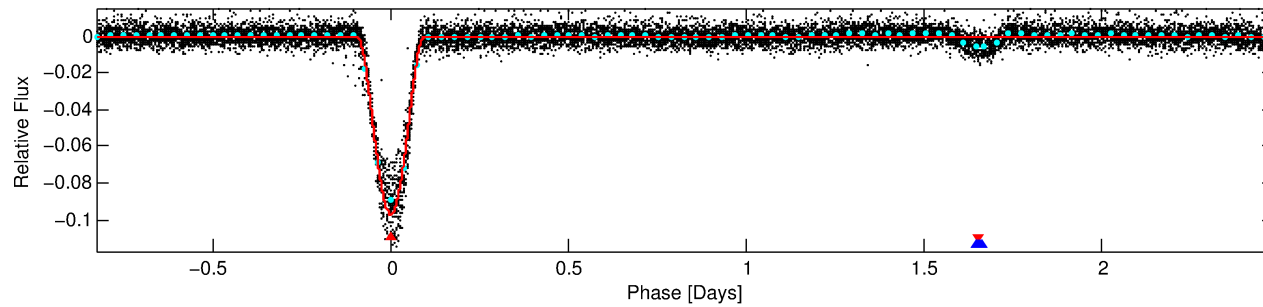
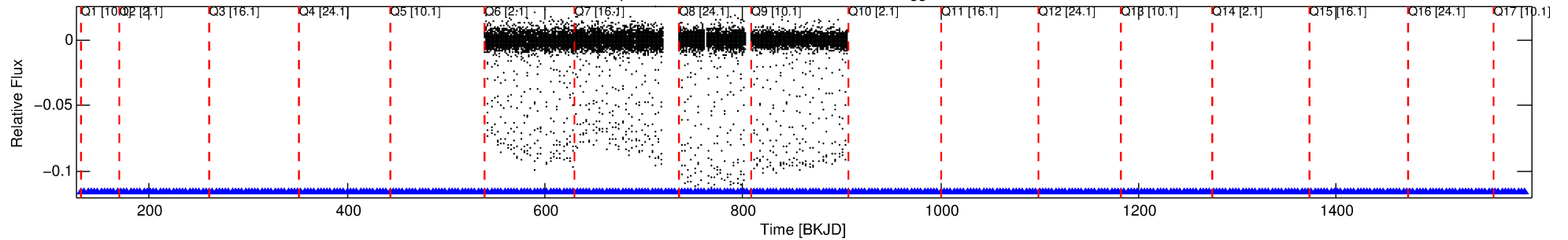
Ephemeris Match Information For 002438490-01

No Significant Match Found

DV One-Page Summary

KIC: 2438490 Candidate: 1 of 2 Period: 3.316 d
KOI: K03699.01 Corr: 0.963

Kp: 17.77 R*: 0.85 Rs Teff: 5528.0 K Logg: 4.52 Fe/H: -0.140



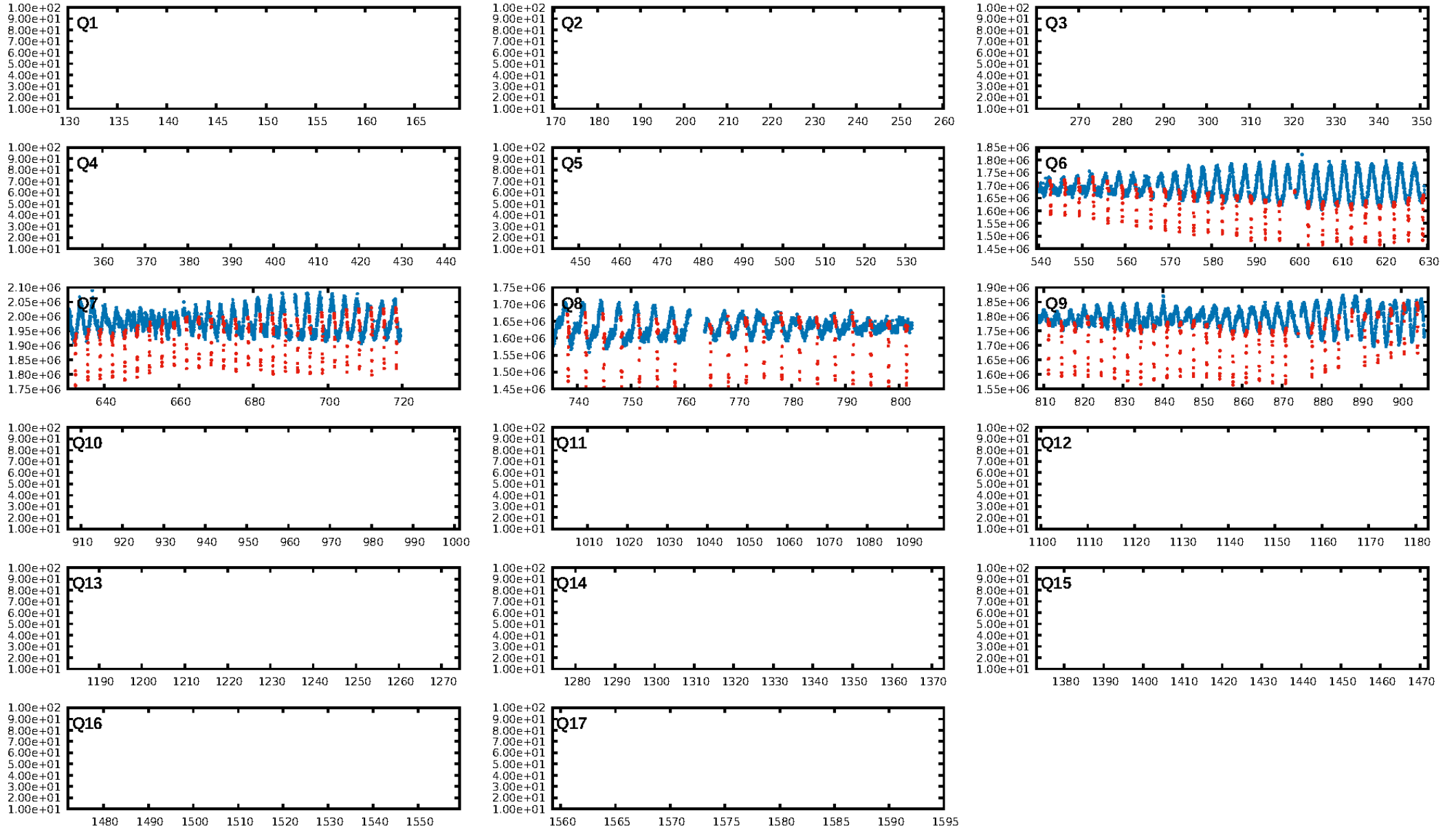
DV Fit Results:

Period = 3.31573 [0.00000] d
Epoch = 131.5473 [0.0006] BKJD
Rp/R* = 0.4134 [0.1005]
a/R* = 6.53 [0.05]
b = 0.90 [0.15]
Seff = 351.29 [106.95]
Teq = 1104 [84] K
Rp = 38.30 [12.94] Re
a = 0.0414 [0.0080] AU
Ag = 3.69 [2.07] [1.30σ]
Teffp = 2365 [299] K [4.06σ]

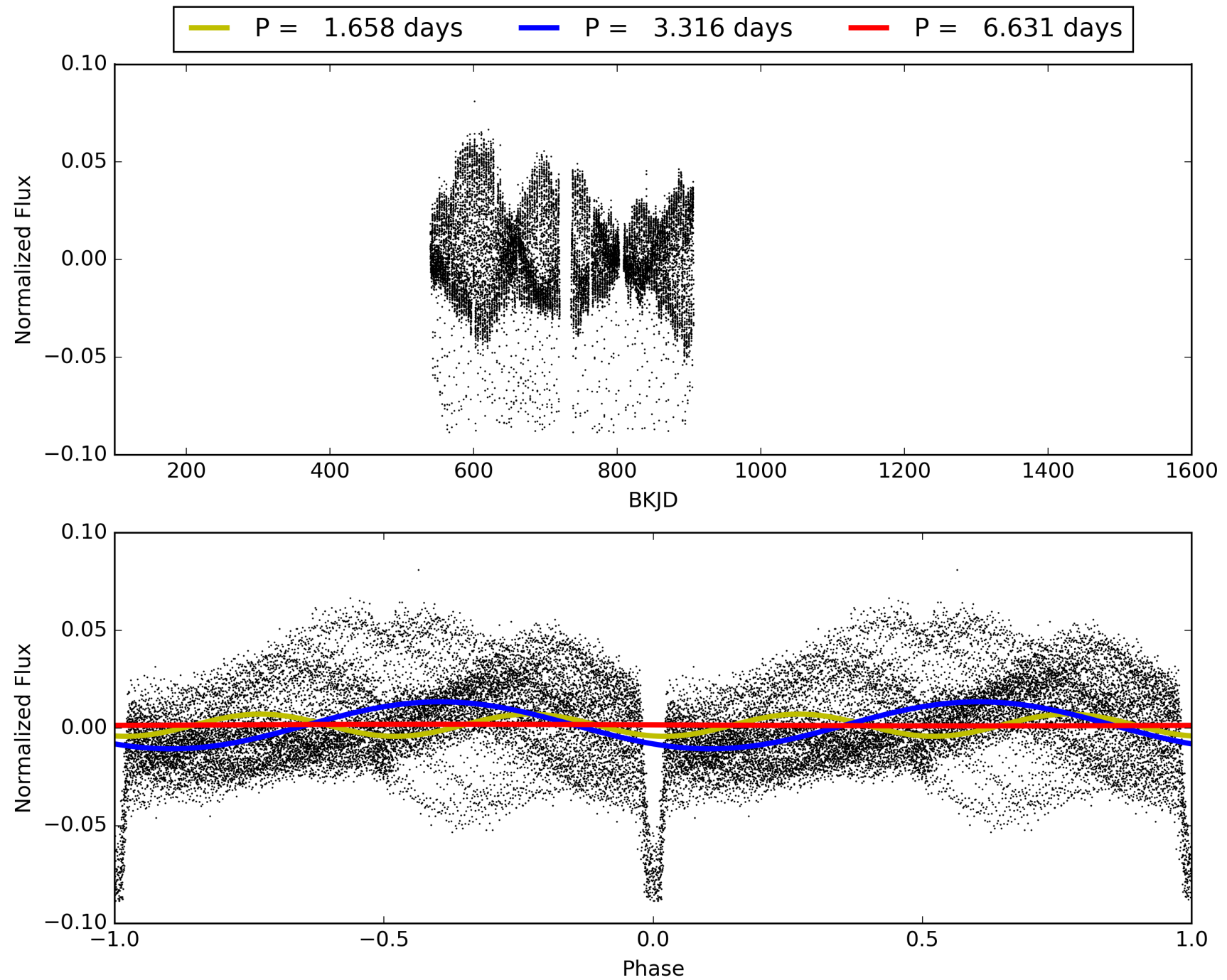
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [101/101]
GhostDiagnostic-chr: 1.929
Centroid-sig: 0.0%
Centroid-so: 0.764 arcsec [114.49σ]
OotOffset-rm: 2.084 arcsec [2.88σ]
KicOffset-rm: 0.120 arcsec [1.60σ]
OotOffset-st: 1/1/1/1 [4]
KicOffset-st: 1/1/1/1 [4]
DiffImageQuality-fgm: 1.00 [4/4]
DiffImageOverlap-fno: 1.00 [4/4]

TCE 002438490-01, PDC Light Curves

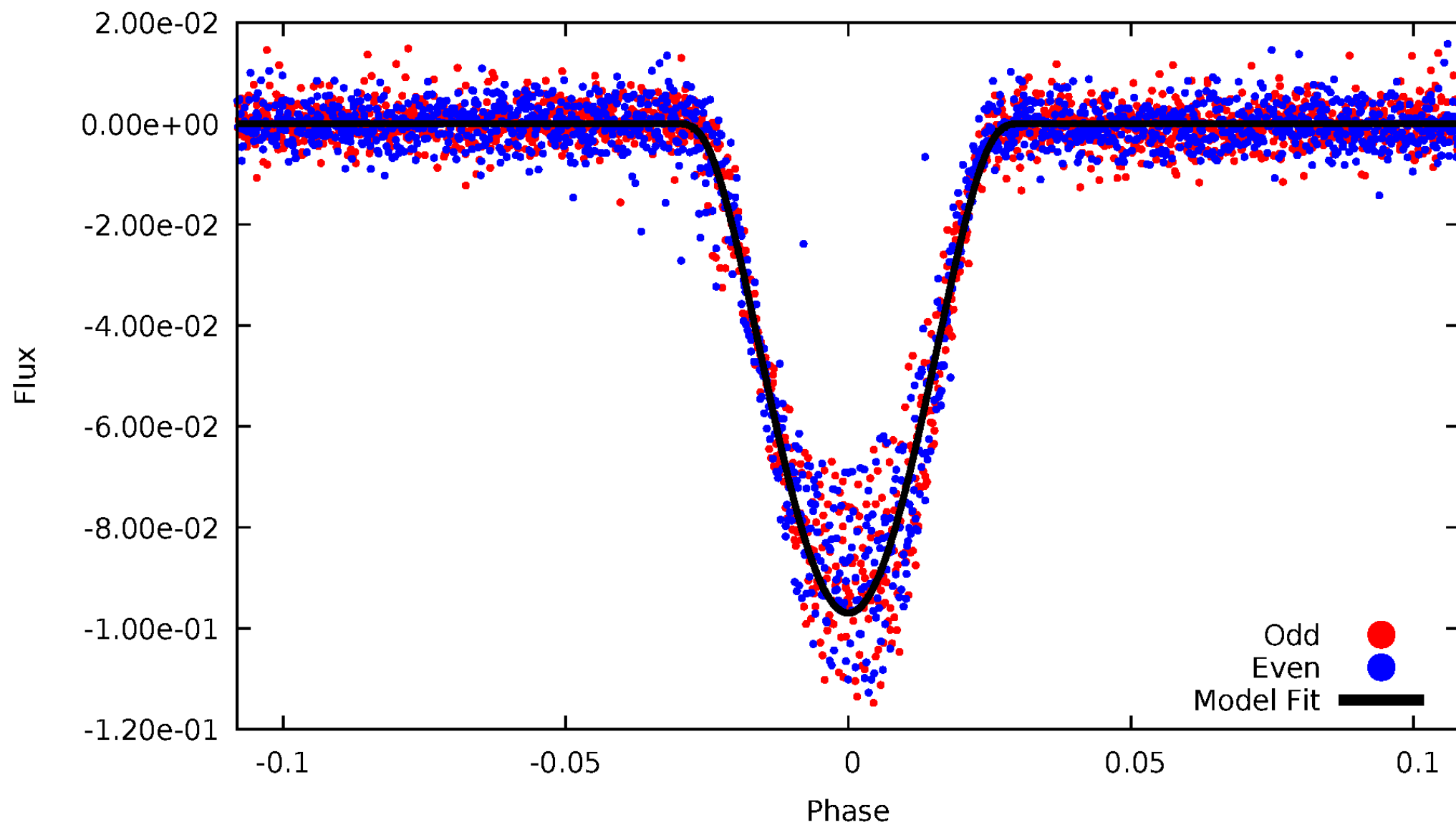


TCE 002438490-01



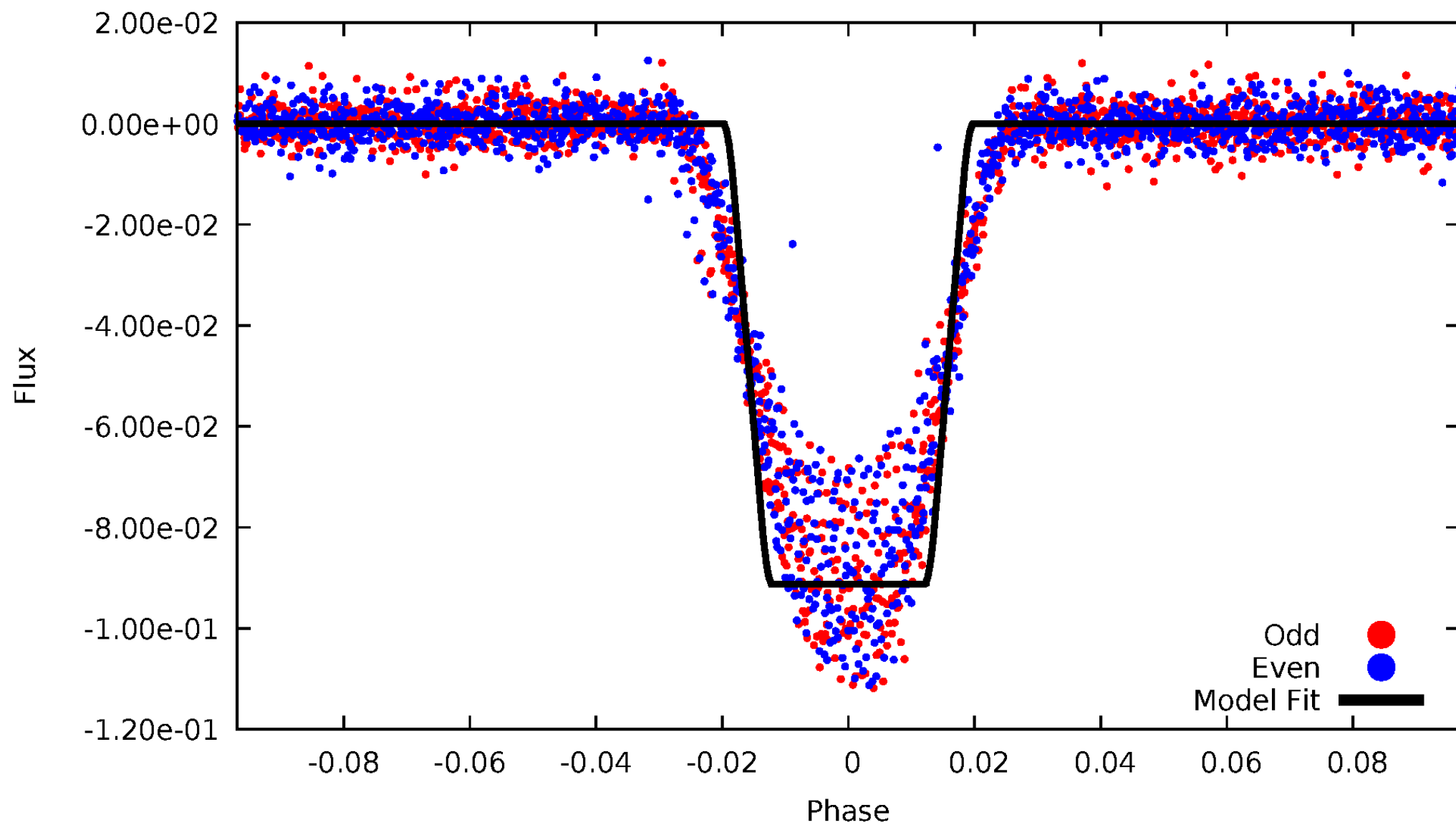
DV Odd/Even

TCE 002438490-01



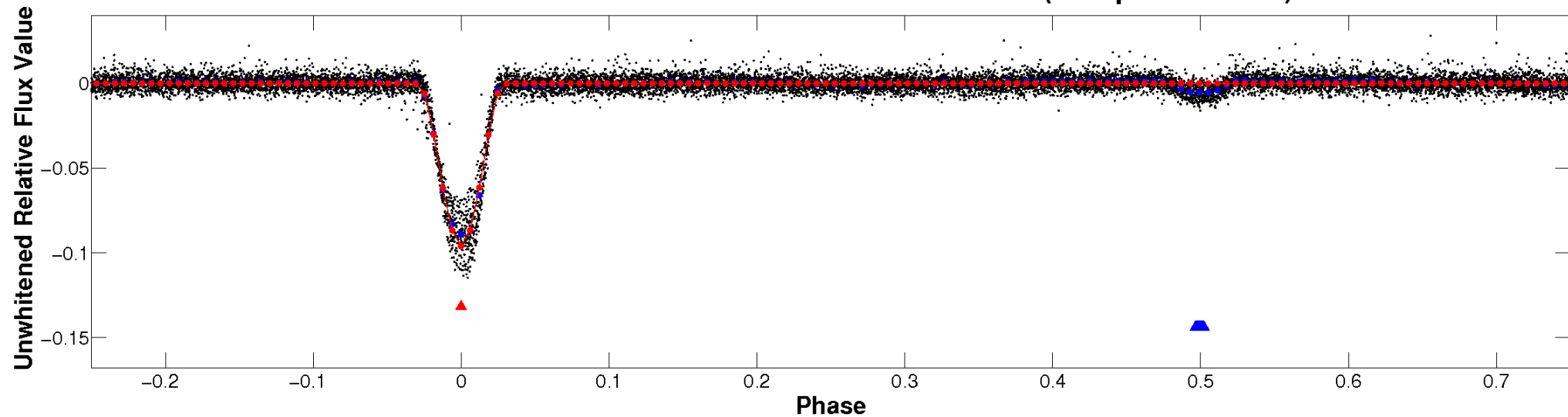
ALT Odd/Even

TCE 002438490-01

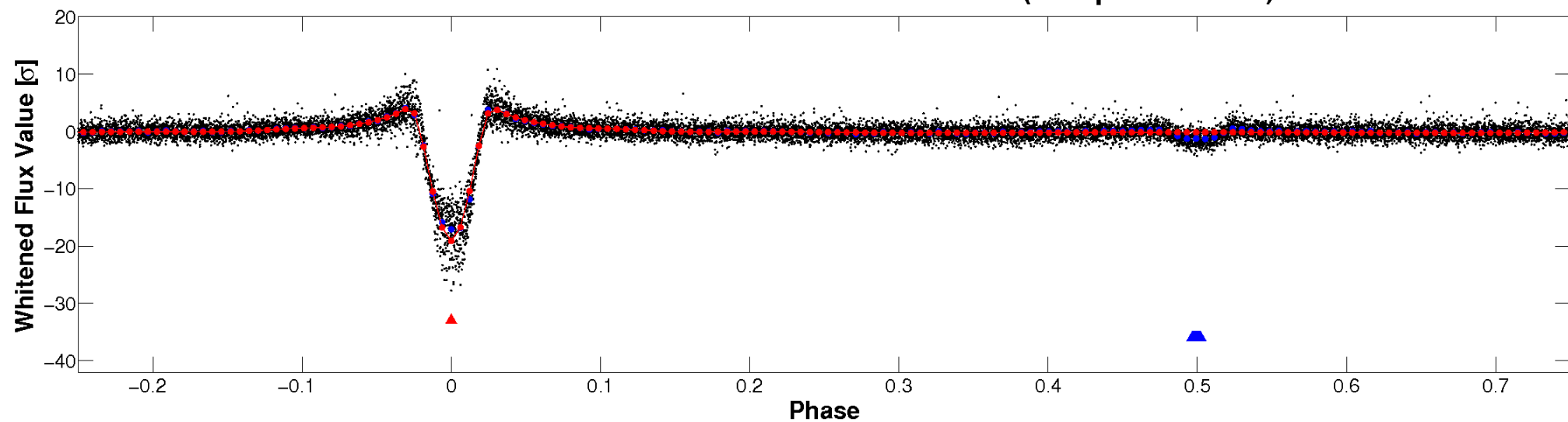


Non-Whitened Vs. Whitened Light Curve

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

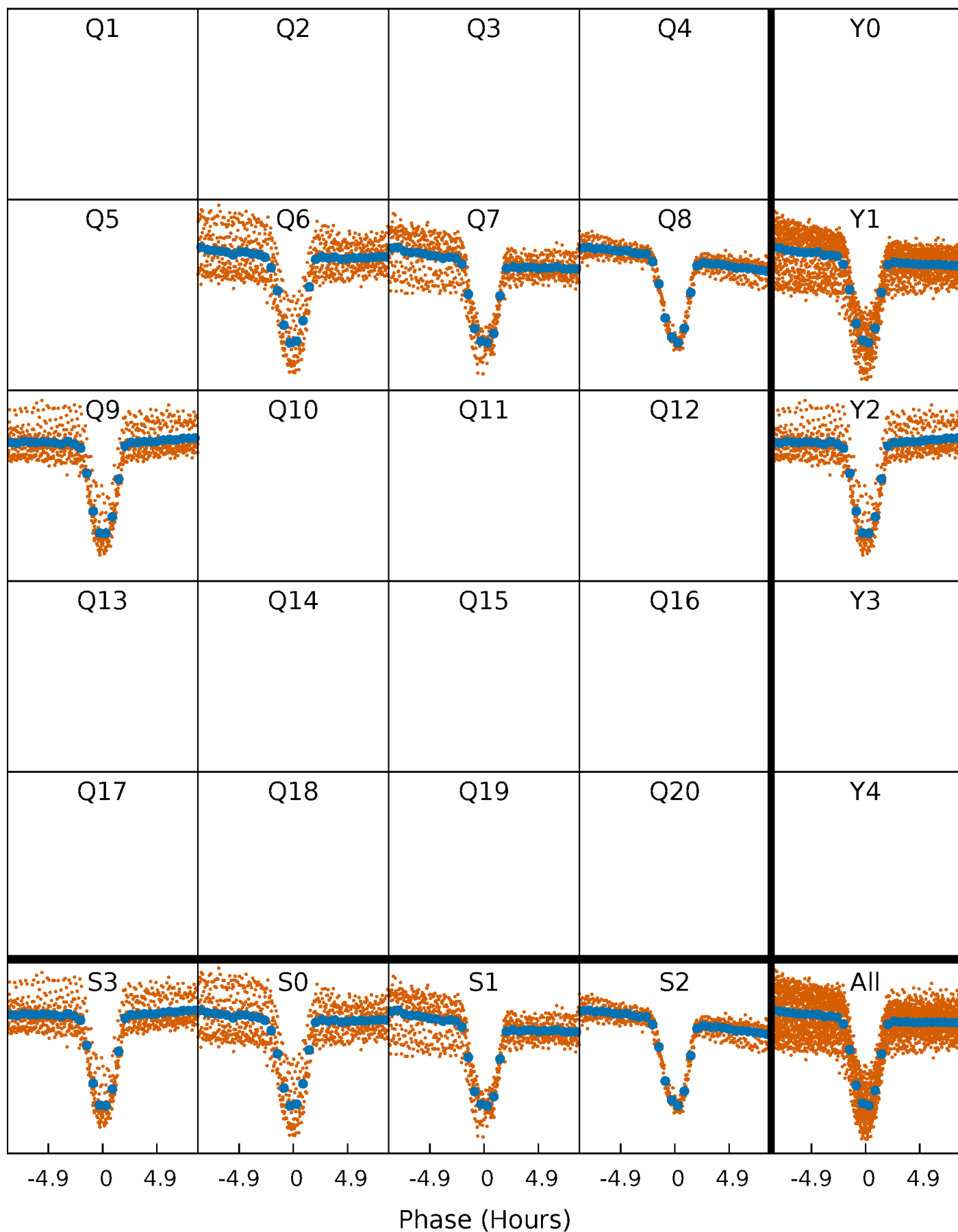


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



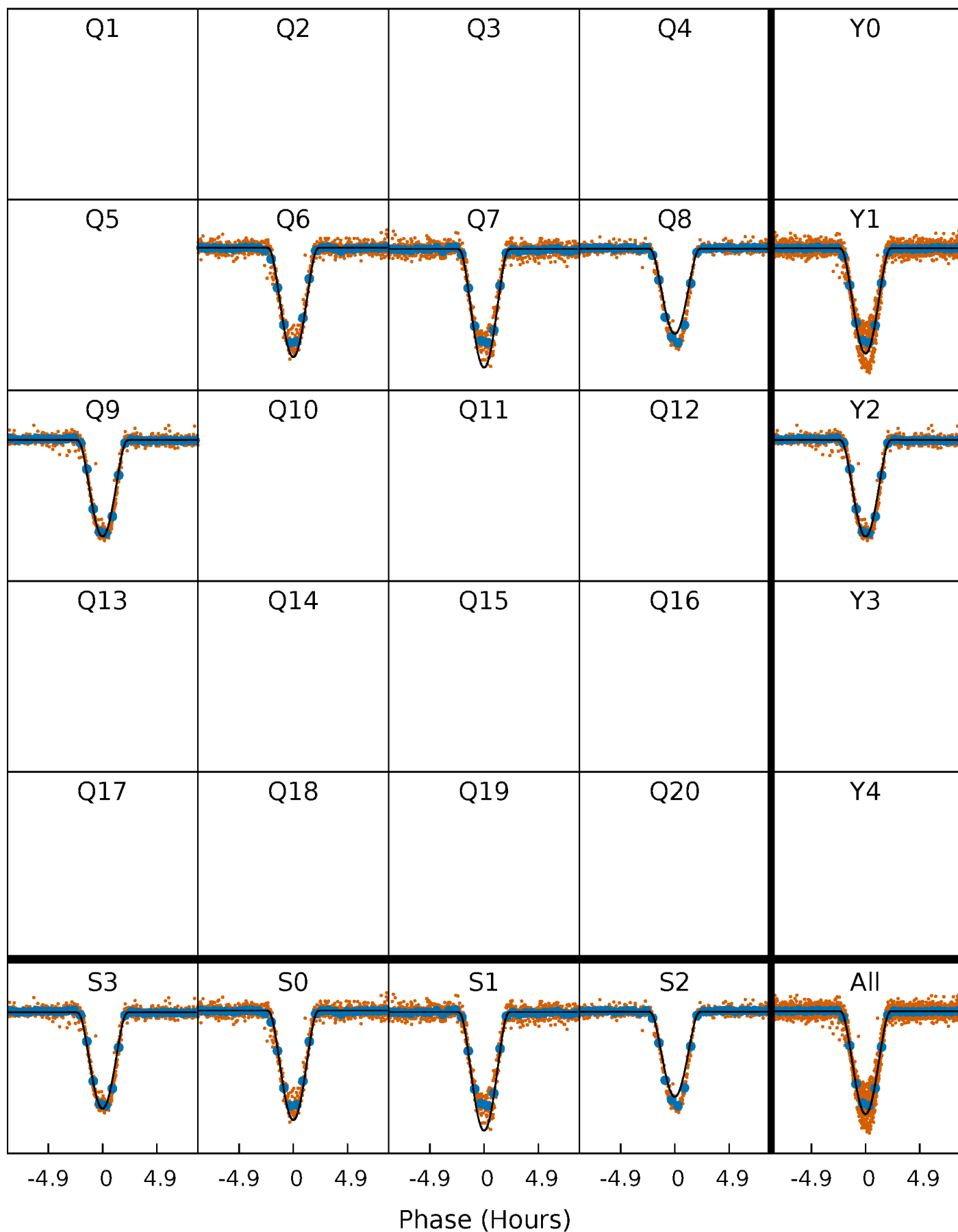
PDC Quarter-Phased Transit Curves

TCE 002438490-01 P= 3.315727 Days $T_0=131.547262$ (BKJD)



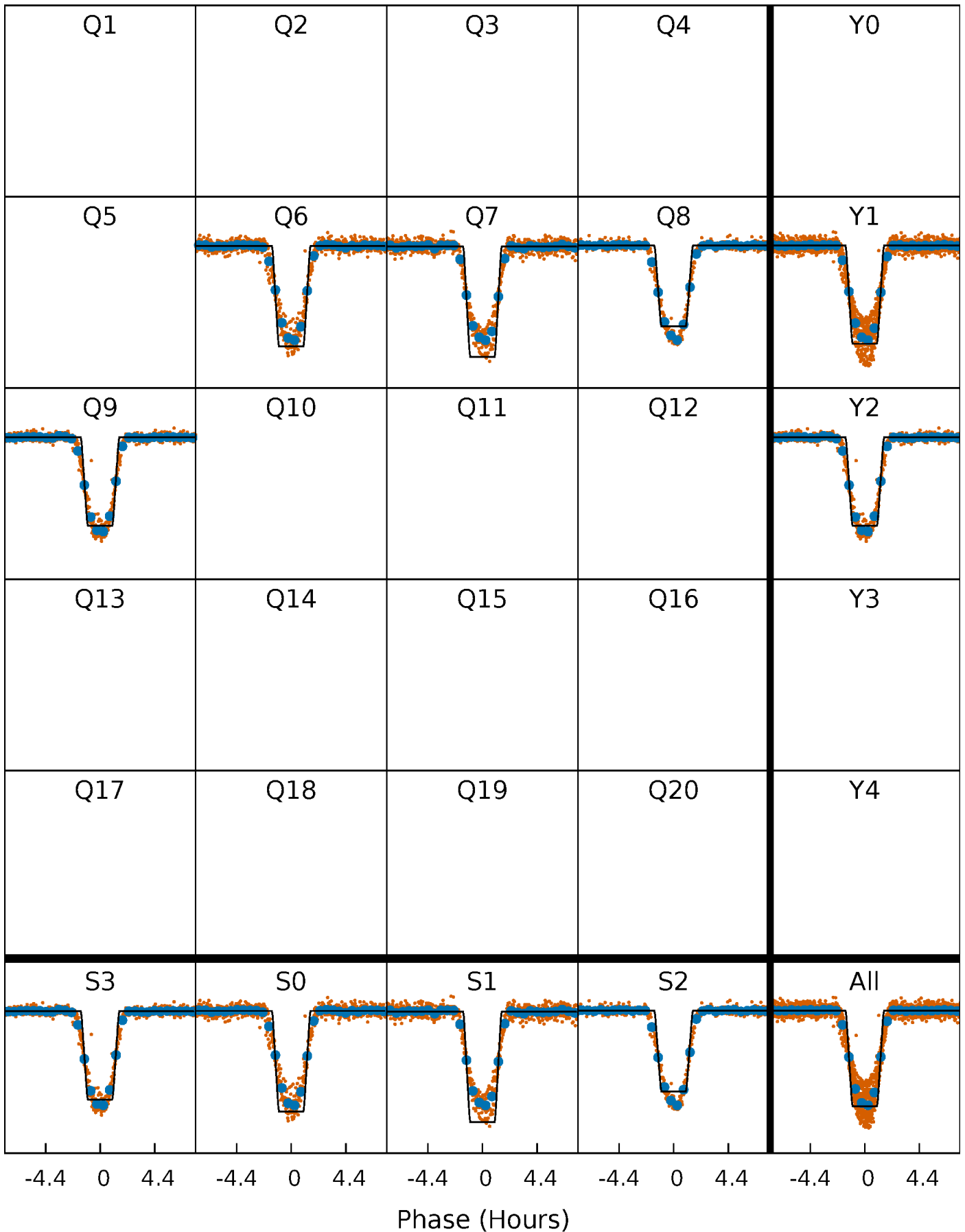
DV Quarter-Phased Transit Curves

TCE 002438490-01 P= 3.315727 Days $T_0=131.547262$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

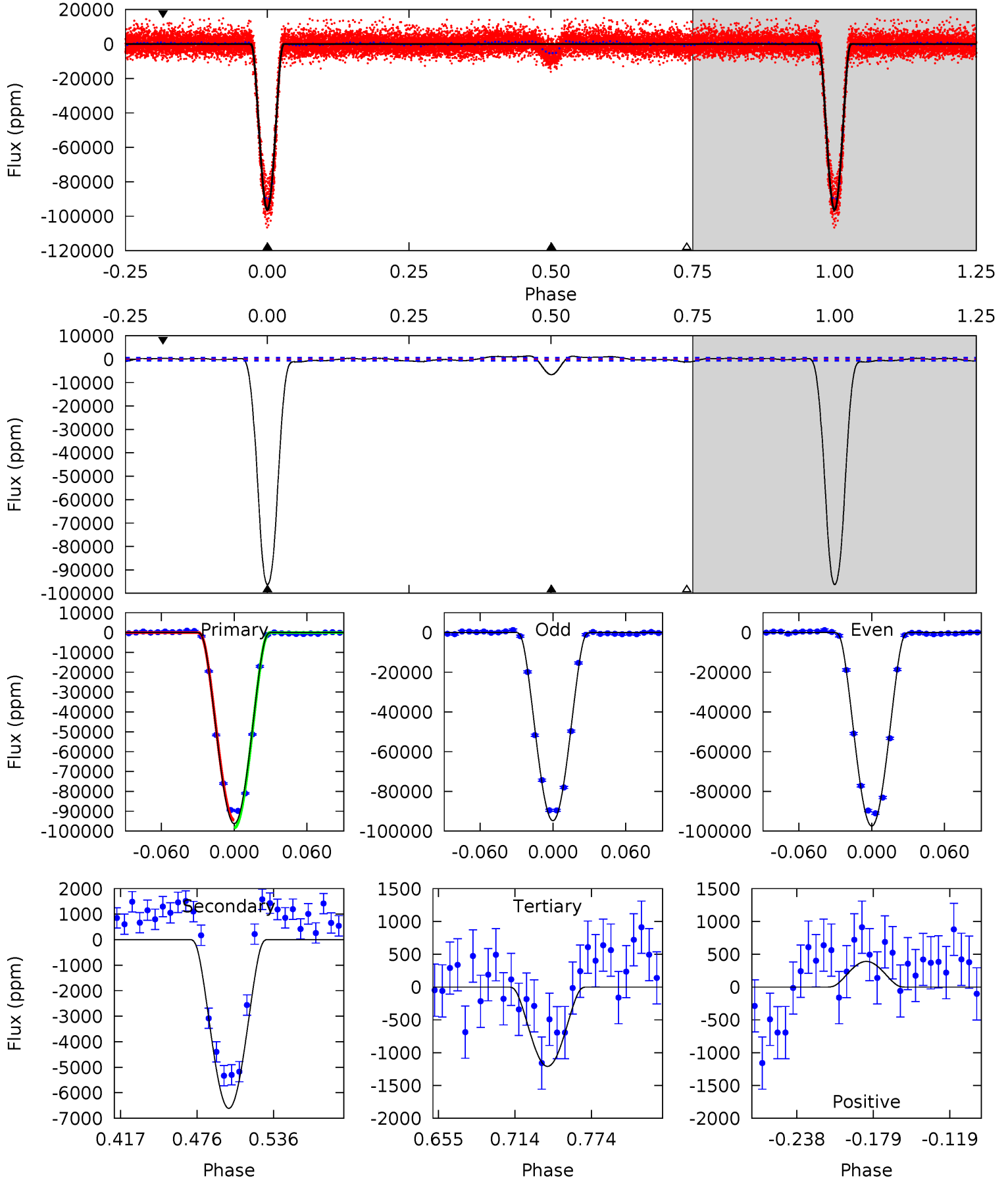
TCE 002438490-01 P= 3.315793 Days $T_0=131.535709$ (BKJD)



DV Model-Shift Uniqueness Test

002438490-01, P = 3.315727 Days, E = 131.547262 Days

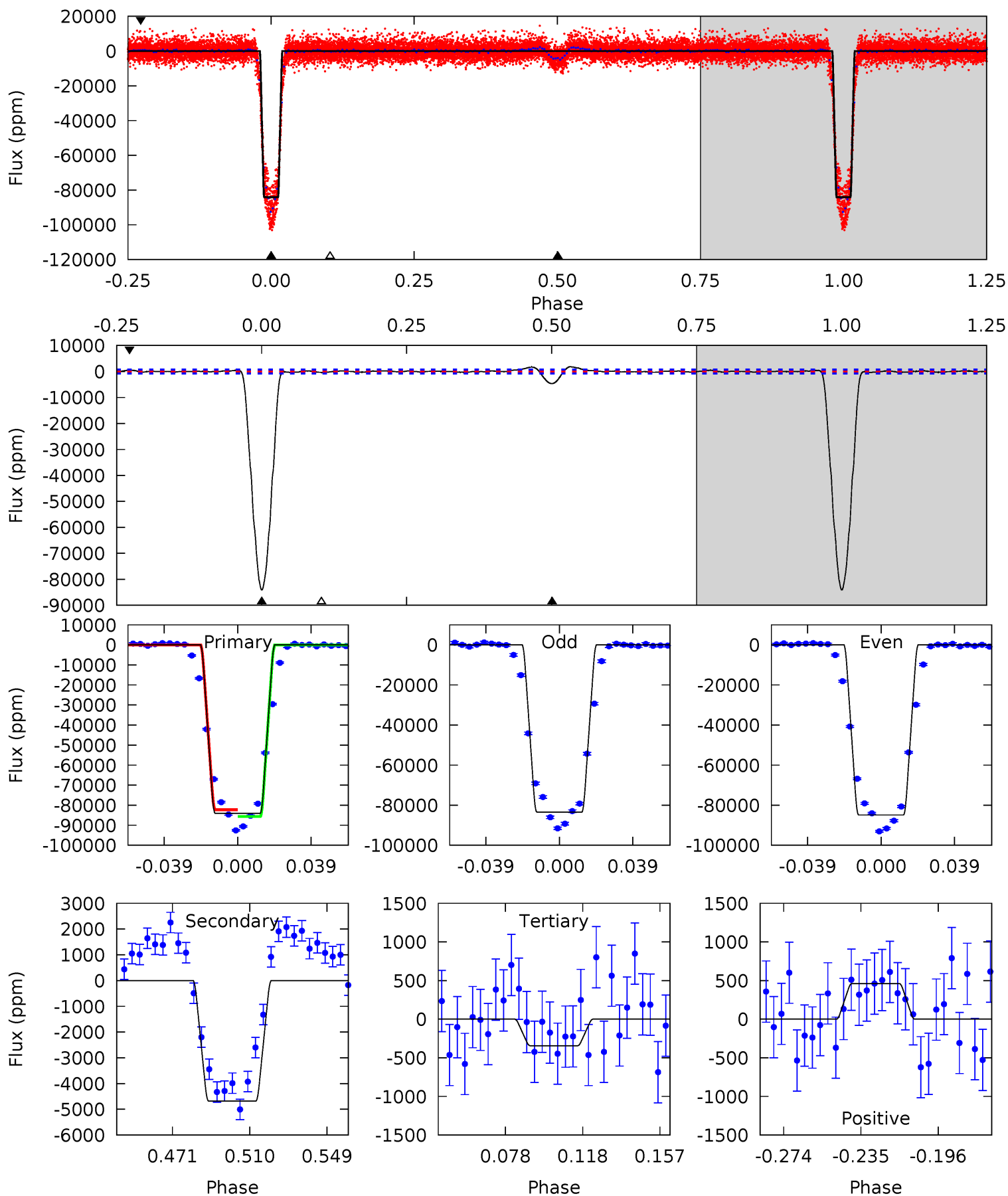
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
744.0	51.1	9.35	3.02	4.67	1.88	4.50	734.7	741.0	41.7	48.1	10.4	1.00	0.01	0



Alt Model-Shift Uniqueness Test

002438490-01, P = 3.315793 Days, E = 131.535709 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
526.1	29.3	2.15	2.88	4.76	2.06	1.83	523.9	523.2	27.1	26.4	4.43	1.00	0.02	0



Stellar Parameters For KIC 002438490

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5528^{+182}_{-182}	$4.516^{+0.063}_{-0.147}$	$-0.140^{+0.300}_{-0.300}$	$0.849^{+0.199}_{-0.100}$	$0.864^{+0.102}_{-0.083}$	$1.985^{+0.543}_{-0.856}$
	+3%/-3%	+1%/-3%	+214%/-214%	+23%/-12%	+12%/-10%	+27%/-43%
Source	KIC0	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 002438490-01 / KOI 3699.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-6610 ± 129	$39.38^{+10.37}_{-9.54}$	1565^{+93}_{-77}	3053^{+283}_{-200}	$4.092^{+2.851}_{-1.566}$
Alt.	-4679 ± 160	$28.98^{+10.65}_{-8.84}$	1562^{+90}_{-77}	3169^{+397}_{-274}	$5.165^{+5.716}_{-2.326}$

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

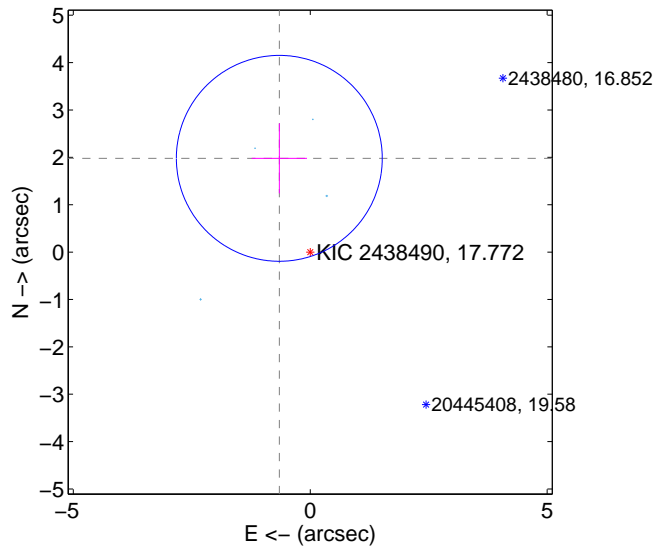
Supplemental centroid analysis for 002438490-01. Kepler magnitude: 17.77. Transit SNR 284.43

There are 4 quarters with good PRF difference image offsets

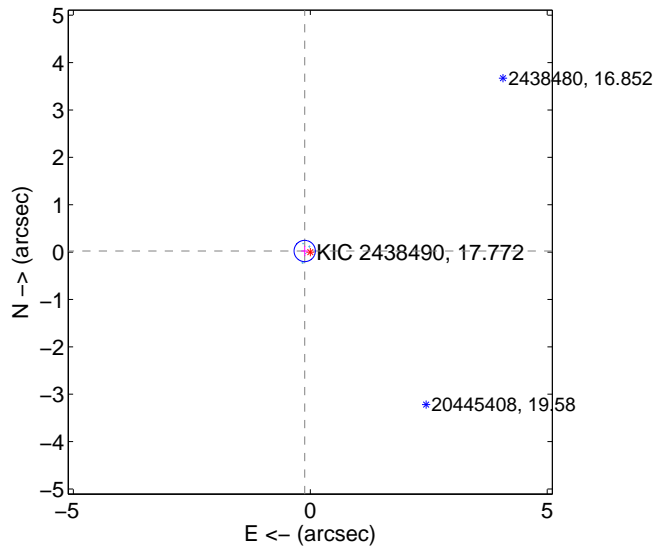
The OOT PRF centroid is offset from the target star catalog position by about 2.46 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.084 ± 0.724	2.88	0.653 ± 0.585	1.979 ± 0.738
PRF-fit source offset from KIC position	0.120 ± 0.075	1.60	0.118 ± 0.073	0.023 ± 0.108
photometric centroid source offset	0.76 ± 0.01	114.49	-0.19 ± 0.01	-0.74 ± 0.01

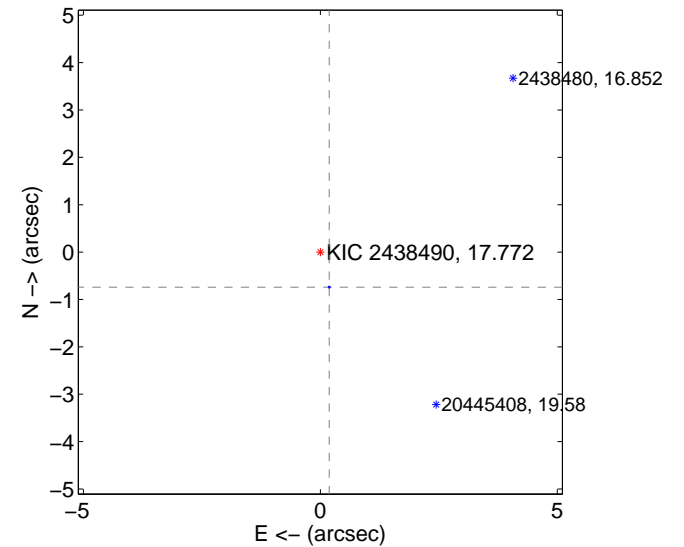
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

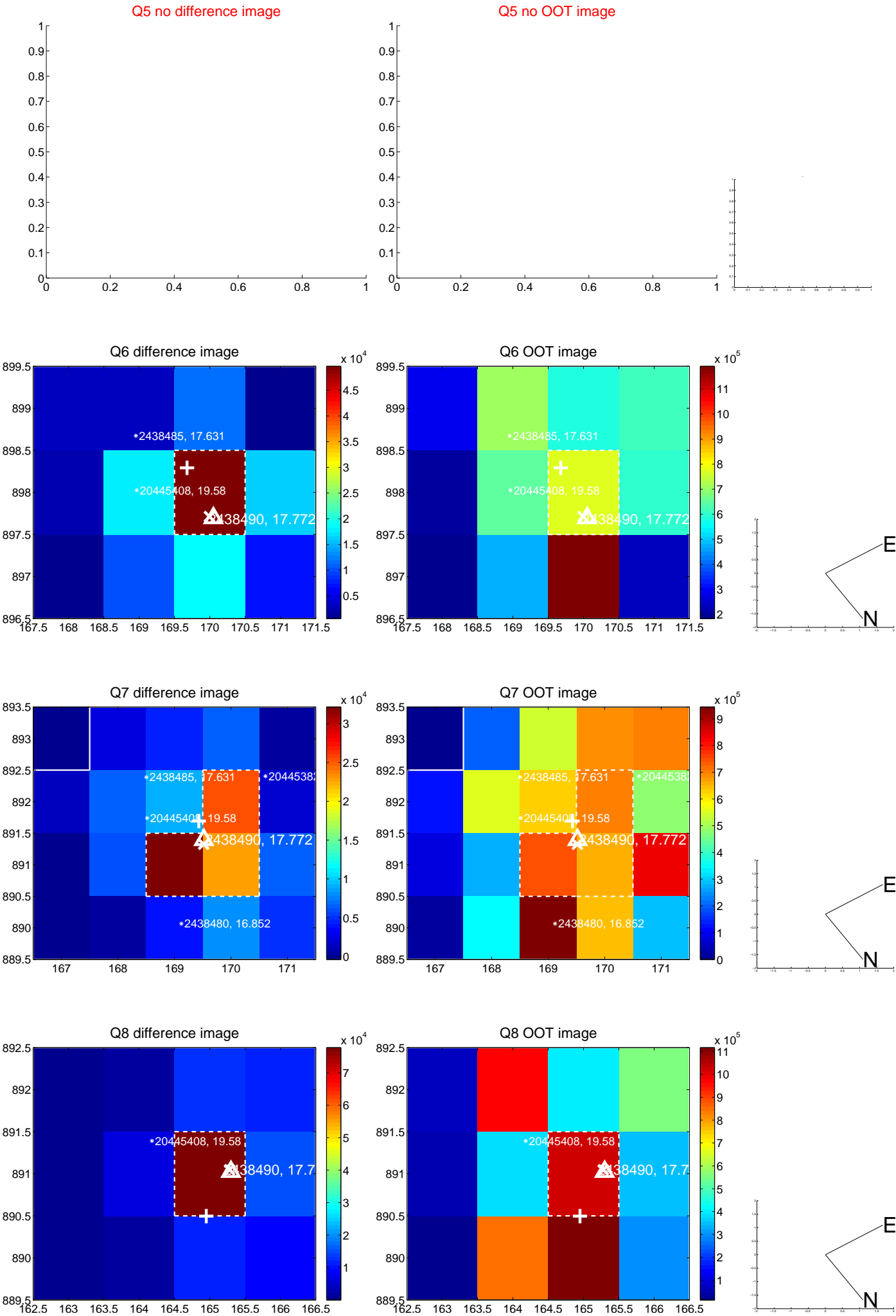


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

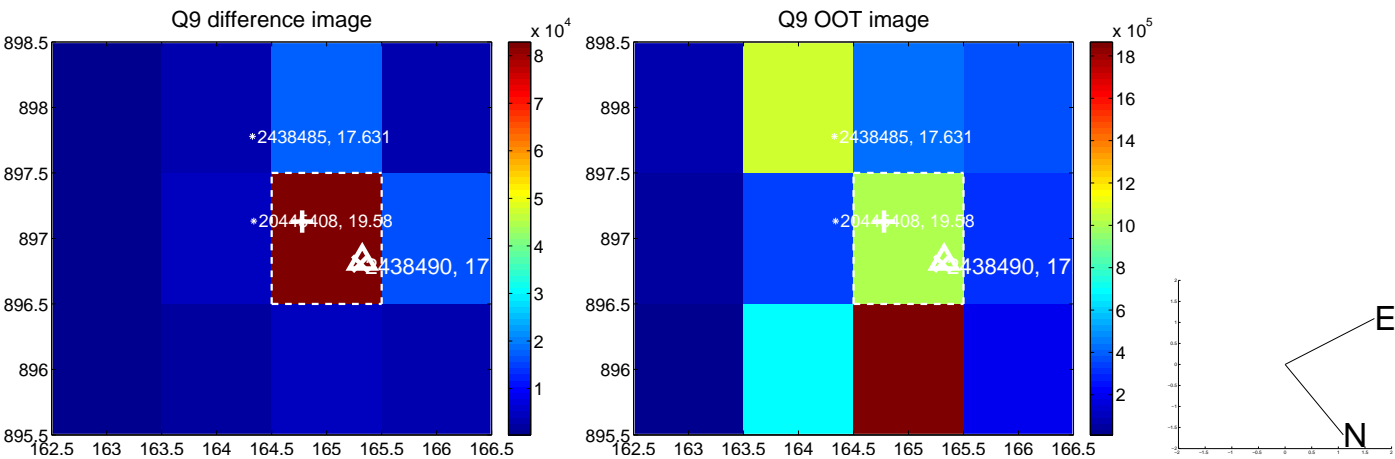
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



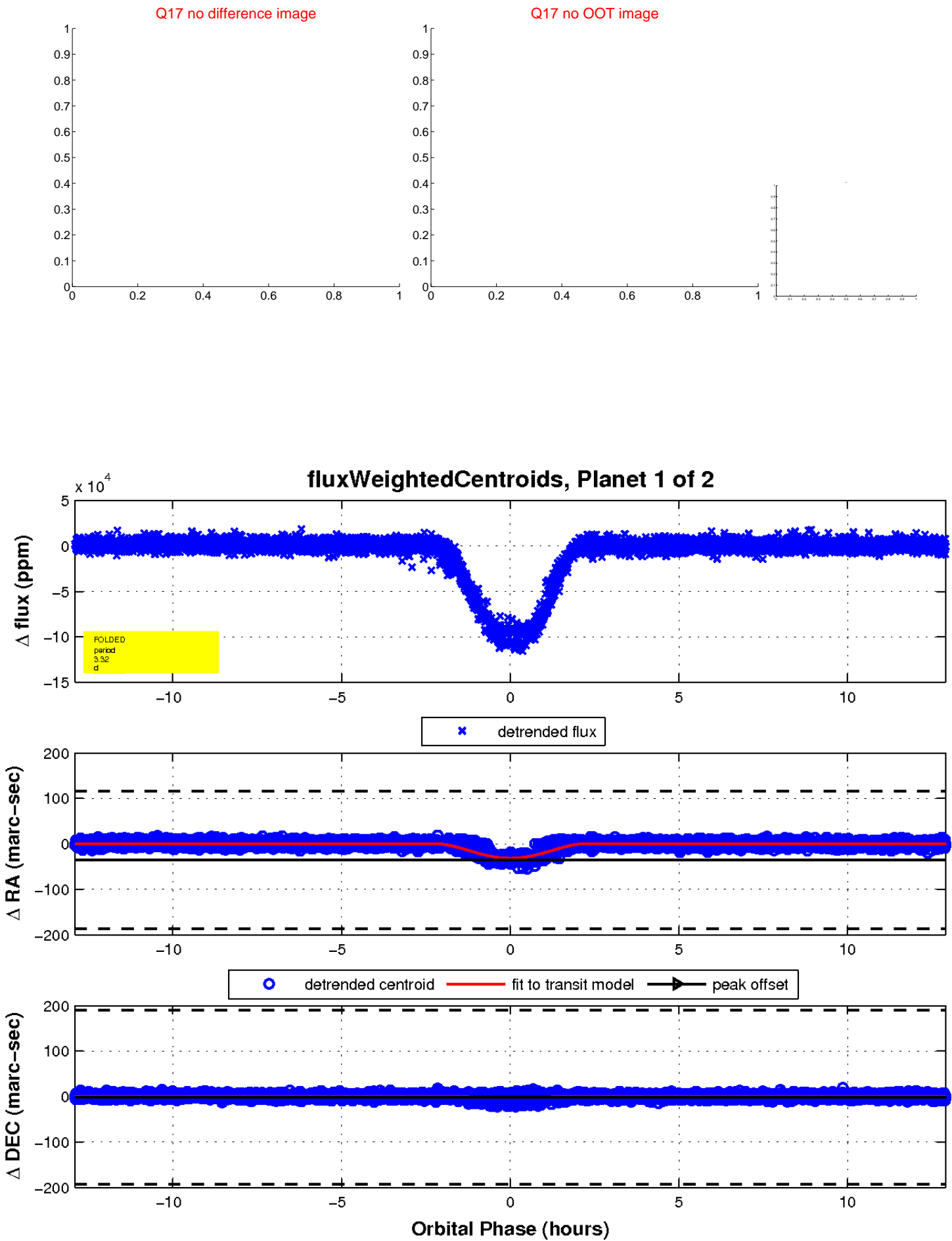
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

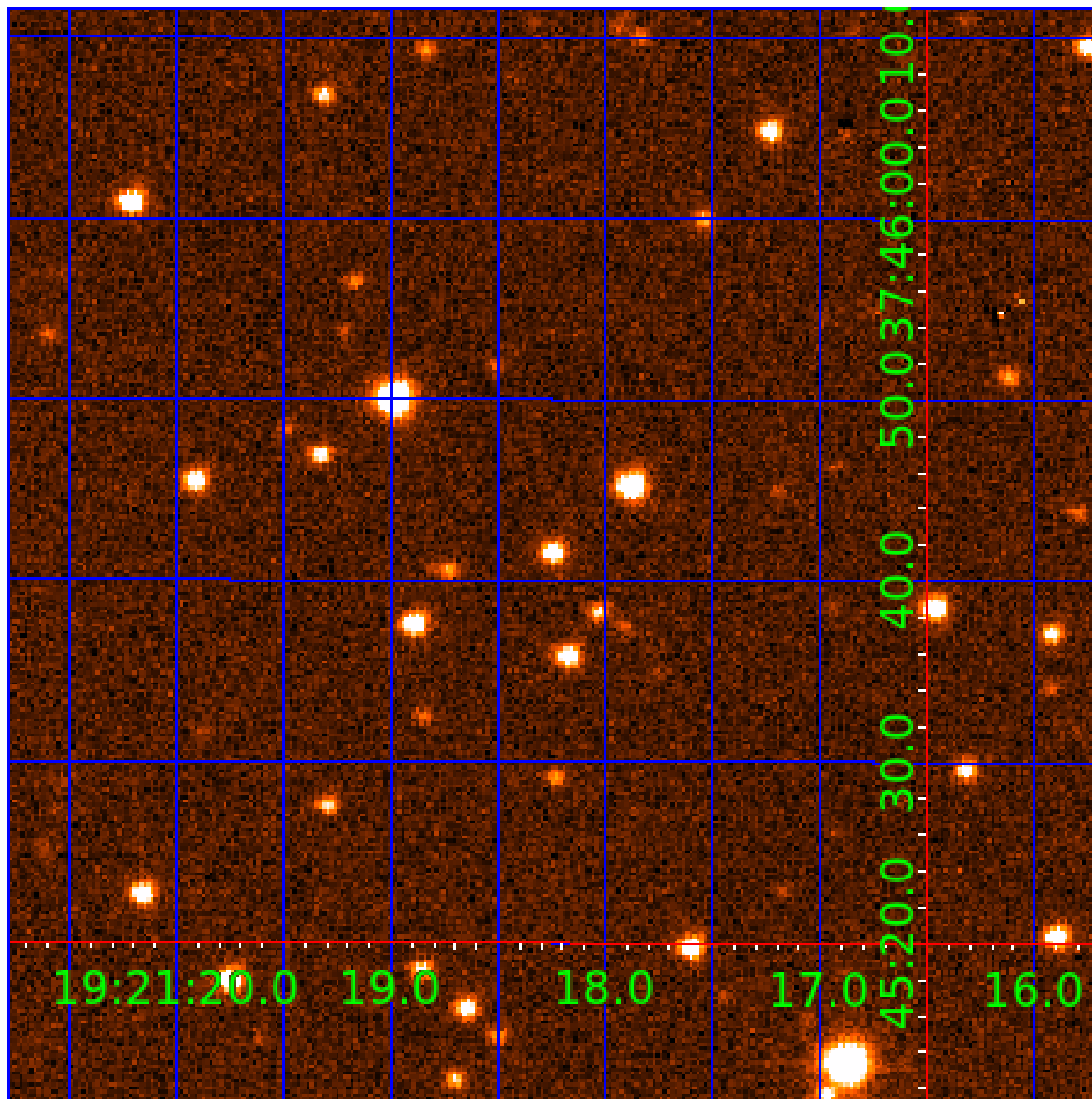


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002438490

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})
002438490-01	OBS	3699.01	3.315727	131.547262	96990.3	4.301	356.5	284.4	0.85	5528	38.30	351.29
002438490-02	OBS	No	3.315685	133.212379	6462.6	3.631	25.6	28.4	0.85	5528	7.94	351.30

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002438490-01	OBS	FP	0.01	0	1	0	0	SWEET_EB—MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_KIC_POS
002438490-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

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 002438490-02

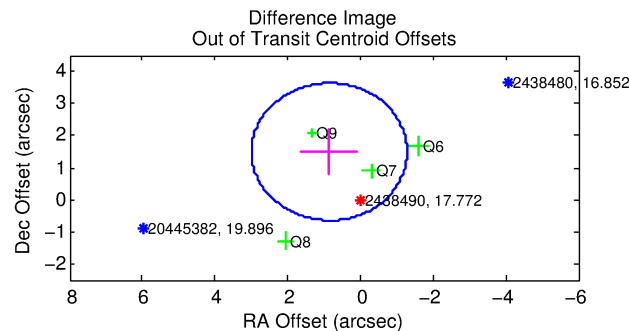
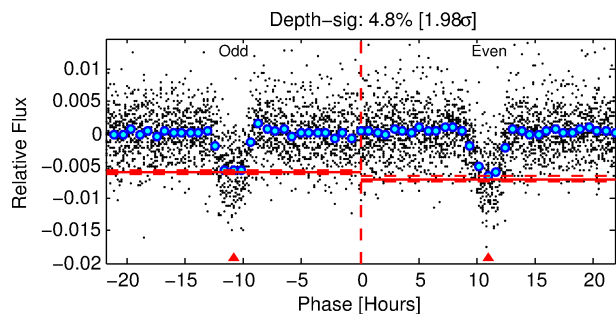
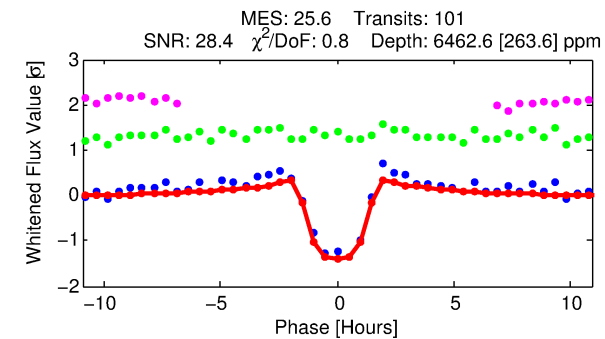
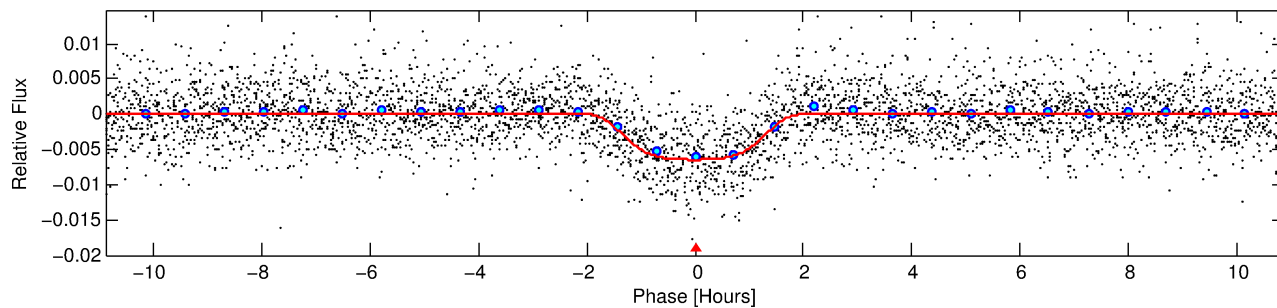
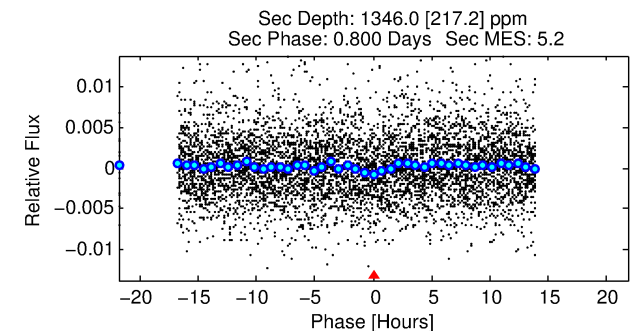
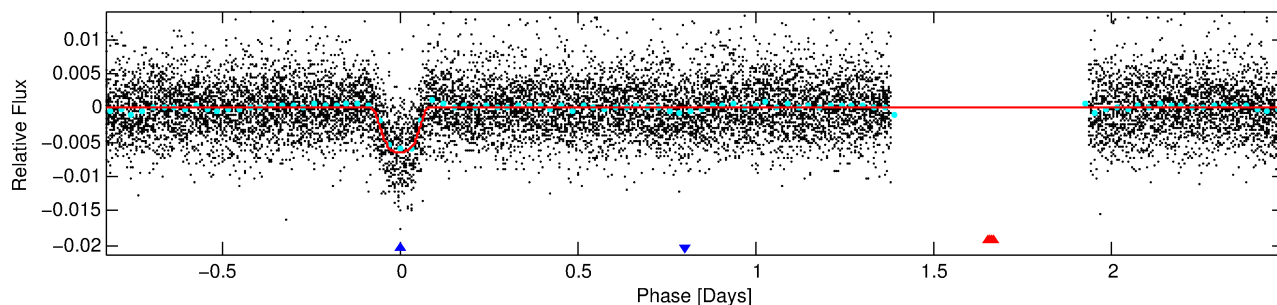
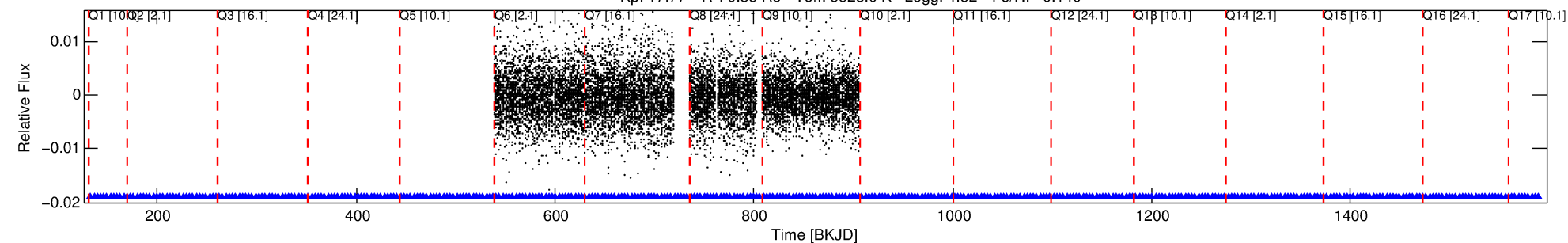
No Significant Match Found

DV One-Page Summary

KIC: 2438490 Candidate: 2 of 2 Period: 3.316 d

KOI: K03699 Corr: No Ephemeris Match

Kp: 17.77 R*: 0.85 Rs Teff: 5528.0 K Logg: 4.52 Fe/H: -0.140



DV Fit Results:

Period = 3.31569 [0.00002] d
Epoch = 133.2124 [0.0041] BKJD
Rp/R* = 0.0857 [0.0033]
a/R* = 4.69 [0.55]
b = 0.86 [0.04]
Seff = 351.30 [106.95]
Teq = 1104 [84] K
Rp = 7.94 [1.89] Re
a = 0.0414 [0.0080] AU
Ag = 20.15 [6.60] [2.90σ]
Teff = 3616 [201] K [11.55σ]

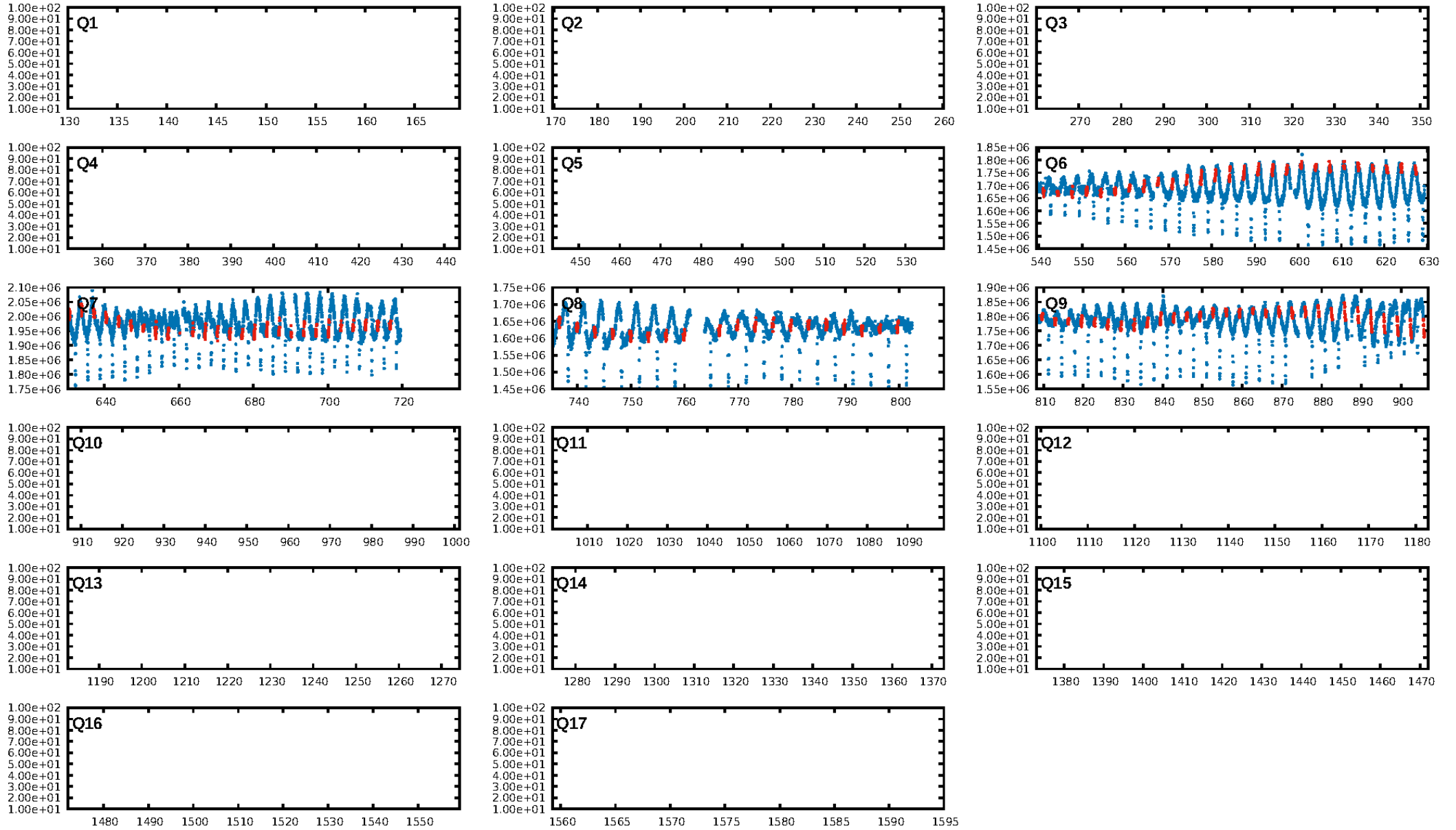
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 95.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 7.58e-133
RollingBand-fgt: 1.00 [101/101]
GhostDiagnostic-chr: 1.504
Centroid-sig: 0.0%
Centroid-so: 0.645 arcsec [6.62σ]
OotOffset-rm: 1.724 arcsec [2.42σ]
KicOffset-rm: 0.248 arcsec [1.39σ]
OotOffset-st: 1/1/1/1 [4]
KicOffset-st: 1/1/1/1 [4]
DiffImageQuality-fgm: 1.00 [4/4]
DiffImageOverlap-fno: 1.00 [4/4]

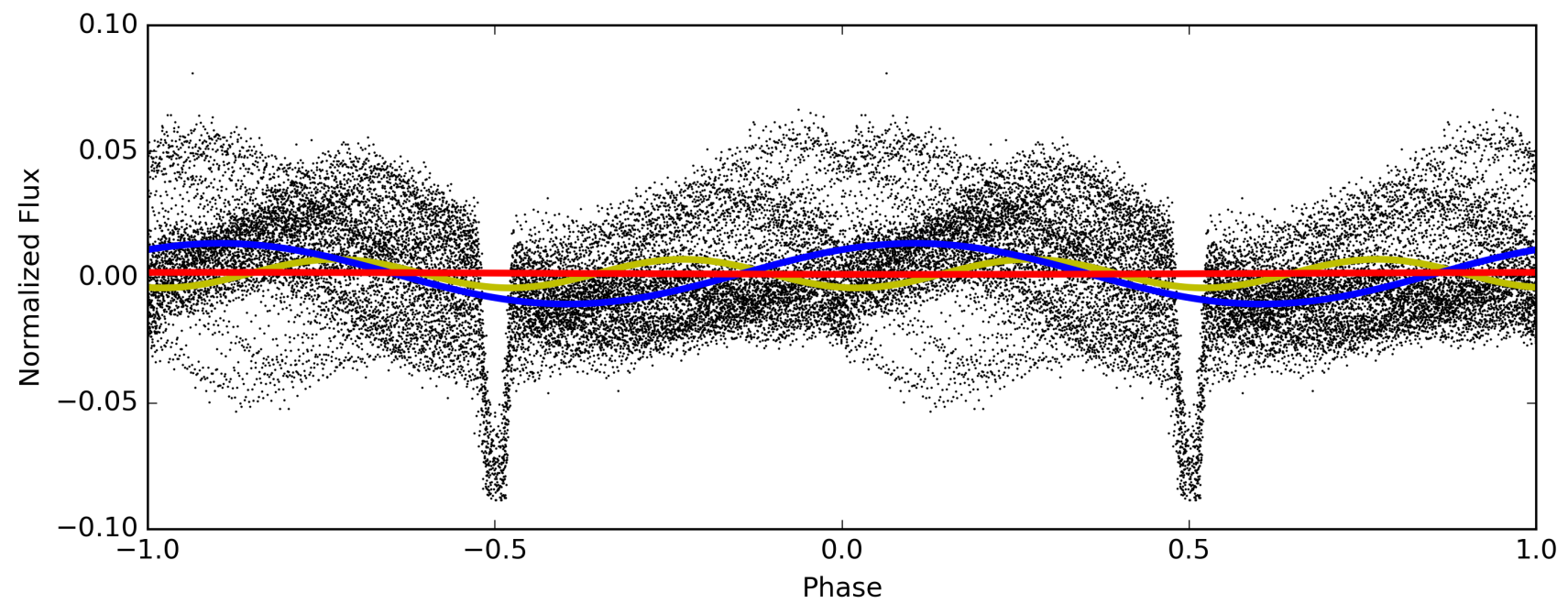
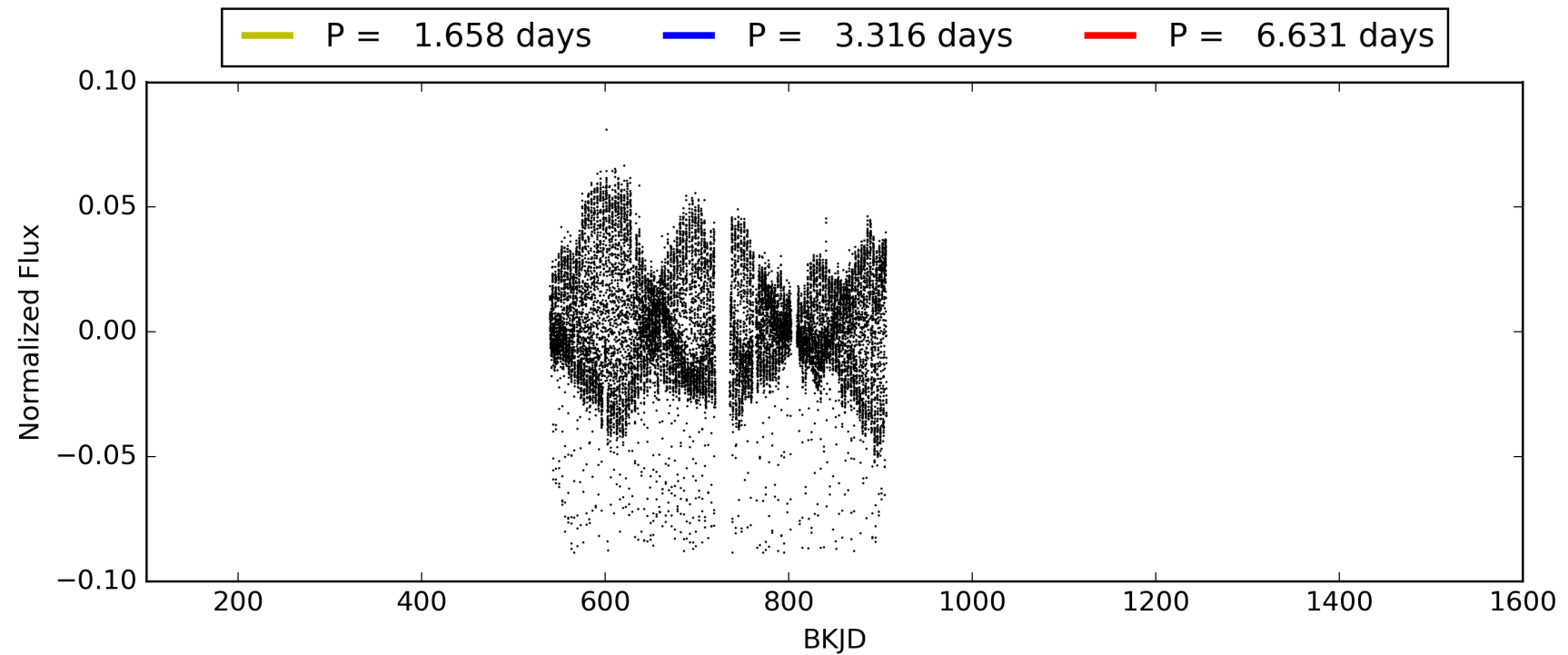
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:42:46 Z

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

TCE 002438490-02, PDC Light Curves

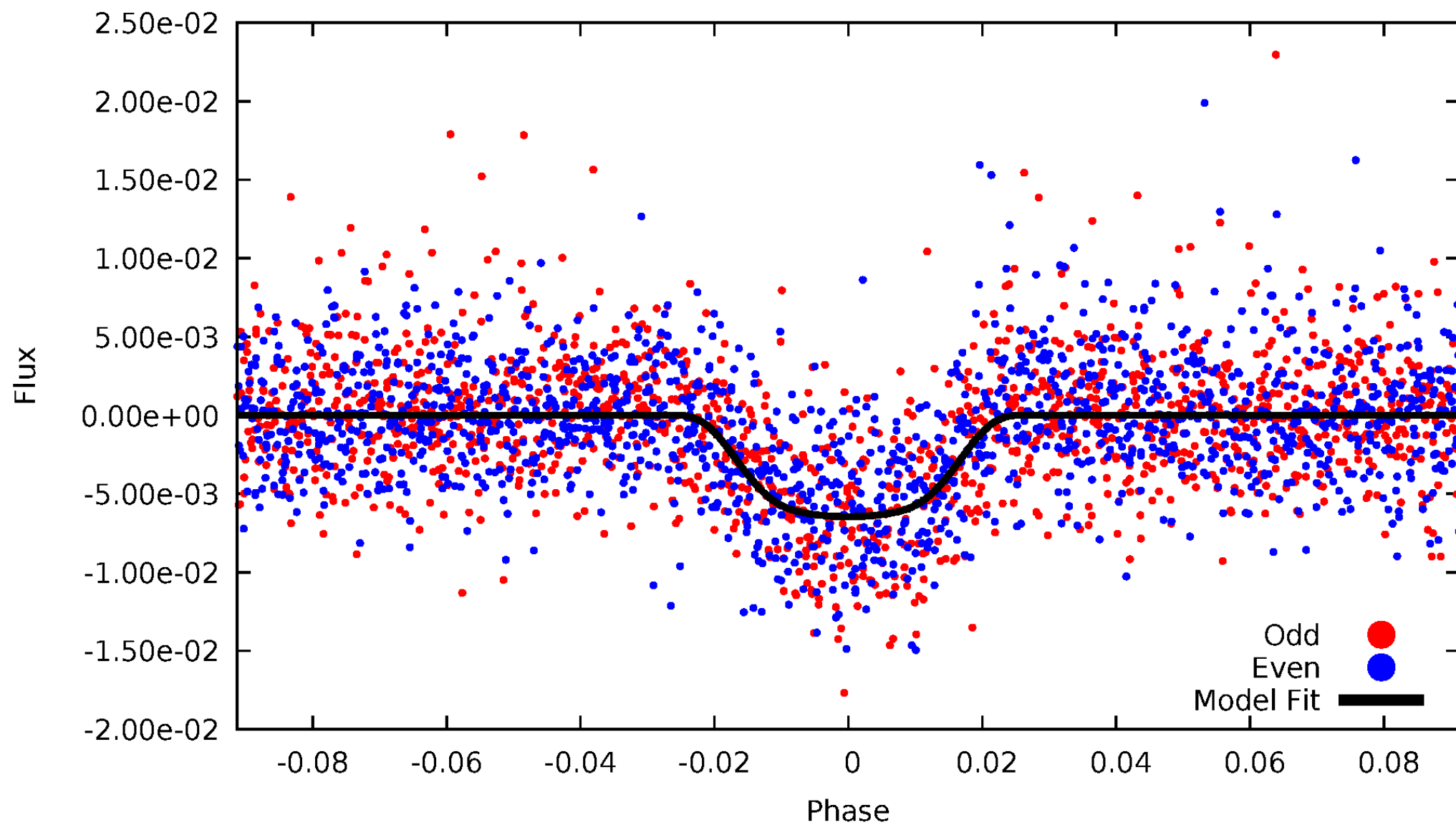


TCE 002438490-02



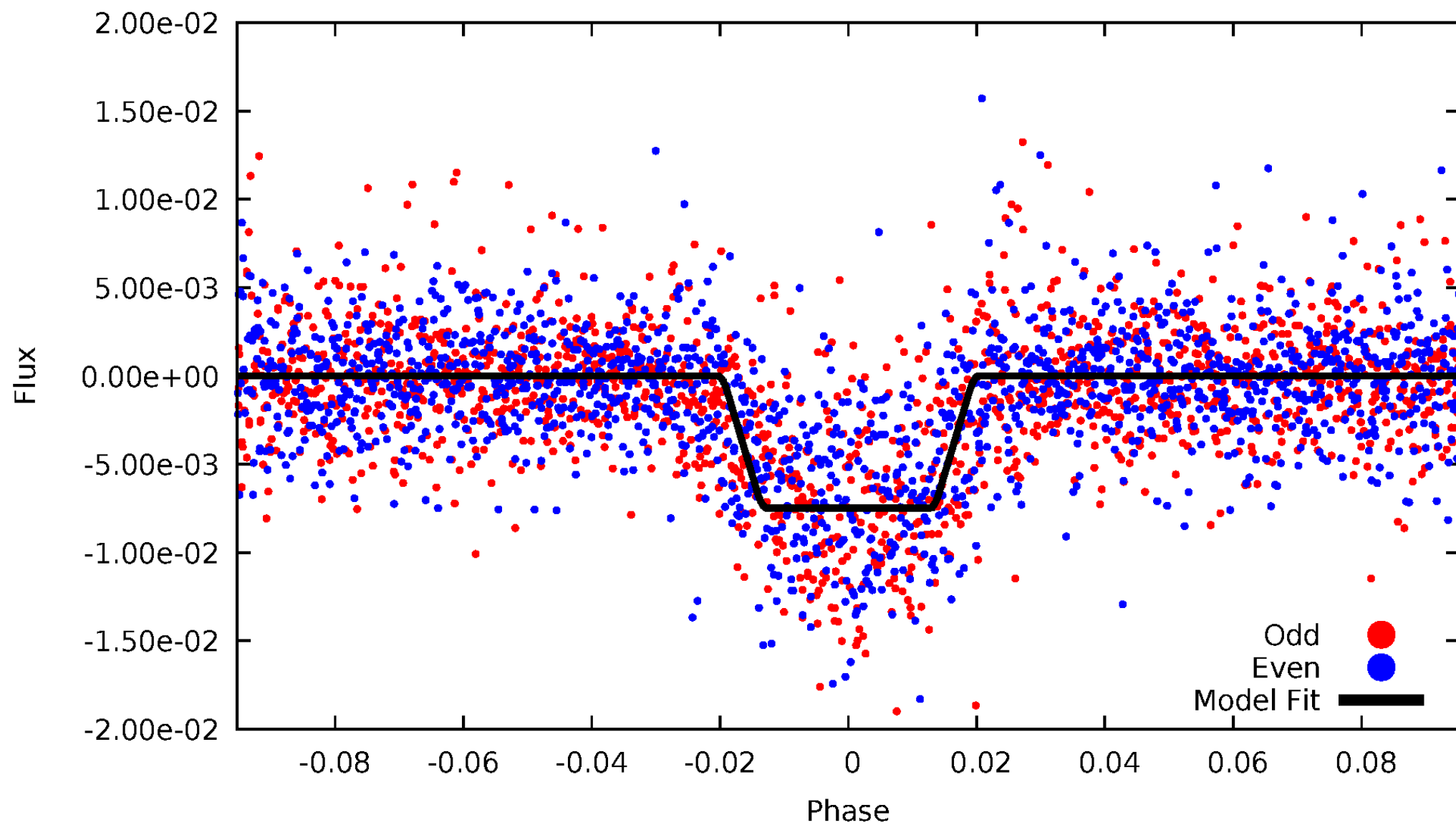
DV Odd/Even

TCE 002438490-02



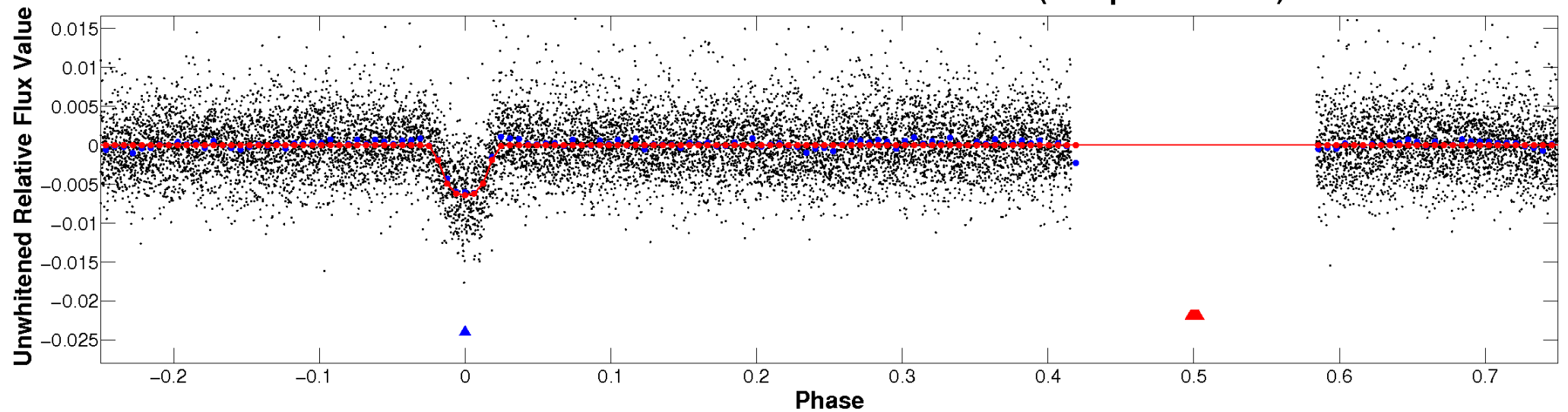
ALT Odd/Even

TCE 002438490-02

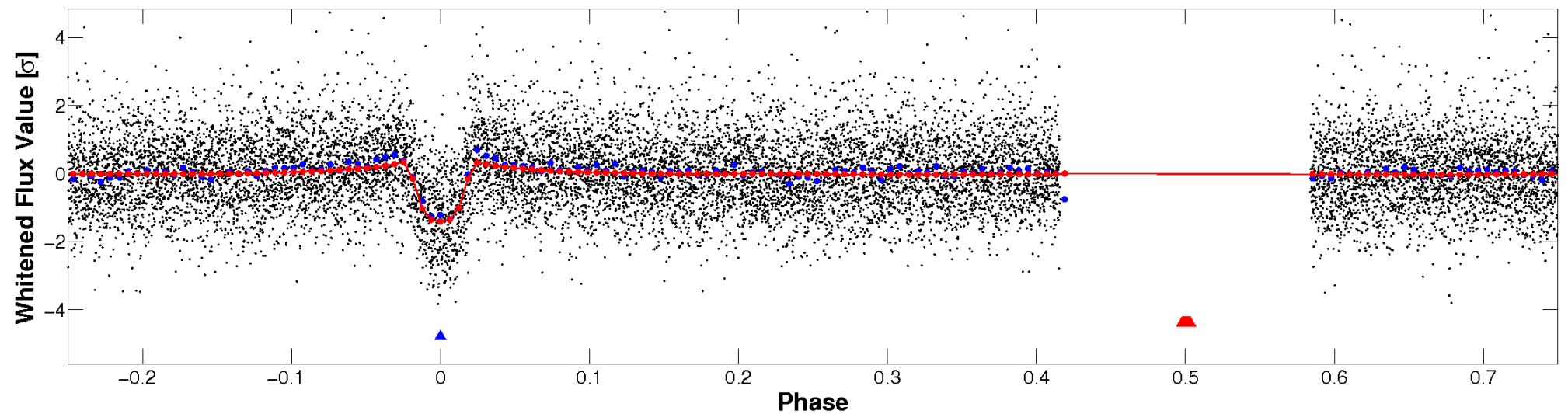


Non-Whitened Vs. Whitened Light Curve

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

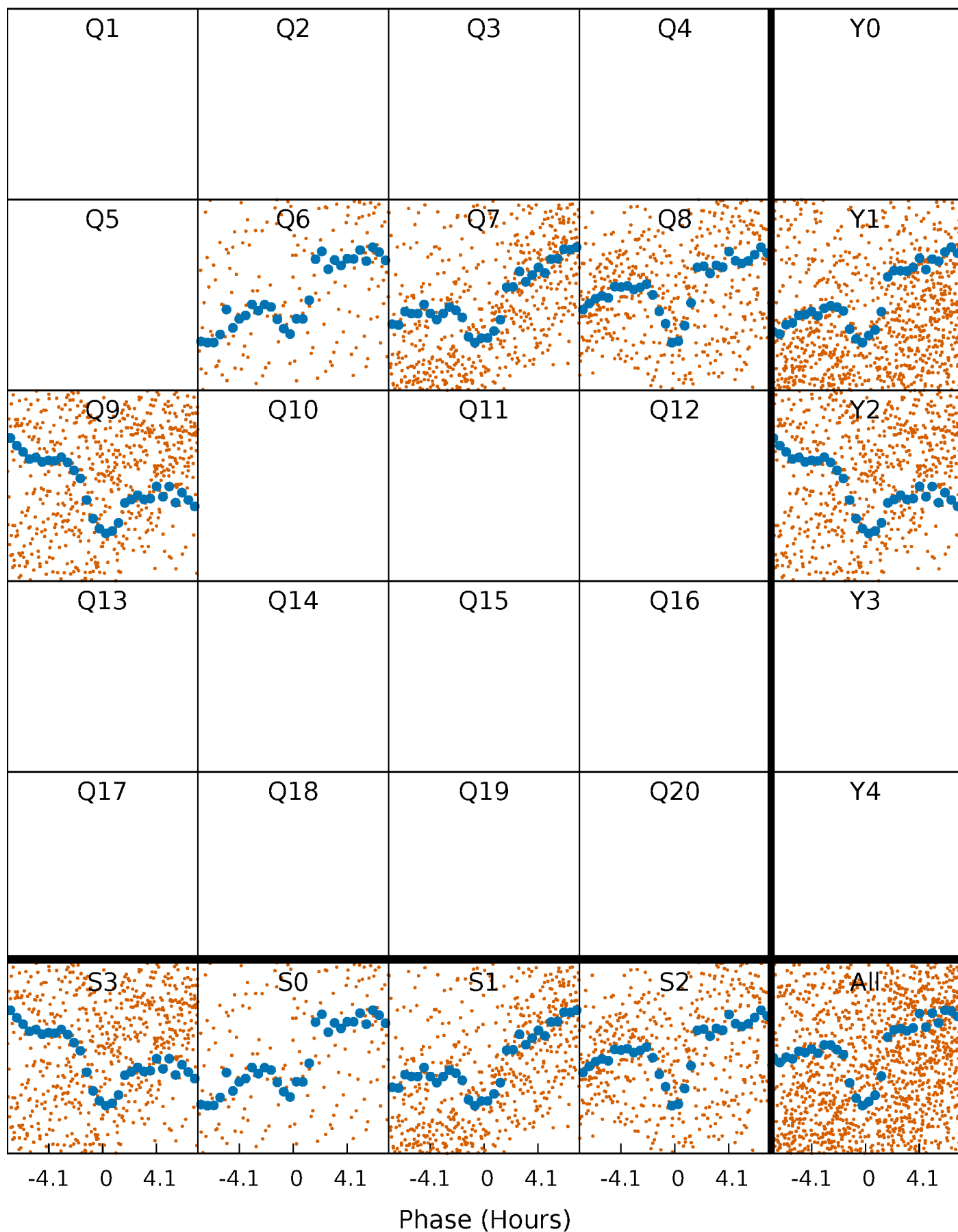


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



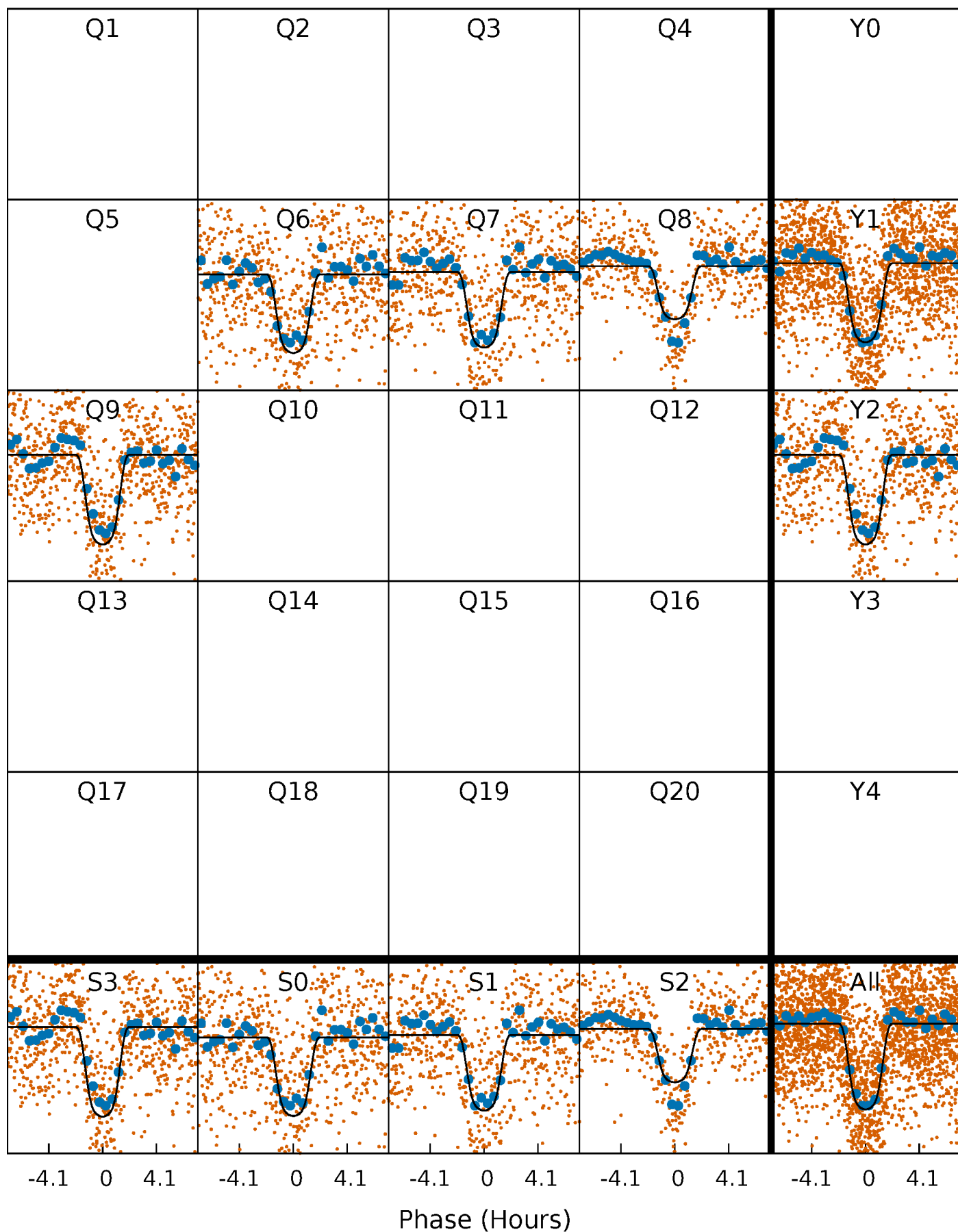
PDC Quarter-Phased Transit Curves

TCE 002438490-02 $P = 3.315685$ Days $T_0 = 133.212378$ (BKJD)



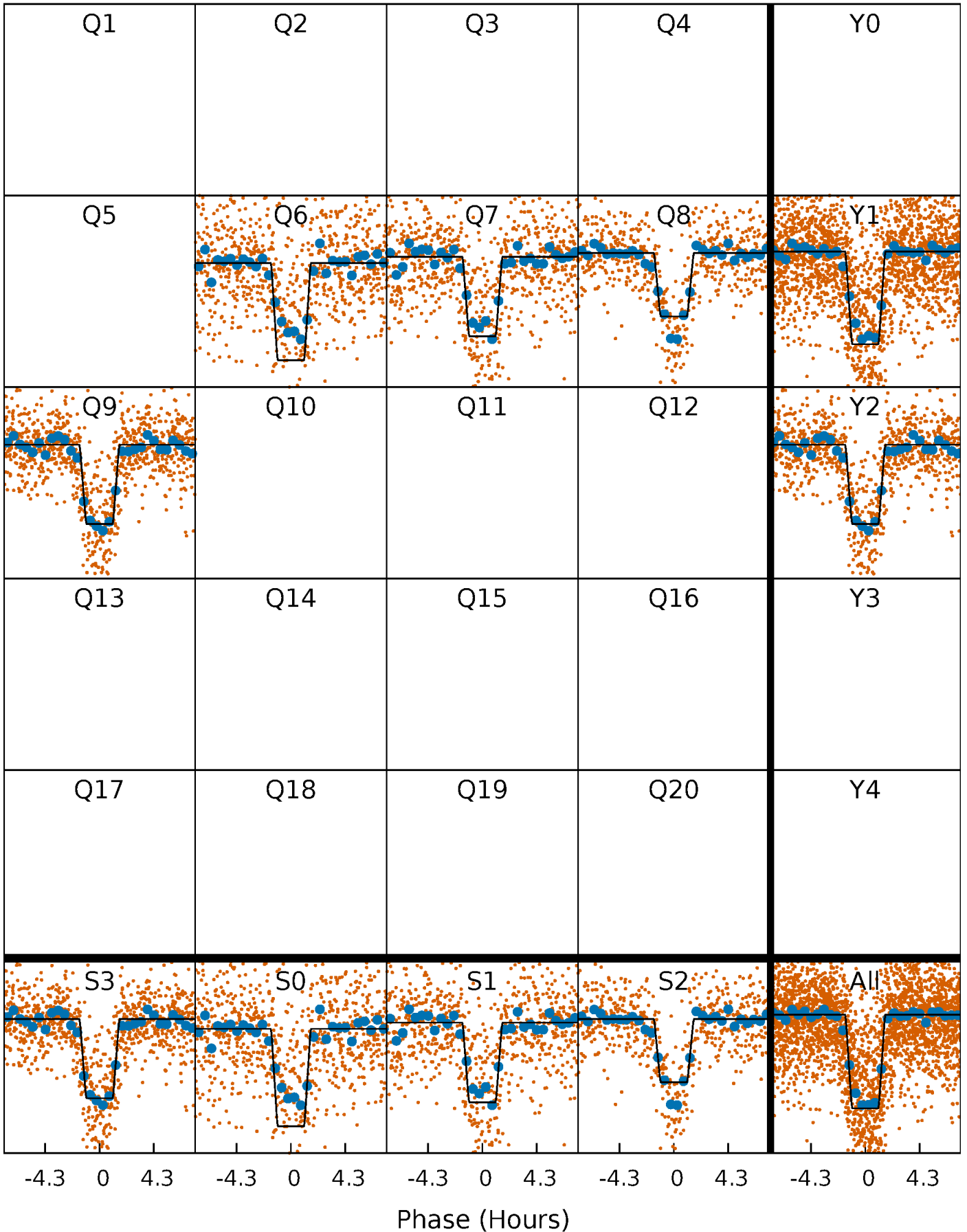
DV Quarter-Phased Transit Curves

TCE 002438490-02 $P = 3.315685$ Days $T_0 = 133.212378$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

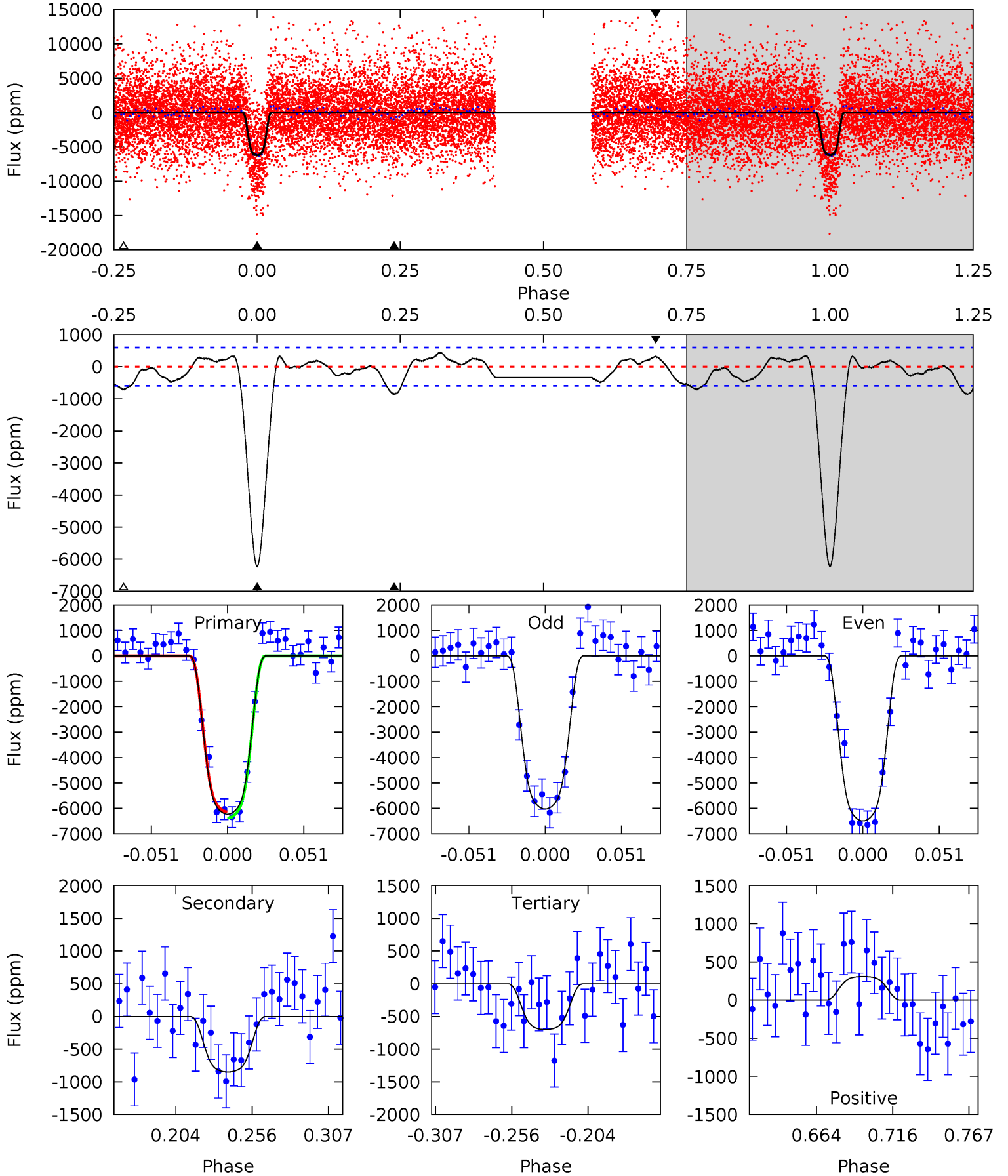
TCE 002438490-02 P= 3.315823 Days $T_0=133.186337$ (BKJD)



DV Model-Shift Uniqueness Test

002438490-02, P = 3.315685 Days, E = 133.212378 Days

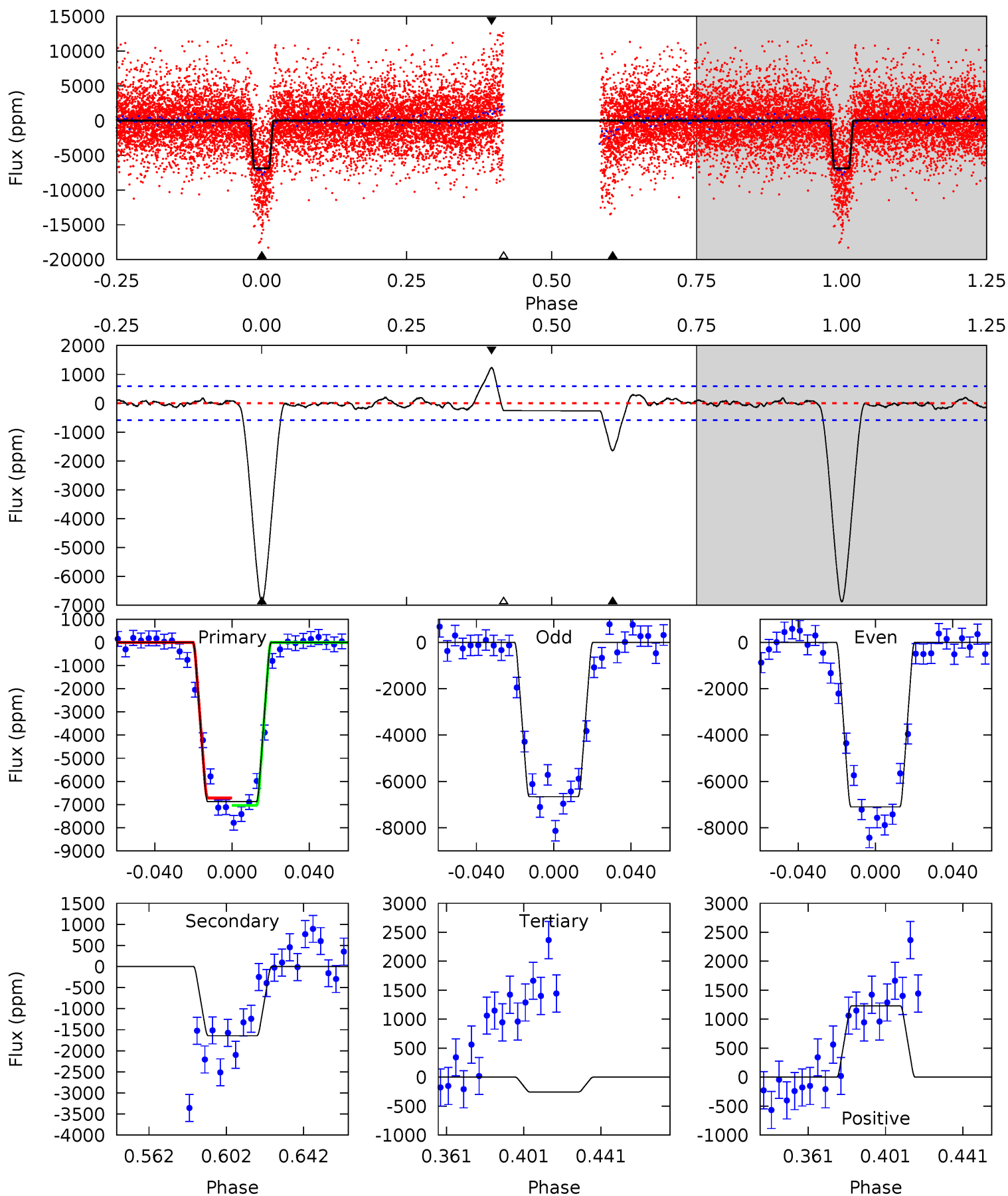
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
49.1	6.71	5.54	2.44	4.70	1.95	2.19	43.5	46.7	1.16	4.27	1.85	0.99	0.07	0.97



Alt Model-Shift Uniqueness Test

002438490-02, P = 3.315823 Days, E = 133.186337 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
55.6	13.3	2.07	9.93	4.75	2.05	1.71	53.5	45.6	11.2	3.35	1.79	0.96	0.15	1.32



Stellar Parameters For KIC 002438490

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5528^{+182}_{-182}	$4.516^{+0.063}_{-0.147}$	$-0.140^{+0.300}_{-0.300}$	$0.849^{+0.199}_{-0.100}$	$0.864^{+0.102}_{-0.083}$	$1.985^{+0.543}_{-0.856}$
	+3%/-3%	+1%/-3%	+214%/-214%	+23%/-12%	+12%/-10%	+27%/-43%
Source	KIC0	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 002438490-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-850 ± 127	$8.17^{+1.02}_{-0.71}$	1560^{+91}_{-69}	3622^{+133}_{-121}	12^{+3}_{-3}
Alt.	-1643 ± 124	$8.18^{+1.00}_{-0.63}$	1566^{+90}_{-76}	4063^{+133}_{-133}	23^{+4}_{-5}

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 $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

DV Centroid Data

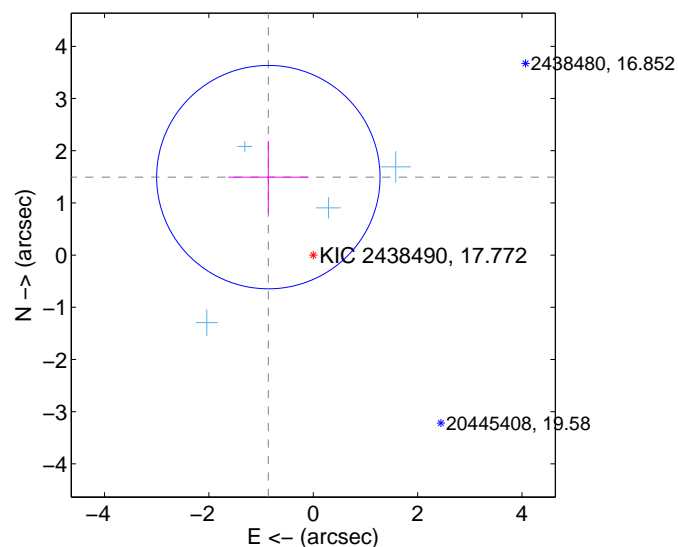
Supplemental centroid analysis for 002438490-02. Kepler magnitude: 17.77. Transit SNR 28.38

There are 4 quarters with good PRF difference image offsets

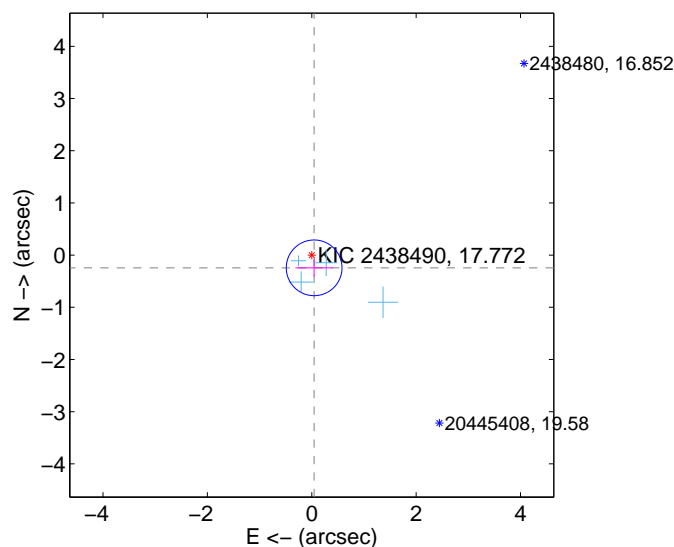
The OOT PRF centroid is offset from the target star catalog position by about 2.43 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.724 ± 0.713	2.42	0.861 ± 0.771	1.494 ± 0.693
PRF-fit source offset from KIC position	0.248 ± 0.178	1.39	-0.046 ± 0.357	-0.244 ± 0.168
photometric centroid source offset	0.64 ± 0.10	6.62	-0.36 ± 0.11	-0.54 ± 0.09

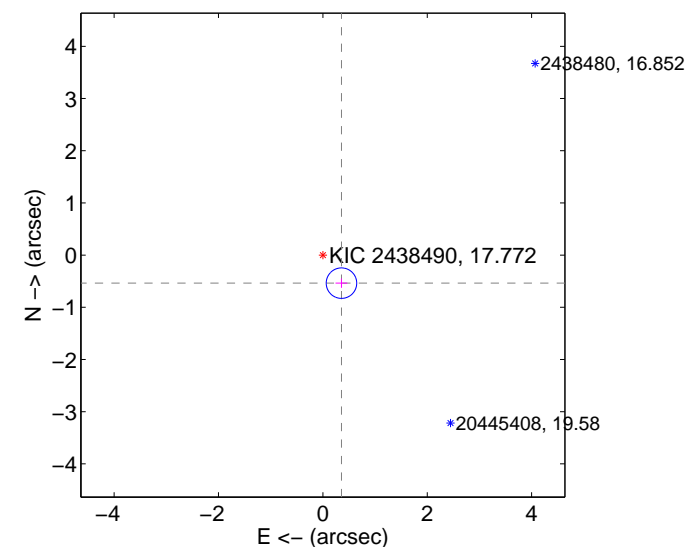
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

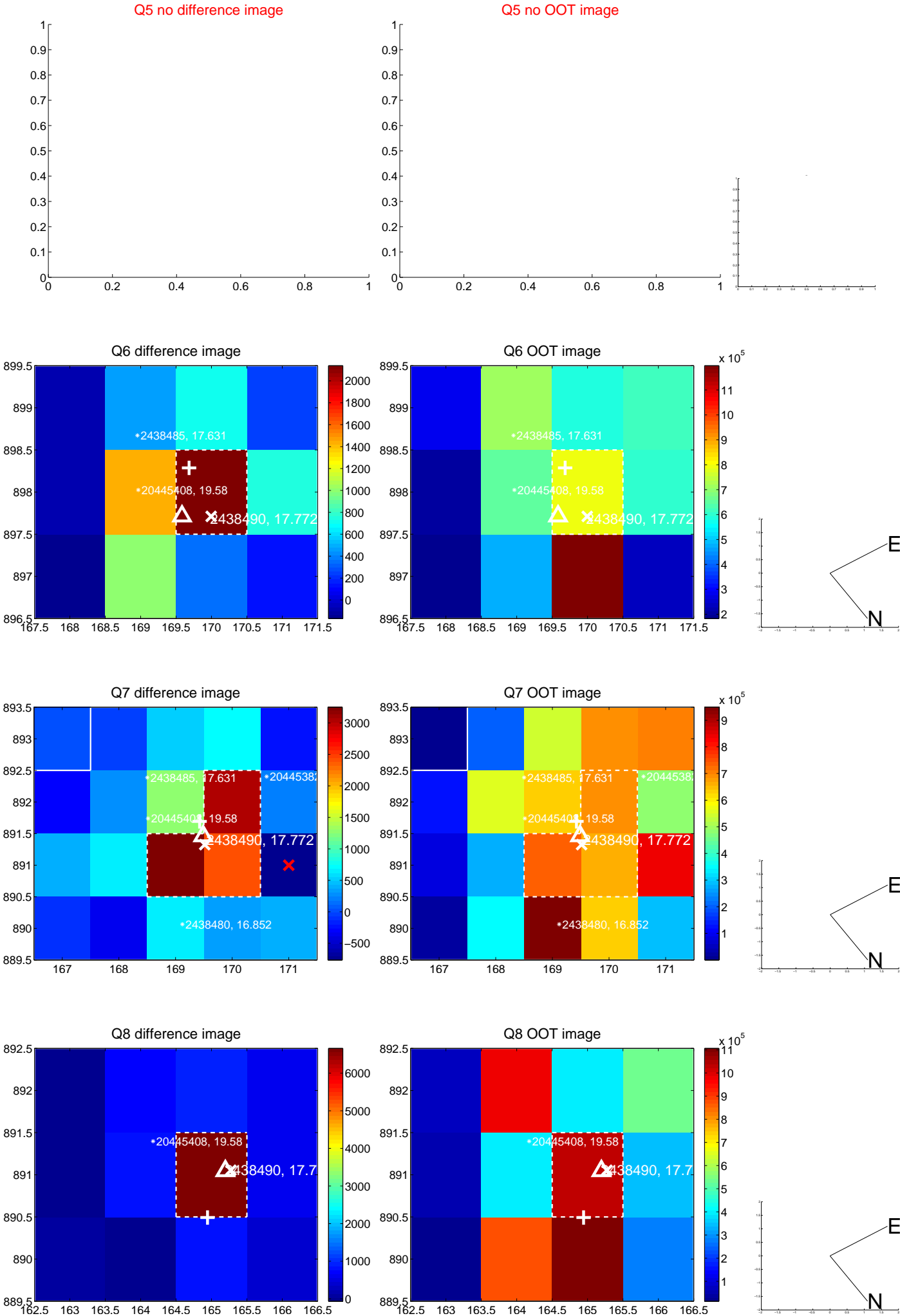


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

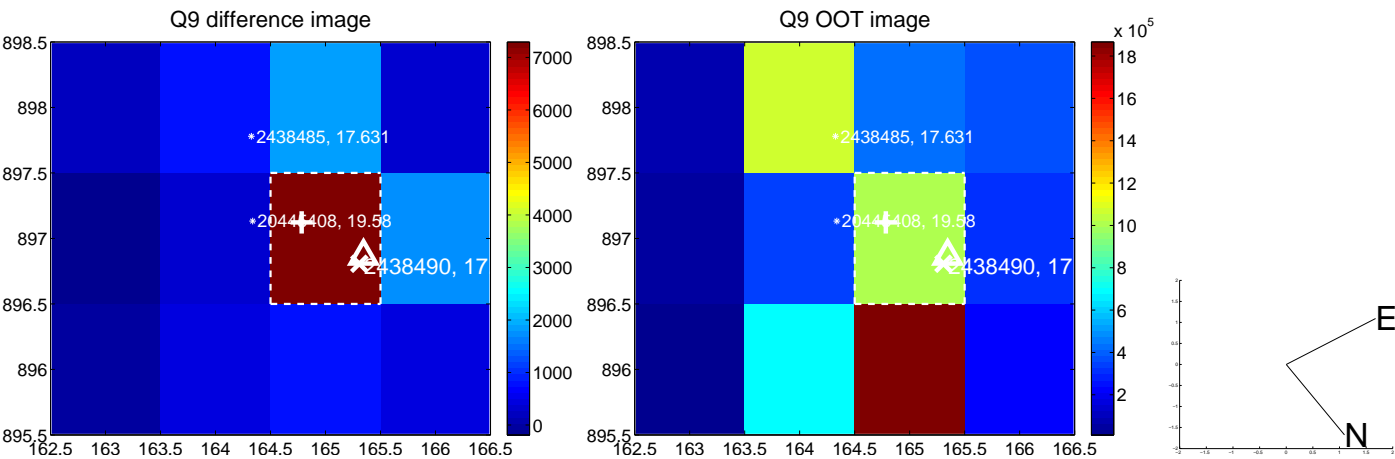
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



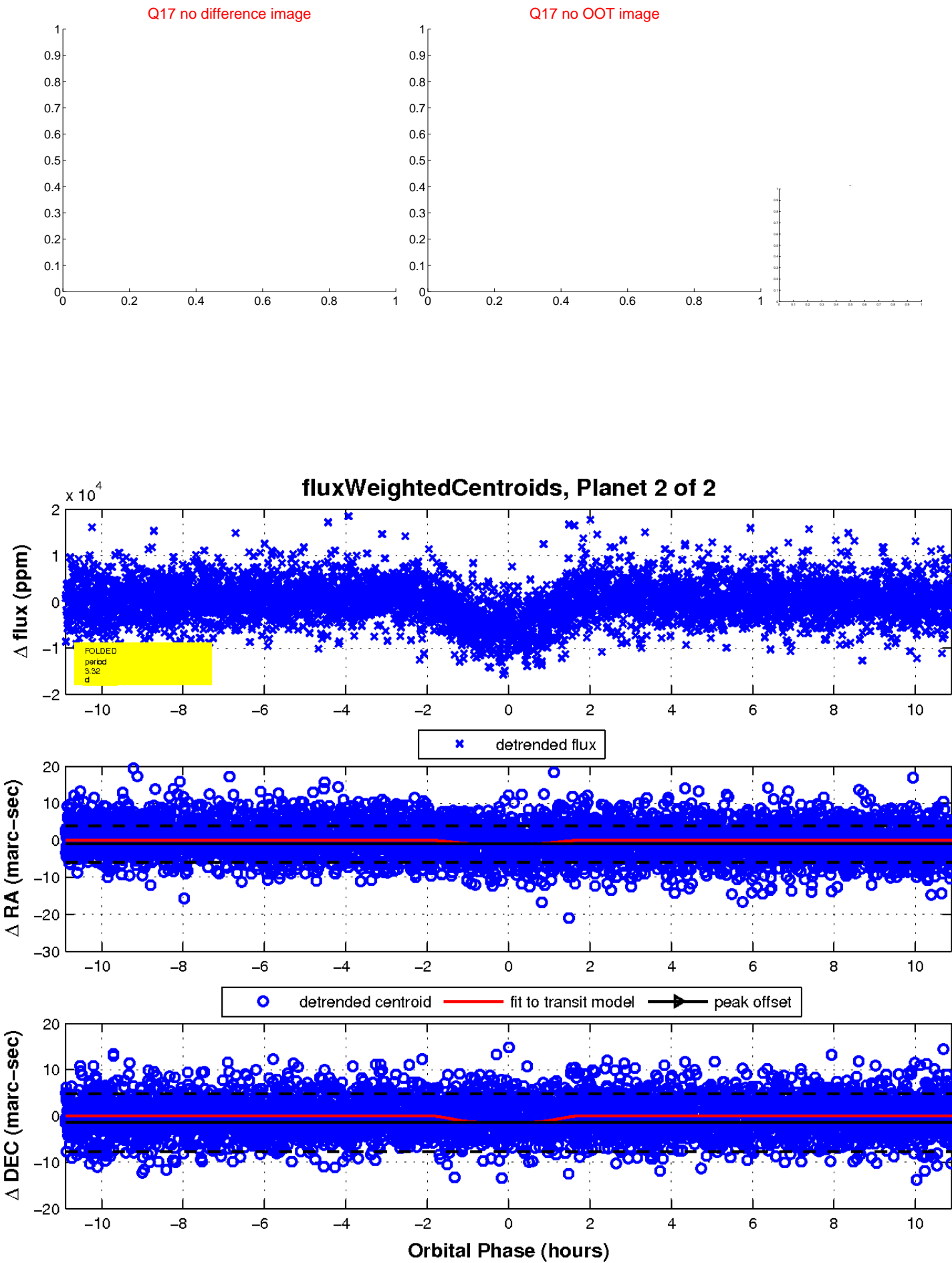
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

