

KIC 006864885

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})
006864885-01	OBS	2434.01	40.877624	158.307925	586.8	8.503	20.8	20.2	0.94	5930	2.71	18.18
006864885-02	OBS	No	40.878026	163.430384	636.8	9.454	21.1	19.8	0.94	5930	3.53	18.18

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006864885-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—EPHEM_MATCH
006864885-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—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 006864885-01

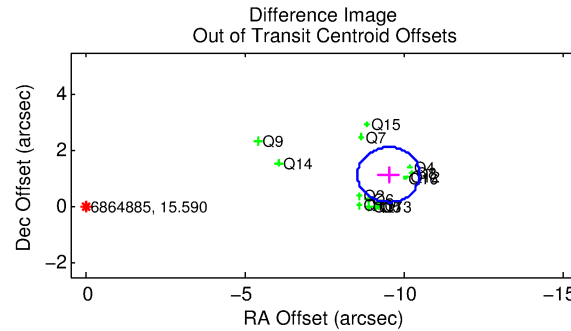
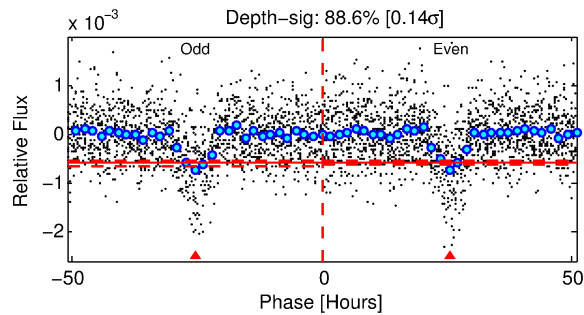
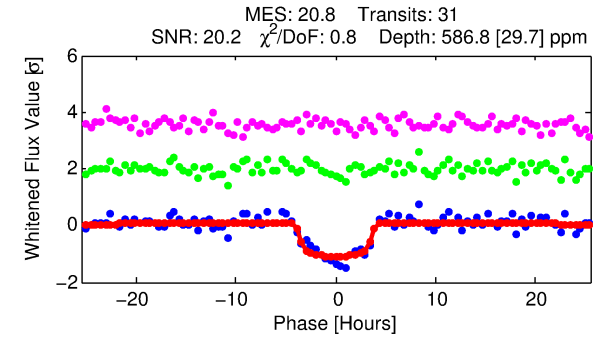
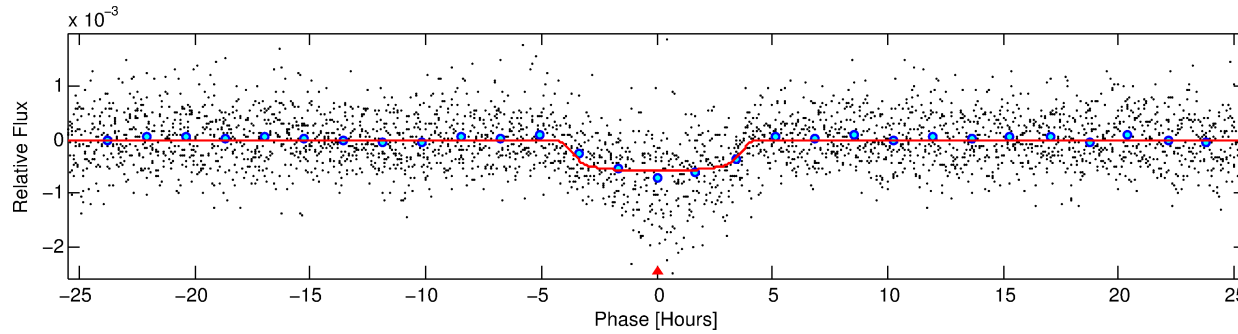
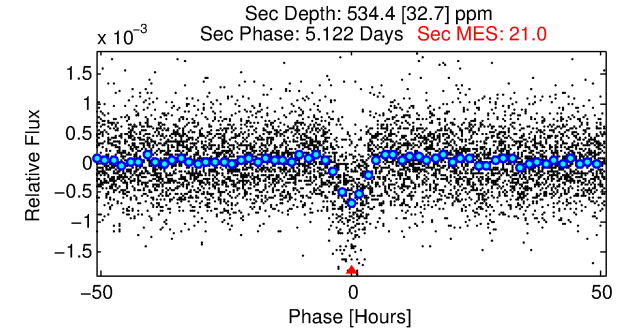
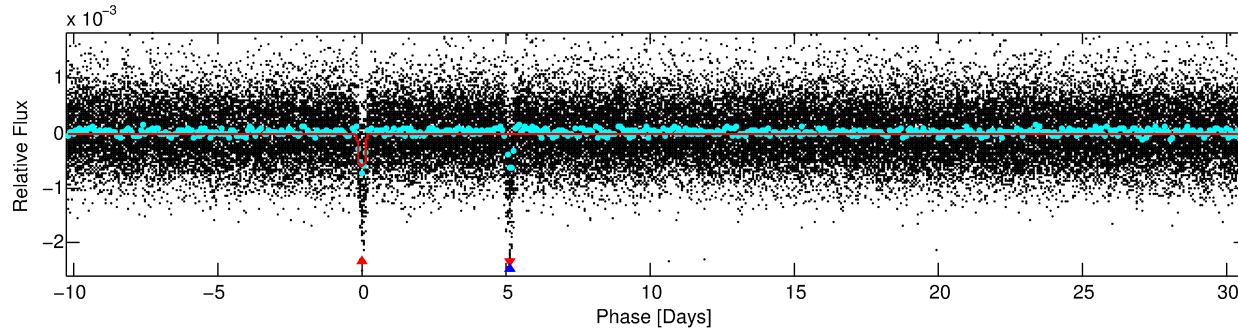
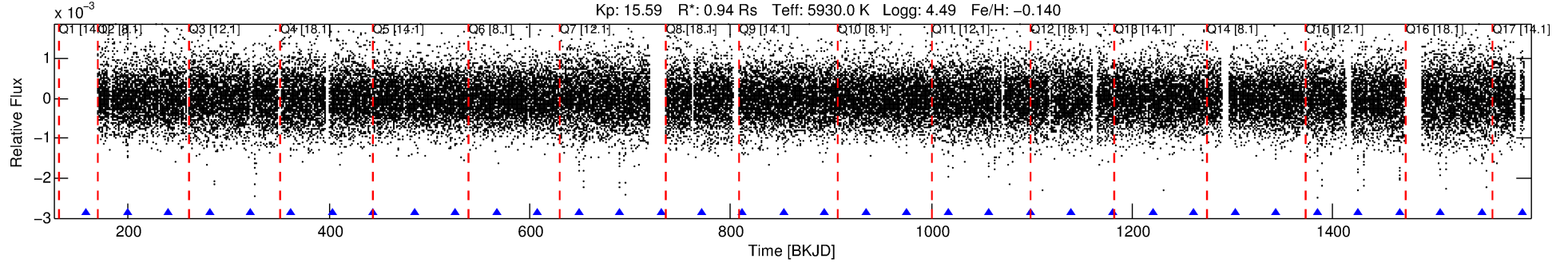
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
006864885-01	6864885	006864859-01	6864859	1:1	24.5	5	2	11.66	15.59	438.60	Direct-PRF	0	0.34	0.03

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: 6864885 Candidate: 1 of 2 Period: 40.878 d
KOI: K02434 Corr: No Ephemeris Match

Kp: 15.59 R*: 0.94 Rs Teff: 5930.0 K Logg: 4.49 Fe/H: -0.140



DV Fit Results:

Period = 40.87762 [0.00042] d
Epoch = 158.3079 [0.0090] BKJD
Rp/R* = 0.0265 [0.0015]
a/R* = 17.51 [4.27]
b = 0.91 [0.05]
Seff = 18.18 [7.52]
Teq = 527 [54] K
Rp = 2.71 [0.86] Re
a = 0.2313 [0.0617] AU
Ag = 2146.37 [887.43] [2.42σ]
Teff = 5541 [258] K [19.01σ]

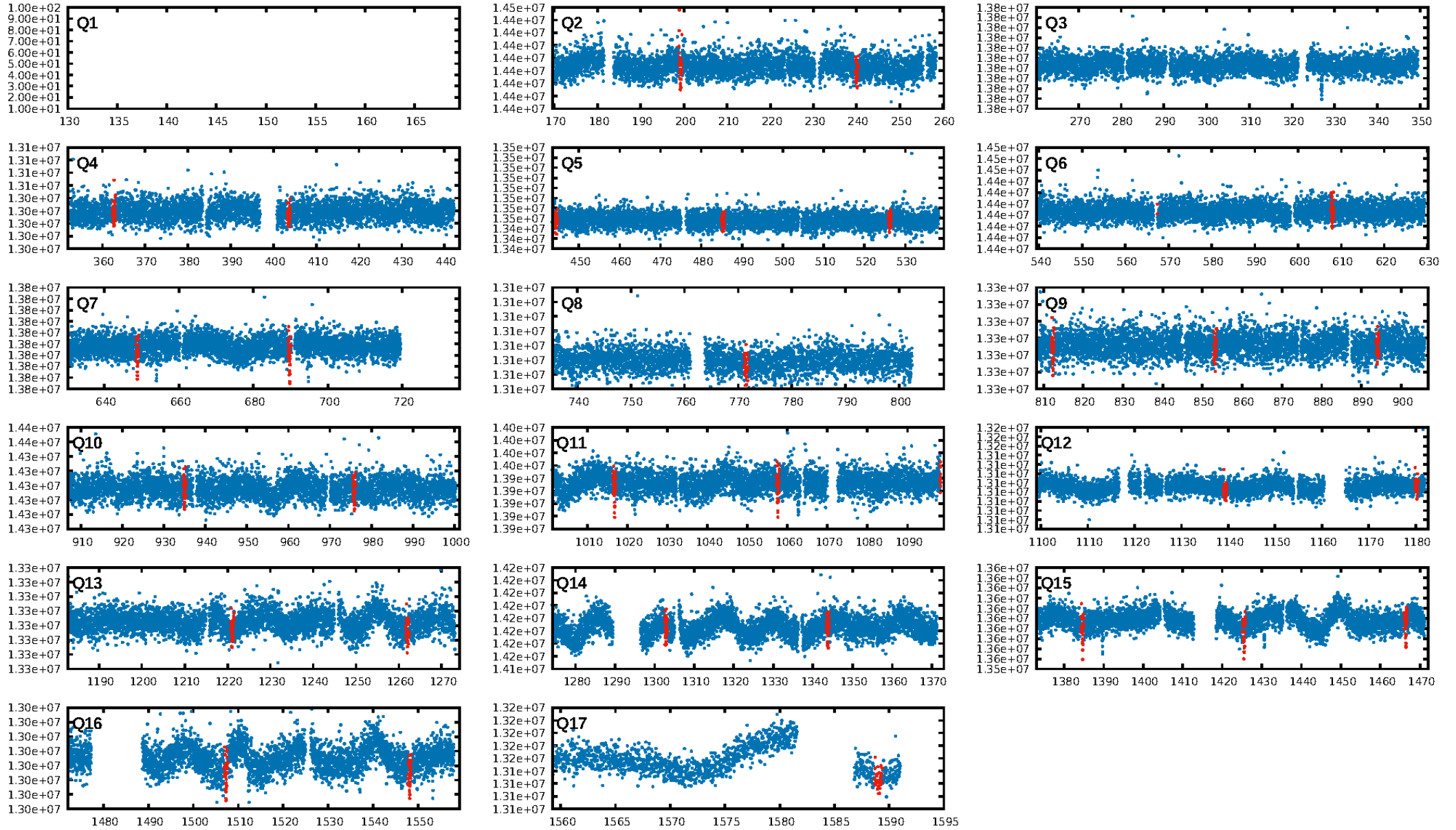
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.1% [0.00σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGoF-sig: 100.0%
Bootstrap-pfa: 1.08e-97
RollingBand-fgt: 1.00 [30/30]
GhostDiagnostic-chr: -0.2822
Centroid-sig: 0.0%
Centroid-so: 10.791 arcsec [16.09σ]
OotOffset-rm: 9.574 arcsec [29.41σ]
KicOffset-rm: 9.614 arcsec [25.99σ]
OotOffset-st: 4/2/4/4 [14]
KicOffset-st: 4/2/4/4 [14]
DiffImageQuality-fgm: 0.86 [12/14]
DiffImageOverlap-fno: 1.00 [15/15]

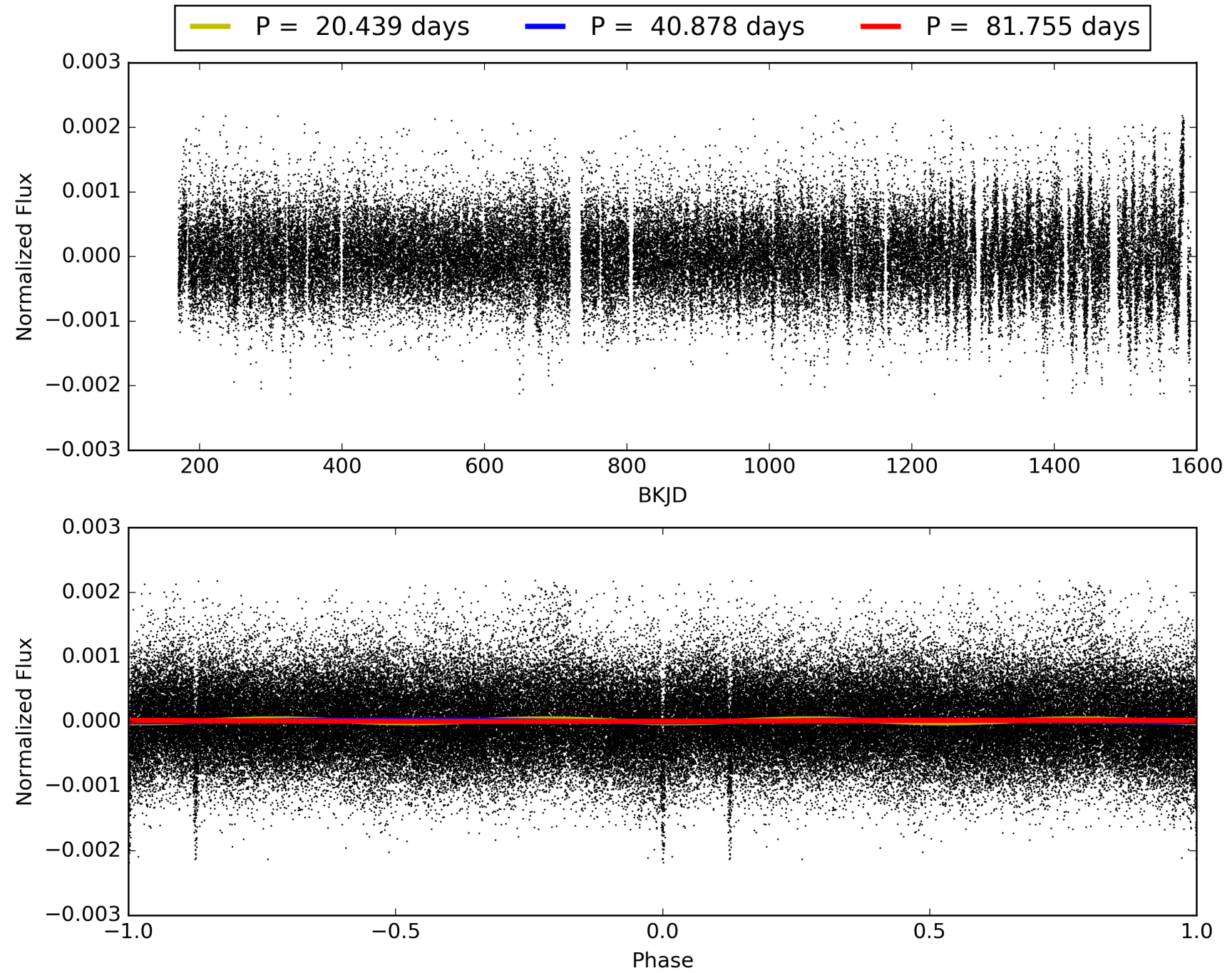
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 09:44:37 Z

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

TCE 006864885-01, PDC Light Curves

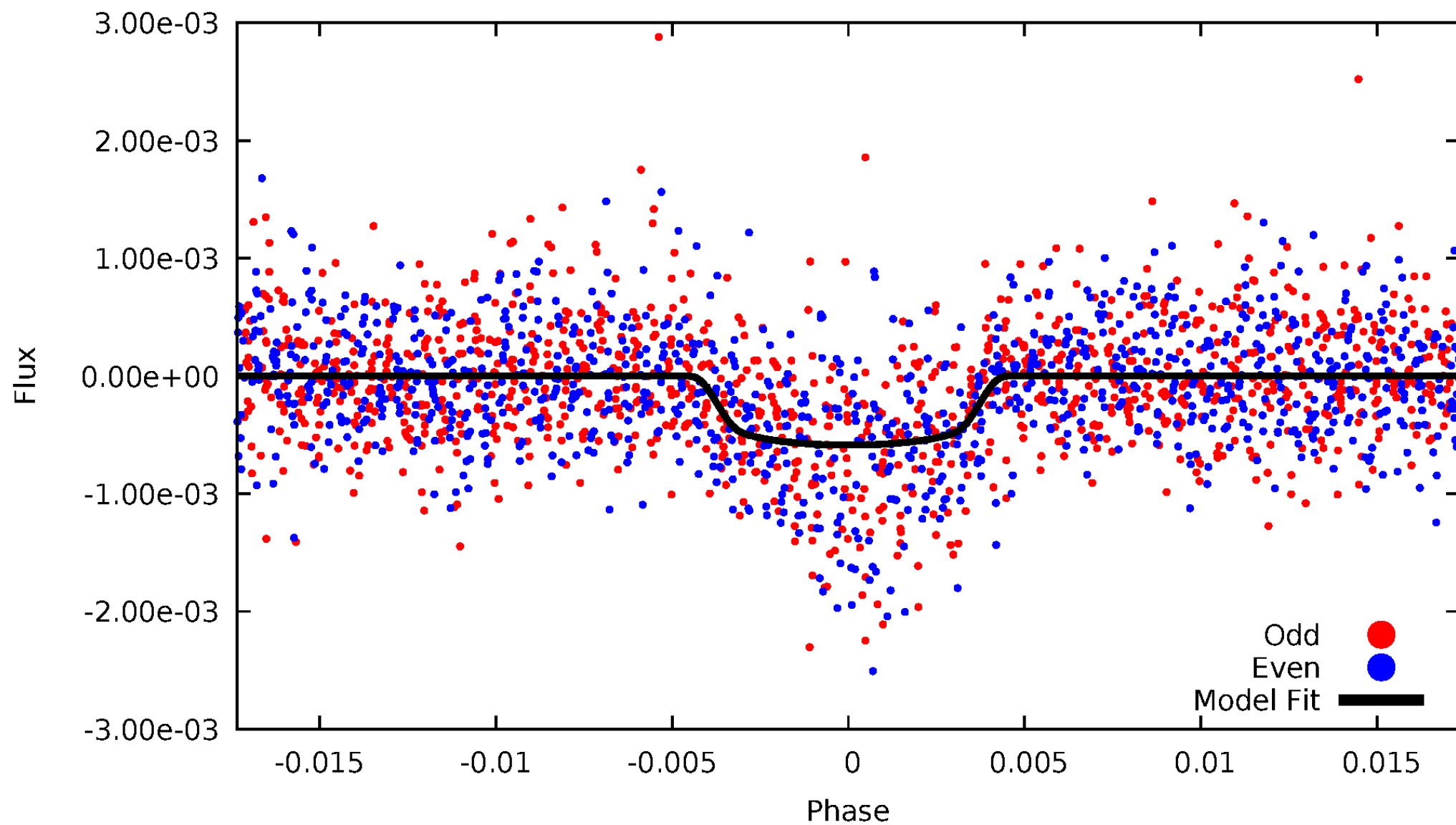


TCE 006864885-01



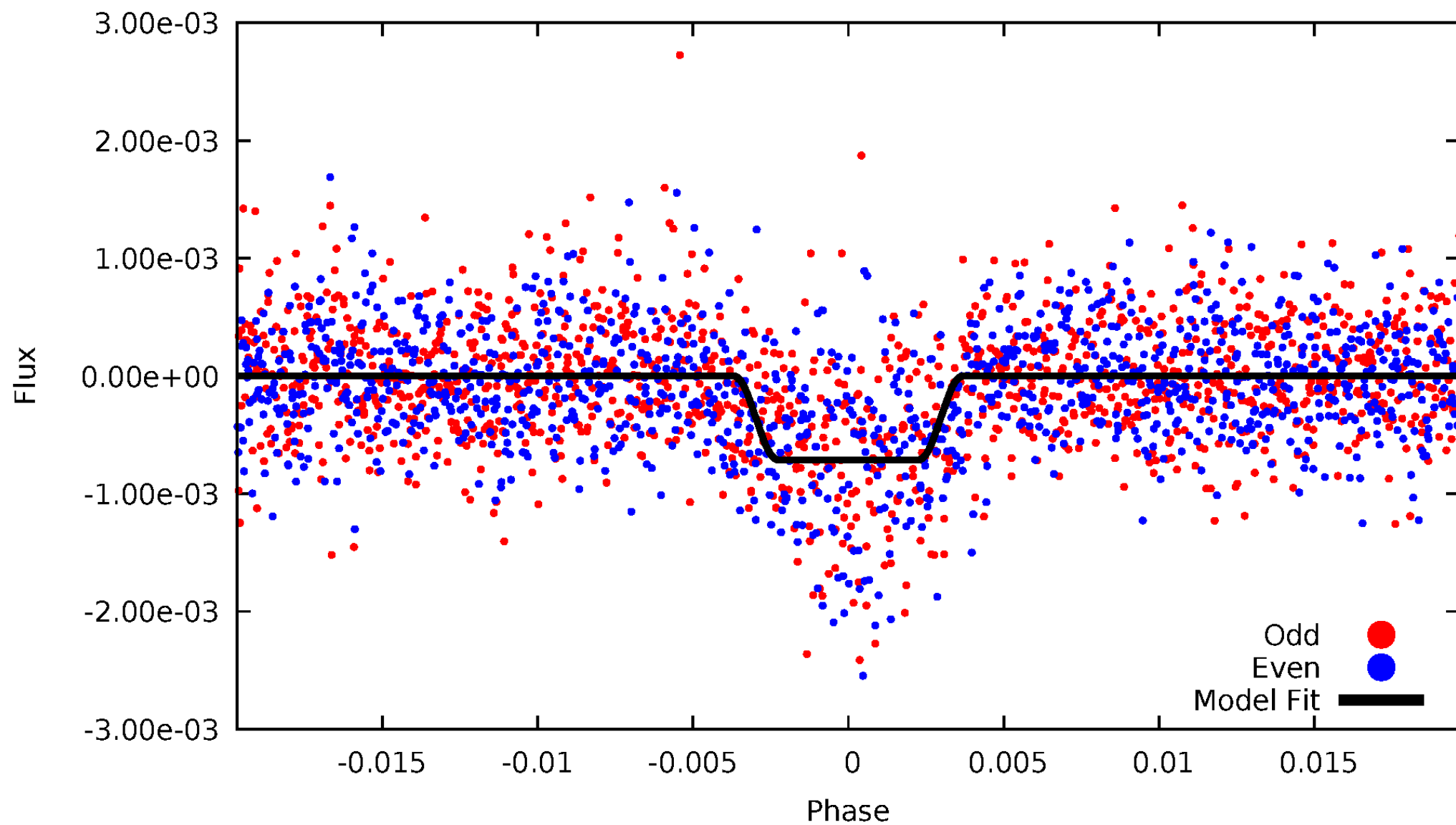
DV Odd/Even

TCE 006864885-01



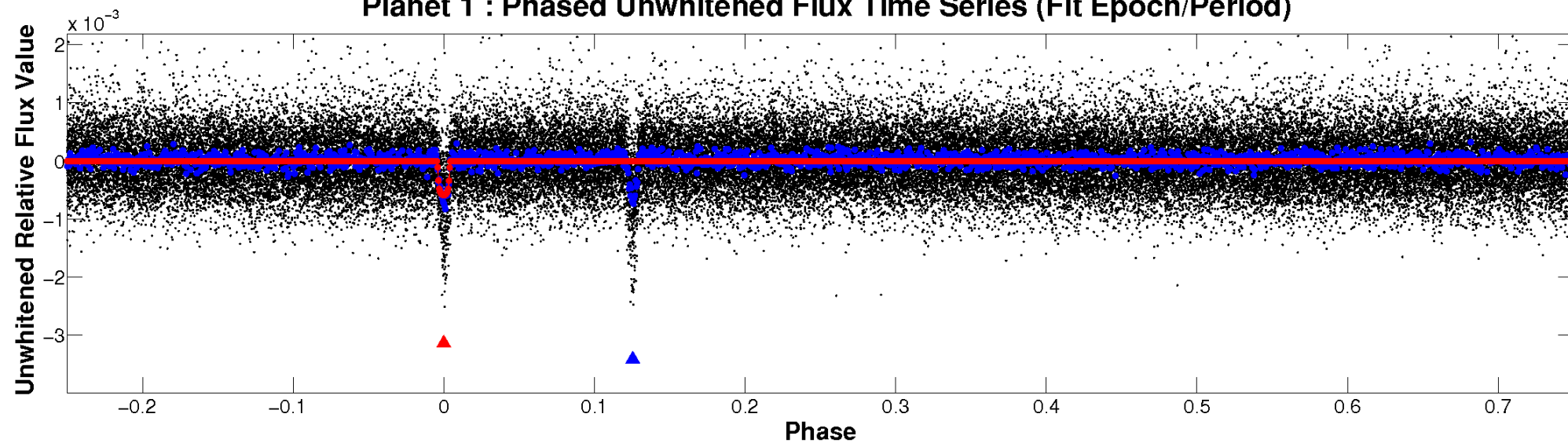
ALT Odd/Even

TCE 006864885-01

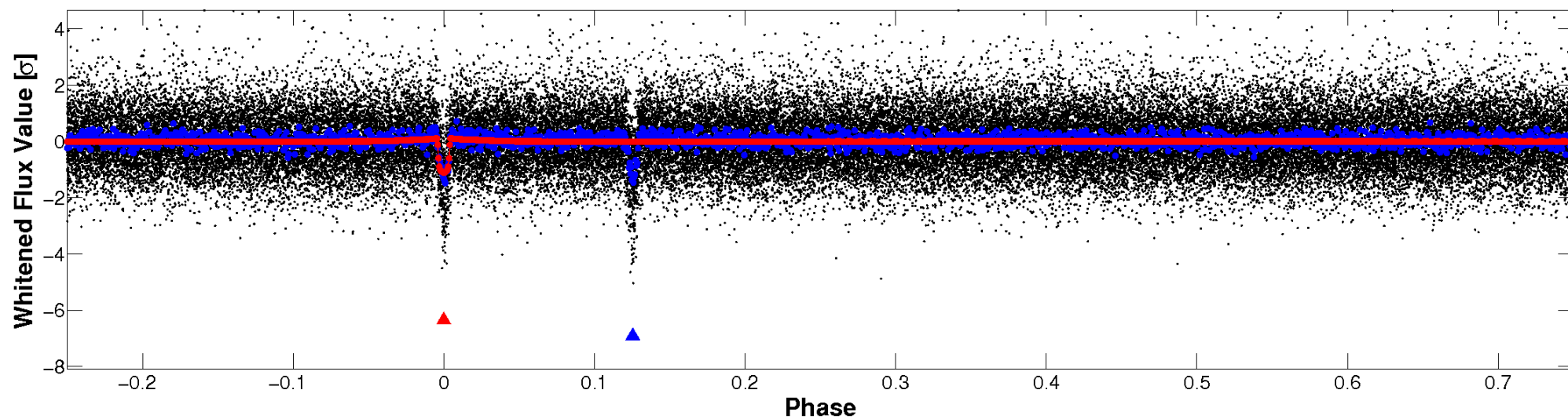


Non-Whitened Vs. Whitened Light Curve

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

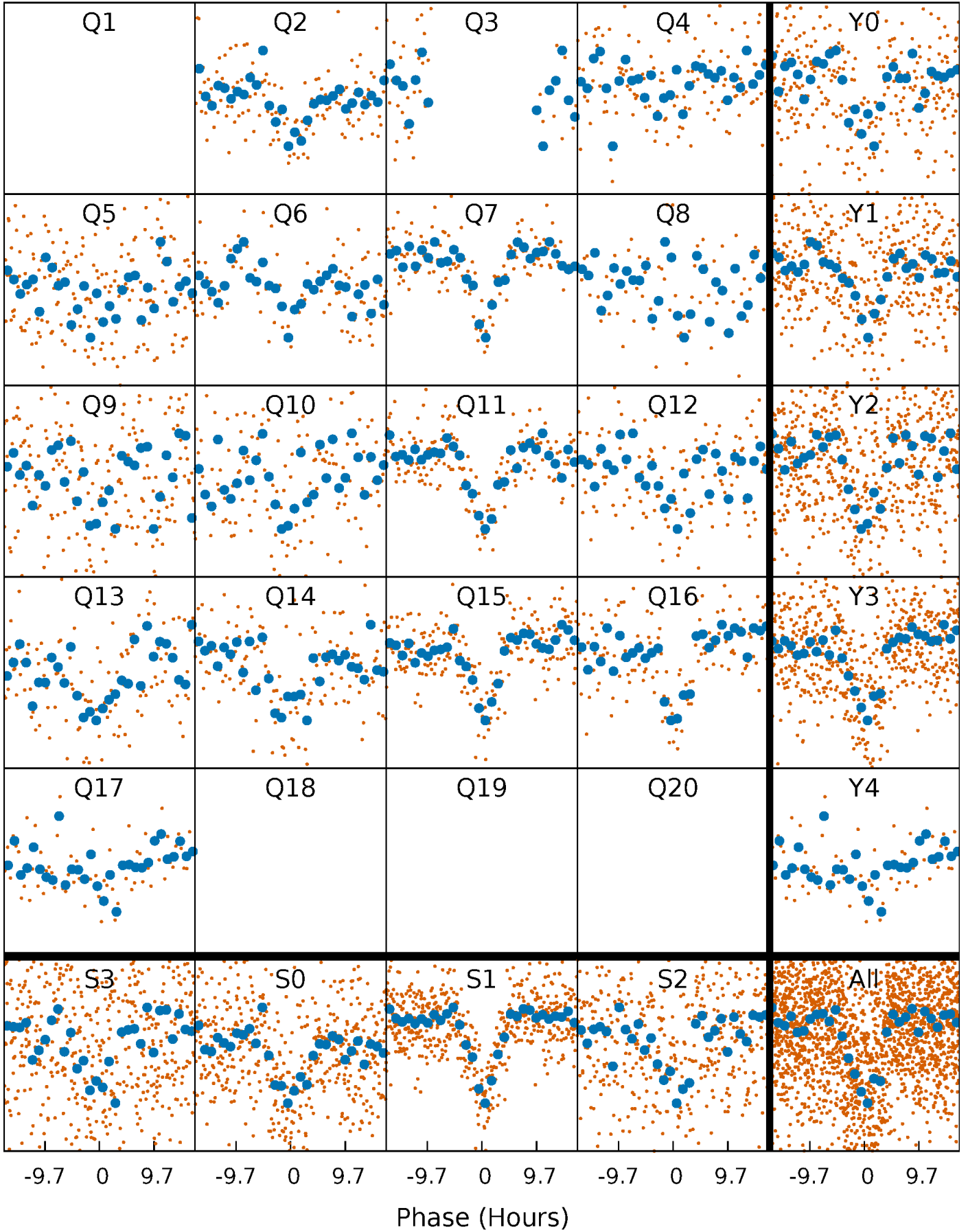


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



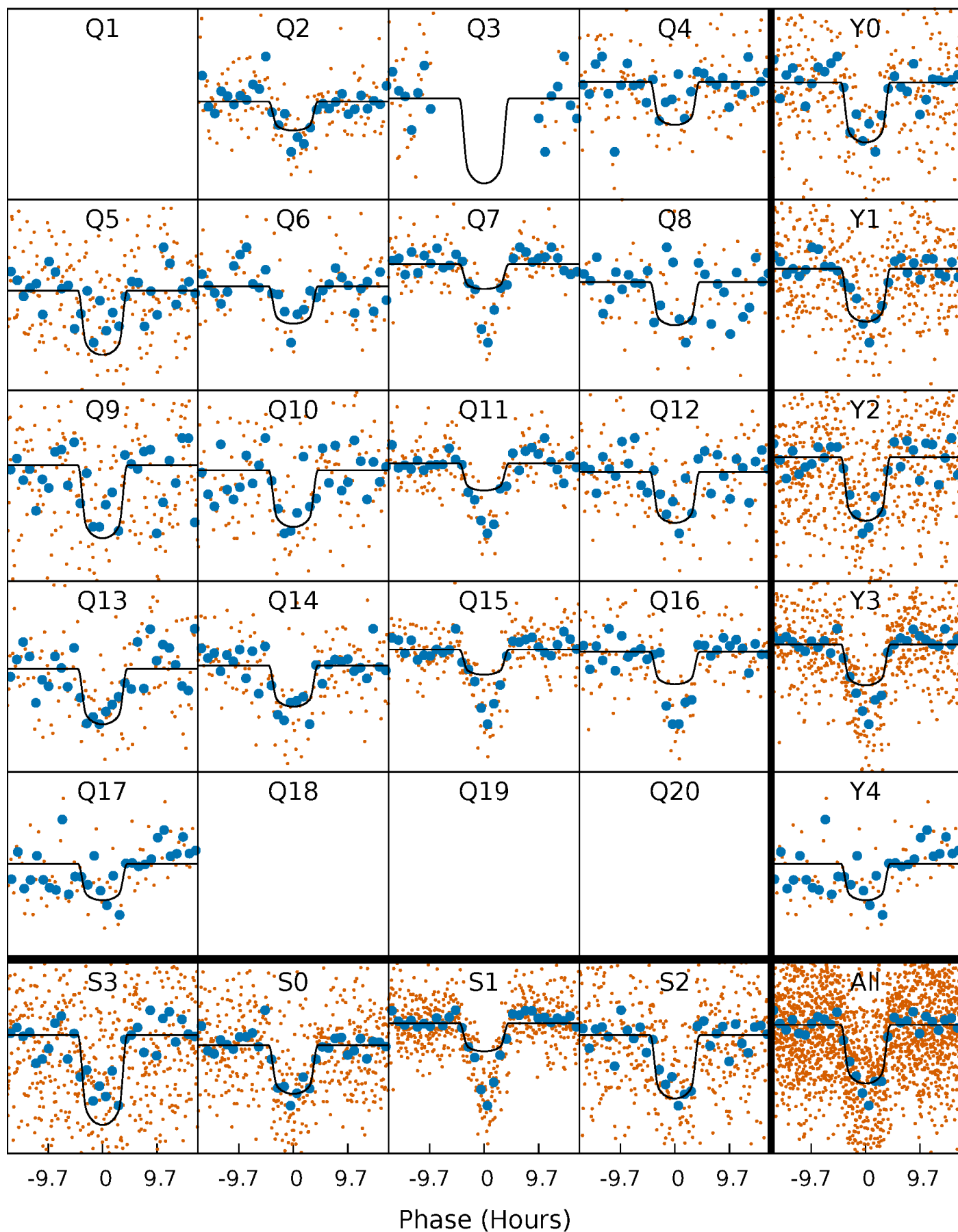
PDC Quarter-Phased Transit Curves

TCE 006864885-01 P= 40.877624 Days $T_0=158.307925$ (BKJD)



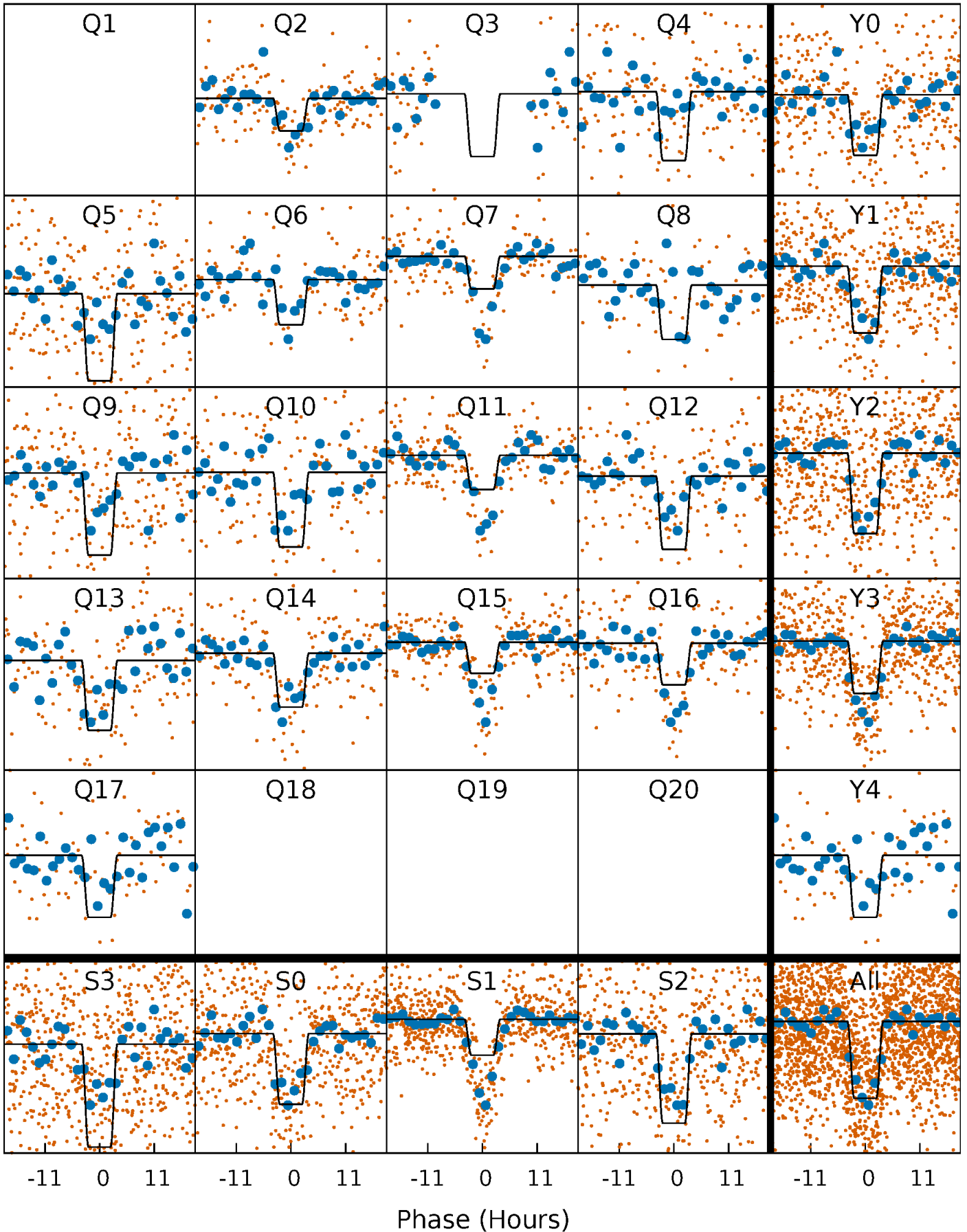
DV Quarter-Phased Transit Curves

TCE 006864885-01 P= 40.877624 Days $T_0=158.307925$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

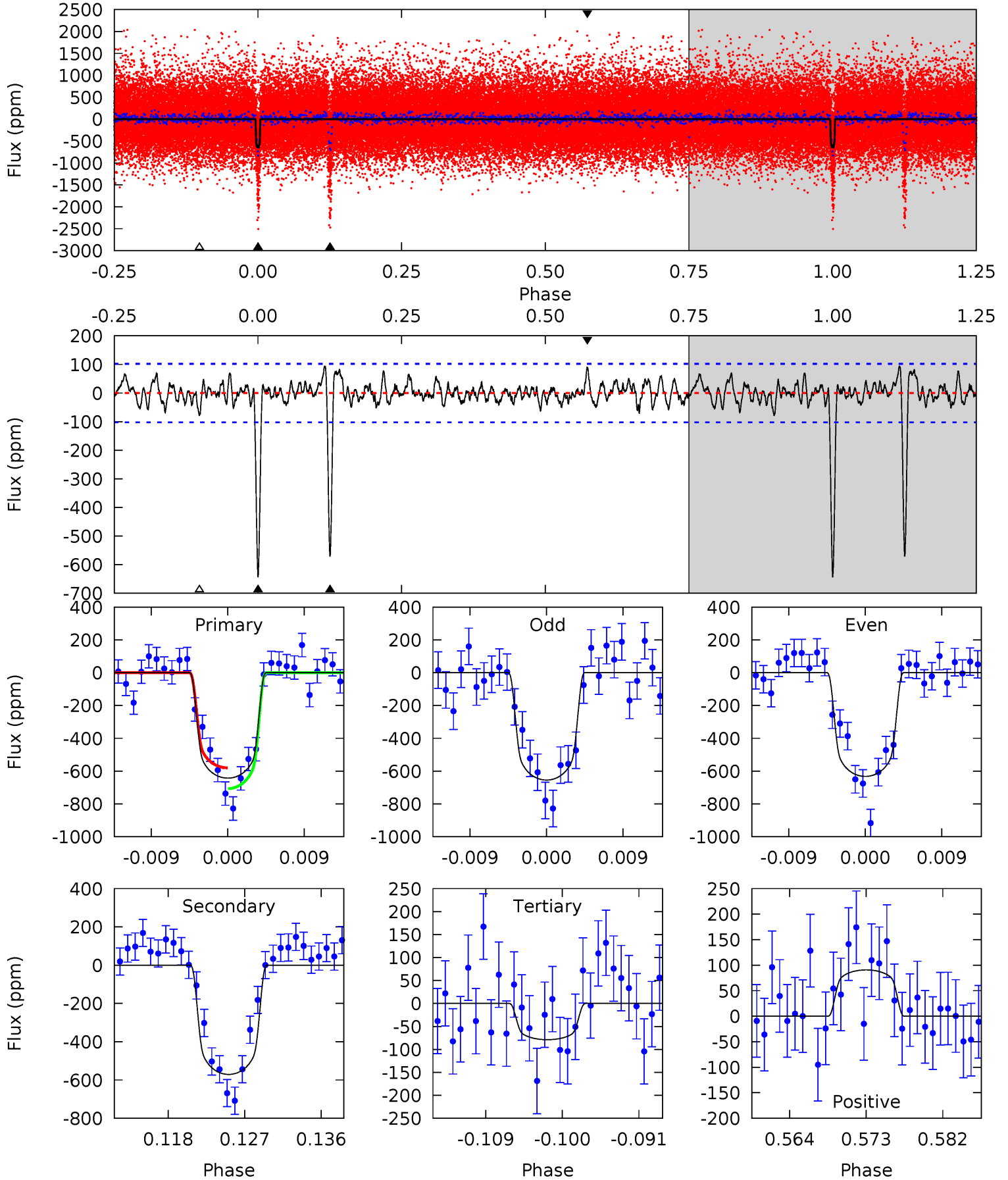
TCE 006864885-01 P= 40.877884 Days $T_0=158.309250$ (BKJD)



DV Model-Shift Uniqueness Test

006864885-01, $P = 40.877624$ Days, $E = 158.307925$ Days

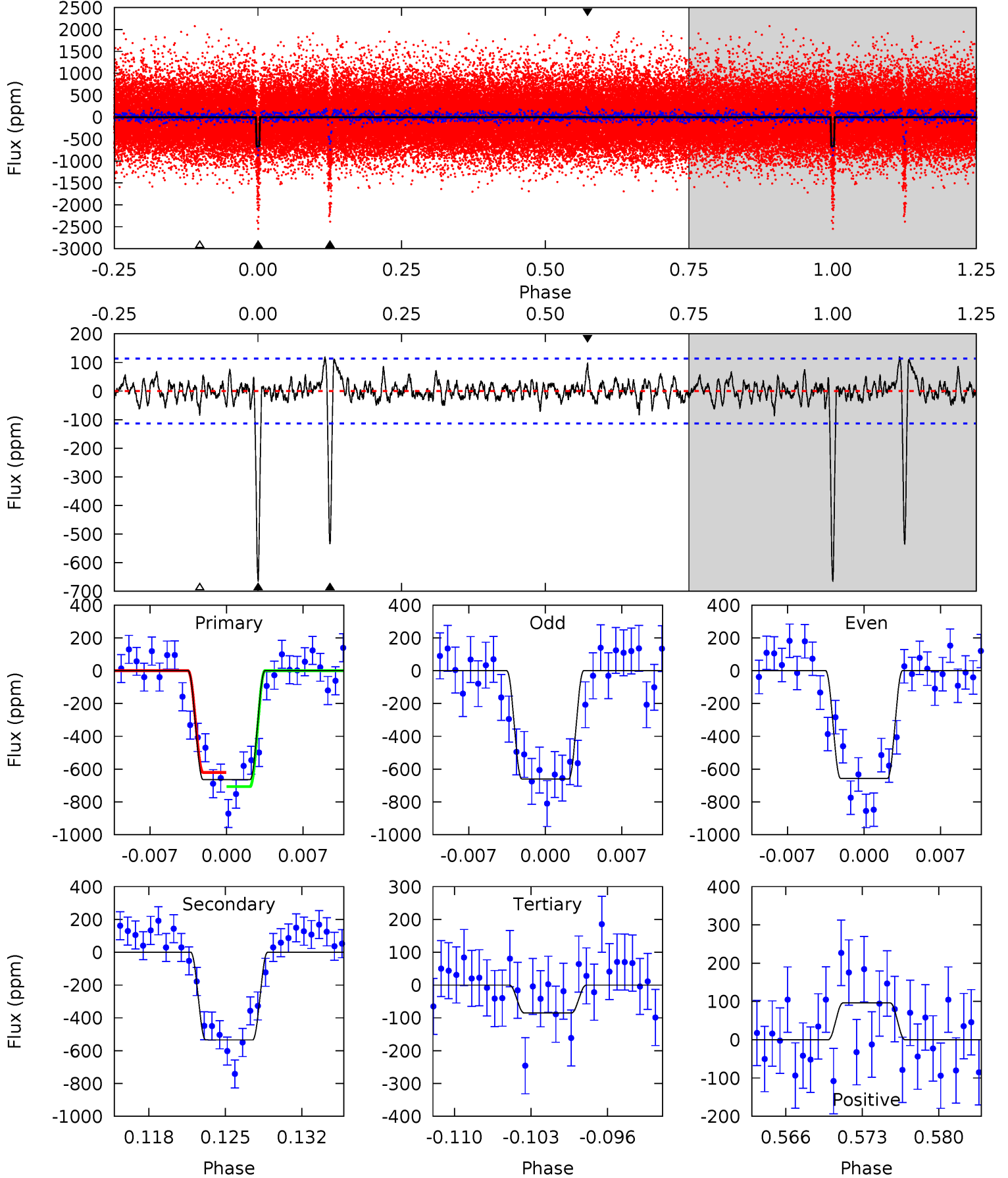
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.7	28.2	3.89	4.47	5.04	2.61	1.37	27.8	27.2	24.3	23.7	0.55	1.25	0.13	3.13



Alt Model-Shift Uniqueness Test

006864885-01, $P = 40.877884$ Days, $E = 158.309250$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.7	23.9	3.81	4.31	5.09	2.68	1.23	25.9	25.4	20.1	19.6	0.09	1.31	0.15	1.92



Stellar Parameters For KIC 006864885

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5930^{+178}_{-196}	$4.489^{+0.054}_{-0.216}$	$-0.140^{+0.300}_{-0.300}$	$0.937^{+0.294}_{-0.098}$	$0.988^{+0.122}_{-0.122}$	$1.693^{+0.470}_{-0.877}$
	+3%/-3%	+1%/-5%	+214%/-214%	+31%/-10%	+12%/-12%	+28%/-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 006864885-01 / KOI 2434.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-571 ± 20	$2.80^{+0.45}_{-0.30}$	751^{+51}_{-37}	5647^{+229}_{-230}	2105^{+469}_{-485}
Alt.	-535 ± 22	$2.83^{+0.47}_{-0.29}$	751^{+59}_{-38}	5533^{+215}_{-212}	1930^{+450}_{-456}

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 $A_{obs} \gg 1.0$

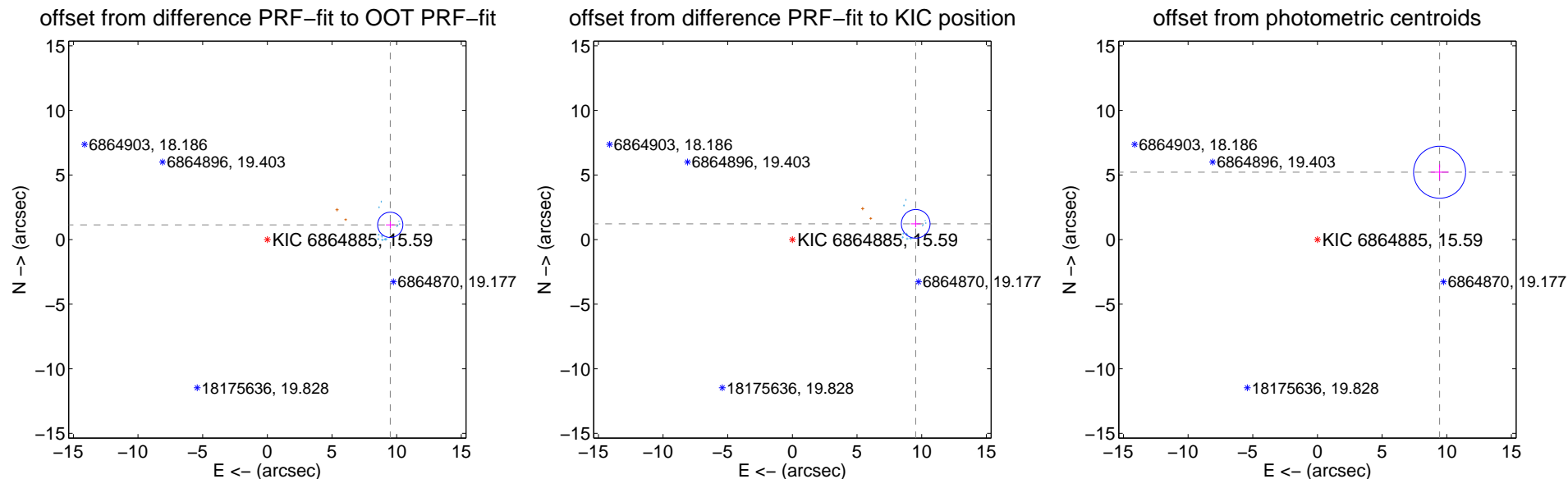
DV Centroid Data

Supplemental centroid analysis for 006864885-01. Kepler magnitude: 15.59. Transit SNR 20.19

There are 12 quarters with good PRF difference image offsets

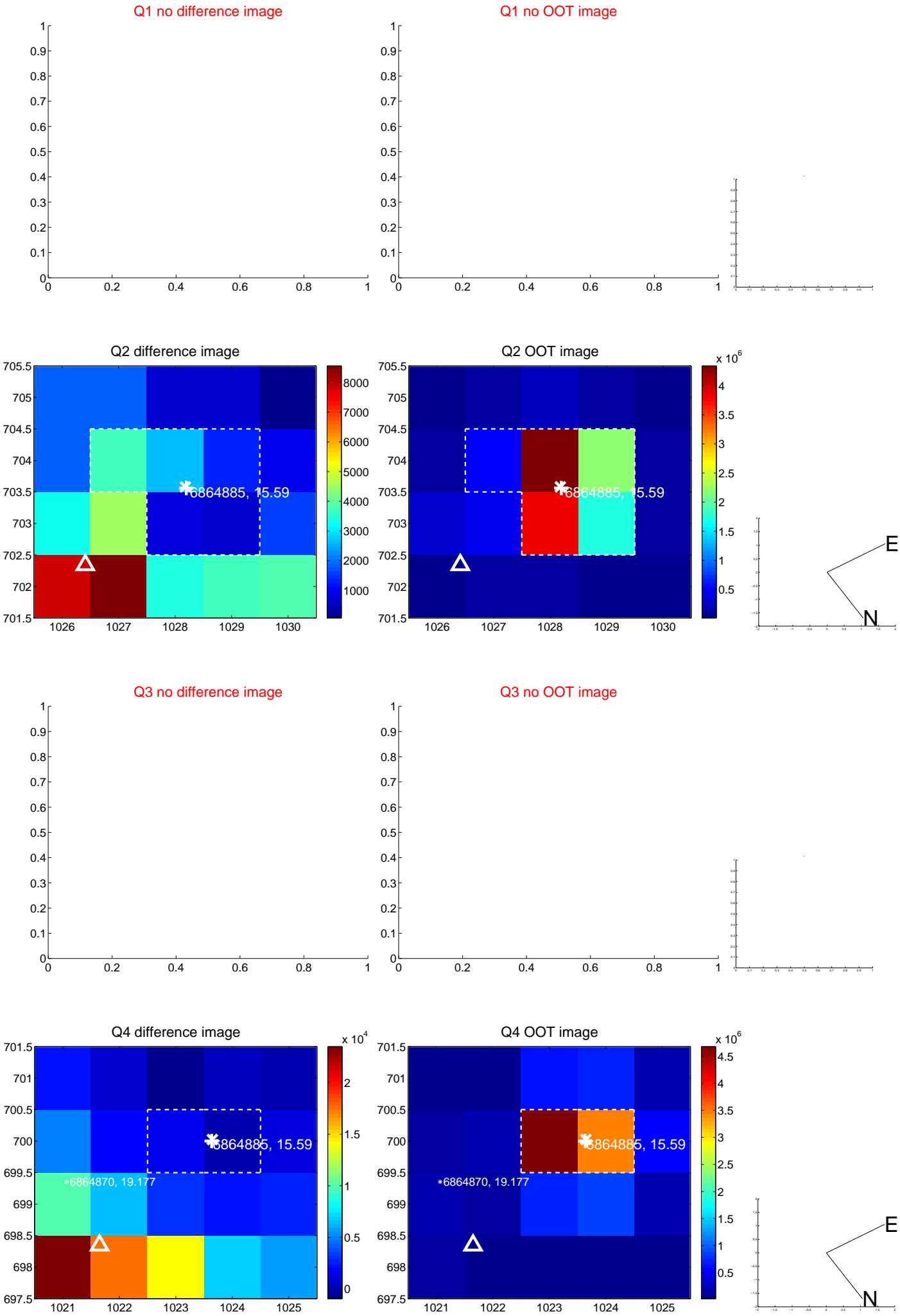
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	9.574 ± 0.326	29.41	-9.505 ± 0.334	1.142 ± 0.261
PRF-fit source offset from KIC position	9.614 ± 0.370	25.99	-9.537 ± 0.381	1.219 ± 0.254
photometric centroid source offset	10.79 ± 0.67	16.09	-9.45 ± 0.69	5.21 ± 0.61

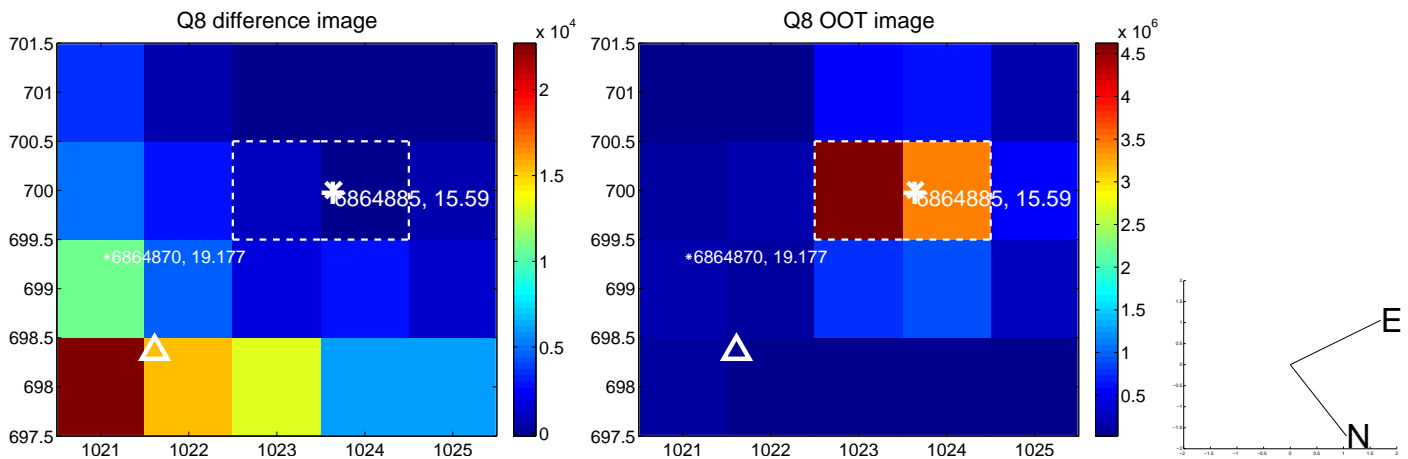
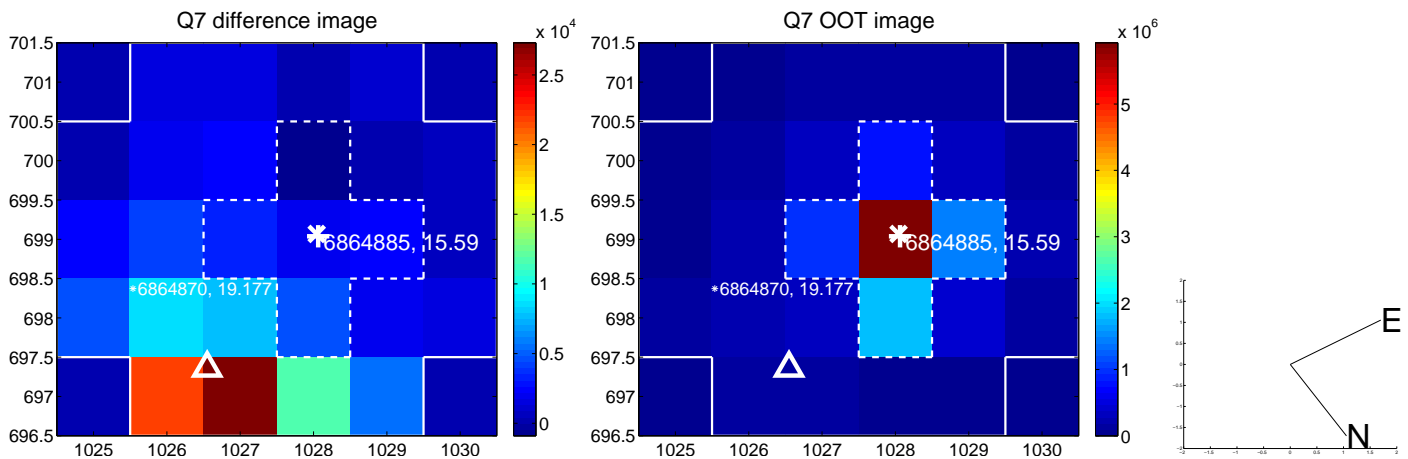
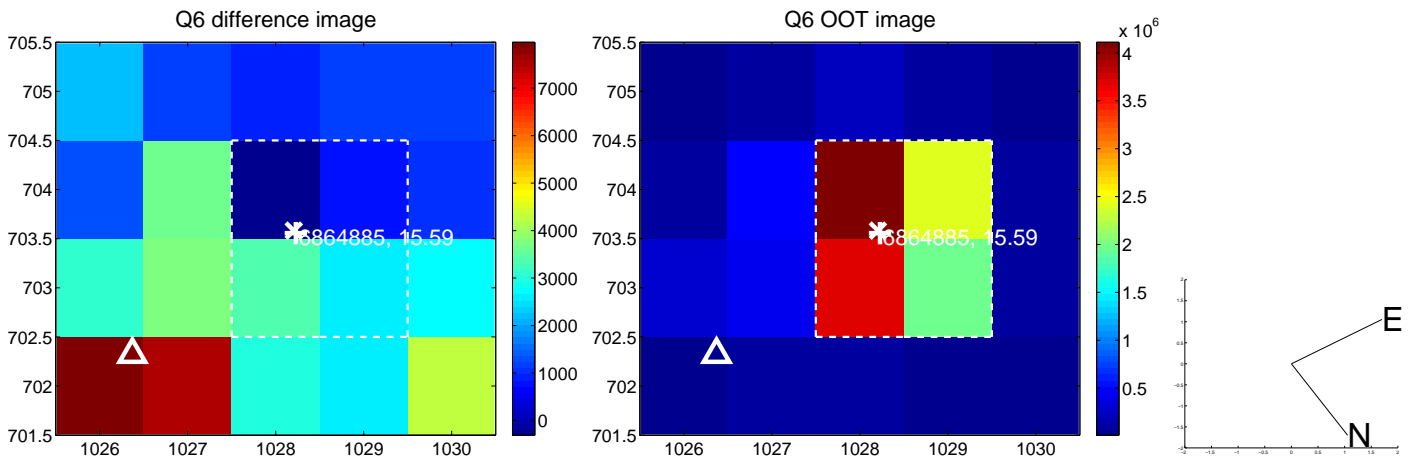
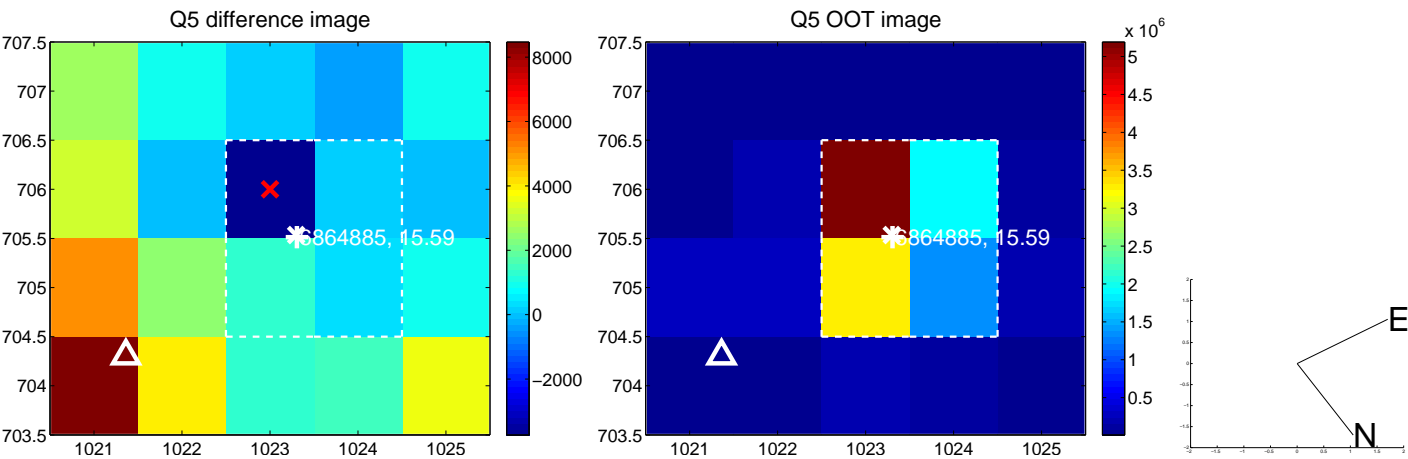


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

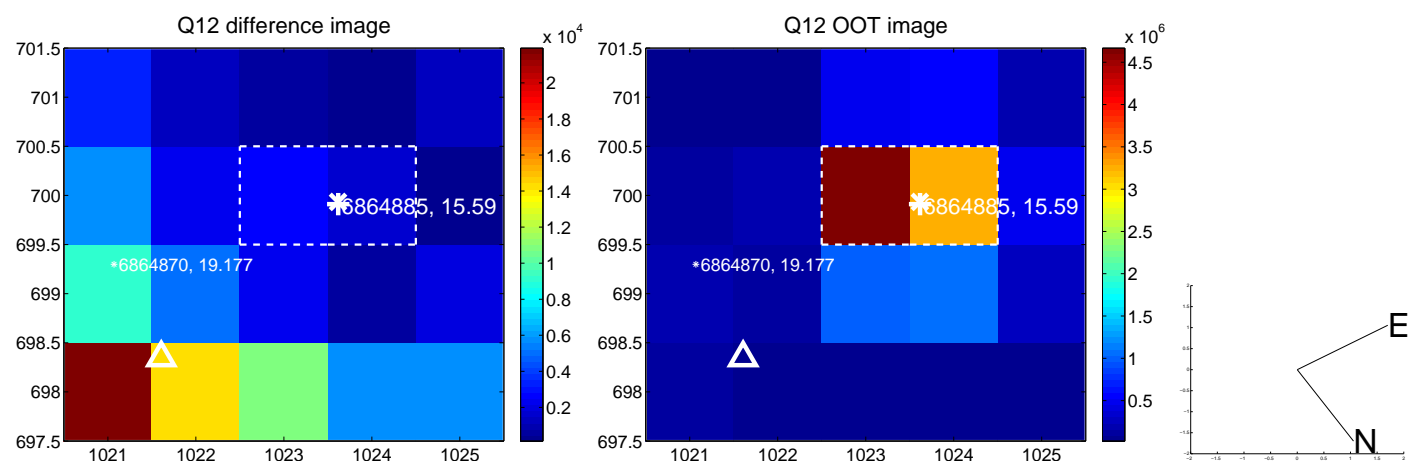
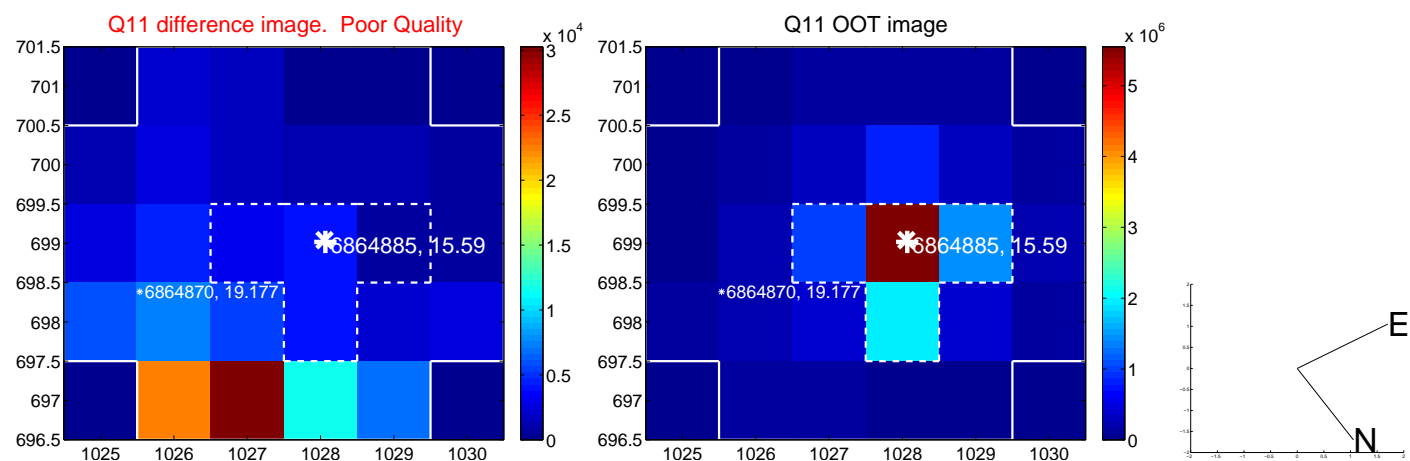
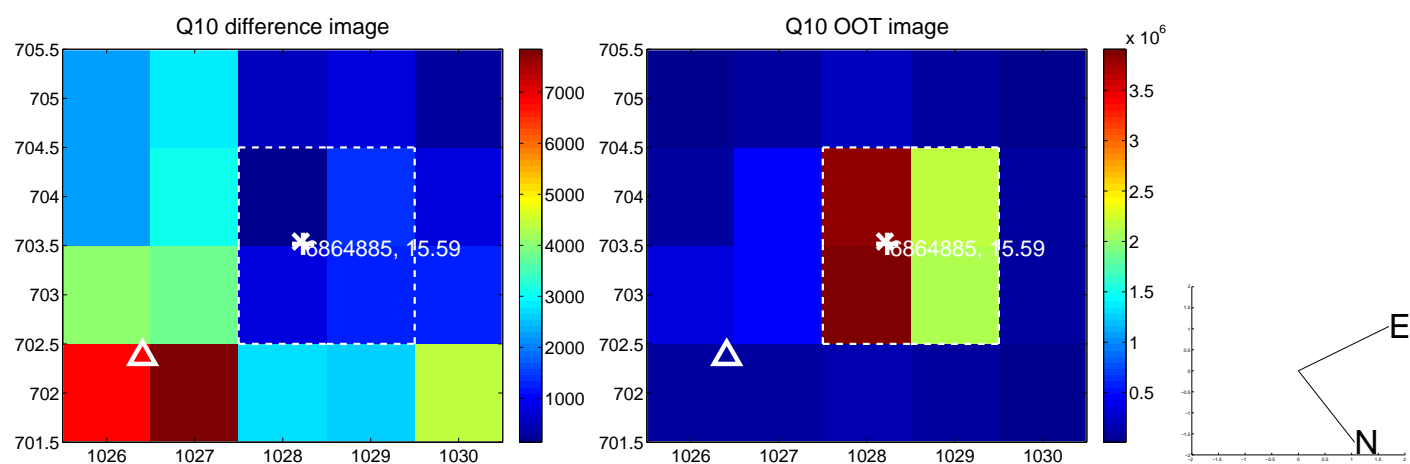
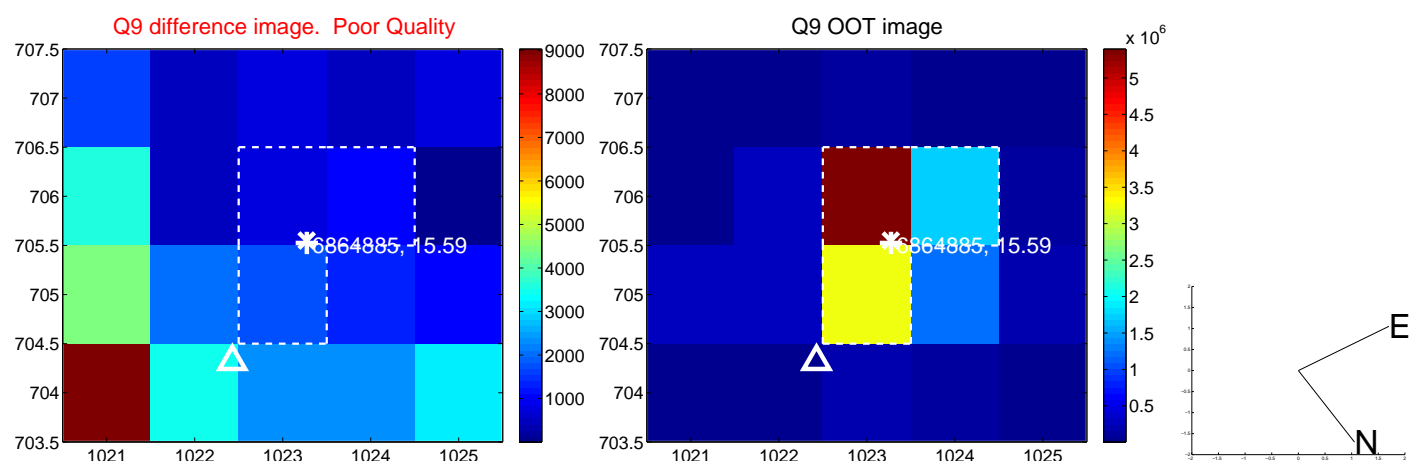
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



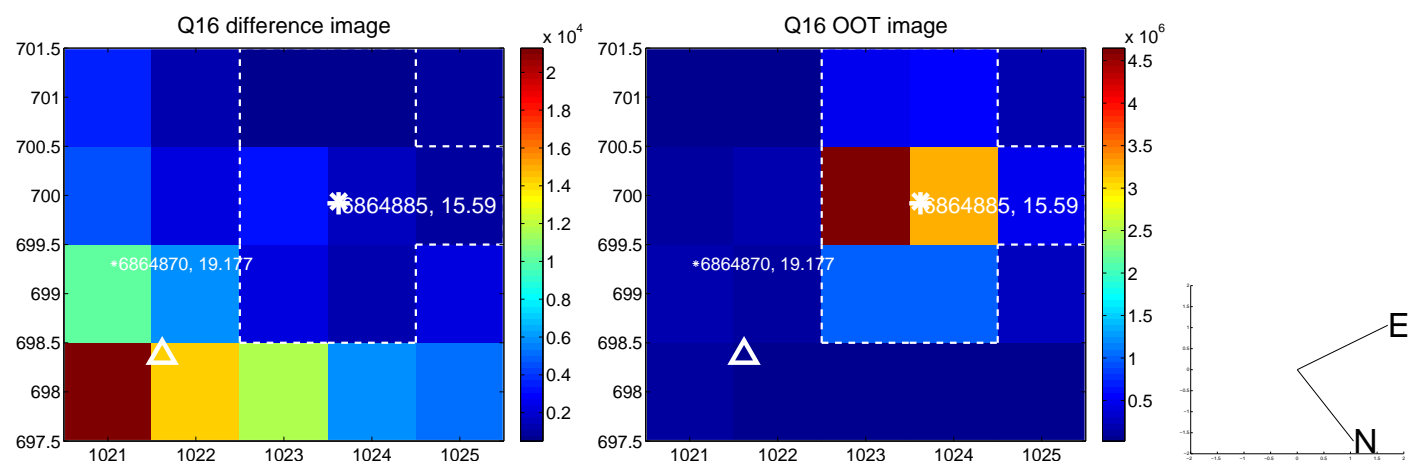
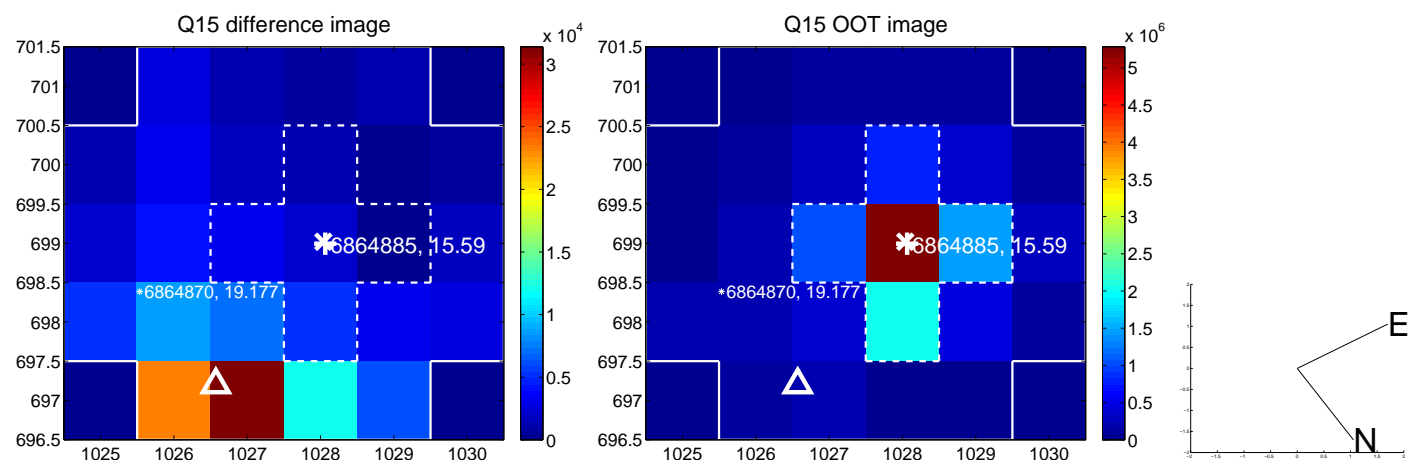
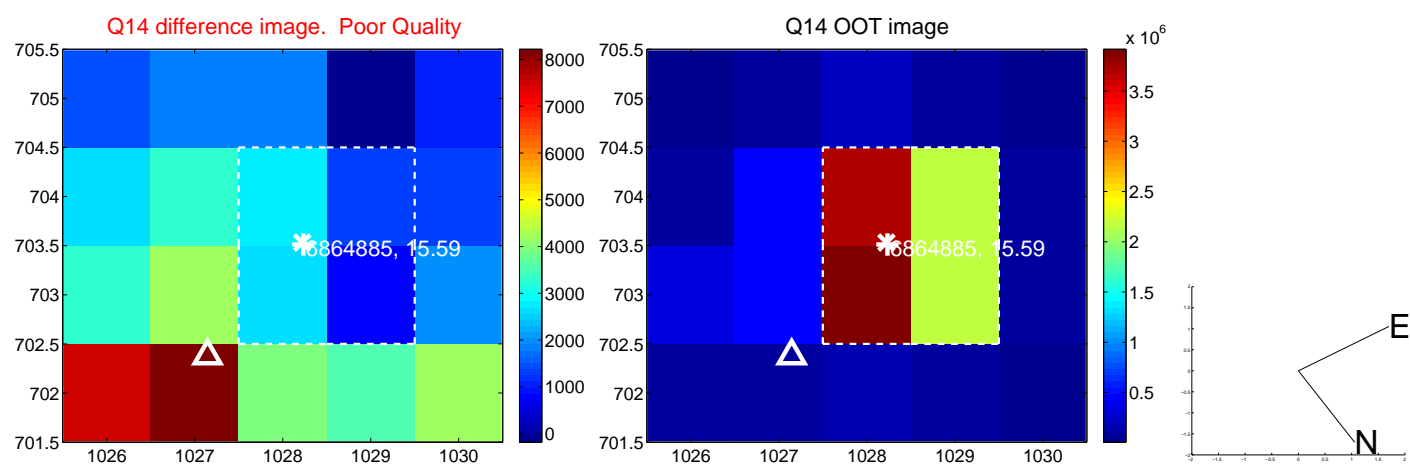
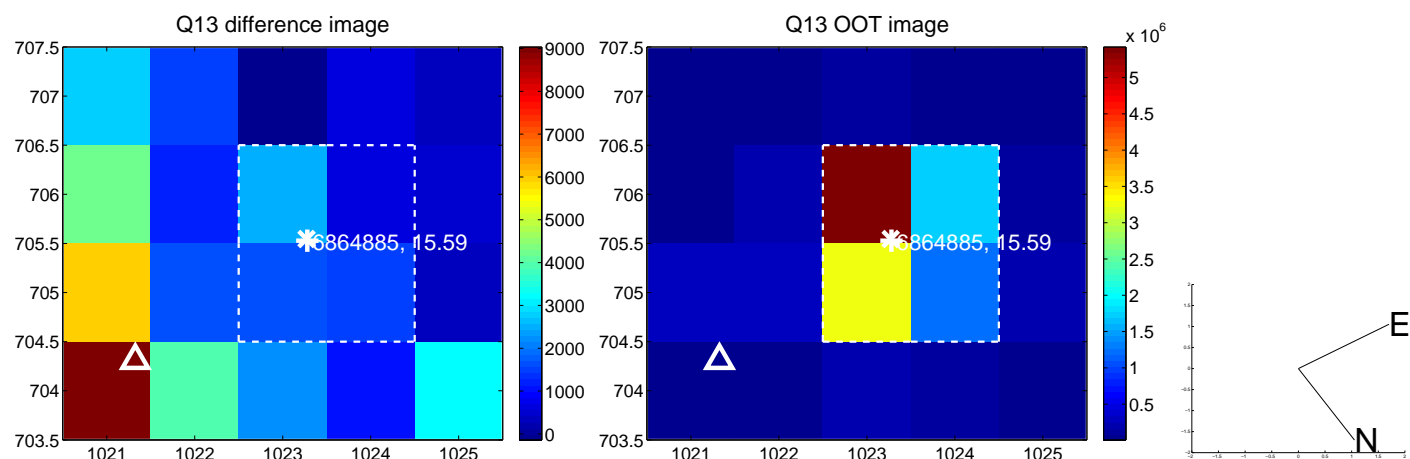
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



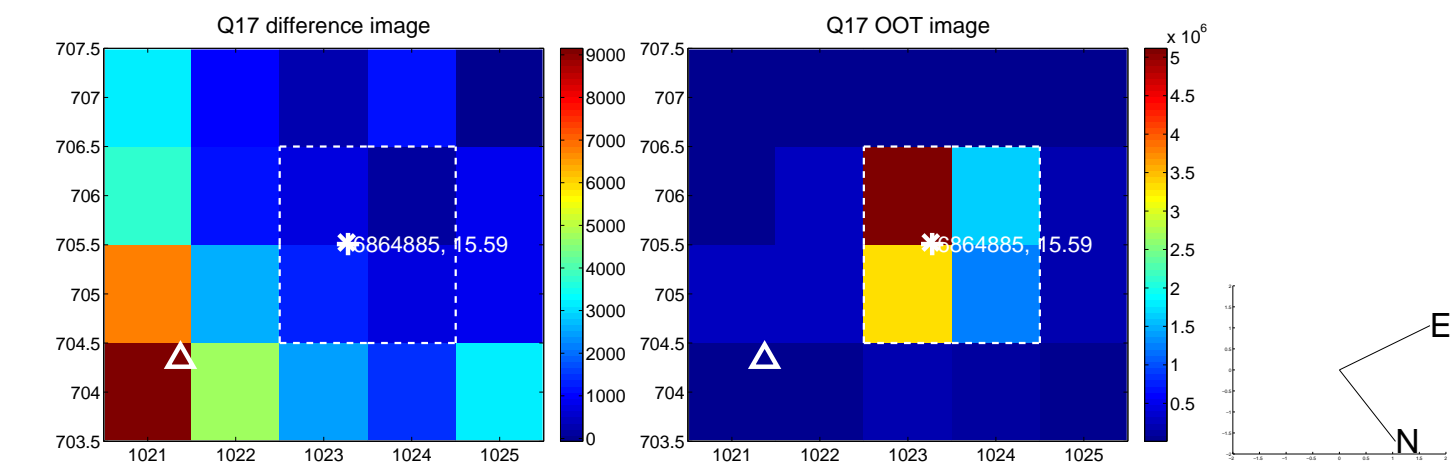
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



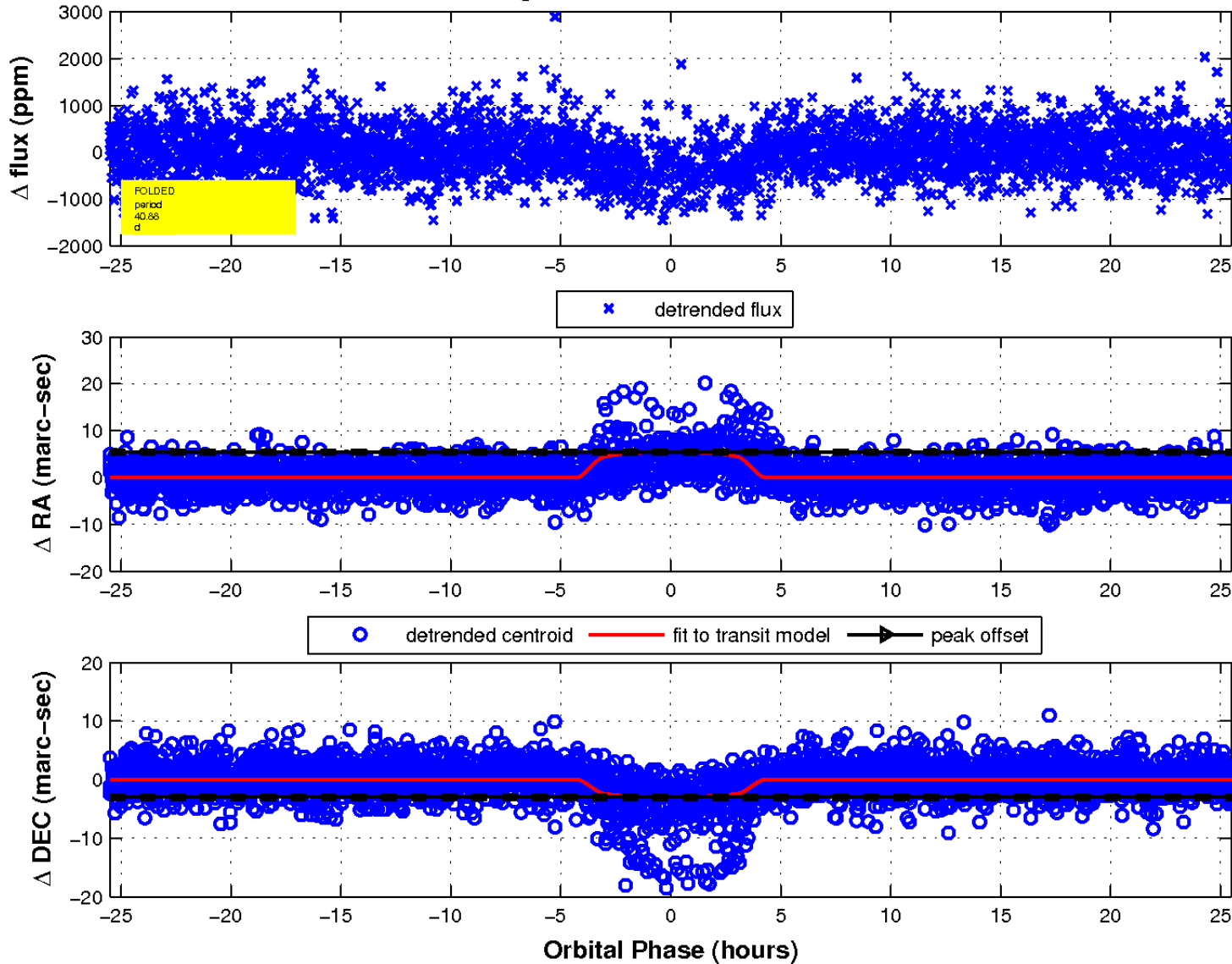
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

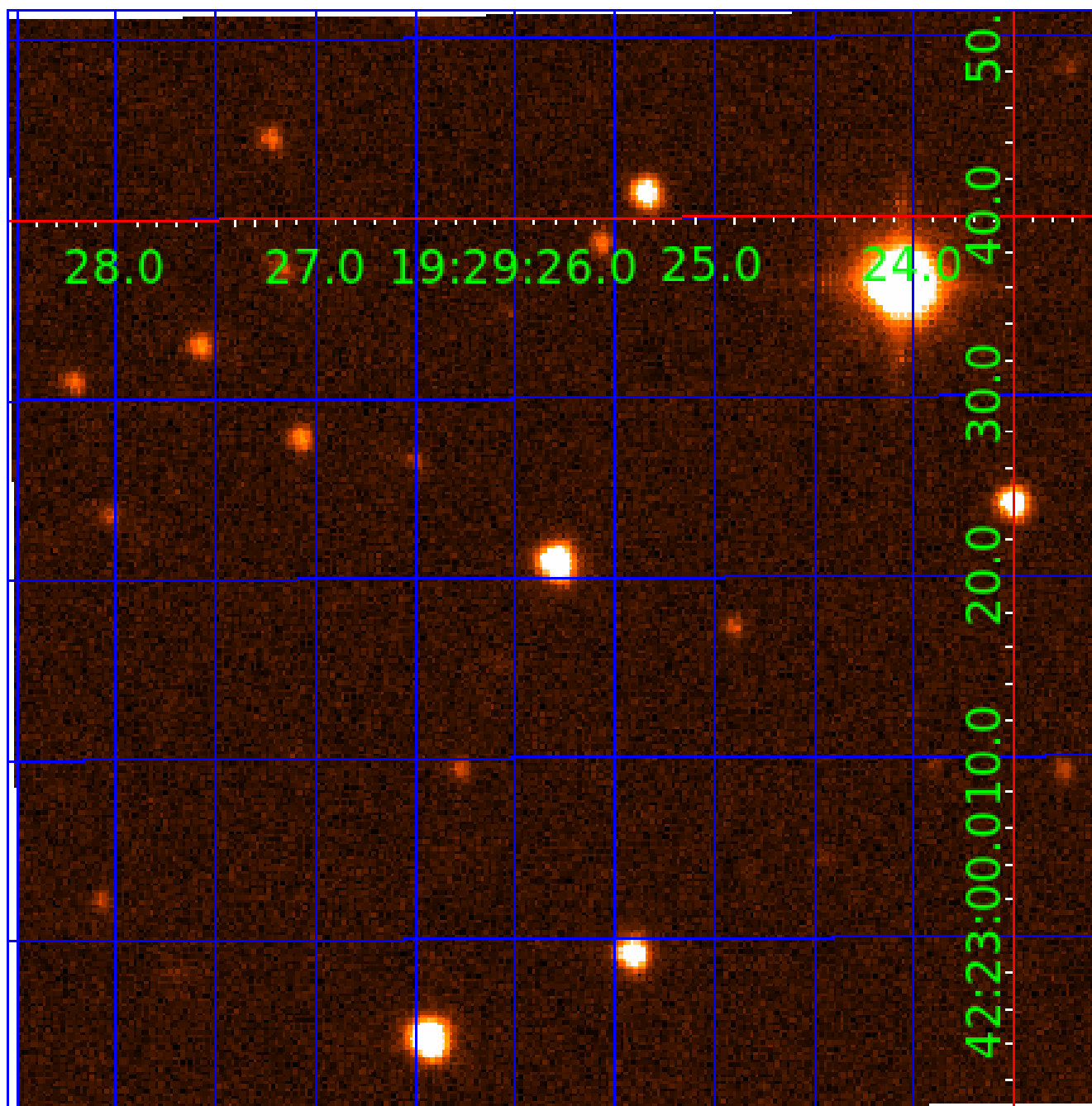


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 006864885

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})
006864885-01	OBS	2434.01	40.877624	158.307925	586.8	8.503	20.8	20.2	0.94	5930	2.71	18.18
006864885-02	OBS	No	40.878026	163.430384	636.8	9.454	21.1	19.8	0.94	5930	3.53	18.18

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006864885-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—EPHEM_MATCH
006864885-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—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 006864885-02

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
006864885-02	6864885	006864859-02	6864859	1:1	24.5	5	2	11.66	15.59	399.42	Direct-PRF	0	0.08	0.04

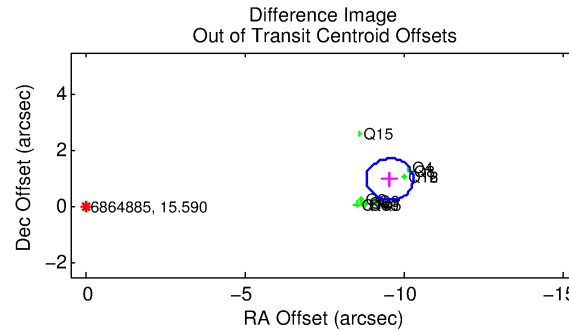
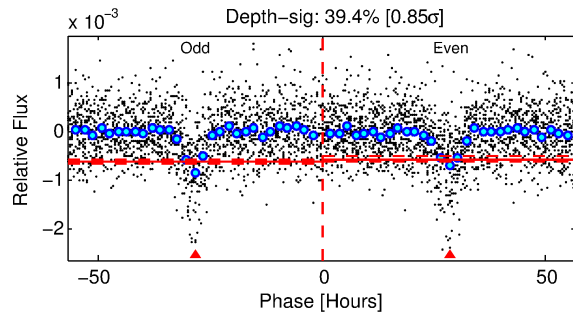
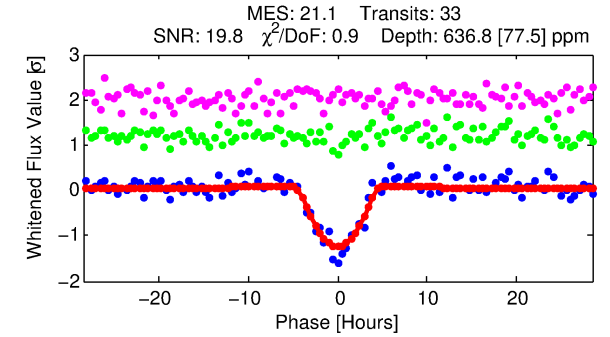
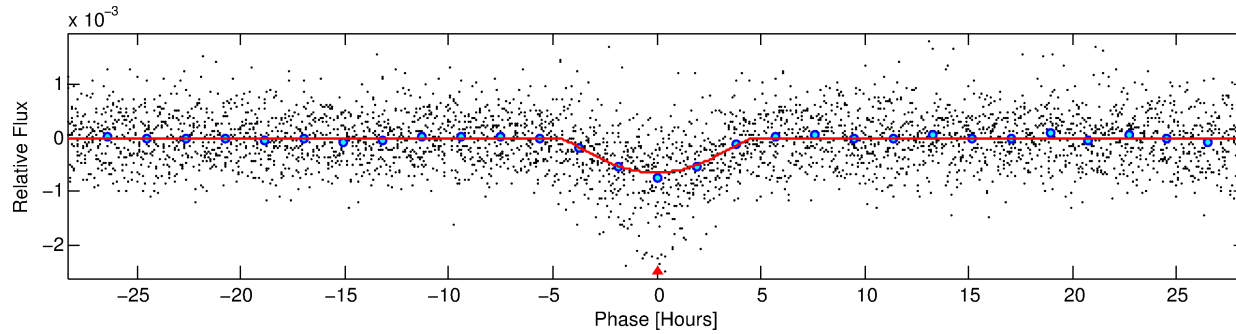
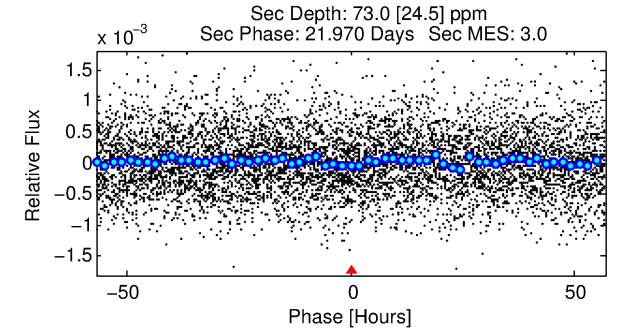
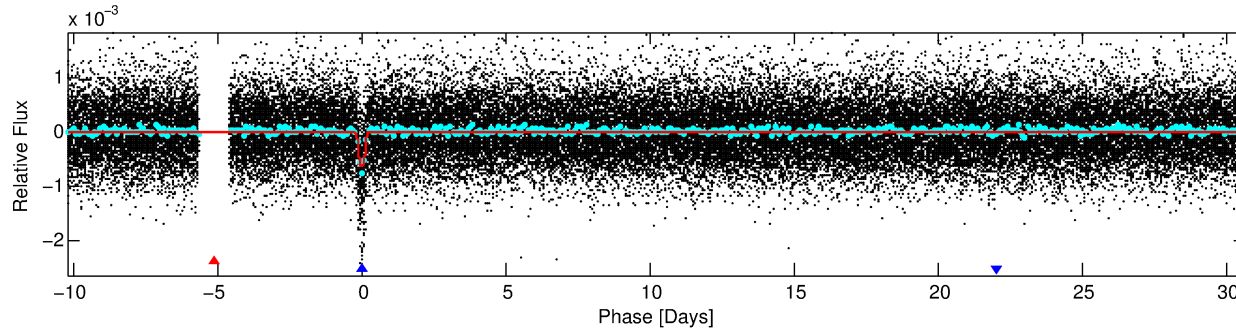
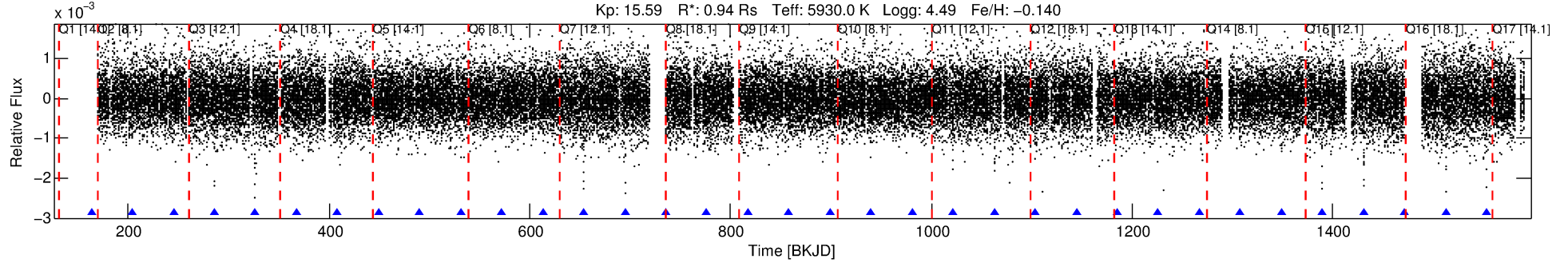
Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match 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: 6864885 Candidate: 2 of 2 Period: 40.878 d

KOI: K02434.01 Corr: 0.991

Kp: 15.59 R*: 0.94 Rs Teff: 5930.0 K Logg: 4.49 Fe/H: -0.140



DV Fit Results:

Period = 40.87803 [0.00059] d
Epoch = 163.4304 [0.0112] BKJD
Rp/R* = 0.0346 [0.0186]
a/R* = 10.85 [2.59]
b = 0.98 [0.04]
Seff = 18.18 [7.52]
Teq = 527 [54] K
Rp = 3.53 [2.20] Re
a = 0.2313 [0.0617] AU
Ag = 172.00 [205.22] [0.83σ]
Teff = 2948 [836] K [2.89σ]

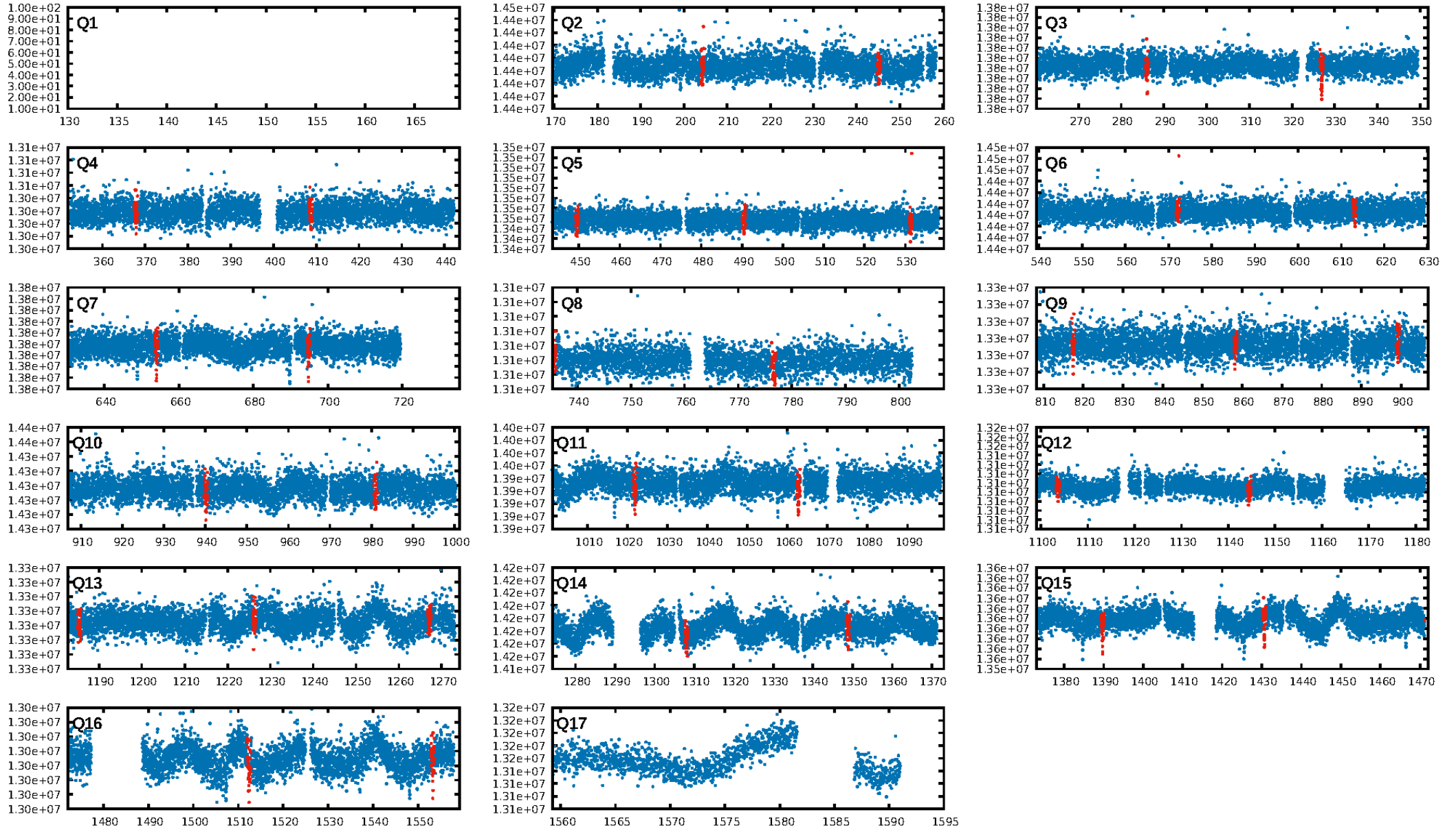
DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGoF-sig: 100.0%
Bootstrap-pfa: 1.02e-100
RollingBand-fgt: 1.00 [33/33]
GhostDiagnostic-chr: -0.1142
Centroid-sig: 0.0%
Centroid-so: 9.567 arcsec [14.06σ]
OotOffset-rm: 9.589 arcsec [39.04σ]
KicOffset-rm: 9.632 arcsec [37.03σ]
OotOffset-st: 4/1/4/2 [11]
KicOffset-st: 4/1/4/2 [11]
DiffImageQuality-fgm: 1.00 [11/11]
DiffImageOverlap-fno: 1.00 [13/13]

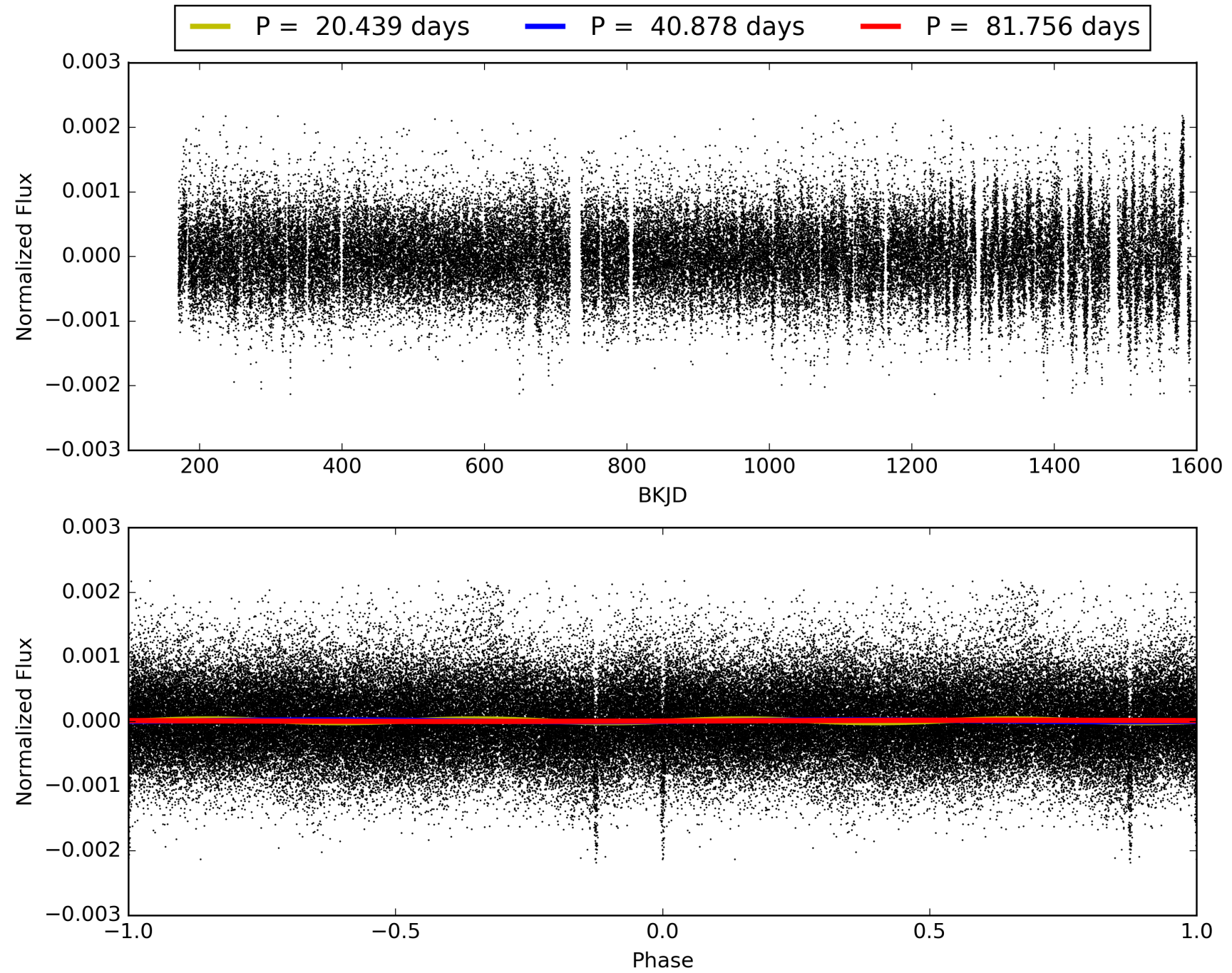
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 09:44:43 Z

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

TCE 006864885-02, PDC Light Curves

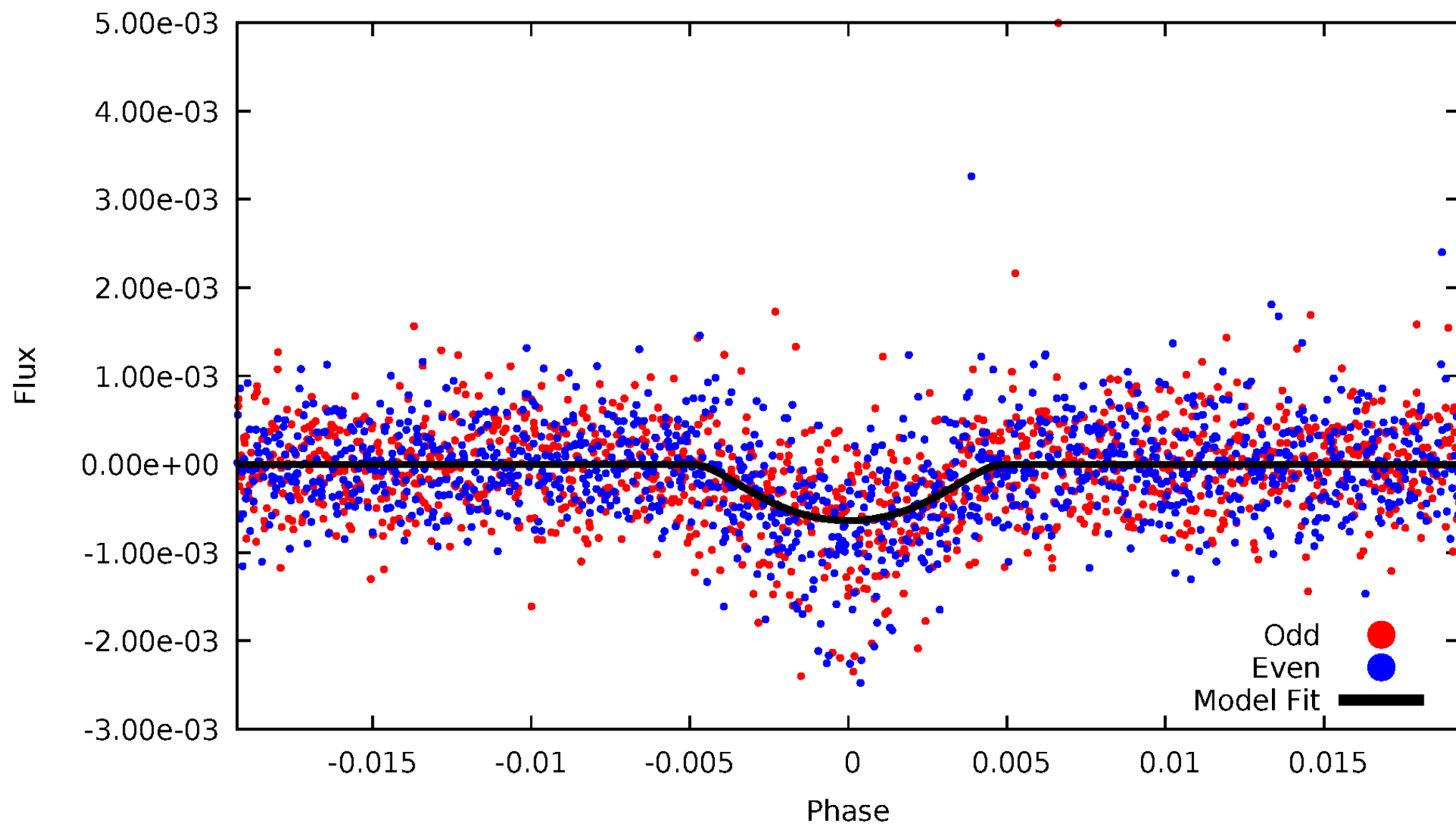


TCE 006864885-02



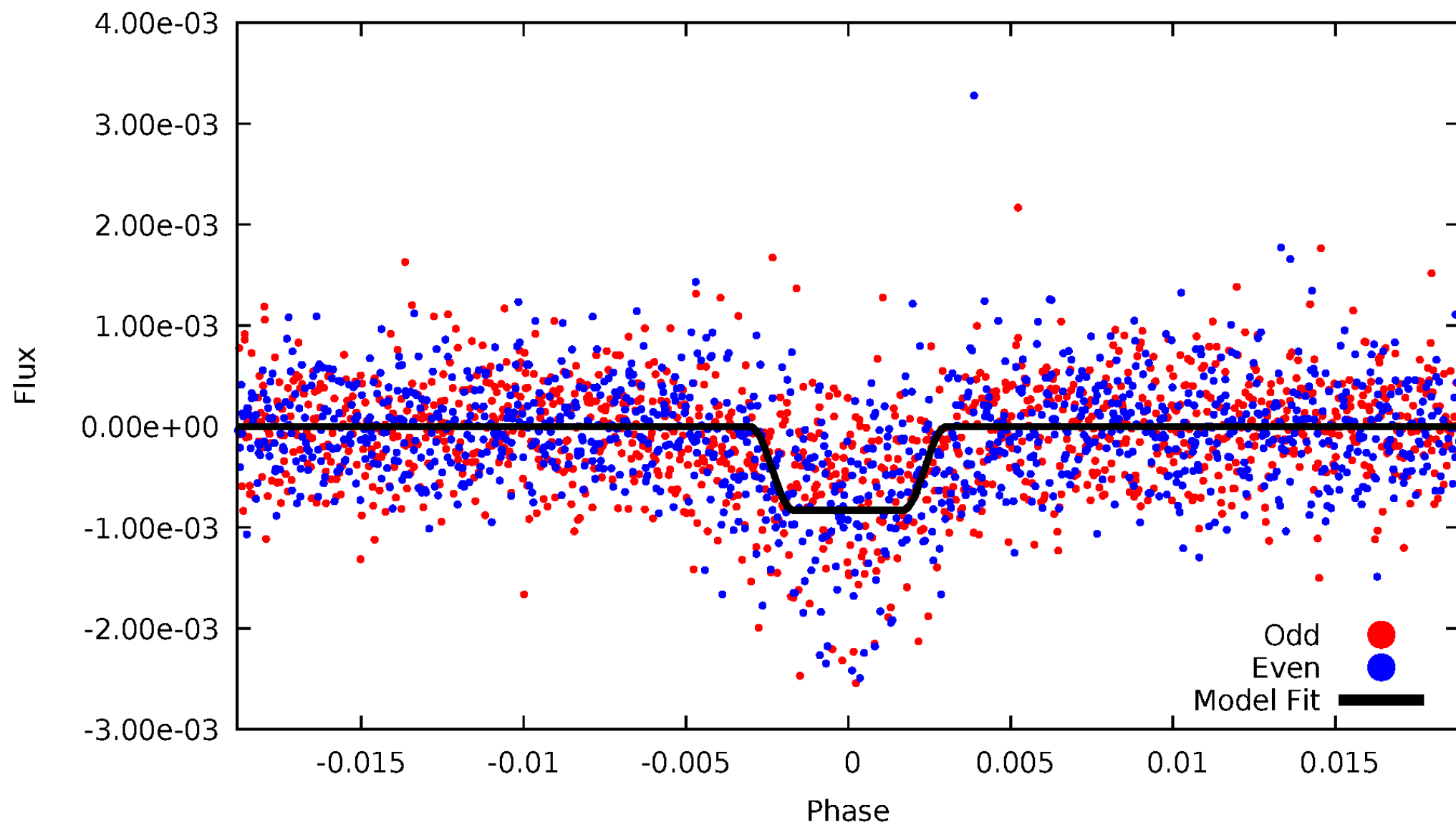
DV Odd/Even

TCE 006864885-02



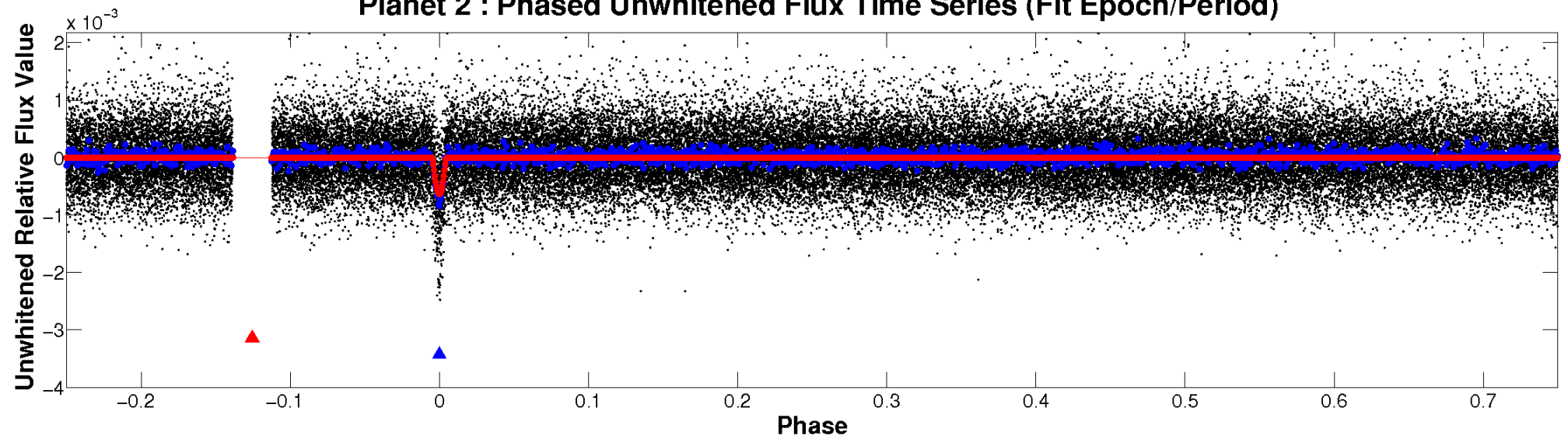
ALT Odd/Even

TCE 006864885-02

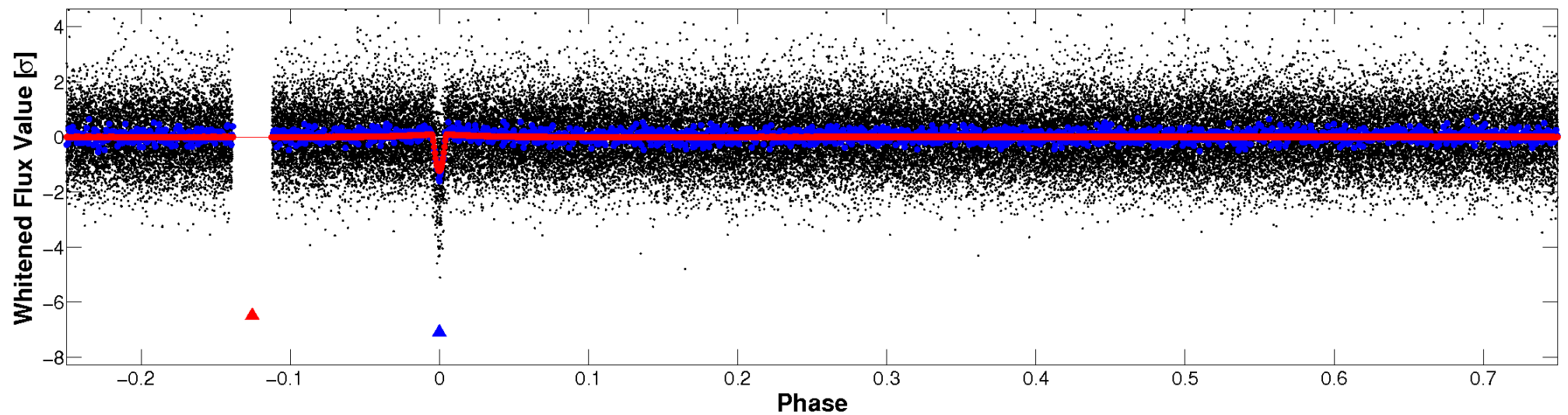


Non-Whitened Vs. Whitened Light Curve

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

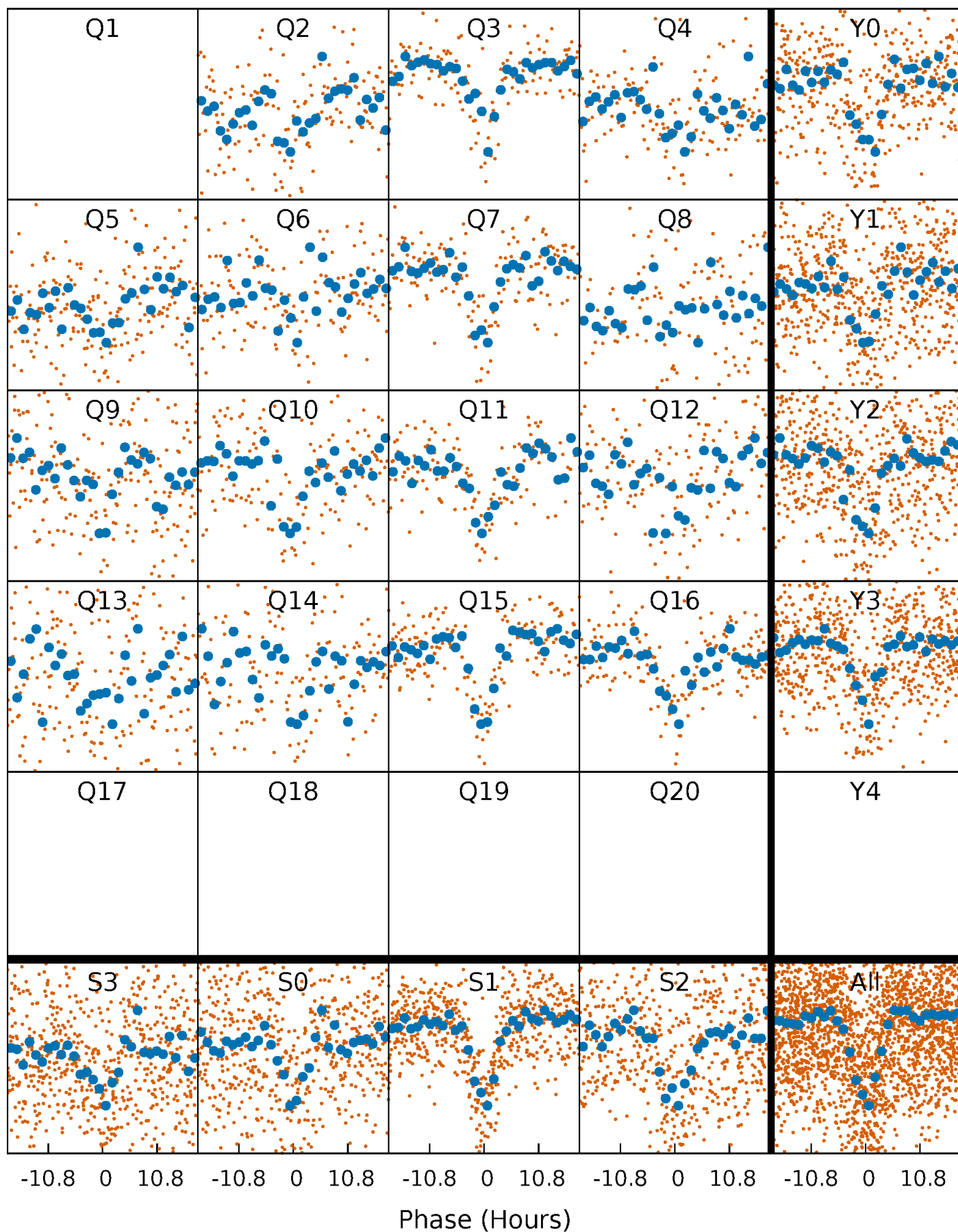


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



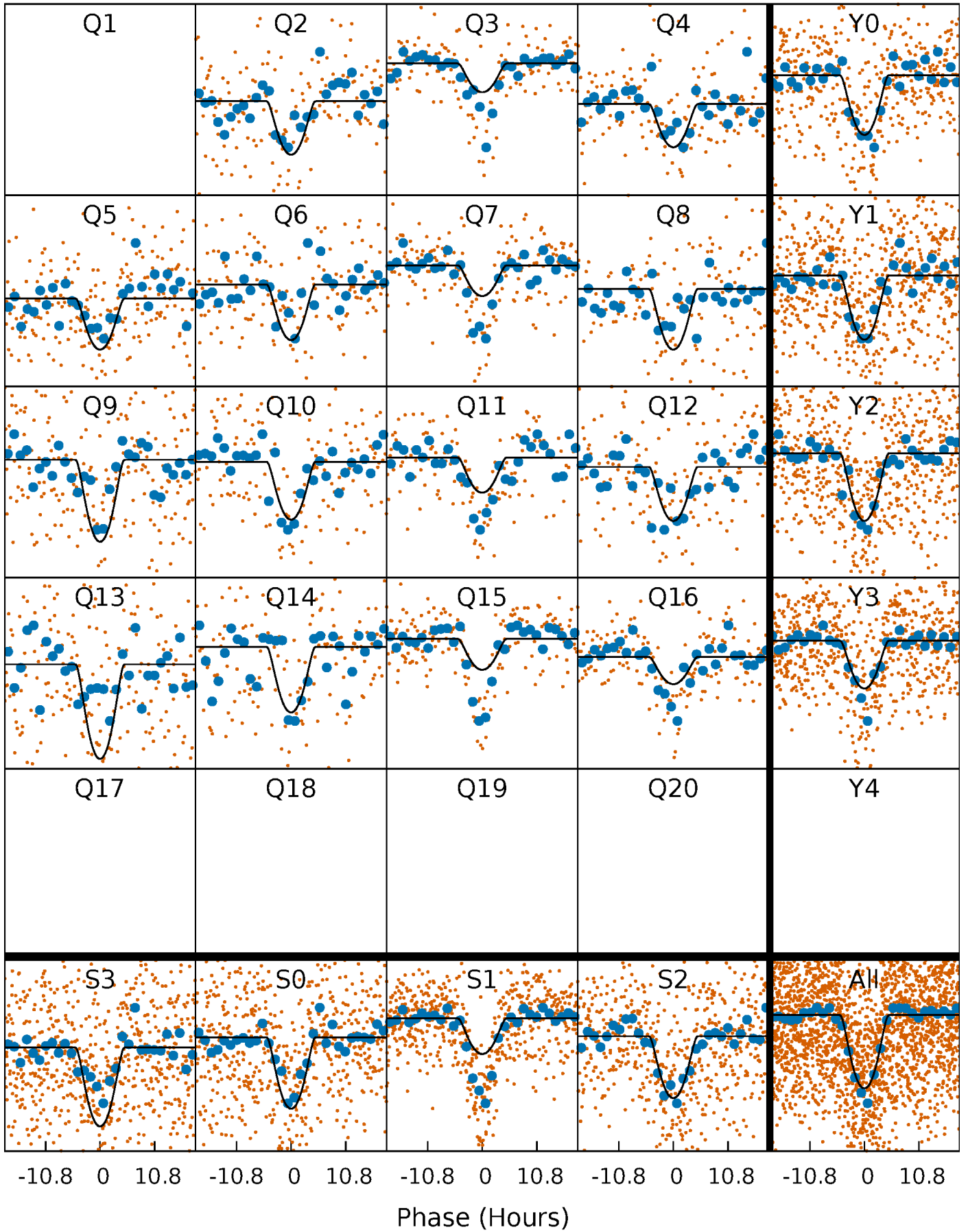
PDC Quarter-Phased Transit Curves

TCE 006864885-02 P= 40.878026 Days $T_0=163.430384$ (BKJD)



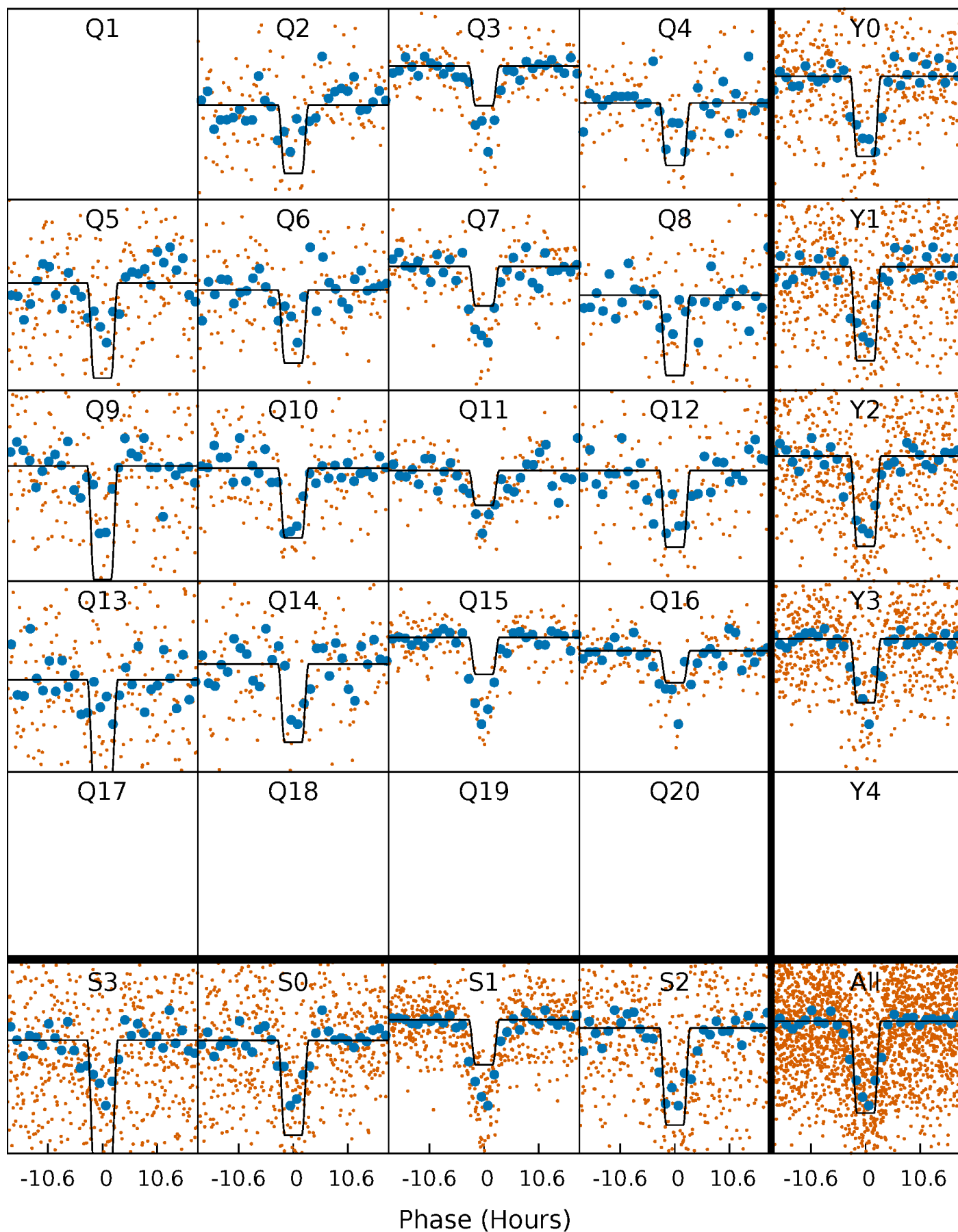
DV Quarter-Phased Transit Curves

TCE 006864885-02 P= 40.878026 Days $T_0=163.430384$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

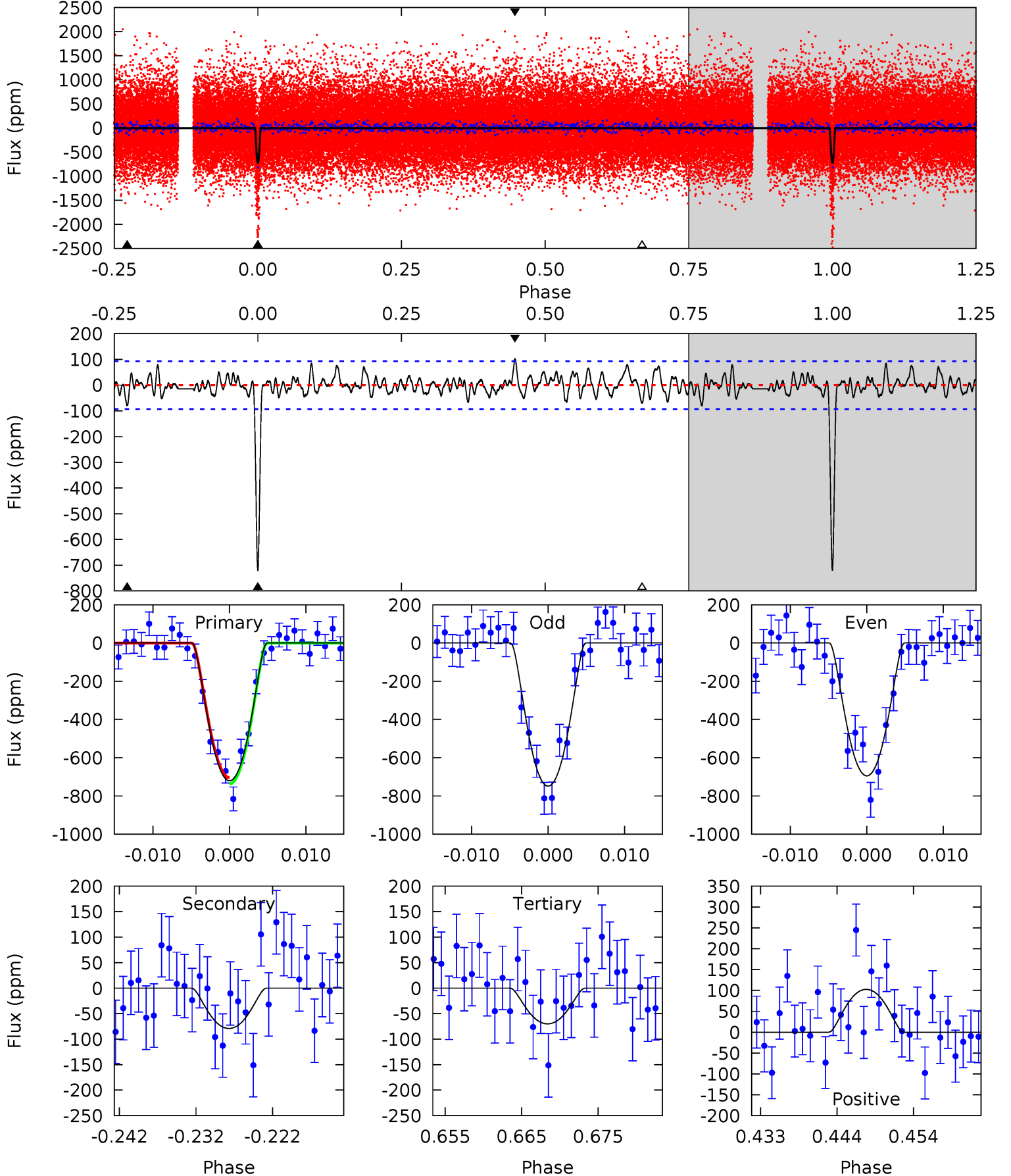
TCE 006864885-02 $P = 40.877884$ Days $T_0 = 163.432093$ (BKJD)



DV Model-Shift Uniqueness Test

006864885-02, P = 40.878026 Days, E = 163.430384 Days

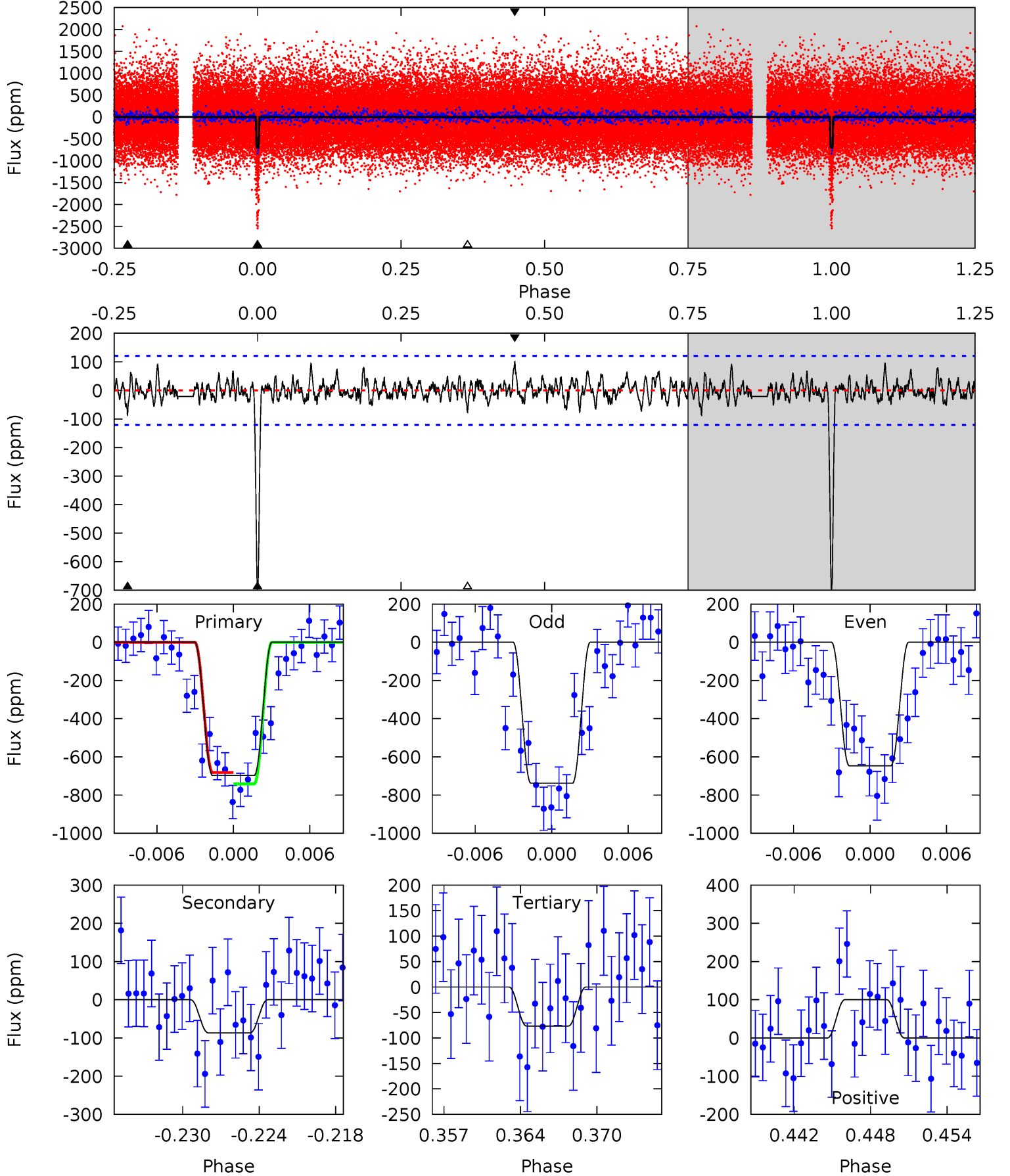
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
38.9	4.26	3.78	5.53	5.02	2.57	1.55	35.1	33.3	0.49	-1.26	1.45	1.26	0.12	0.89



Alt Model-Shift Uniqueness Test

006864885-02, $P = 40.877884$ Days, $E = 163.432093$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.5	3.68	3.24	4.25	5.12	2.74	1.14	26.3	25.3	0.43	-0.57	1.93	1.25	0.13	1.27



Stellar Parameters For KIC 006864885

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5930^{+178}_{-196}	$4.489^{+0.054}_{-0.216}$	$-0.140^{+0.300}_{-0.300}$	$0.937^{+0.294}_{-0.098}$	$0.988^{+0.122}_{-0.122}$	$1.693^{+0.470}_{-0.877}$
	+3%/-3%	+1%/-5%	+214%/-214%	+31%/-10%	+12%/-12%	+28%/-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 006864885-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-79 ± 19	$3.80^{+2.10}_{-1.76}$	750^{+52}_{-34}	3446^{+862}_{-420}	150^{+388}_{-84}
Alt.	-87 ± 24	$3.30^{+2.05}_{-1.81}$	754^{+56}_{-39}	3687^{+1339}_{-523}	233^{+886}_{-150}

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 $A_{\text{obs}} \gg 1.0$

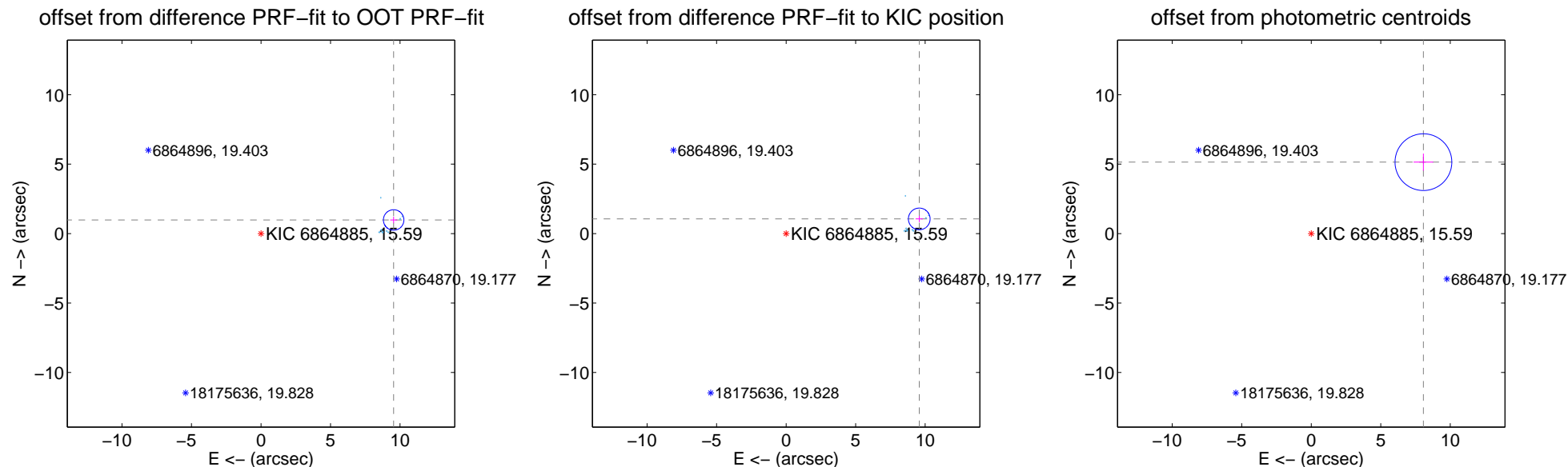
DV Centroid Data

Supplemental centroid analysis for 006864885-02. Kepler magnitude: 15.59. Transit SNR 19.82

There are 11 quarters with good PRF difference image offsets

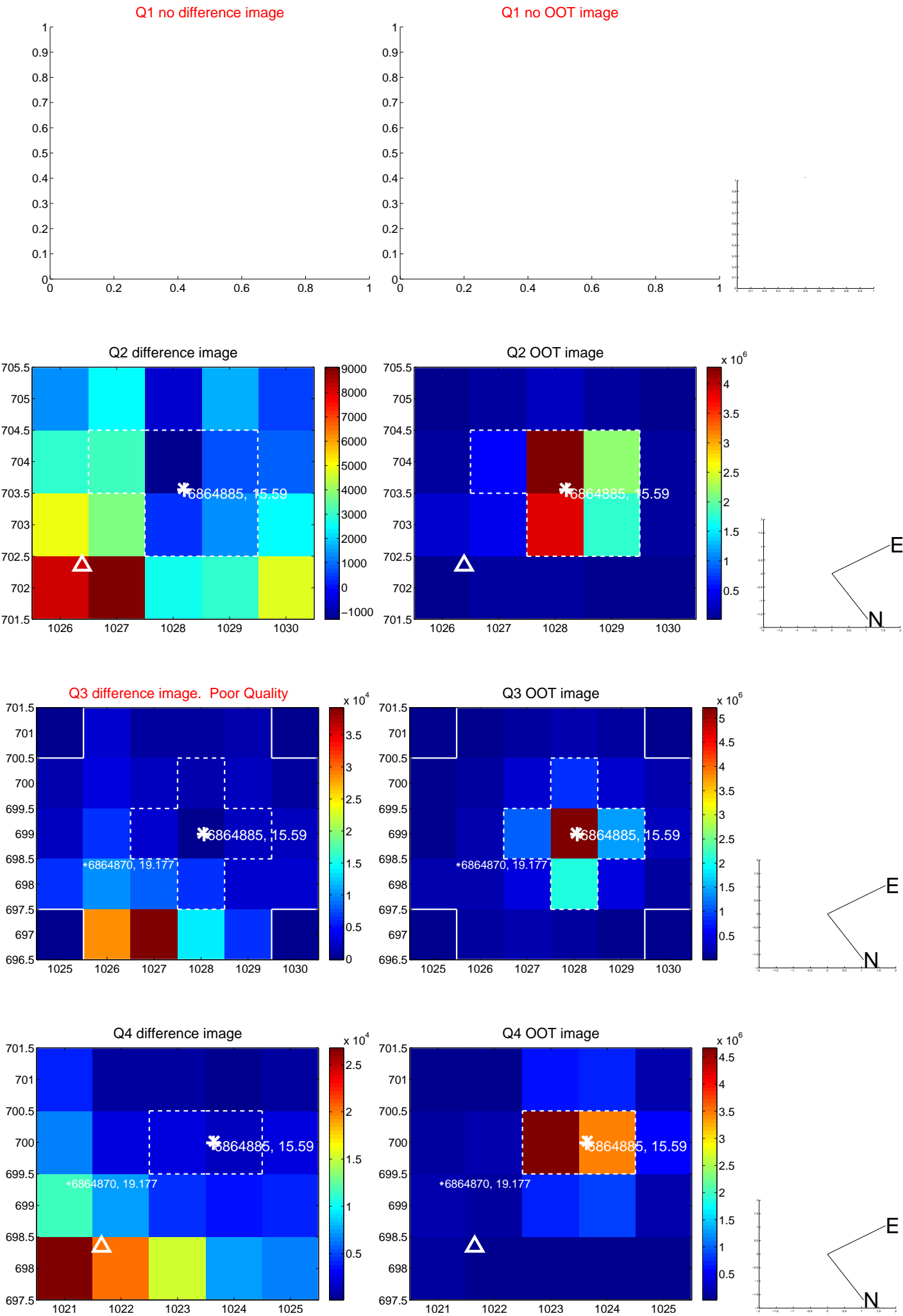
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	9.589 ± 0.246	39.04	-9.539 ± 0.246	0.980 ± 0.233
PRF-fit source offset from KIC position	9.632 ± 0.260	37.03	-9.574 ± 0.260	1.055 ± 0.230
photometric centroid source offset	9.57 ± 0.68	14.06	-8.07 ± 0.70	5.14 ± 0.62

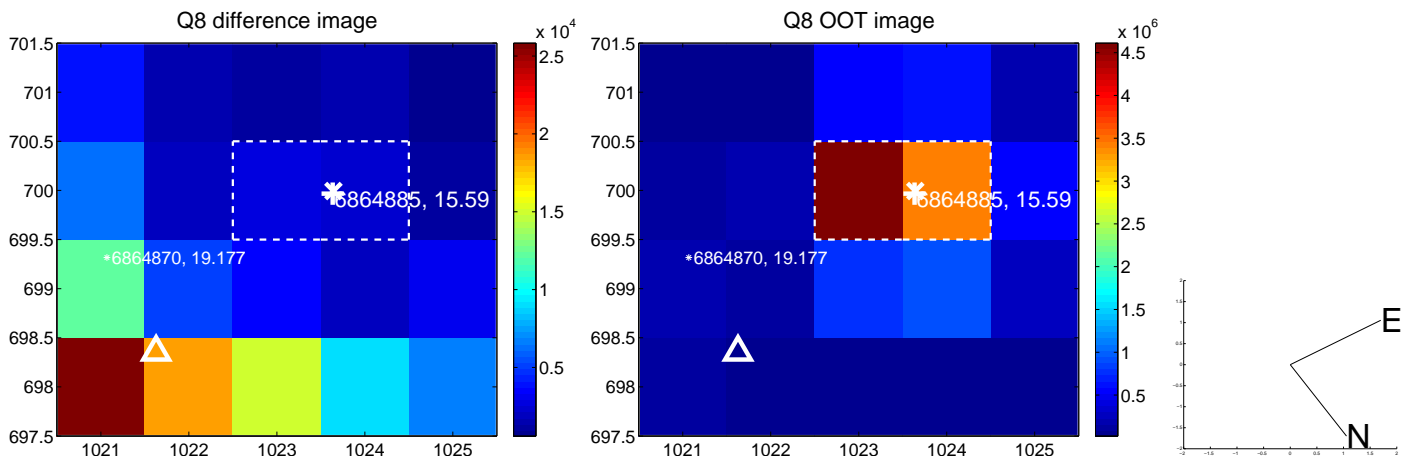
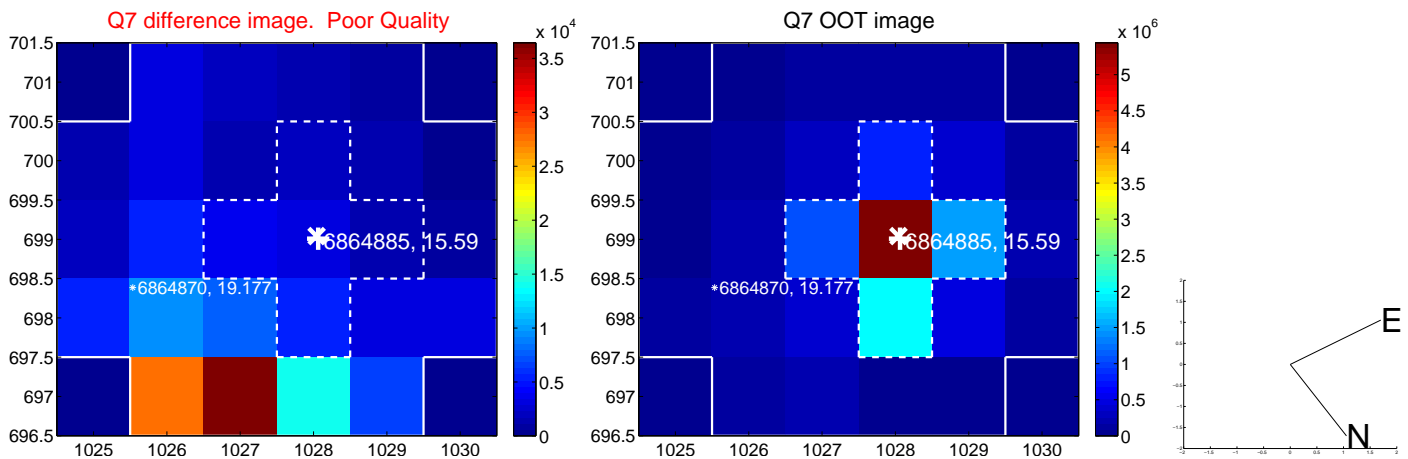
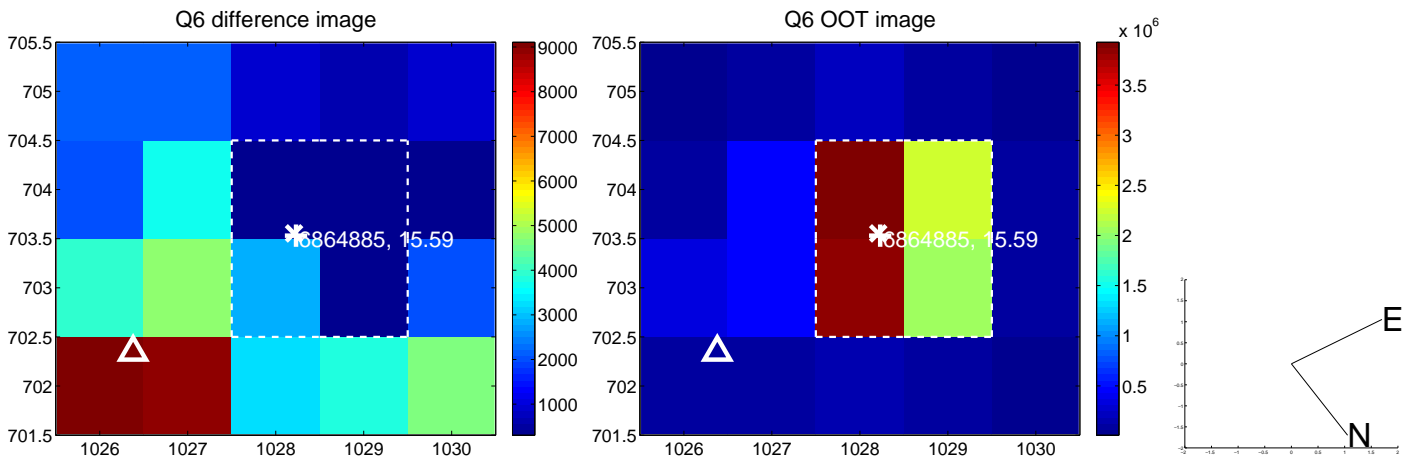
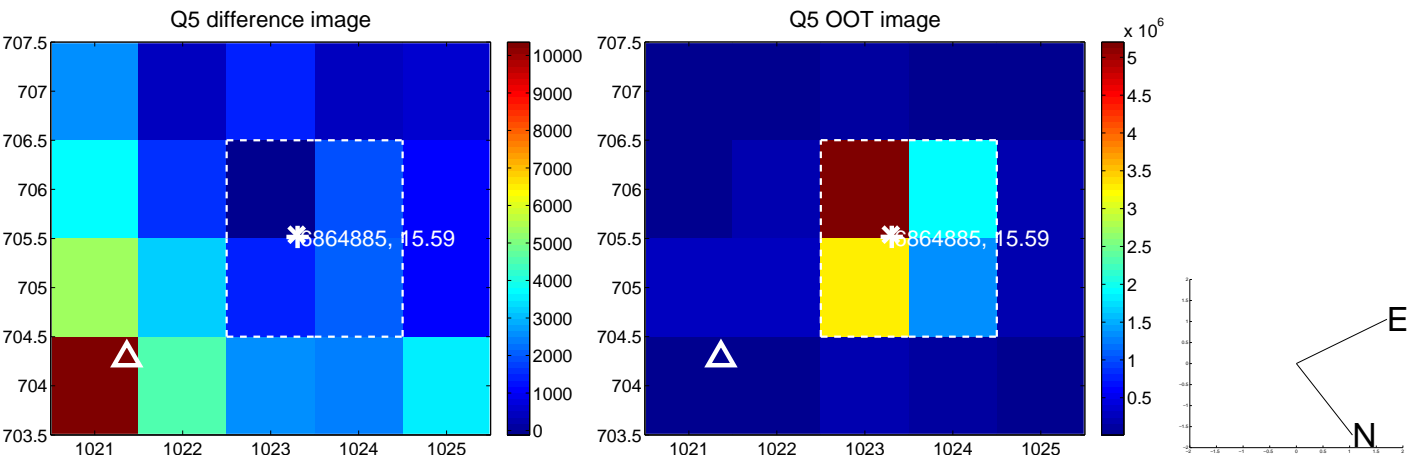


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

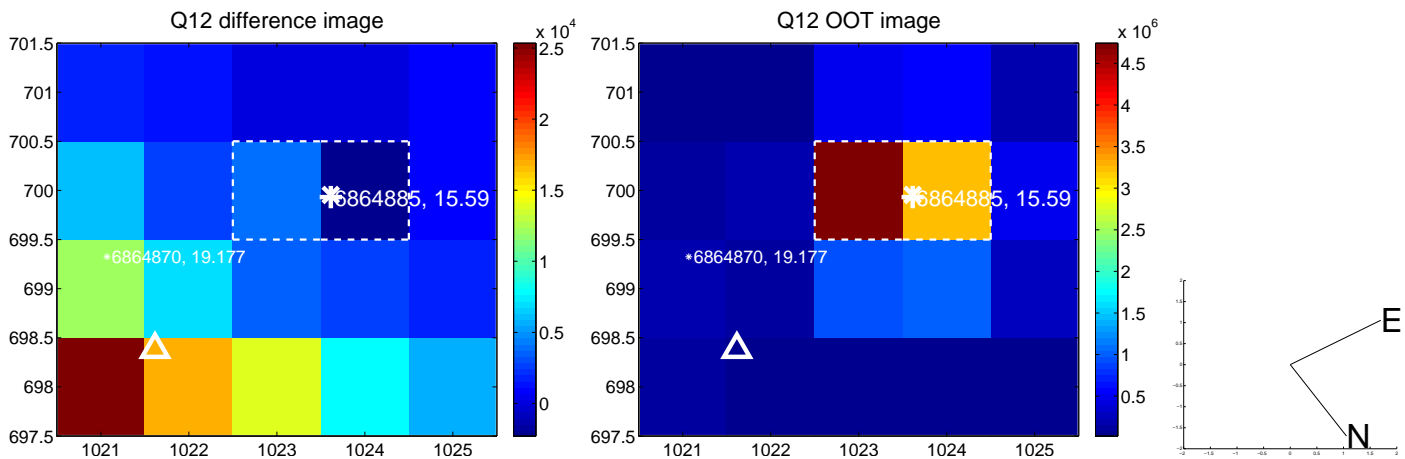
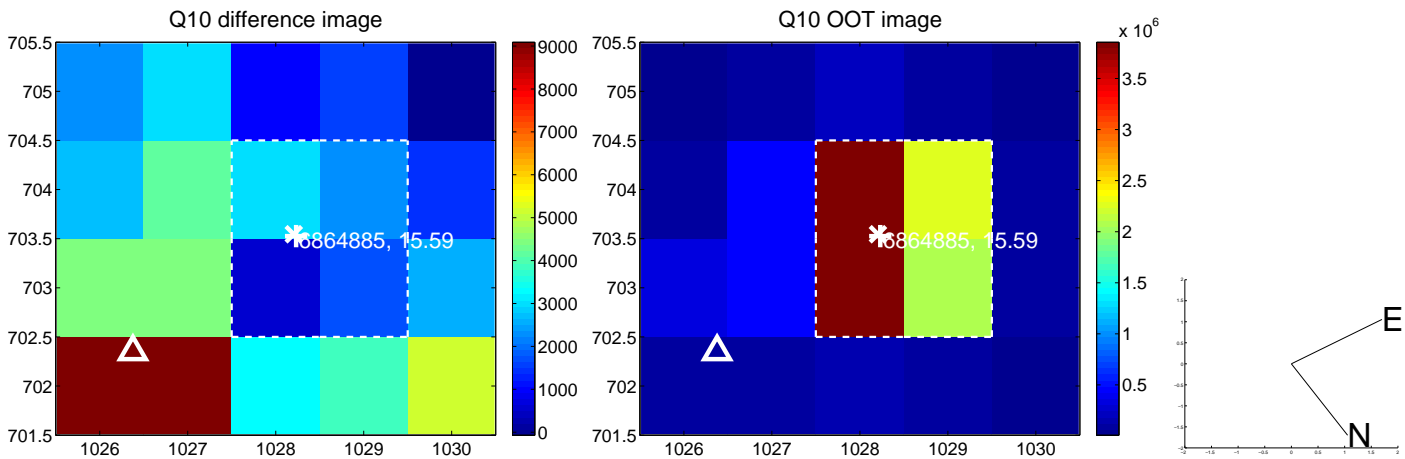
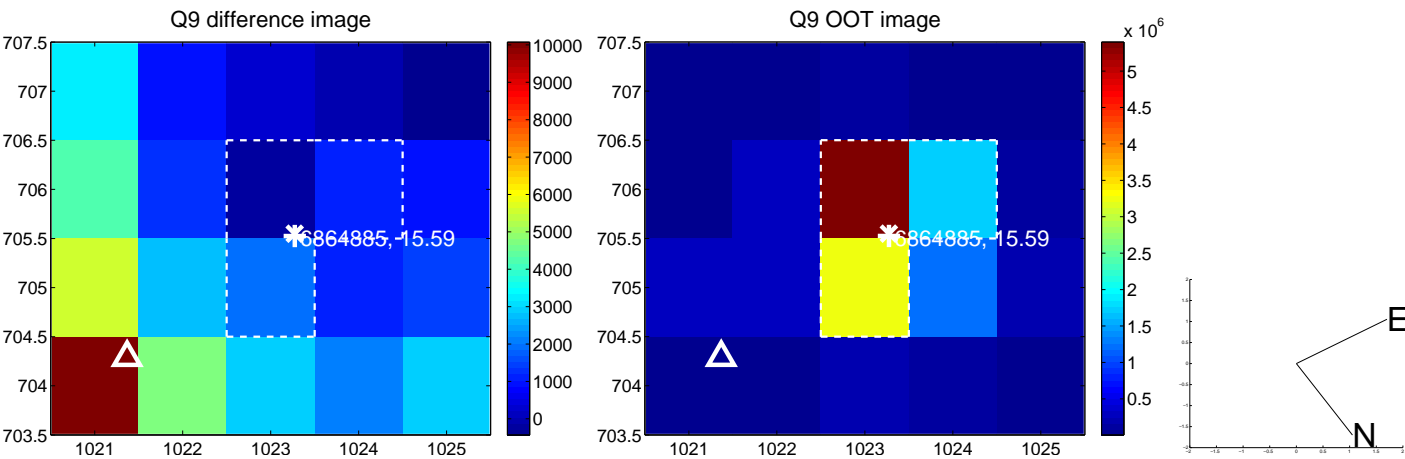
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



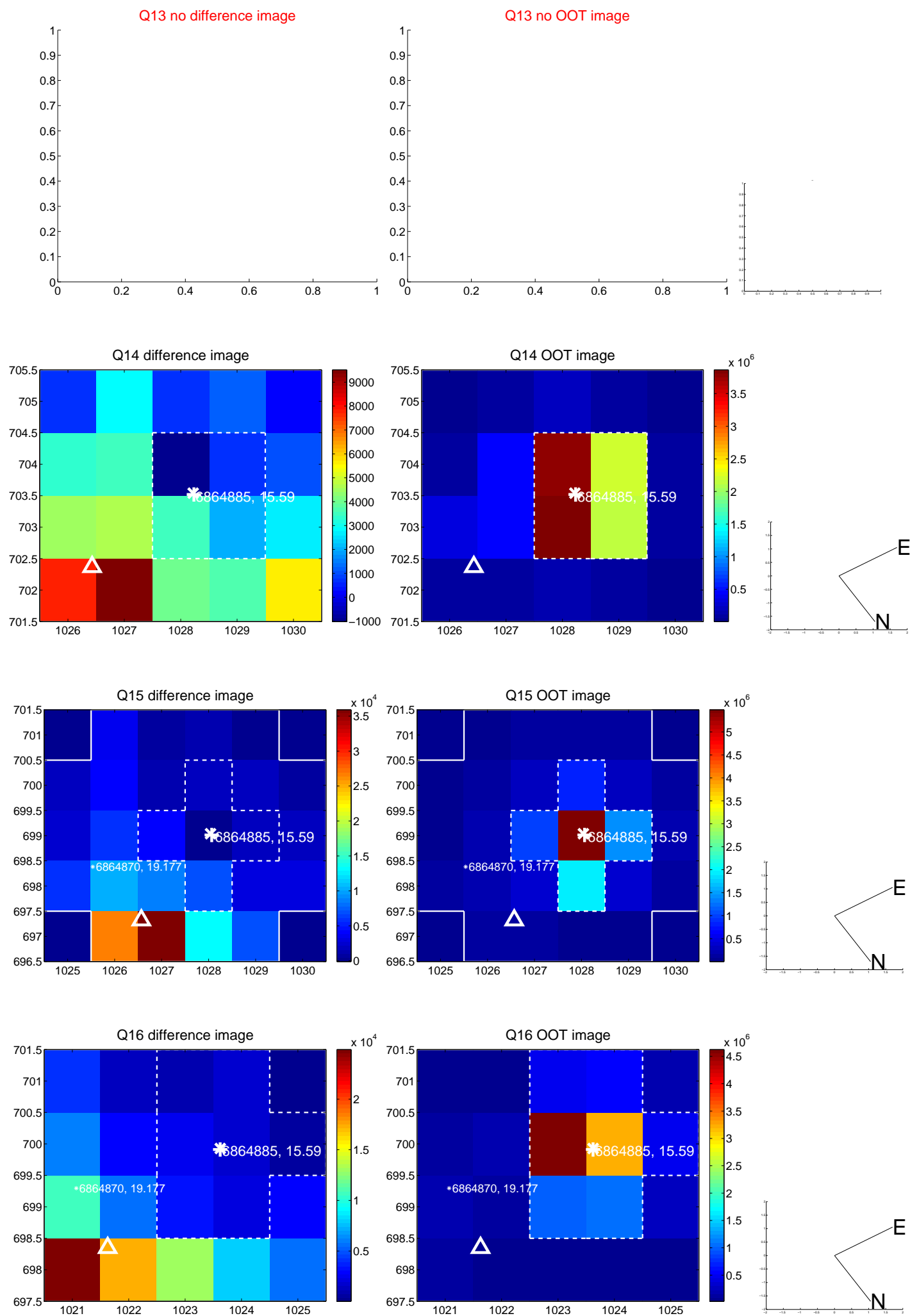
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



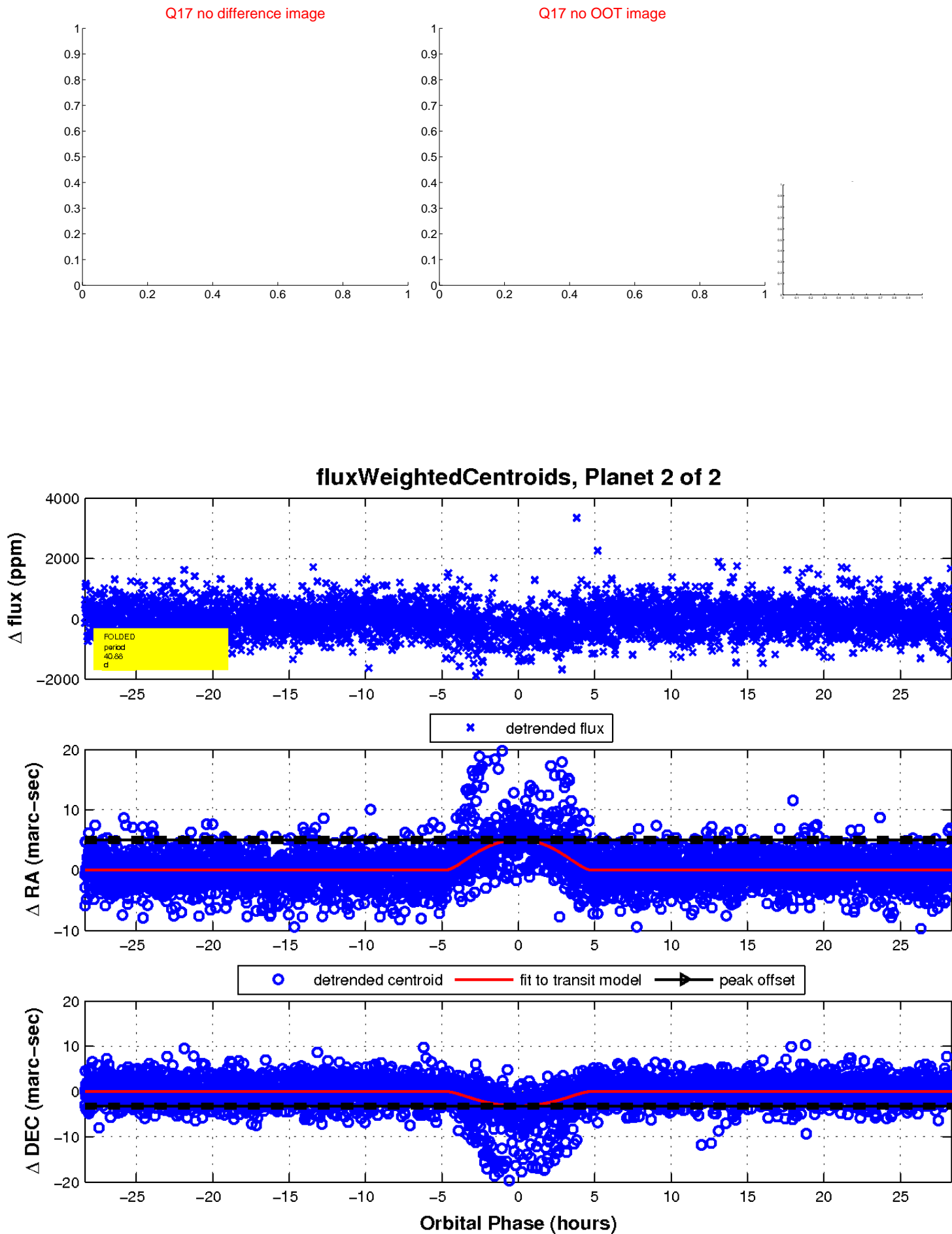
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

