

KIC 004860890

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})
004860890-01	OBS	No	247.437103	195.651253	692.1	3.925	13.6	8.4	75.69	3729	207.04	1209.71
004860890-02	OBS	No	494.405242	509.884977	1491.4	15.430	12.2	10.2	75.69	3729	360.69	480.68

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004860890-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—INCONSISTENT_TRANS—CENT_SATURATED
004860890-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_SATURATED

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

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

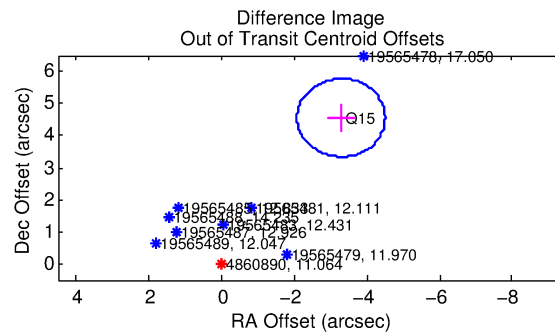
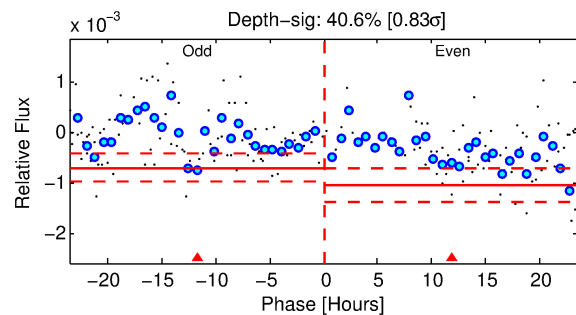
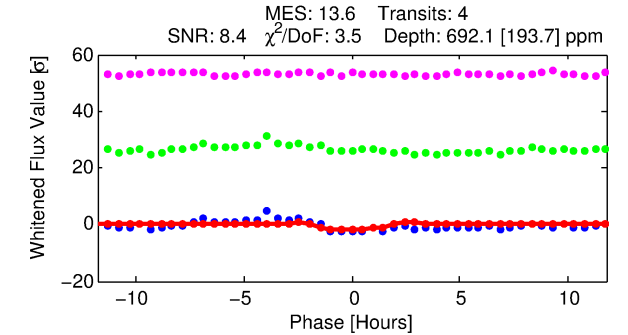
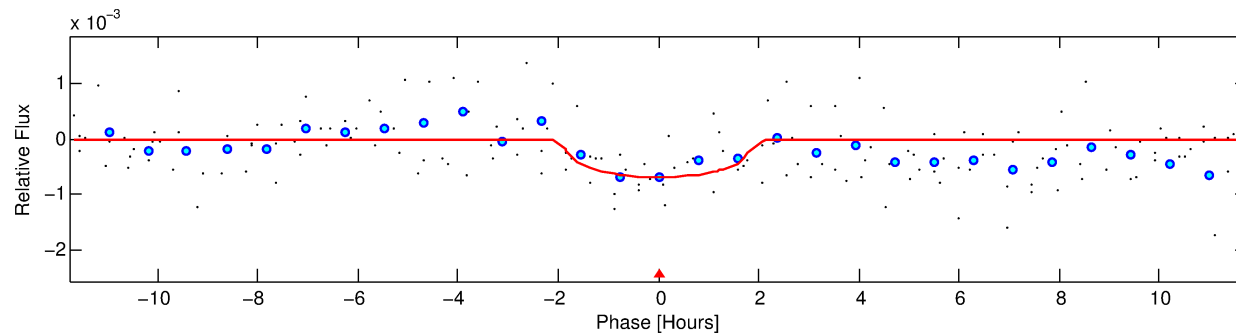
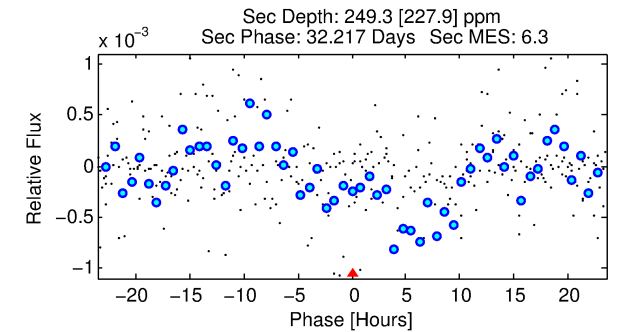
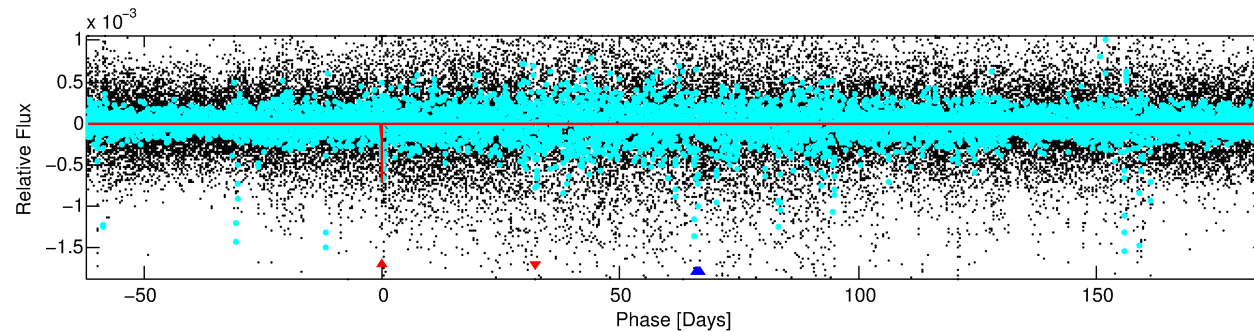
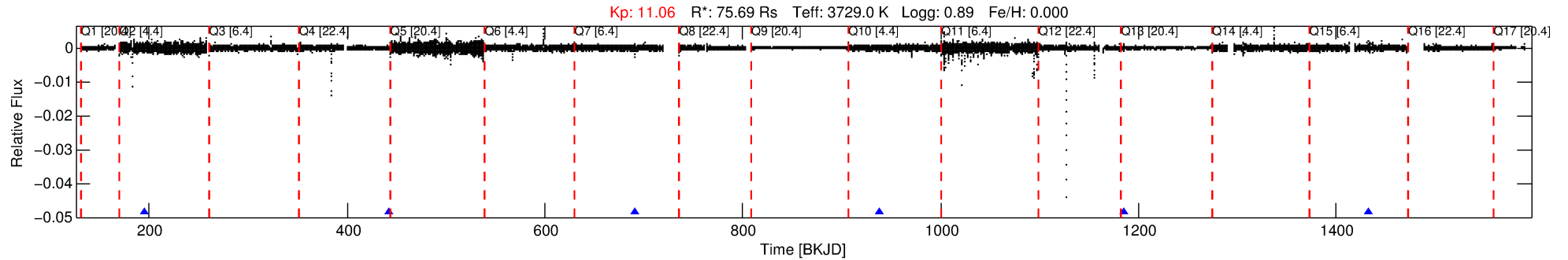
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004860890-01

No Significant Match Found

DV One-Page Summary

KIC: 4860890 Candidate: 1 of 2 Period: 247.437 d



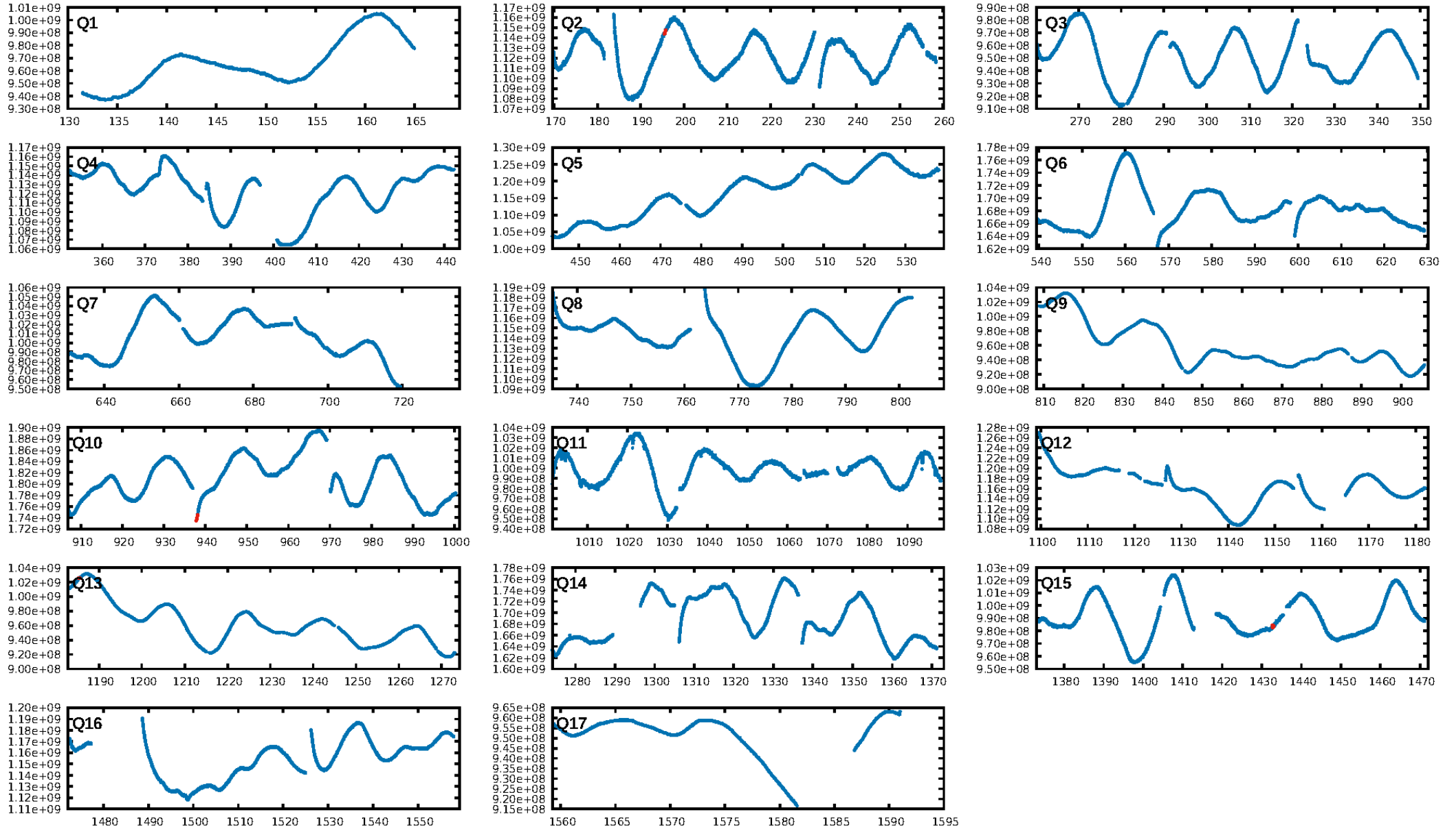
DV Fit Results:

Period = 247.43710 [0.00757] d
Epoch = 195.6513 [0.0292] BKJD
Rp/R* = 0.0251 [0.0560]
a/R* = 384.26 [2027.09]
b = 0.64 [5.04]
Seff = 1209.71 [578.76]
Teff = 1504 [180] K
Rp = 207.04 [467.35] Re
a = 0.9058 [0.2752] AU
Ag = 2.63 [12.03] [0.14σ]
Teffp = 2960 [3373] K [0.43σ]

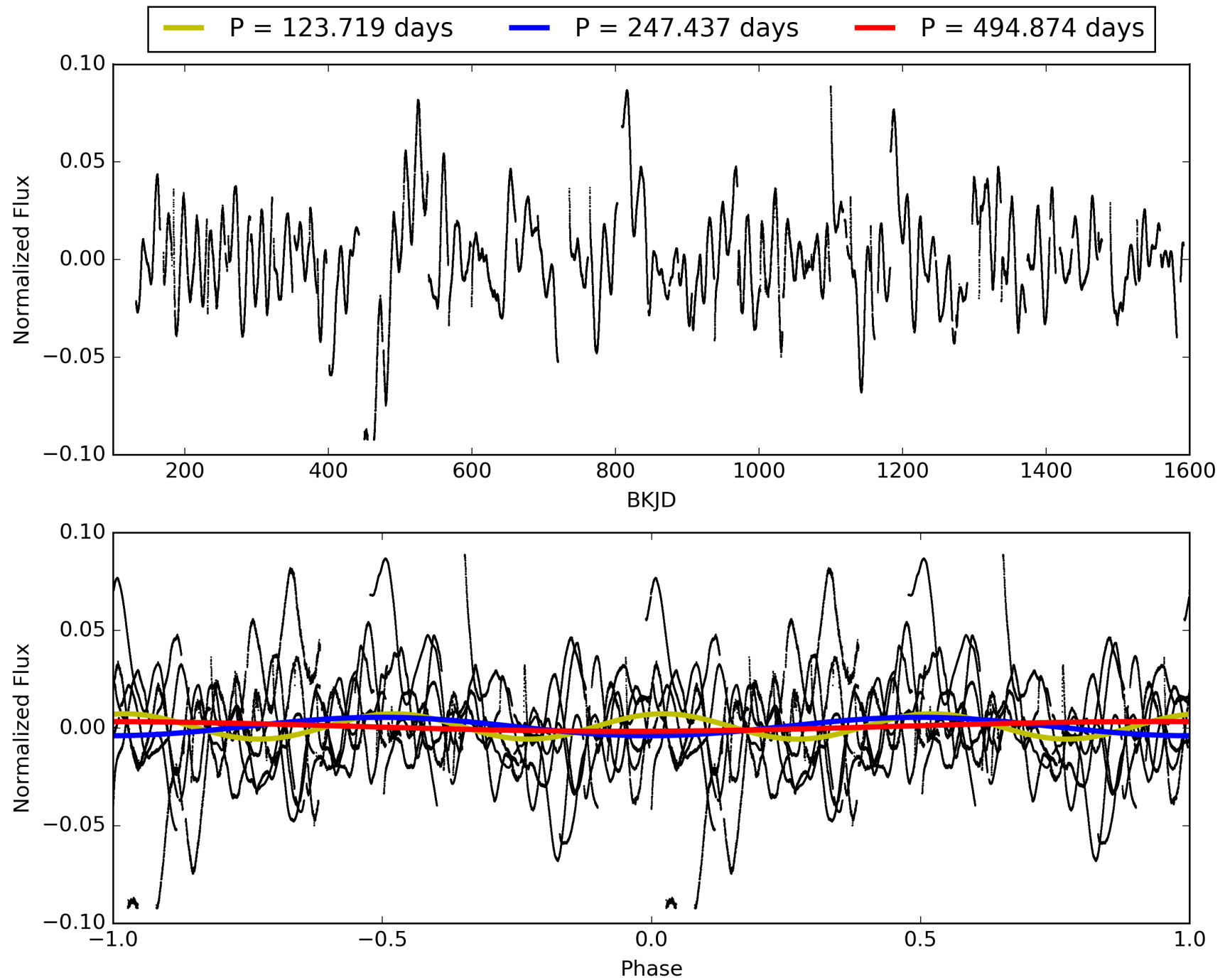
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [372.28σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.4%
Bootstrap-pfa: 4.47e-07
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 1.216
Centroid-sig: 21.9%
Centroid-so: 3.096 arcsec [1.71σ]
OotOffset-rm: 5.619 arcsec [13.87σ]
KicOffset-rm: 5.463 arcsec [13.36σ]
OotOffset-st: 0/1/0/0 [1]
KicOffset-st: 0/1/0/0 [1]
DiffImageQuality-fgm: 0.00 [0/1]
DiffImageOverlap-fno: 1.00 [2/2]

TCE 004860890-01, PDC Light Curves

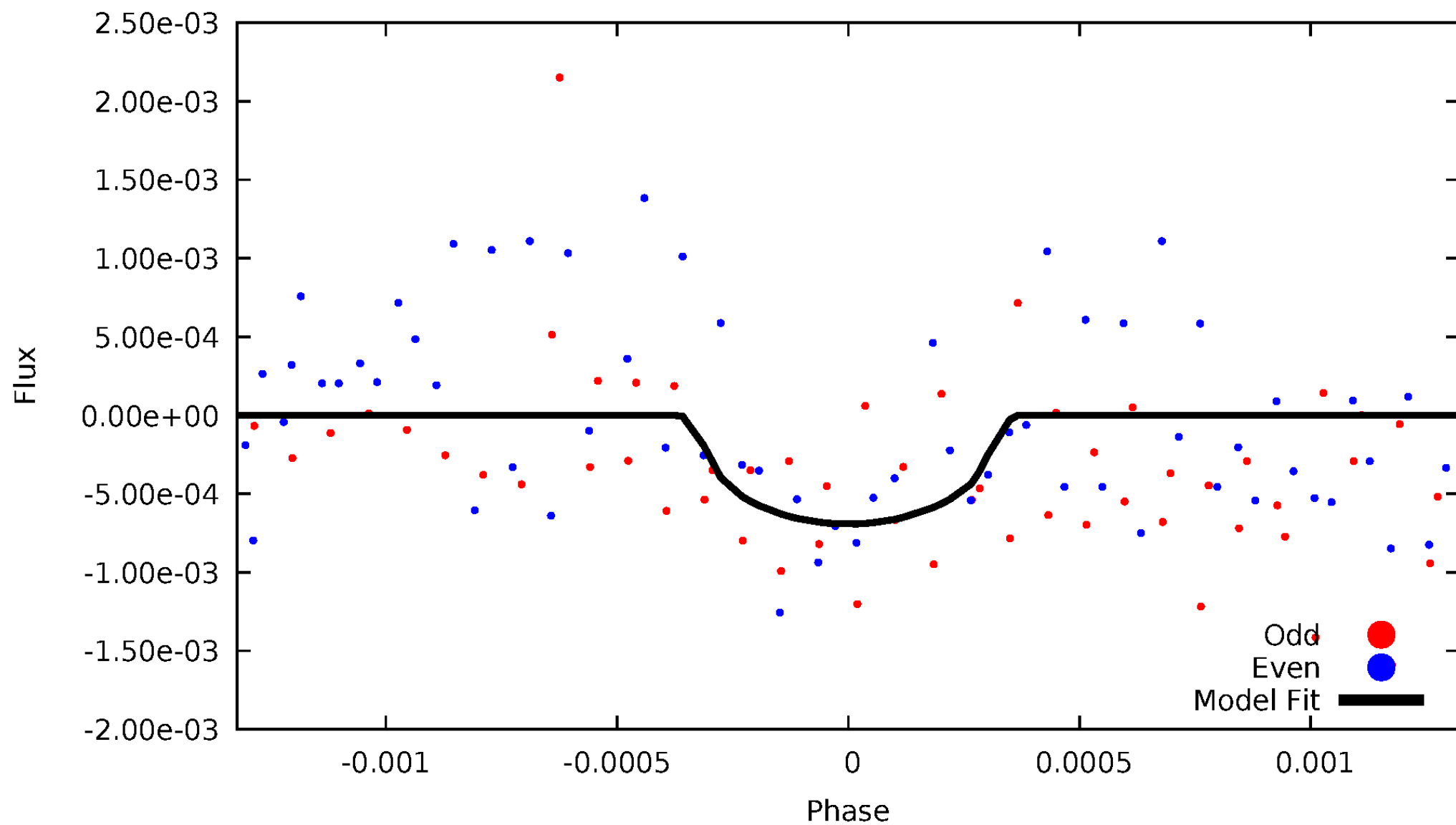


TCE 004860890-01



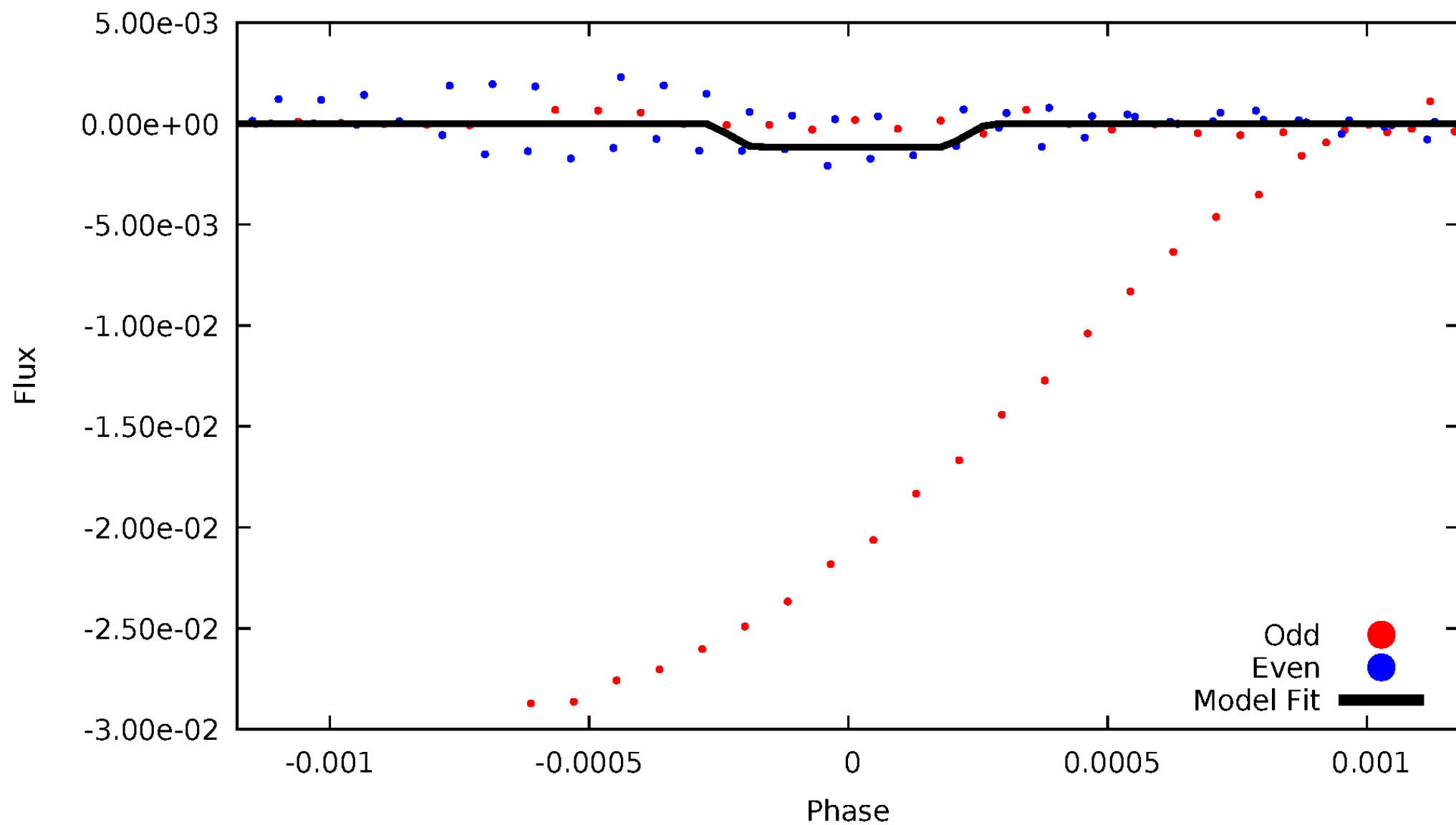
DV Odd/Even

TCE 004860890-01



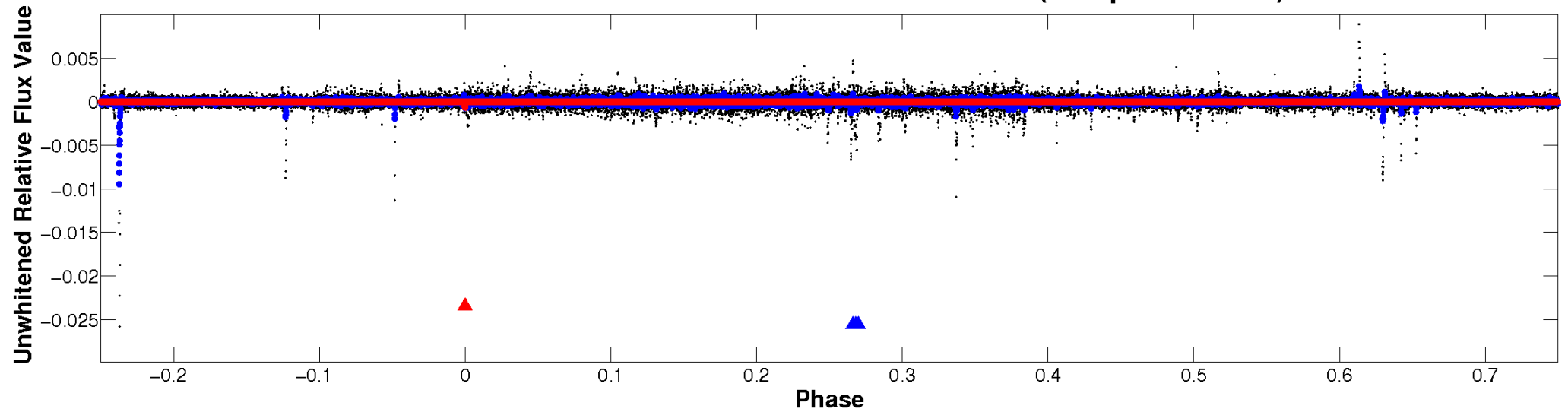
ALT Odd/Even

TCE 004860890-01

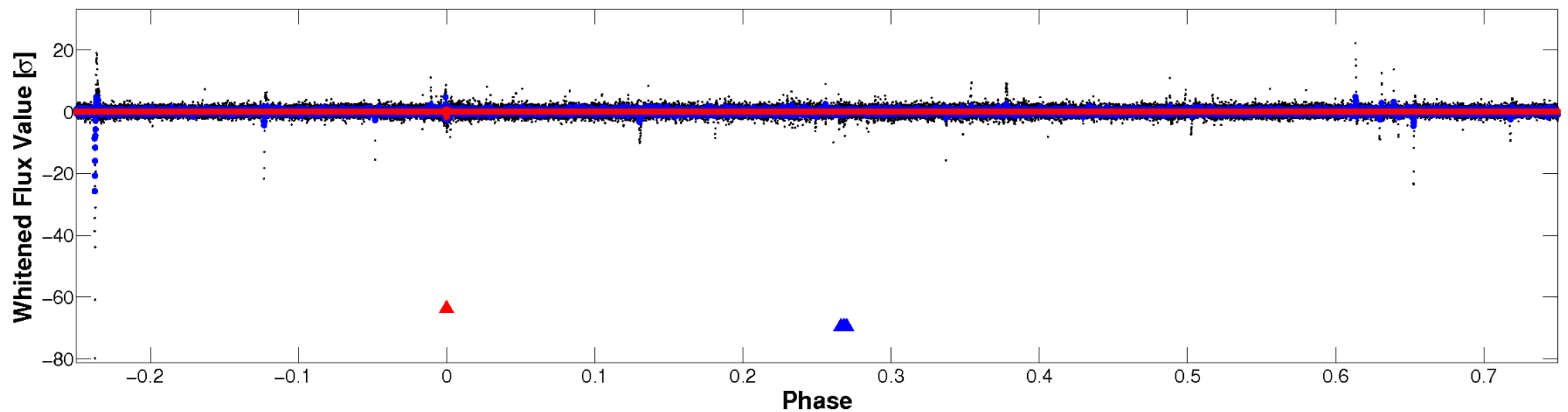


Non-Whitened Vs. Whitened Light Curve

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

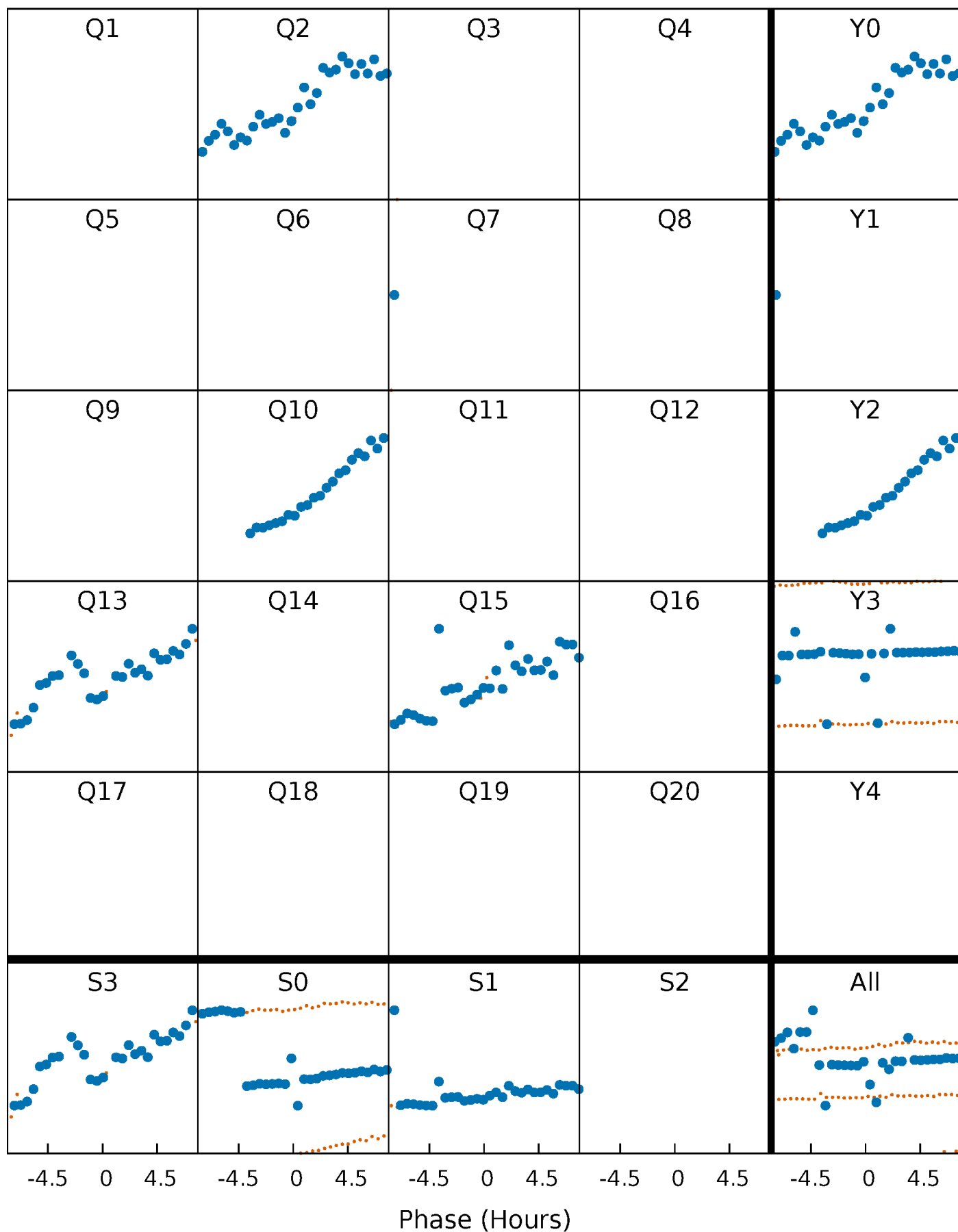


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



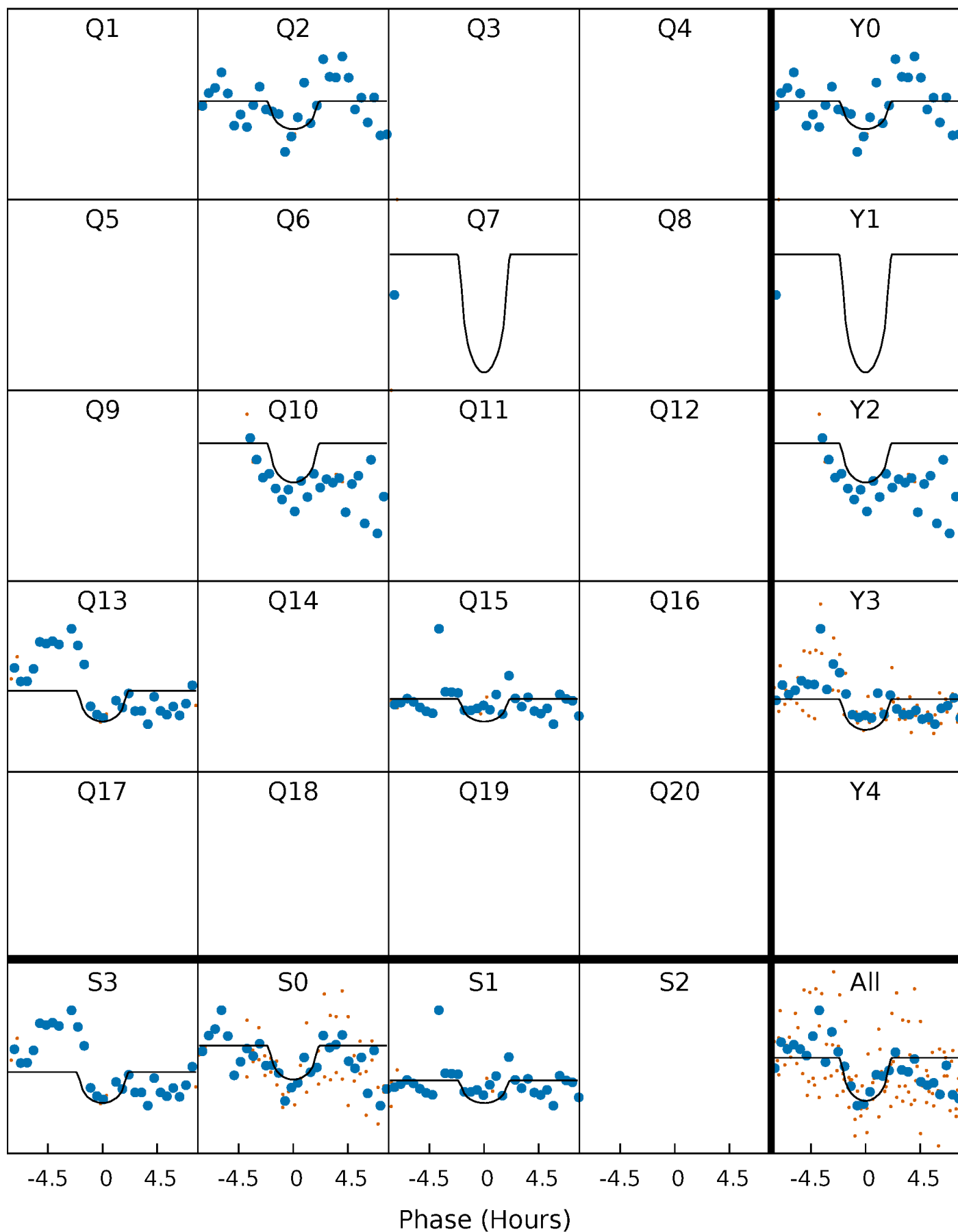
PDC Quarter-Phased Transit Curves

TCE 004860890-01 P=247.437103 Days $T_0=195.651253$ (BKJD)



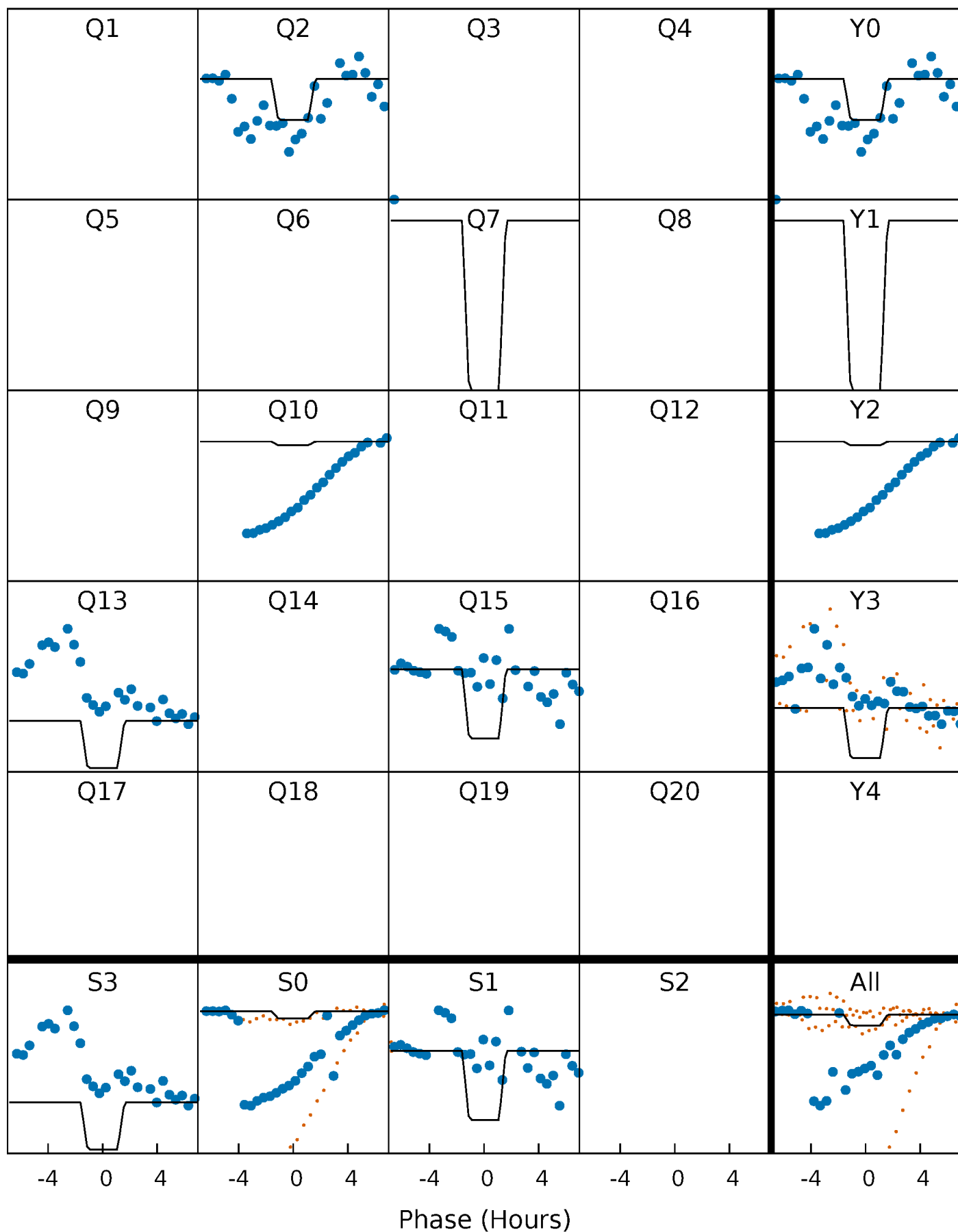
DV Quarter-Phased Transit Curves

TCE 004860890-01 P=247.437103 Days $T_0=195.651253$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

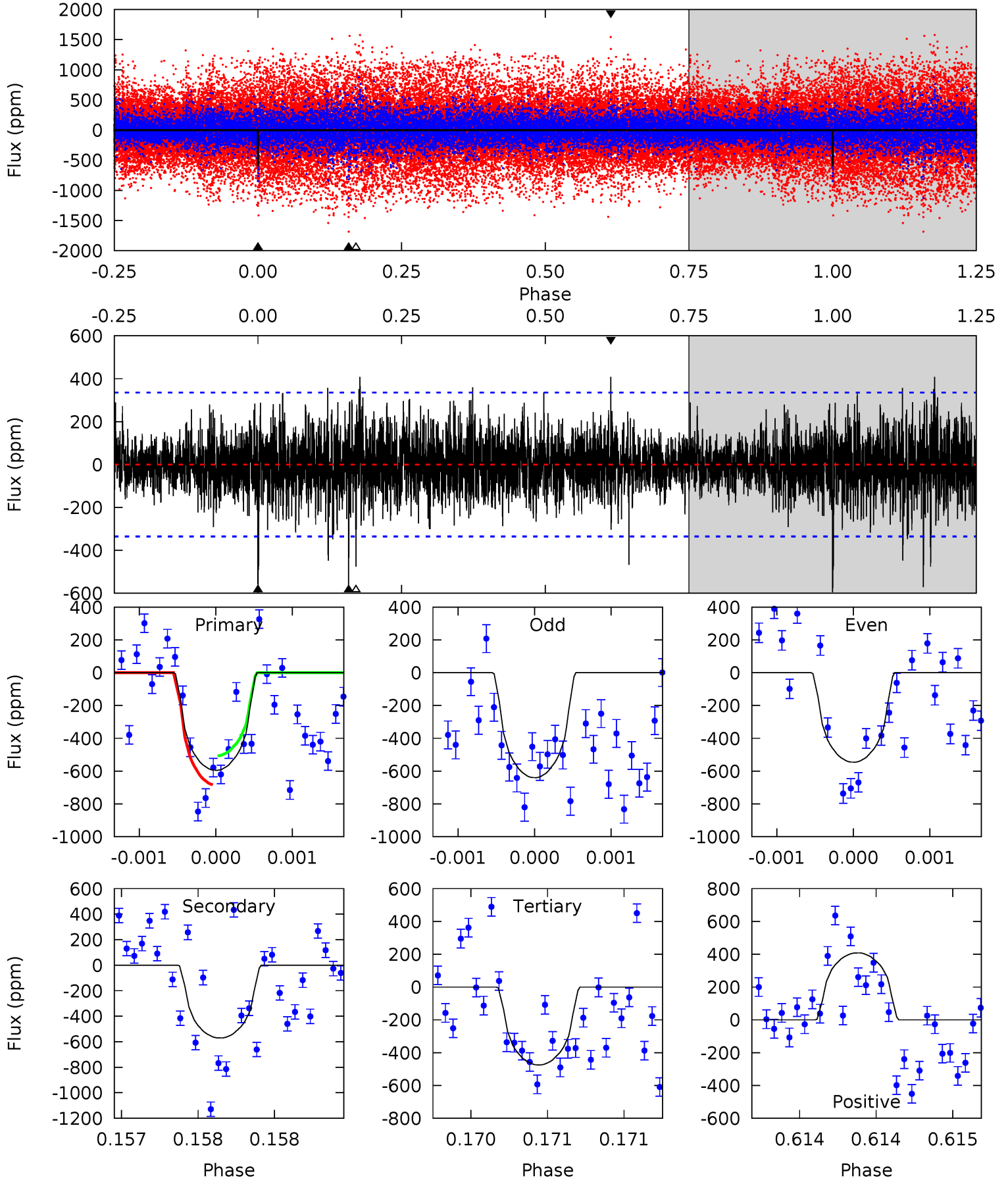
TCE 004860890-01 P=247.443600 Days $T_0=195.624591$ (BKJD)



DV Model-Shift Uniqueness Test

004860890-01, P = 247.437103 Days, E = 195.651253 Days

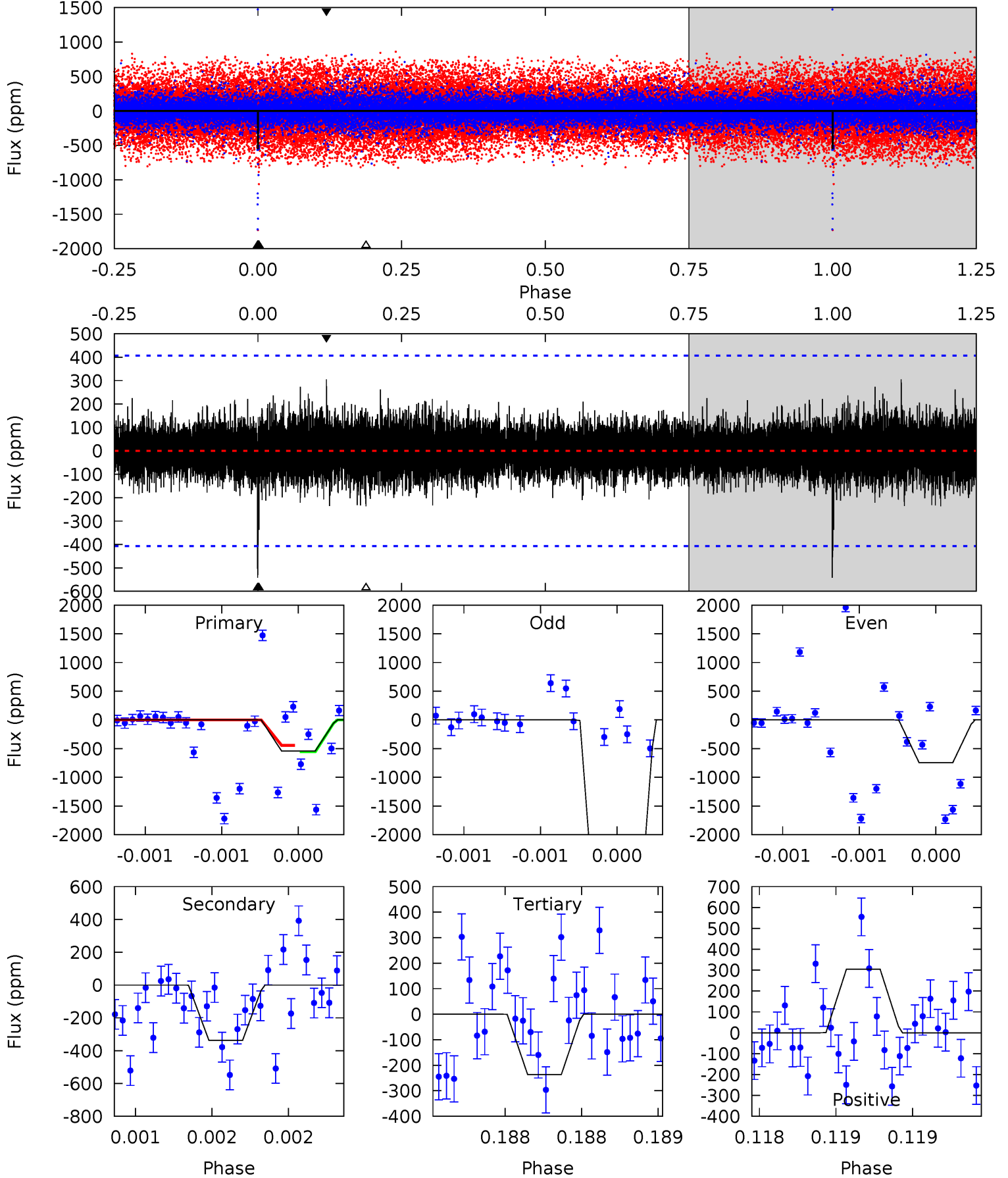
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.79	9.40	7.81	6.72	5.52	3.40	1.59	1.98	3.07	1.58	2.68	0.75	1.10	0.41	1.44



Alt Model-Shift Uniqueness Test

004860890-01, P = 247.443600 Days, E = 195.624591 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.39	4.60	3.23	4.16	5.55	3.45	0.79	4.16	3.23	1.37	0.44	29.8	6.94	0.36	0.69



Stellar Parameters For KIC 004860890

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3729^{+82}_{-74}	$0.889^{+0.270}_{-0.180}$	$0.000^{+0.250}_{-0.250}$	$75.693^{+15.526}_{-25.230}$	$1.617^{+0.126}_{-0.504}$	$0.000^{+0.000}_{-0.000}$
	+2%/-2%	+30%/-20%	+inf%/-inf%	+21%/-33%	+8%/-31%	+176%/-42%
Source	SPE14	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 004860890-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-571 ± 61	$372.88^{+397.92}_{-263.89}$	2110^{+143}_{-179}	2949^{+1531}_{-777}	$1.754^{+20.206}_{-1.325}$
Alt.	-337 ± 73	$436.31^{+409.75}_{-294.30}$	2099^{+149}_{-181}	2539^{+1125}_{-4691}	$0.806^{+5.814}_{-0.615}$

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 $A_{obs} \gg 1.0$

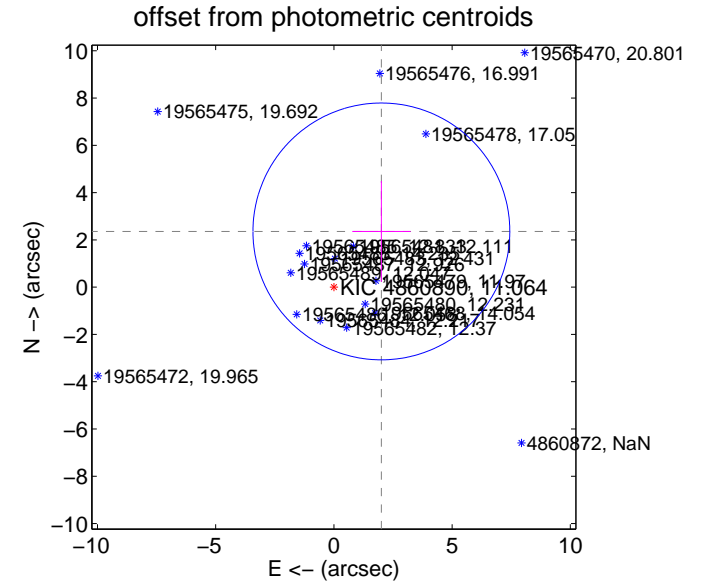
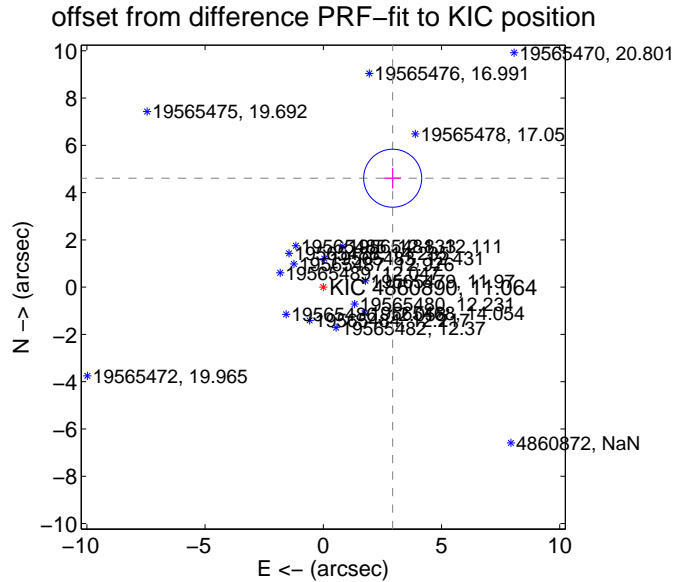
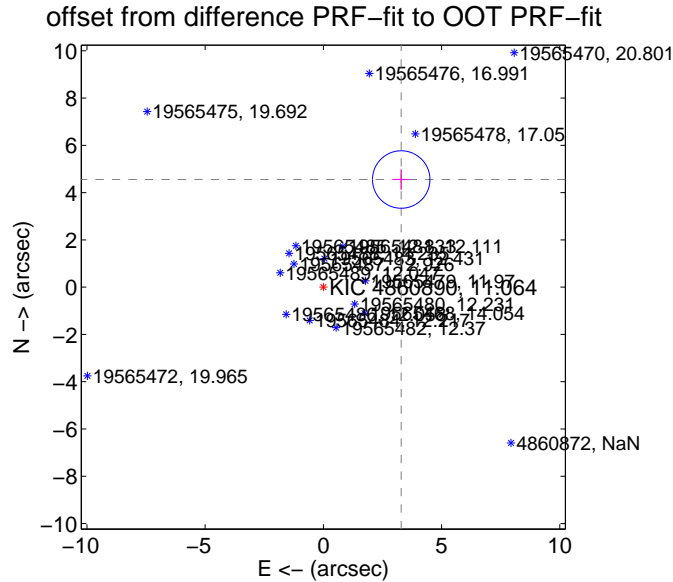
DV Centroid Data

Supplemental centroid analysis for 004860890-01. **Kepler magnitude: 11.06.** Transit SNR 8.44

There are 0 quarters with good PRF difference image offsets

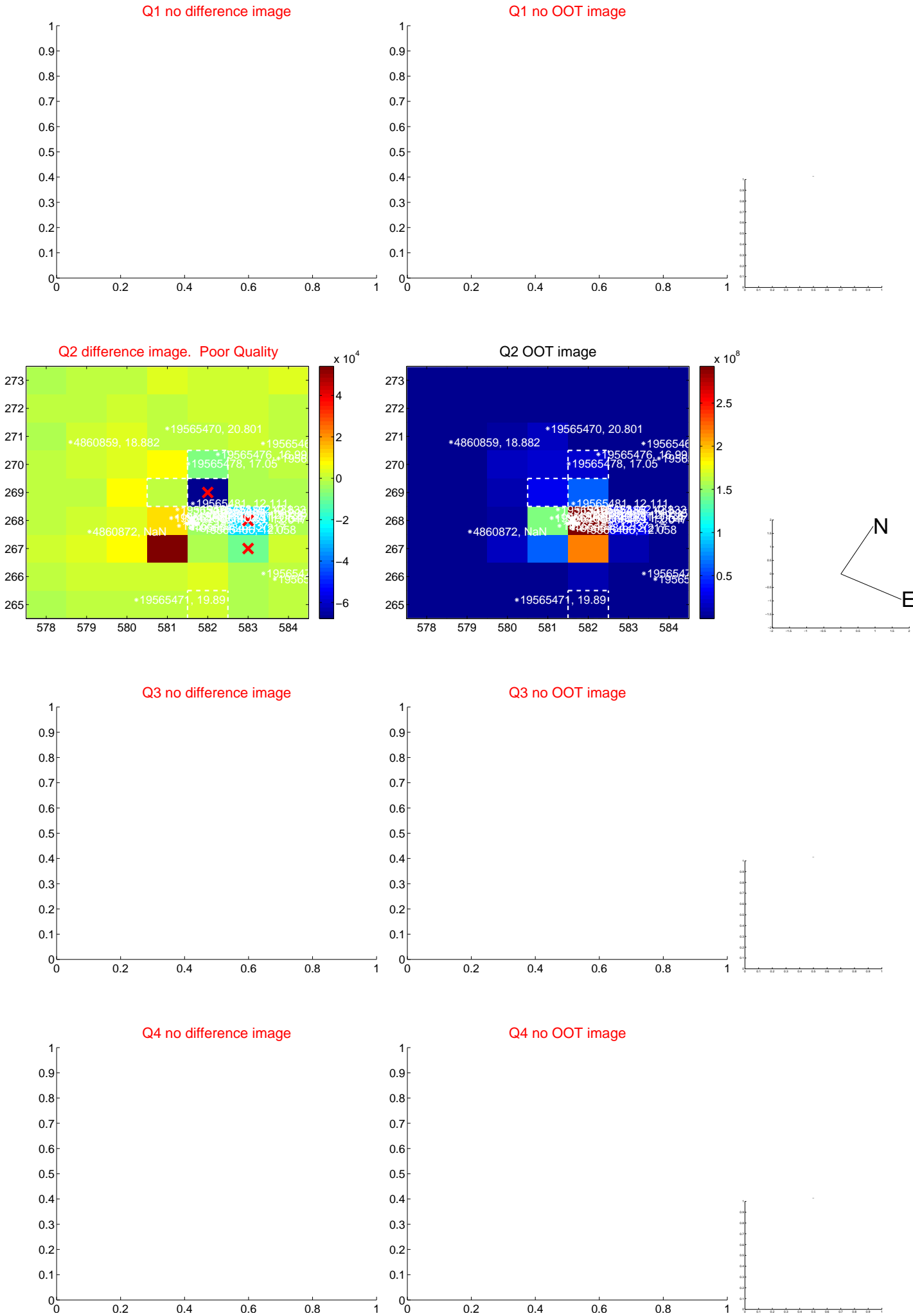
The direct PRF centroid is offset from the target star catalog position by about 0.36 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.619 \pm 0.405	13.87	-3.293 \pm 0.354	4.553 \pm 0.429
PRF-fit source offset from KIC position	5.463 \pm 0.409	13.36	-2.933 \pm 0.354	4.608 \pm 0.429
photometric centroid source offset	3.10 \pm 1.81	1.71	-2.01 \pm 1.23	2.36 \pm 2.13



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.



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

Q13 no difference image



Q13 no OOT image



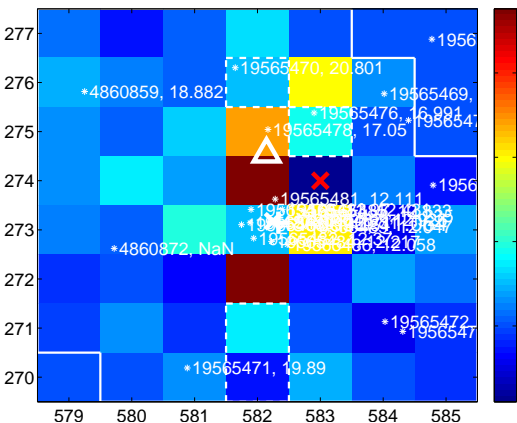
Q14 no difference image



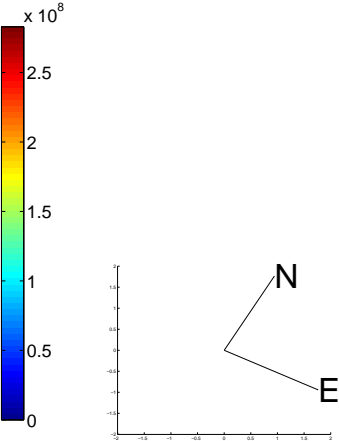
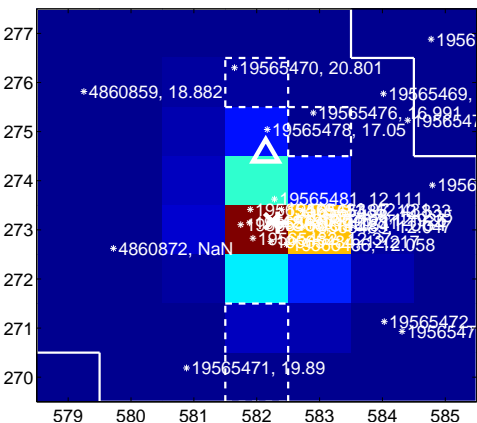
Q14 no OOT image



Q15 difference image. Poor Quality



Q15 OOT image



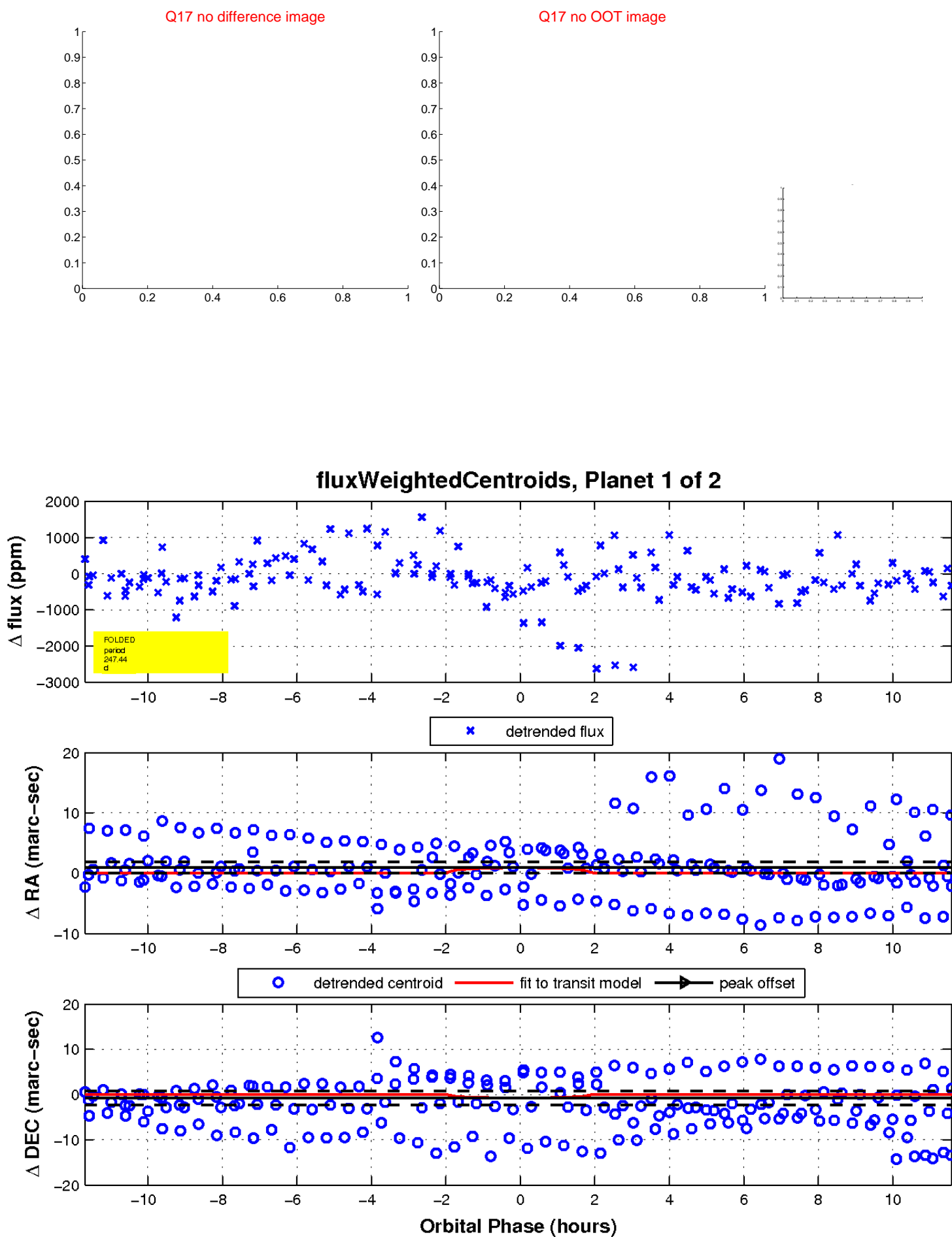
Q16 no difference image



Q16 no OOT image

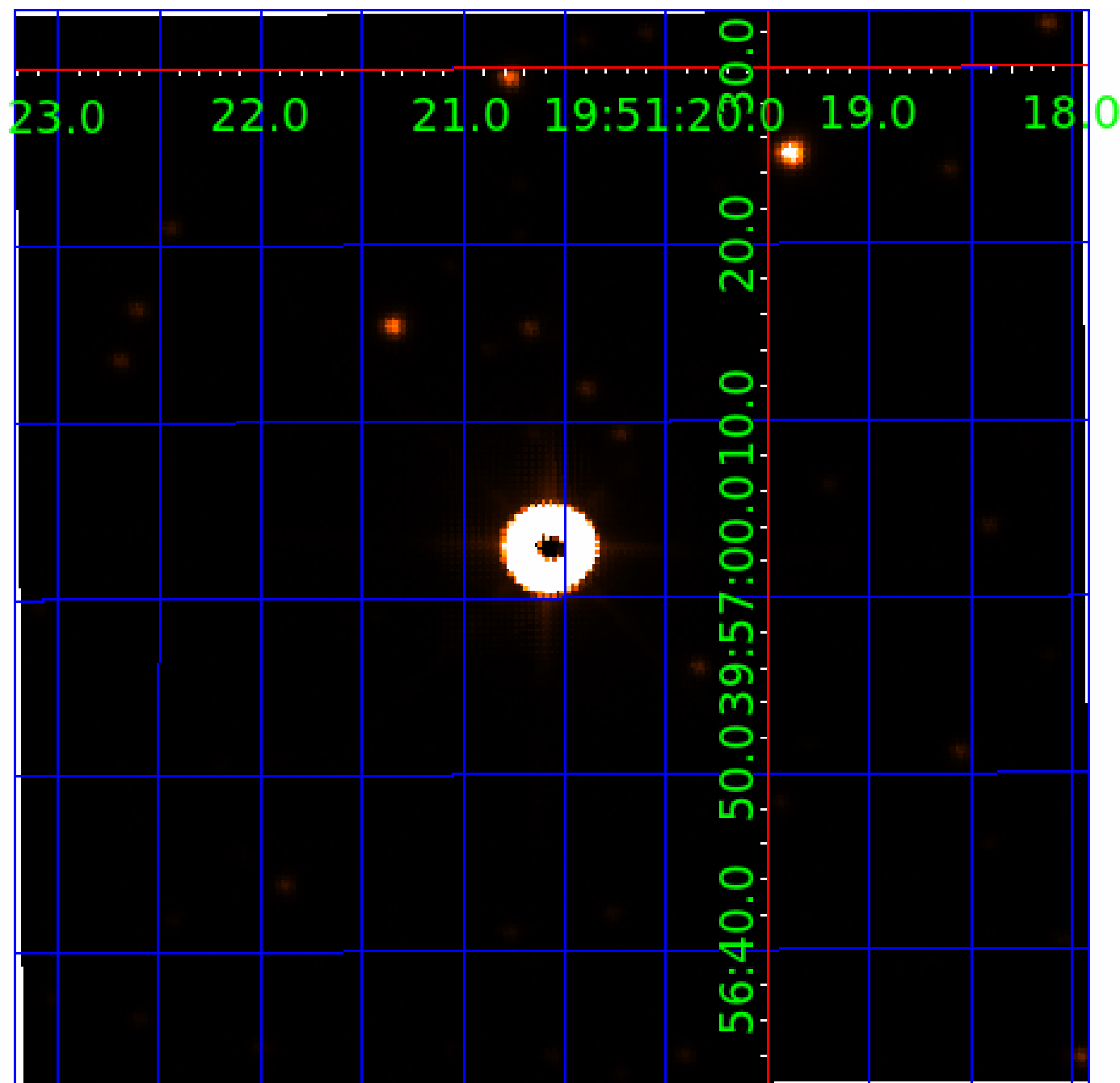


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004860890

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})
004860890-01	OBS	No	247.437103	195.651253	692.1	3.925	13.6	8.4	75.69	3729	207.04	1209.71
004860890-02	OBS	No	494.405242	509.884977	1491.4	15.430	12.2	10.2	75.69	3729	360.69	480.68

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004860890-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—INCONSISTENT_TRANS—CENT_SATURATED
004860890-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_SATURATED

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

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

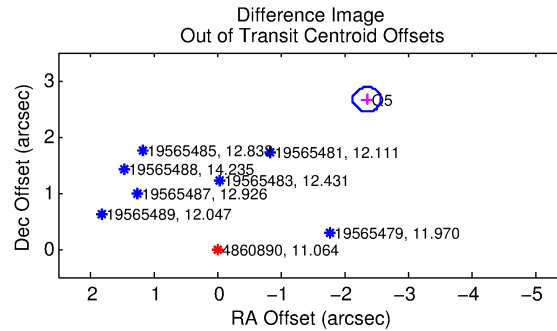
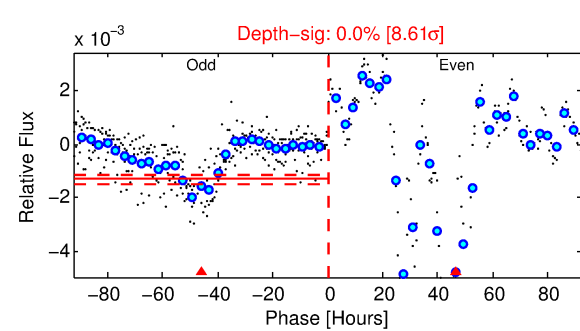
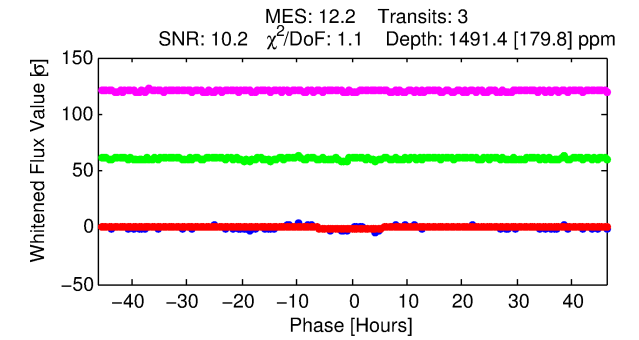
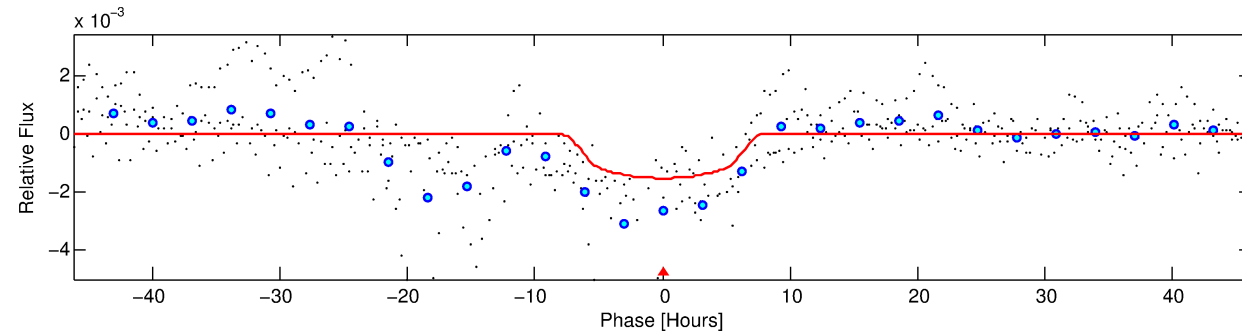
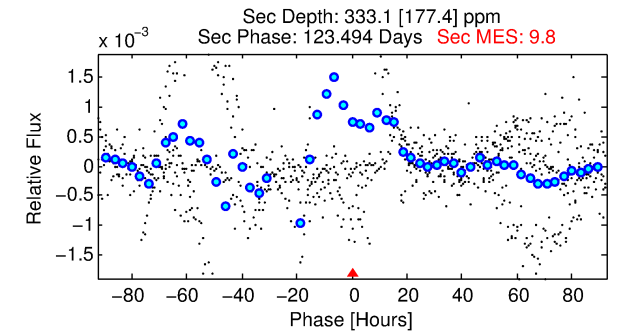
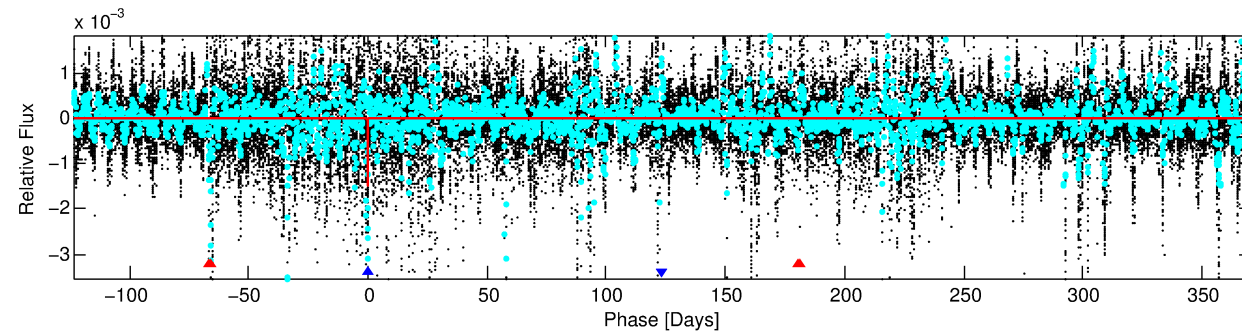
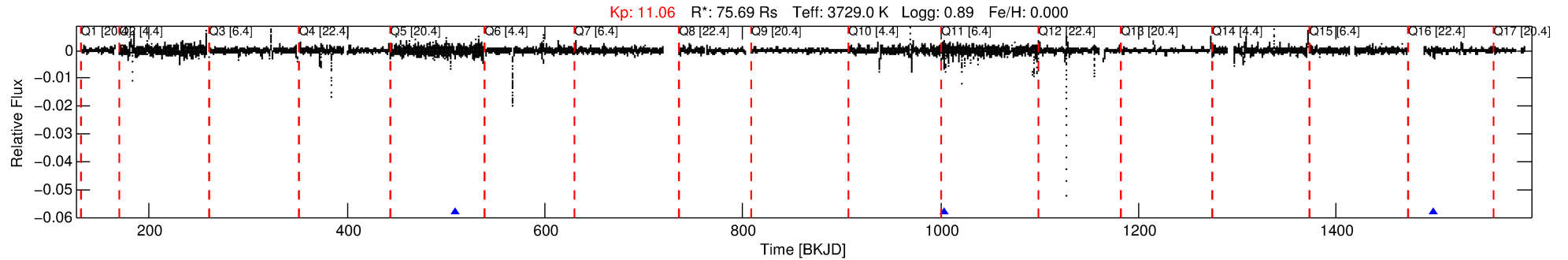
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004860890-02

No Significant Match Found

DV One-Page Summary

KIC: 4860890 Candidate: 2 of 2 Period: 494.405 d



DV Fit Results:

Period = 494.40524 [0.01254] d
Epoch = 509.8850 [0.0226] BKJD
Rp/R* = 0.0437 [0.0040]
a/R* = 139.25 [22.79]
b = 0.87 [0.05]
Seff = 480.68 [229.97]
Teq = 1194 [143] K
Rp = 360.69 [124.59] Re
a = 1.4370 [0.4366] AU
Ag = 2.91 [2.13] [0.89σ]
Teffp = 2411 [343] K [3.27σ]

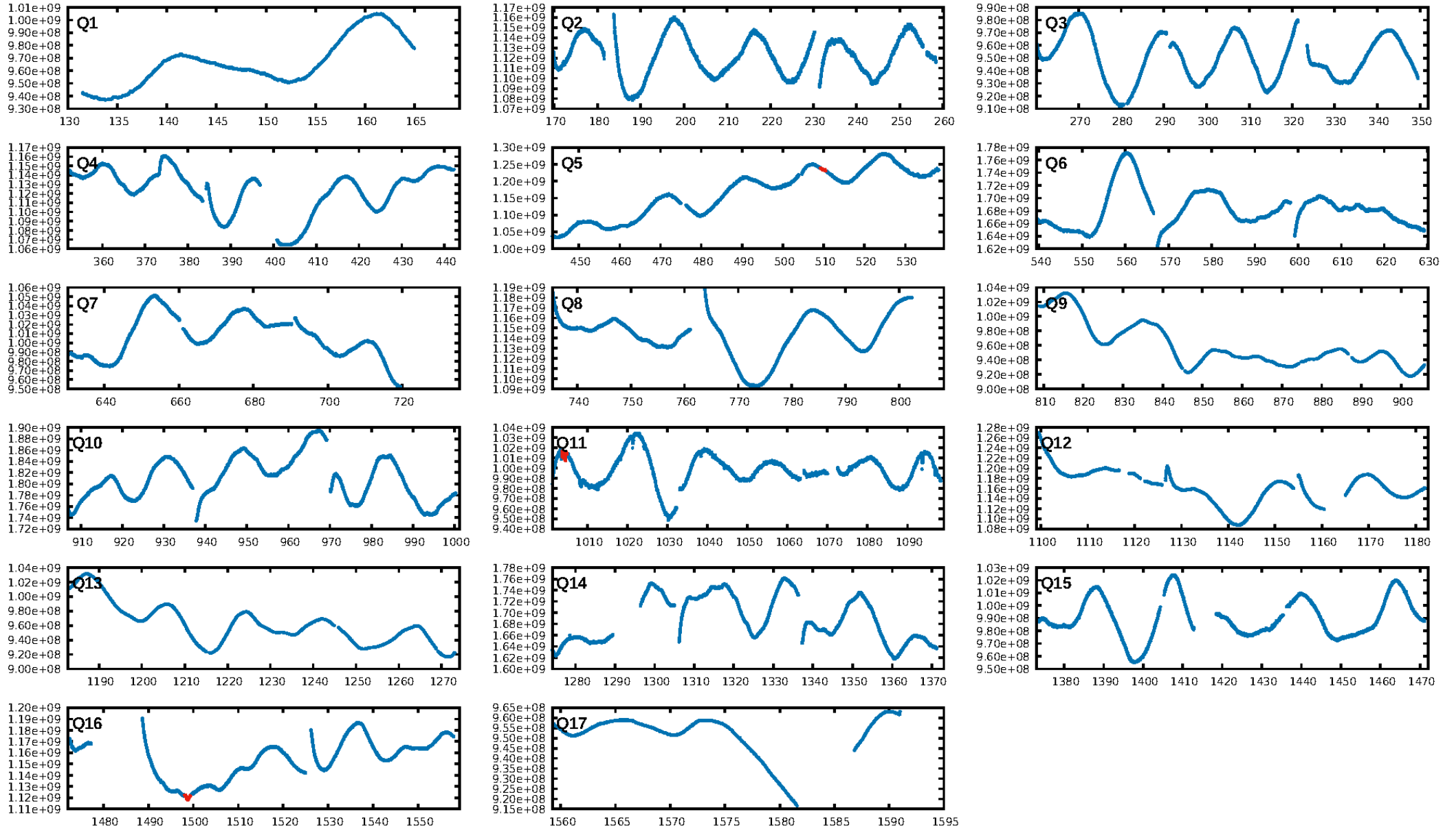
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [372.28σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.7%
ModelChiSquareGof-sig: 97.5%
Bootstrap-pfa: 1.08e-04
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.9263
Centroid-sig: 4.5%
Centroid-so: 0.399 arcsec [0.19σ]
OotOffset-rm: 3.555 arcsec [48.97σ]
KicOffset-rm: 3.296 arcsec [45.37σ]
OotOffset-st: 0/0/0/1 [1]
KicOffset-st: 0/0/0/1 [1]
DiffImageQuality-fgm: 0.00 [0/1]
DiffImageOverlap-fno: 1.00 [1/1]

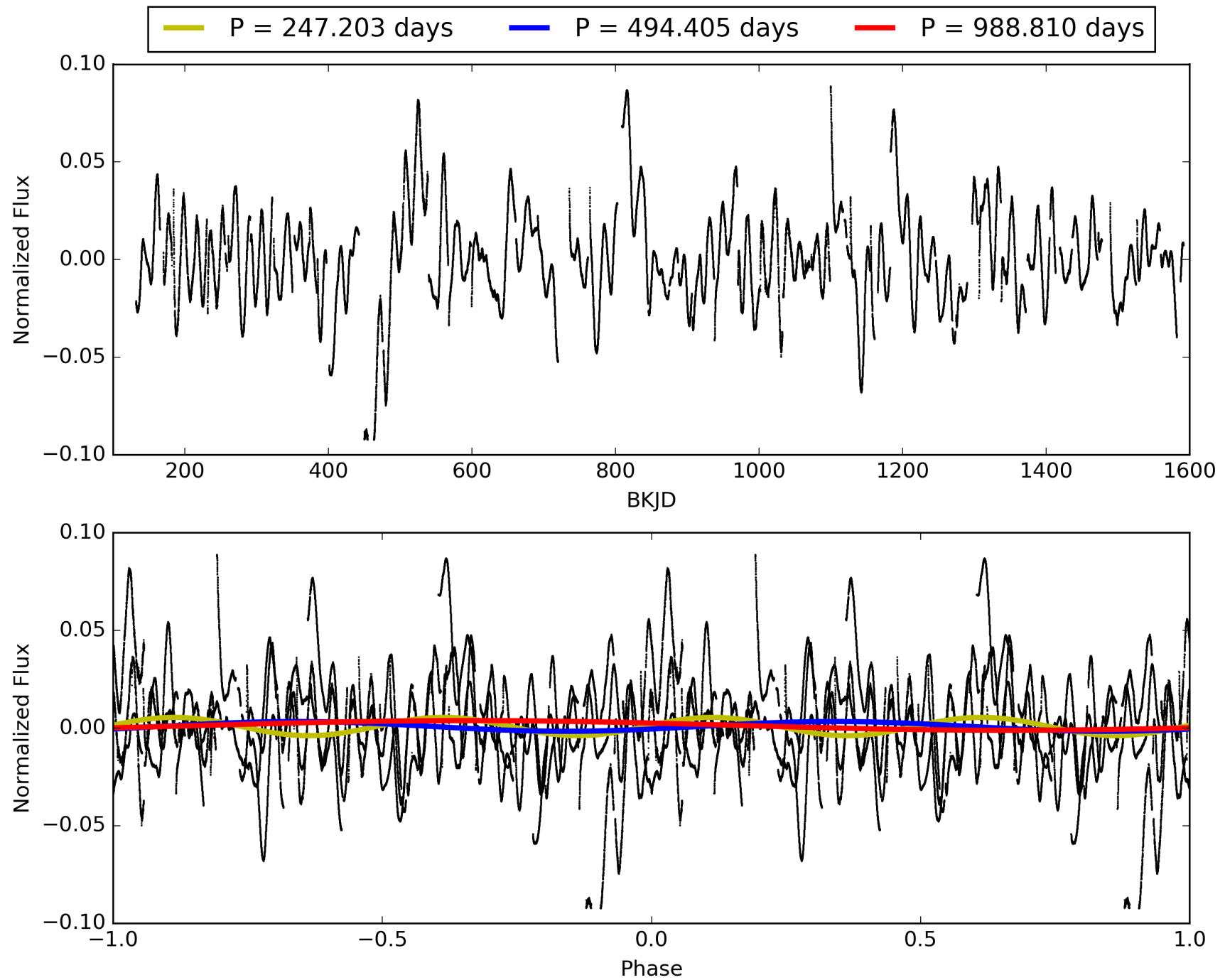
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 19:34:00 Z

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

TCE 004860890-02, PDC Light Curves

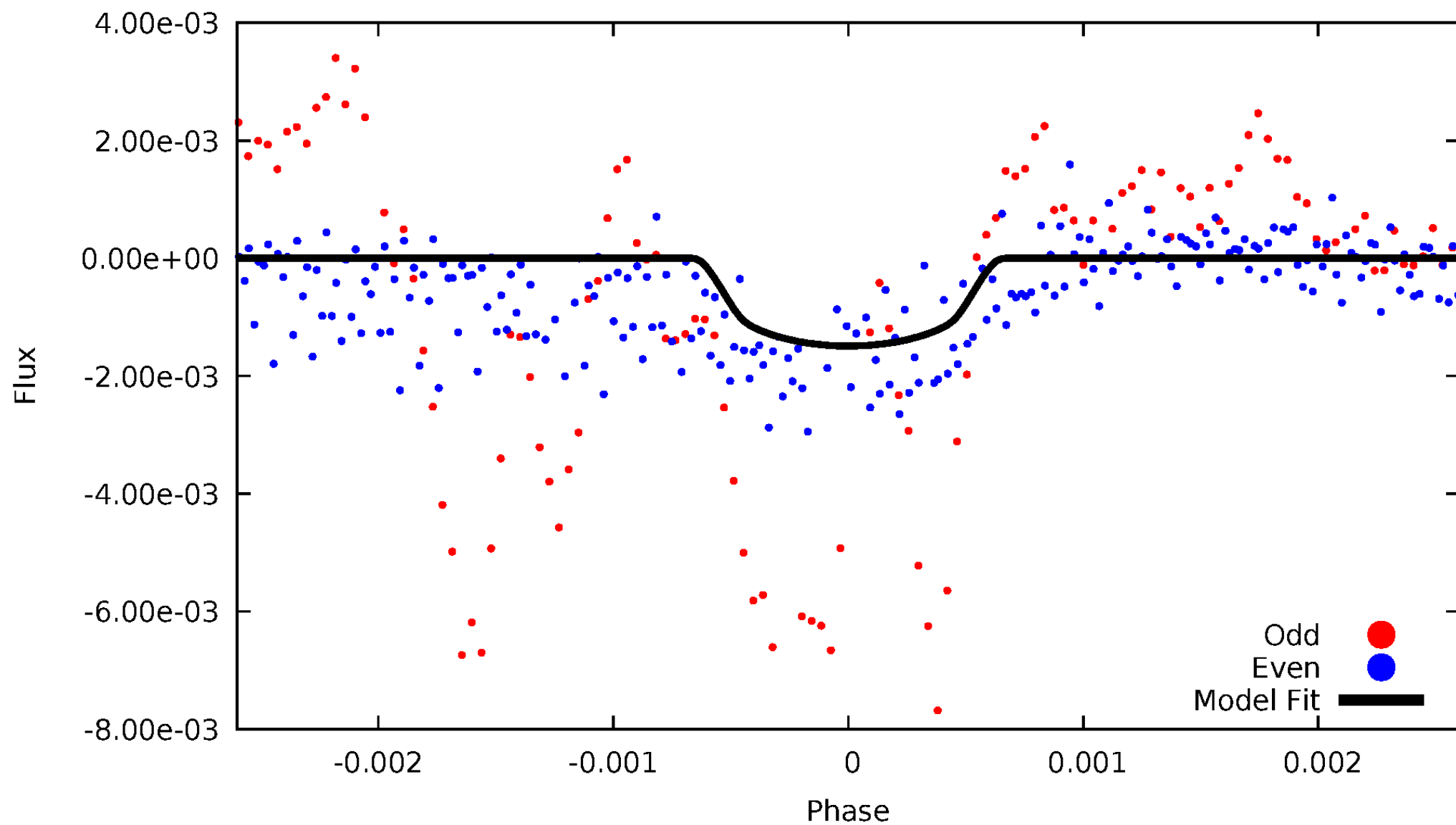


TCE 004860890-02



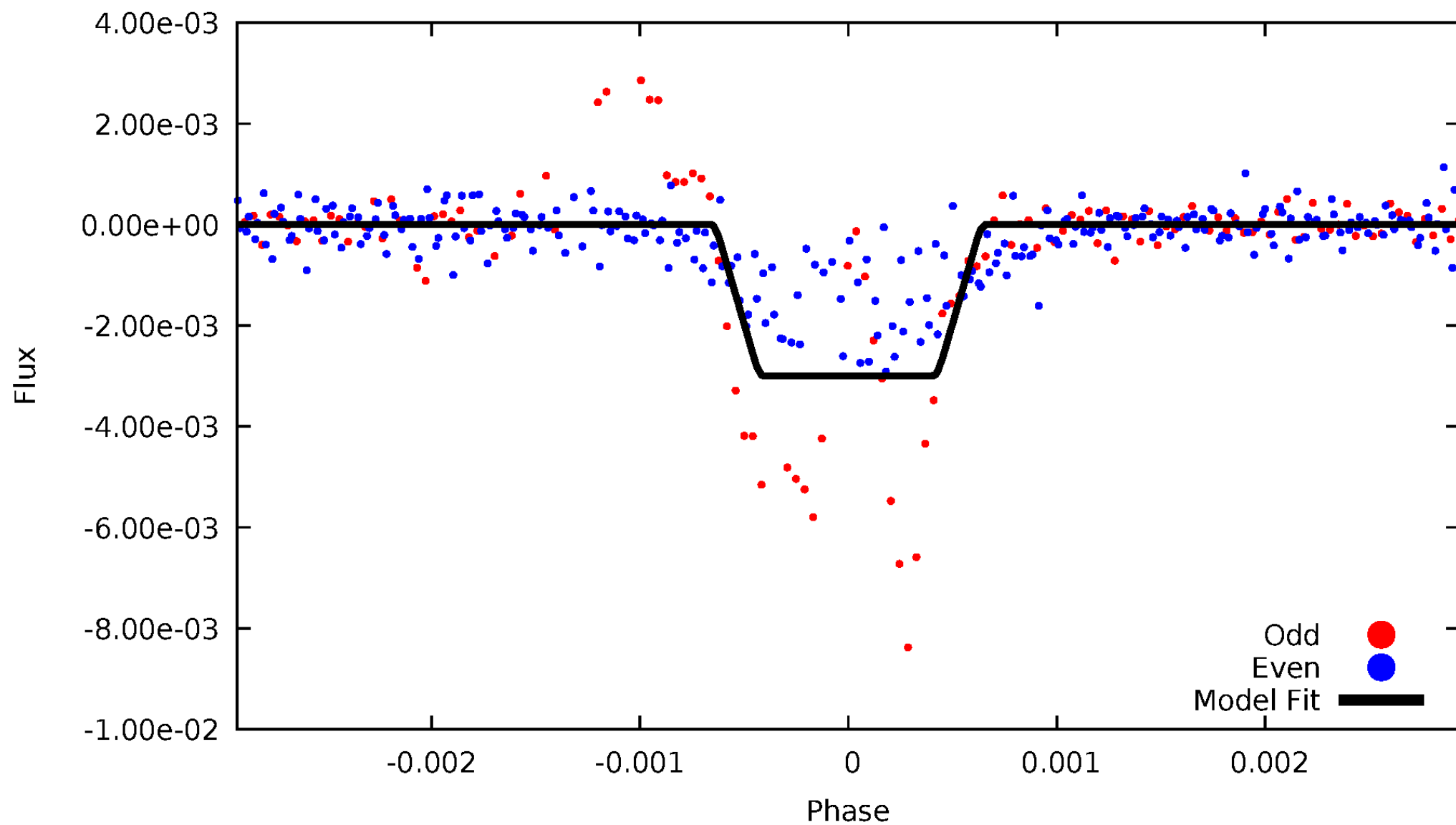
DV Odd/Even

TCE 004860890-02



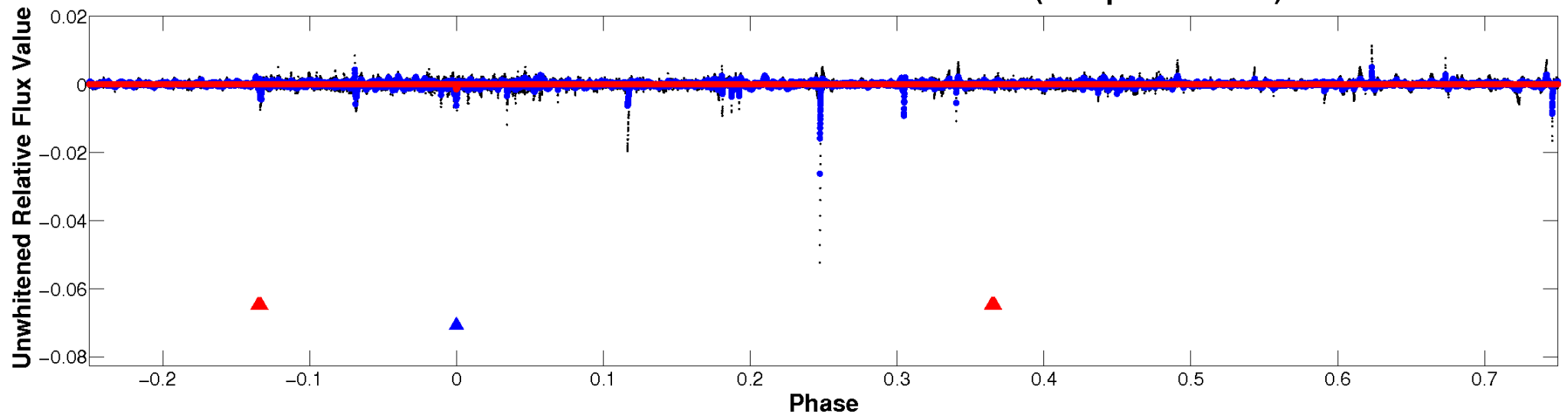
ALT Odd/Even

TCE 004860890-02

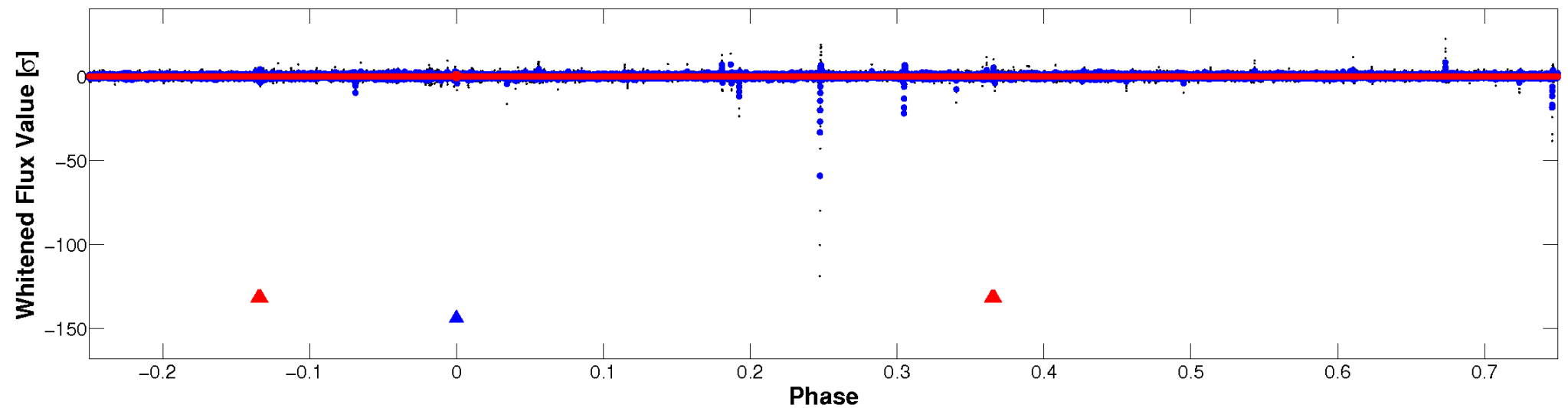


Non-Whitened Vs. Whitened Light Curve

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

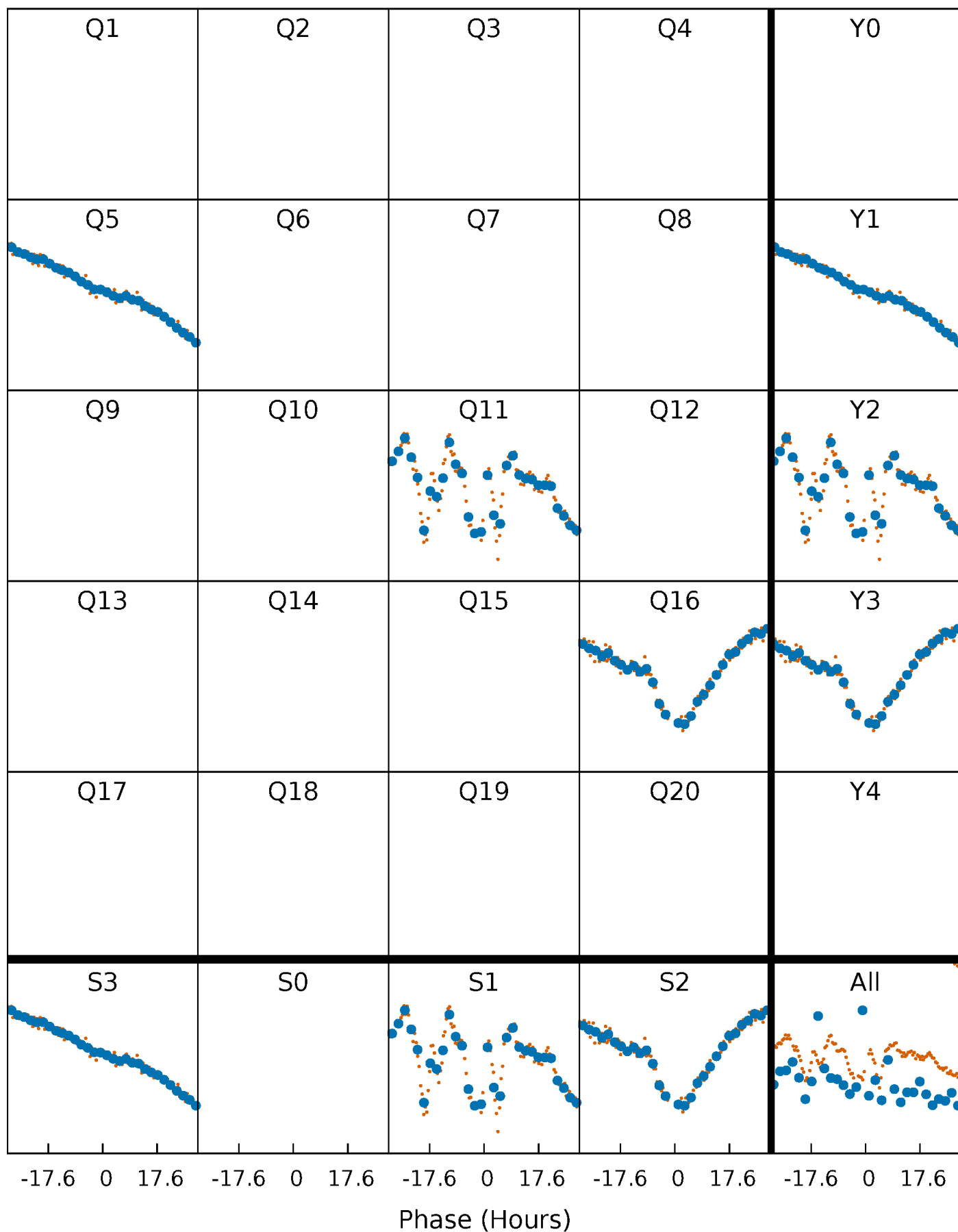


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



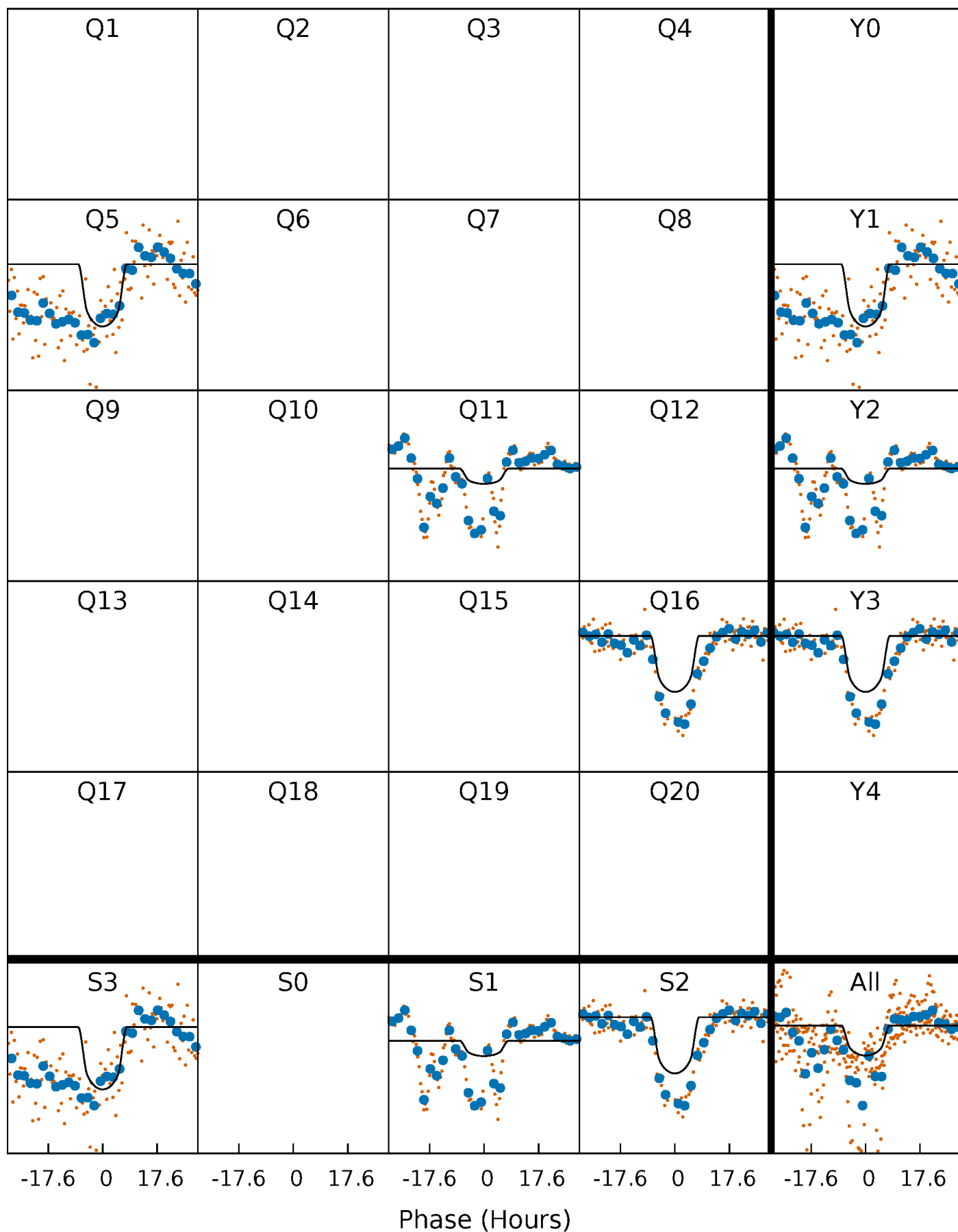
PDC Quarter-Phased Transit Curves

TCE 004860890-02 $P=494.405242$ Days $T_0=509.884977$ (BKJD)



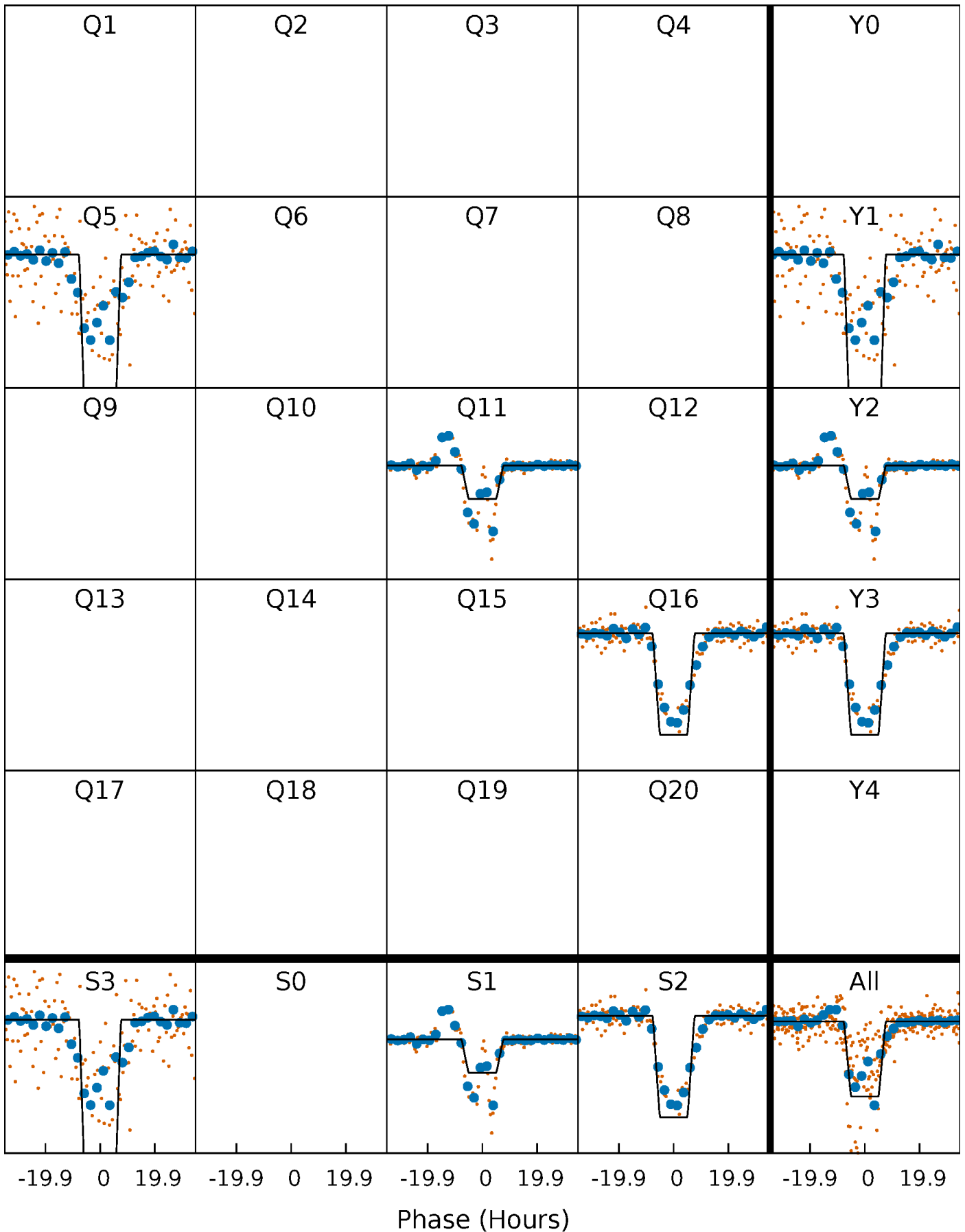
DV Quarter-Phased Transit Curves

TCE 004860890-02 $P=494.405242$ Days $T_0=509.884977$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

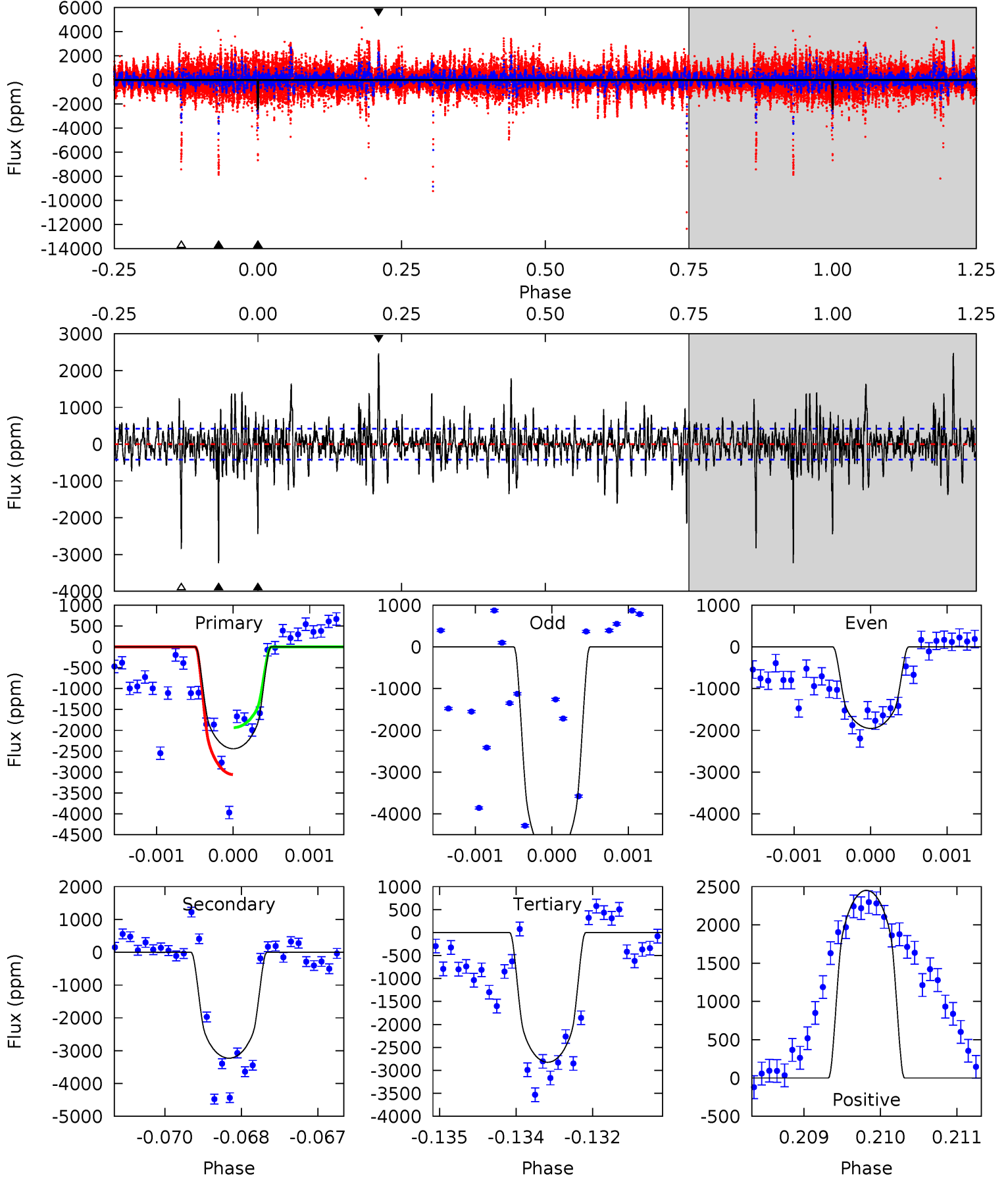
TCE 004860890-02 P=494.376362 Days $T_0=509.960525$ (BKJD)



DV Model-Shift Uniqueness Test

004860890-02, P = 494.405242 Days, E = 15.479735 Days

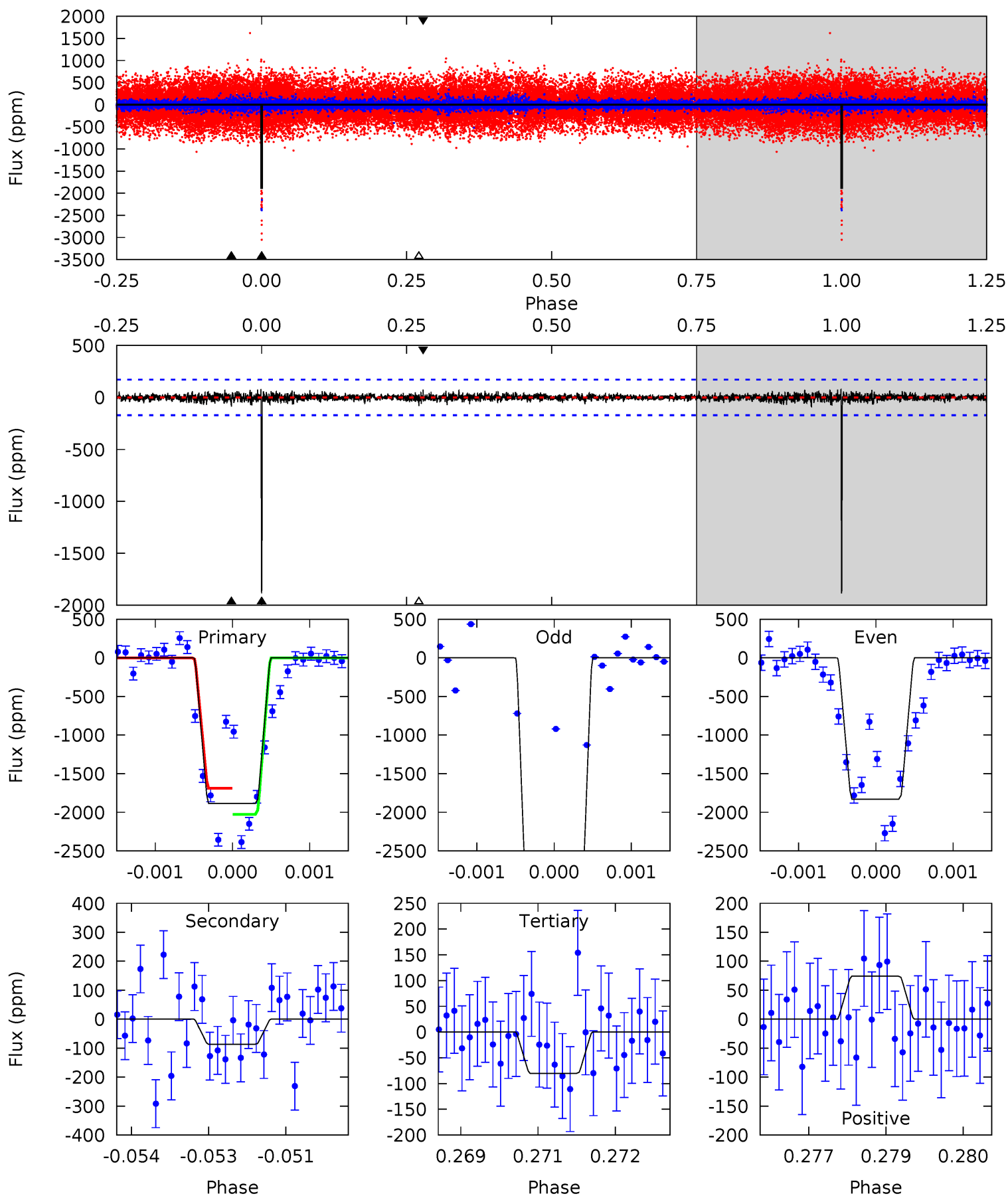
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.2	41.3	36.1	31.3	5.40	3.21	4.92	-4.89	-0.13	5.18	9.94	17.3	1.28	0.43	7.28



Alt Model-Shift Uniqueness Test

004860890-02, P = 494.376362 Days, E = 15.584163 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
59.7	2.74	2.54	2.35	5.40	3.21	0.54	57.2	57.3	0.20	0.39	43.5	1.09	0.04	5.37



Stellar Parameters For KIC 004860890

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3729^{+82}_{-74}	$0.889^{+0.270}_{-0.180}$	$0.000^{+0.250}_{-0.250}$	$75.693^{+15.526}_{-25.230}$	$1.617^{+0.126}_{-0.504}$	$0.000^{+0.000}_{-0.000}$
	+2%/-2%	+30%/-20%	+inf%/-inf%	+21%/-33%	+8%/-31%	+176%/-42%
Source	SPE14	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 004860890-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-3229 ± 78	$355.95^{+61.36}_{-71.94}$	1669^{+118}_{-145}	4084^{+168}_{-157}	29^{+13}_{-8}
Alt.	-86 ± 32	$443.25^{+71.58}_{-93.47}$	1666^{+112}_{-140}	2060^{+179}_{-378}	$0.483^{+0.285}_{-0.209}$

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

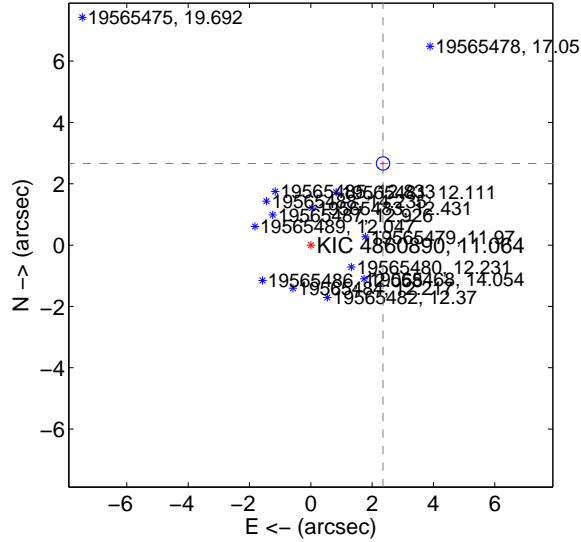
Supplemental centroid analysis for 004860890-02. **Kepler magnitude: 11.06.** Transit SNR 10.16

There are 0 quarters with good PRF difference image offsets

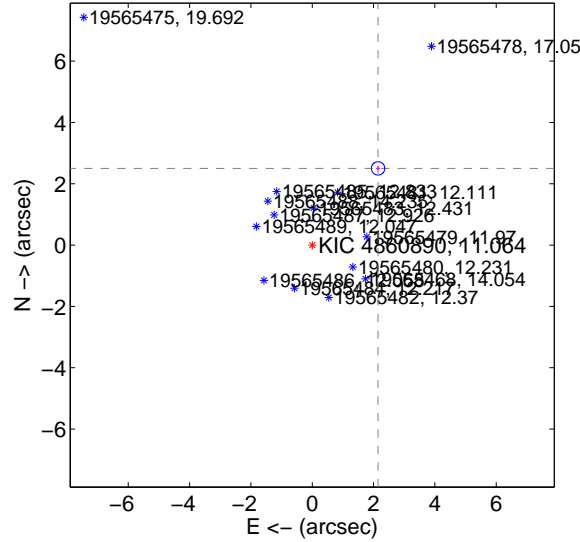
The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.555 \pm 0.073	48.97	-2.356 \pm 0.071	2.663 \pm 0.074
PRF-fit source offset from KIC position	3.296 \pm 0.073	45.37	-2.146 \pm 0.071	2.502 \pm 0.074
photometric centroid source offset	0.40 \pm 2.06	0.19	0.04 \pm 0.37	0.40 \pm 2.07

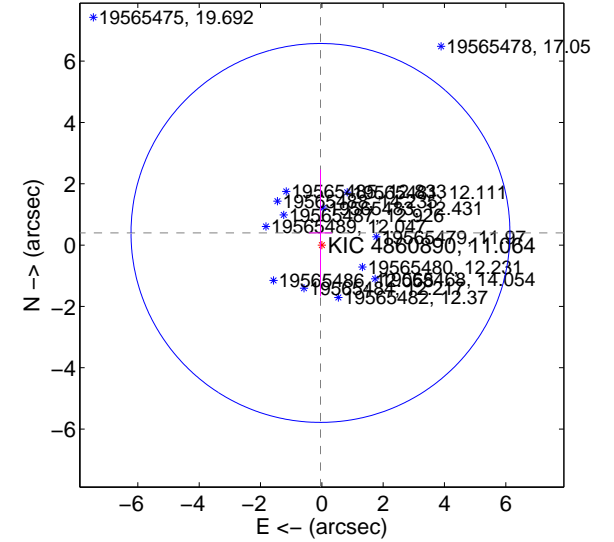
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

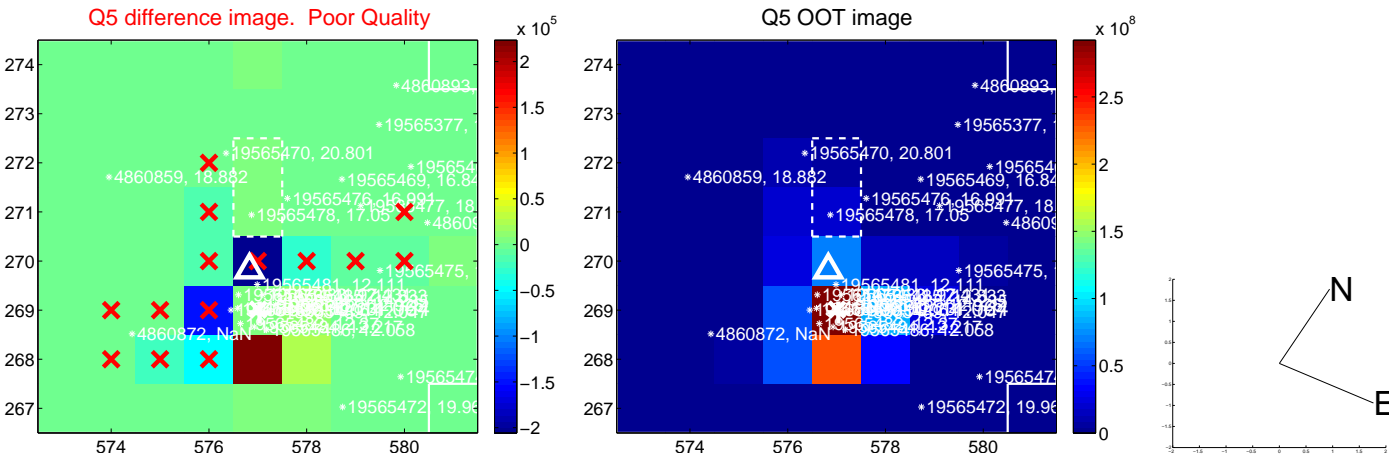


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

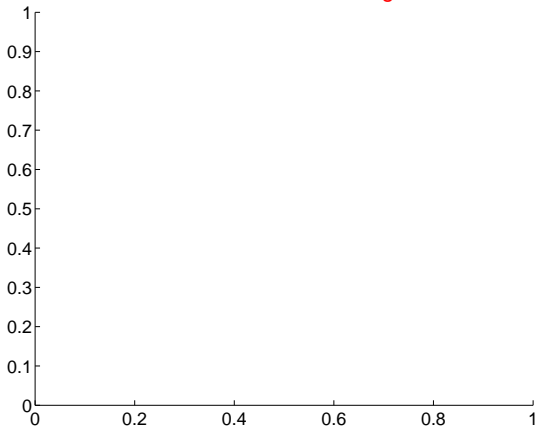


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

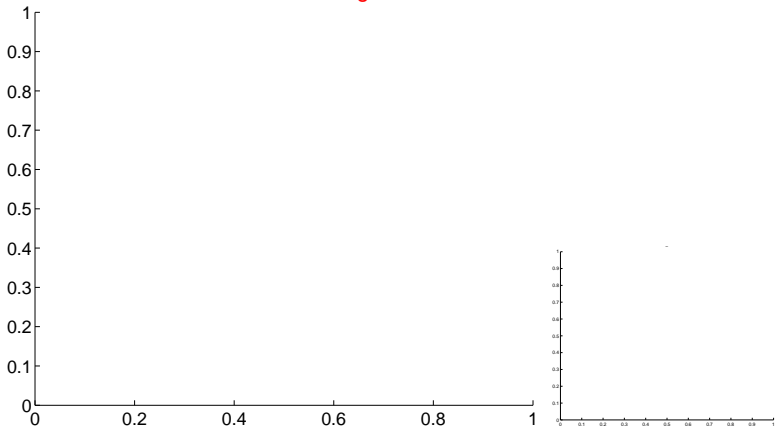


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

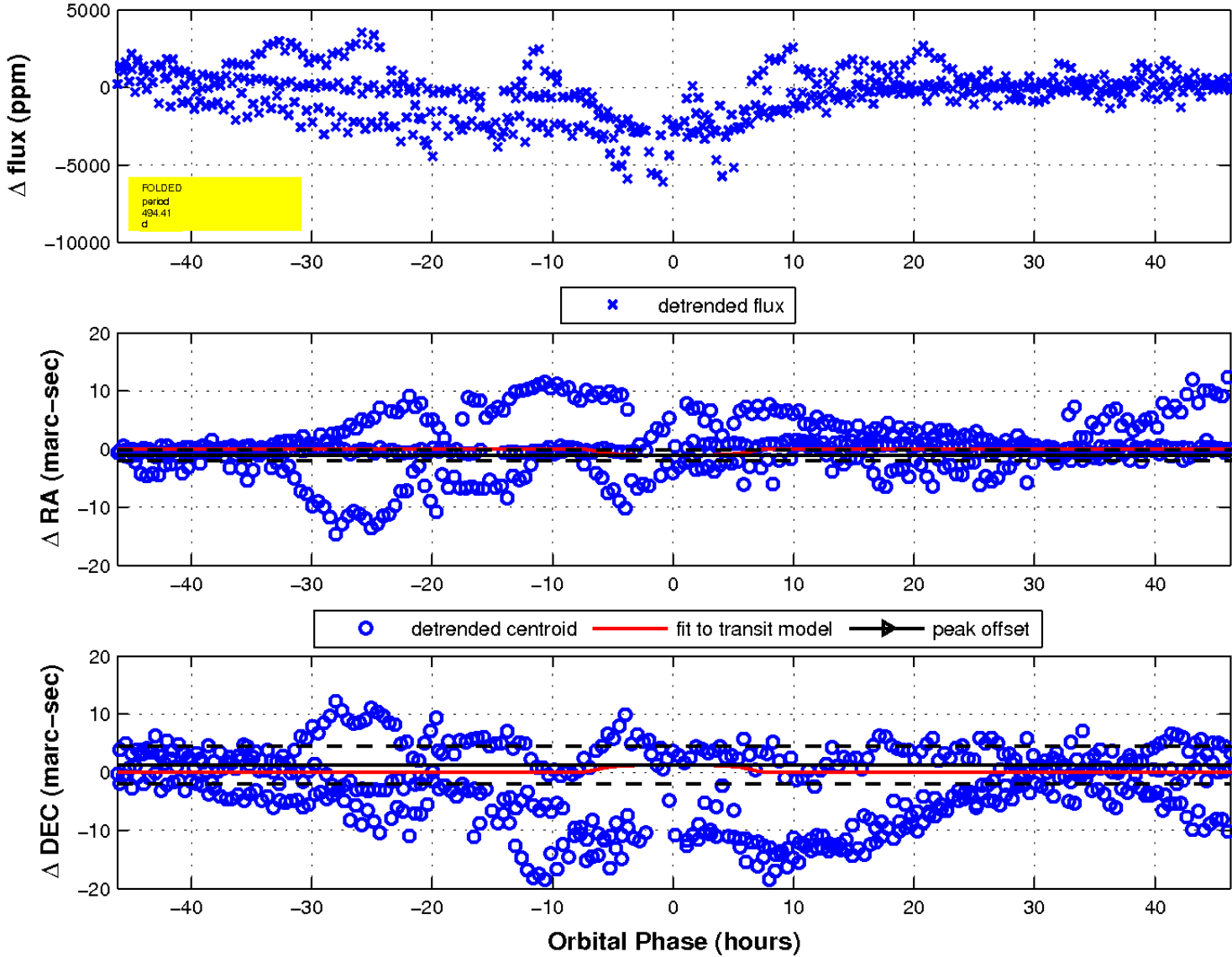
Q17 no difference image



Q17 no OOT image



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

